UNIVERSITY OF CALIFORNIA, SAN DIEGO

SAN DIEGO STATE UNIVERSITY

High Risk Behaviors Among Latino Adolescents Along the US/Mexico Border

A dissertation submitted in partial satisfaction of the requirements for the degree of Doctor of Philosophy

in

Public Health (Health Behavior)

by

Joshua Heber West

Committee in charge:

University of California, San Diego

Professor Christina Chambers
Professor Lisa Madlensky

San Diego State University

Professor Melbourne Hovell, Chair
Professor John Clapp
Professor Linda Hill
Professor Ming Ji

2008

UMI Number: 3315853

INFORMATION TO USERS

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleed-through, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

UMI®

The dissertation of Joshua Heber West is approved, and it is acceptable in quality and form for publication on microfilm:

_____

_____

_____

_____

_____

_____

Chair

University of California, San Diego

San Diego State University

2008

DEDICATION

I would like to dedicate this dissertation to my family. My dad, Dr. Richard P. West, provided me with emotional support and encouragement at very critical and timely points throughout the entire process. My children, Benny, Lydia, and Ryan were never a trouble or nuisance. They were never a distraction. Rather, I feel bad for the many nights they went to bed without their dad reading them a story. I'll always remember the precious moments when I prepared for work and then gave in to their requests for me to stay home 'a few minutes longer.' Lastly, I recognize my wife, Layne. Without her I would have regretfully abandoned this long ago. She is the single most important reason this document is complete.

EPIGRAPH

That which we persist in doing becomes easier for us to do; not that the nature of the thing itself has changed, but that our power to do has increased.

Ralph Waldo Emerson

TABLE OF CONTENTS

LIST OF TABLES AND GRAPH

ACKNOWLEDGEMENTS

I would like to acknowledge the help of my dissertation committee and dissertation chair, Dr. Mel Hovell. Mel was a great support, college and friend throughout the whole process. I would also like to thank the co-authors for their insights and recommendations. And lastly, I would like to acknowledge the entire FIESTA team for their efforts and assistance throughout the project, especially Norma Kelley. Without her help the entire dissertation process would have been more cumbersome.

VITA

Education:

Ph.D., University of California, San Diego/San Diego State University (Emphasis in Health Behavior), 2008

M.P.H., San Diego State University, Epidemiology, 2005

B.A., Utah State University, Psychology and Spanish, 2003 (National Dean's List)

Current Positions:

Assistant Professor, Department of Health Science, Brigham Young University

Professional Experience:

Project Coordinator, Project FIESTA, Center for Behavioral Epidemiology and Community Health, San Diego State University

Consultant, NP Strategies, San Diego, CA, 2007-2008

Research Associate, Center for Behavioral Epidemiology and Community Health, San Diego State University, 2003-2008

Behavior/Intervention Specialist, Center for the School of the Future, Utah State University, 2001-2003

Teaching Experience:

Course Instructor, Confronting AIDS, San Diego State University, 2006-2007

Teaching Assistant, Theoretical Foundations for Behavior Change, Graduate School of Public Health, San Diego State University, 2005-2008

Teaching Assistant, Motivating Health Behavior, Graduate School of Public Health, San Diego State University, 2003

Teaching Assistant, Analysis of Behavior, Psychology Department, Utah State University, 2001

ESL Instructor, River Heights Elementary, Cache School District, North Logan, UT, 2000-2002

Presentations:

Hill, L., Hovell, M., West, J., Blumberg, E., Kelley, N., Sipan, C., Salas, L., Friedman, L. (2008, November). *Missed Opportunities for Intervening With Adolescents During Office Visits.* Presentation at the annual conference of the American Public Health Association, San Diego, CA.

West, J., Blumberg, E., Hovell, M., Hill, L., Kelley, N., Sipan, C., Schmitz, K., Friedman, L. (2008, May). *A Comparison Between Parents' and Children's Reports of Parenting Practices*. Poster presentation at the 24th annual San Diego Epi Exchange, La Jolla, CA.

Blumberg, E., West, J., Hovell, M., Hill, L., Kelley, N., Sipan, C., Schmitz, K., Friedman,
L. (2008, May). *Correlates of Alcohol and Tobacco Use in Latino Adolescents*. Poster
presentation at the 24th annual San Diego Epi Exchange, La Jolla, CA.

West, J., Blumberg, E., Hovell, M., Hill, L., Kelley, N., Sipan, C., Schmitz, K., Friedman, L.
(2008, February). A *Comparison Between Parents' and Children's Reports of Parenting
Practices in Predicting Risk Behavior Among Latino Adolescents.* San Diego State
University Research Symposium, San Diego, CA.

Blumberg, E., West, J., Hovell, M., Hill, L., Kelley, N., Sipan, C., Schmitz, K., Friedman, L.
(2008, March). *Predictors of Alcohol and Tobacco Use in Latino Adolescents.* Annual
Meeting for the Society for Behavioral Medicine, San Diego, CA.

West, J., Blumberg, E., Hovell, M., Hill, L., Kelley, N., Sipan, C., Schmitz, K., Friedman, L.
(2008, March). *A Comparison Between Parents' and Children's Reports of Parenting
Practices.* Annual Meeting for the Society for Behavioral Medicine, San Diego, CA.

West, J. H., (2007, October). *Why do we behave this way?* San Diego State University, San Diego,
CA.

West, J. H., Chambers, C. D., Kao, K. K., Dick, L. M., Jones, K. L., Hovell, M. F. (2007, May).
Identifying Characteristics and the risk profile of pregnant women that binge-drink. San
Diego Epidemiology Research Exchange, University of California, San Diego.

Romero, R.A., Messer, K., West, J.H., Trinidad, D. R. (2007, May). *Smoking Trends in
California*. San Diego Epidemiology Research Exchange, University of California, San
Diego.

West, J., Blumberg, E., Sipan, C., Hill, L., Hovell, M., Kelley, N., Schmitz, K., Moser, K.,
Friedman, L., Kolody, B., Ji, M. (2007, May). *Examination of Reported Risk Behavior in
Latino Youth in the San Diego-Tijuana Border Region: An Ecological Analysis.* San
Diego Epi Exchange, University of California, San Diego.

West, J. H., Chambers, C. D., Kao, K. K., Dick, L. M., Jones, K. L., Hovell, M. F. (2007, April).
Examination of data from the California Teratogen Information Service. 25th Anniversary
Symposium, Graduate School of Public Health, San Diego State University, San Diego,
CA.

Sipan, C., West, J., Blumberg, E., Hill, L., Hovell, M., Kelley, N., Schmitz, K., Moser, K.,
Friedman, L., Kolody, B., Ji, M. (2007, April) *Trends of risk behaviors in Latino Youth in
the San Diego-Tijuana Border Region.* 25th Anniversary Symposium, Graduate School
of Public Health, San Diego State University, San Diego, CA, April 2007.

West, J. H., Romero, R. A., Trinidad D. R. (2007, February). *Adolescent receptivity to Tobacco
advertising across race/ethnicity in California*. Annual conference, Society for Research
on Nicotine and Tobacco. Austin, TX.

Romero, R.A., Messer, K., West, J. H., Trinidad, D. R. (2007, February). *Smoking Trends Among
Filipino Americans in California*. Annual conference, Society for Research on Nicotine
and Tobacco. Austin, TX.

West, R. P., West, J. H. (2007, February). *School Indicators of Behavior Support and Their
Relationship to Safety and Academic Achievement*. 15th Annual conference, Western

Regional Conference of the California Association for Behavior Analysis, San Francisco, CA.

West, J. H., Romero, R. A., Trinidad D. R. (2007, January). *Adolescent receptivity to Tobacco advertising by smoking status.* Annual All-Grad Symposium, University of California, San Diego. San Diego, CA.

Romero, R. A., Messer, K., West, J. H., Trinidad, D. R. (2006, October). *Asian-Pacific Islander smoking Trends in California.* Annual All Grad Symposium, University of California, San Diego. San Diego, CA.

West, J. H., Trinidad, D., Pierce, J. P., White, M. (2006, April). *Adolescent receptivity to Tobacco advertising*. Annual San Diego Epidemiology Research Exchange, University of California, San Diego. San Diego, CA.

West, R. P., Sanders, R., West, J. H. (2005, February). *Solving School-wide Problems*. 13th Annual Meeting, Western Regional Conference of the California Association for Behavior Analysis, Dana Point, CA.

West, J. H., Sanders, R., Christensen, C. J. (2003, February). *Activity Anorexia*. 11th Annual Meeting, Western Regional Conference of the California Association for Behavior Analysis, Newport Beach, CA.

Book Chapters:

West, R. P., West, J. H. (2005). *Task analysis*. In G. Sugai & R. H. Horner (Eds.), Encyclopedia of behavior modification and cognitive behavior therapy, Volume 3, Educational Applications (M. Hersen, series editor). Thousand Oaks, CA: Sage Publications, pp. 1561-1565.

Publications:

West, J. H., Romero, R. A., Trinidad, D. R. (2007). Adolescent receptivity to tobacco advertising across race/ethnicity in California. *American Journal of Preventive Medicine*, 33 (2).

Romero, R. A., West, J. H., Trinidad, D. R. (2008). Smoking trends among Filipino Americans in California. *American Journal of Preventive Medicine*, 46(4).

Hill, L., Blumberg, E., Hovell, M., West, J., Kelley, N., Sipan, C., Schmitz, K., Friedman, L. Multi-level barriers to LTBI treatment: A research note. Submitted for review at *Archives of Disease in Childhood*.

West, J., Blumberg, E., Kelley, N., Hovell, M., Hill, L., Sipan, C., Schmitz, K., Chambers, C., Friedman, L. *Correlates of Alcohol and Tobacco Use in Latino Adolescents* (Manuscript under review).

West, J., Blumberg, E., Kelley, N., Hill, L., Sipan, C., Schmitz, K., Madlensky, L., Hovell, M. Discrepancies in Latino parenting practices and the association with gateway drug use. (Manuscript under review).

West, J., Blumberg, E., Kelley, N., Hill, L., Sipan, C., Schmitz, K., Kolody, B., Clapp, J., Hovell, M. An exploratory ecological analysis of retailer dispersion and gateway drug use among latino adolescents. (Manuscript under review).

Blumberg, E., Kelley, N., West, J., Hovell, M., Hill, L., Sipan, C., Schmitz, K., Kolody, B., Chambers, C., Friedman, L. *Factors Related to a Positive Skin Test.* (Manuscript in progress).

Dearden, K., Penny, M., West, J., Madanat, H., Escobal, J. *Paternal Absence and the Association With Child Development*. (Manuscript in progress).

Madanat, H., Penny, M., Cueto, S., West, J., Crookston, B., Dearden, K. *Determinants of Nutritional Status*. (Manuscript in progress).

West, J. H., Chambers, C. D., Kao, K. K., Dick, L. M., Jones, K. L., Hovell, M. F. *Identifying Characteristics and the risk profile of pregnant women that binge-drink.* (Manuscript in progress, targeted submission December, 2008).

Thesis:

West, J. H., Ji, M., Hovell, M., Dozier, D. (2005). *The effectiveness of the truth campaign on changing adolescents' attitudes, beliefs and intentions about smoking.* Thesis, San Diego State University.

Research Support:

Fred H. Bixby Scholar, 2006-2008

Graduate Fellowship, San Diego State University, 2006-2007

R01 HL068595-03S1 Hovell (PI) 09/03 - 08/08

NIH/NHLBI

Promoting Adherence to TB Regimens in High-Risk Youth

The purpose of this clinical trial is to investigate methods to increase adolescent adherence to INH medication for treatment of LTBI in high-risk adolescents.

Role: Project Coordinator, Intervention Coordinator, and Counseling Supervisor

Education award, VISTA. 2001

Honors:

New Investigator Award, Society for Research on Nicotine and Tobacco, sponsored by *GlaxoSmithKline* and the *National Cancer Institute*, 2007

Member of National Dean's List, 2002

Utah State University Dean's List, 2001

Academic Internships:

Laboratory research using animal subjects, Activity Anorexia, Utah State University, 2001

Research internship with Psychology Department (Dr. Carl Cheney), Utah State University, 2000

Internship with Alpine Orthopedics, National Student Athlete Testing (NSAT), Specialty Hospital, Logan, UT, 2000

Service and Associations:

Translator, Emergency Room, Intermountain Health Care, Logan, UT, 2000-2003

Vista Volunteer, Center for the School of the Future (CSF), Utah State University, Logan, UT, 2002-2003

Humanitarian Volunteer, Guatemala City, Guatemala, 1998-2000

Society for Behavioral Medicine

Society for Research on Nicotine and Tobacco

Student Advocates for Behavioral Sciences (SABS)

Association for Behavior Analysis

California Association for Behavior Analysis

ABSTRACT OF THE DISSERTATION

High Risk Behaviors Among Latino Adolescents Along the US/Mexico Border

by

Joshua Heber West

Doctor of Philosophy in Public Health (Health Behavior)

University of California, San Diego, 2008

San Diego State University, 2008

Professor Melbourne Hovell, Chair

Use of alcohol, tobacco, and marijuana continues to be a serious problem among Latino adolescents. These behaviors contribute to increased short-term risk (e.g., accidents) and long-term health problems (e.g., lung cancer). Health behavior constructs may be significant correlates of substance use. The purpose of these studies was to identify theoretical constructs prominent in the Behavioral Ecological Model and test their association with substance use. Data for these studies come from a sample of Latino adolescents living along the US/Mexico border that tested positive for latent tuberculosis infection. Chapter 2 presents a study separately testing a multivariate model and its association with alcohol and tobacco use. Peer modeling emerged as significant for both alcohol and tobacco use, but parental consistency was only associated with alcohol use. This finding indicates a potential difference in the uptake of these two substances, and suggests a potential point of intervention for future studies. The independent variable for chapter 3 was gateway drug use (alcohol, tobacco, and marijuana). Chapter 3 includes a comparison between parent-adolescent dyad perceptions of parents' parenting practices. Only variables reported by adolescents were significantly related to gateway drug use. The discrepancies in predictive value between

parent and adolescent reports represent a new finding among Latinos and imply a need for higher quality measures of parenting practices. Chapter 4 includes an exploratory study of the built environment and its association with gateway drug use, while controlling for potential confounding variables. This study involved the use of geocoded participant addresses and their proximity to alcohol and tobacco retailers. Results from this study suggest possible gender differences related to use of gateway drugs in neighborhoods determined as high-risk. Female rates of gateway drug use were lowest in areas closest to retailers. Such areas demonstrated less favorable demographic characteristics. Future studies should explore the possibility of differential gender-related influences (e.g., parents are more controlling of girls vs. boys in high risk areas) that may impact use of alcohol, tobacco, or marijuana. Together these studies extend our current understanding of risk factors and correlates of substance use among Latino adolescents living along the US/Mexico border.

CHAPTER 1

INTRODUCTION

INTRODUCTION

Adolescence is a developmental period often characterized by exploration with high-risk behaviors (Simantov, Schoen, & Klein, 2000). Beyond creating immediate risks, alcohol, tobacco and drug use during adolescence can increase risk for long-term harm (Hawkins, Catalano, & Miller, 1992; Park et al., 2000; Power, 1997). Compared to other ethnic groups, Hispanic adolescents are among the most at risk for alcohol and tobacco use, and many of the resulting long-term health outcomes (Kandel, Kiros, Schaffran, & Hu, 2004; Leichter, 2004).

Alcohol, Tobacco and Marijuana Use

During the later part of the 1990s and into the first half of the current decade we have witnessed substantial reductions in the proportion of daily smokers among adolescents in the US. But according to a recent report by the Monitoring the Future survey, this trend is beginning to slow (Johnston, O'Malley, Bachman, & Schulenberg, 2006). Despite an overall decrease in tobacco use among adolescents in the United States, in 2005 over half of adolescents (54.3%) reported lifetime experimentation with smoking (Centers for Disease Control & Prevention [CDC], 2006). Hispanic adolescents reported higher rates (57.1%) than non-Hispanic Whites (54%) and African Americans (54.7%) (CDC, 2006).

Among adolescents, use of alcohol is more common than tobacco. This is true for all major ethnic groups. Hispanics have the highest rates of lifetime alcohol use (79.4%); rates among African Americans are lowest, and then non-Hispanic Whites (69% and 5.3%, respectively). Racial/ethnic trends of marijuana use are similar to those for alcohol. Lifetime use of marijuana is highest for Hispanic adolescents (42.6% vs. 40.7% African Americans, 38.0% non-Hispanic Whites) (CDC, 2006).

In California, the most populous state in the US, ethnic minorities surpassed whites as the majority population in 2000 (Hobbs & Stoops, 2000). Increasing numbers of Latinos largely fueled this shift. Given the tremendous growth of this population there is a need for continued assessment of risk behaviors. Yet, research has been slow to adopt measurement and methodologies that are specific to the Latino population (Flores et al., 2002), and still fewer have studied risk behaviors in Latino youth living in close proximity to an international border. Previous research has shown heightened rates of risk behaviors in border cities (Maxwell & Wallisch, 1998; McKinnon, O'Rourke, Thompson, & Berumen, 2004).

Risk Factors

Adapting from a landmark publication by Hawkins, Catalano and Miller (1992), the principal influences in an adolescent's life, which may increase or decrease substance use, fall into three domains: family influences, school influences, and peer influences, with an additional dimension encumbering demographic related characteristics. These domains will be addressed in papers 1 and 2. Although these four domains are the most prominent in the literature, recent technology has introduced the possibility to expand and include an emerging area of influence, the built environment. Variables from the built environment are included in paper 3.

Demographics

Previous studies reveal several significant demographic predictors of alcohol and tobacco use in adolescents. Among these are age (Elder et al., 2000), acculturation (Kaplan, Napoles-Springer, Stewart, & Perez-Stable, 2001; Landrine, Richardson, Klonoff, & Flay, 1994), poverty (Georgiades, Boyle, Duku, & Racine, 2006), and family structure (Godley, Kahn, Dennis, Godley, & Funk, 2005; Wu, Lu, Sterling, & Weisner, 2004).

Parental Influences

Parenting, i.e., parenting practices, represents an area of significant influence in the area of adolescent risk behavior prevention (Patterson, DeBaryshee, & Ramsey, 1989; Patterson, Reid, & Dishion, 1992; Walker, Colvin, & Ramsey, 1995). Parenting practices have been estimated to account for as much as 40% of the variance in children's risk behaviors (Patterson et al., 1989; Tolan & McKay, 1996; Walker et al., 1995).

In the early years of a child's life, parents are the primary administrators of punishing and reinforcing stimuli in the child's immediate environment, save the most basic biological contingencies (e.g., putting hand on hot burner and subsequently getting burned). Administering contingent consequences can be a difficult job that requires surprising precision. Some of the common errors in parenting practices include inconsistent and poor timing of reinforcement and inappropriate timing and type of punishment (Kauffman, 2000; Reid & Eddy, 1997; Wierson & Forehand, 1994). With the development of language, parents rely heavily on verbal stimuli to communicate contingencies to the child (e.g., do x and you will get y). This added component is an additional source of error in parenting practices. For example, the promise

of a reward is very enticing, and the behavioral outcome is very desirable to parents. Such outcomes probably maintain the practice in parents. Nevertheless, after repeated errors (e.g., forgot to deliver consequence or did so too late) the child quickly discriminates that the parent is "all talk". Employing contingency management procedures imprecisely can lead to difficulties in child behavior and a developmental trend that potentially escalates problem behavior. When used appropriately, however, these strategies can establish pro-social skills and support children to, for example, avoid alcohol, tobacco and other drugs (ATOD) (Meschke, Bartholomae, & Zentall, 2002).

Parents of children who are non-compliant often demonstrate poor contingency management, including inconsistent discipline and poor monitoring (Kauffman, 2000; Reid & Eddy, 1997; Wierson & Forehand, 1994). Parent reactions to child behavior, often in the form of reactive parenting, can shape anti-social or undesirable practices (Patterson & Cobb, 1971; Patterson, Chamberlain, & Reid, 1982). Imprecise contingency management can lead to difficulties in behavior and a developmental trend that can escalate problem behavior (Patterson, & Yoerger, 1997).

In cases of deteriorating parent-child relationship, adolescents who are further along the risk continuum may be more susceptible to peer influences to initiate risk practices (Simons-Morton, 2002). This parallels the concept of motivating operations (MO), one that is highlighted in the applied behavior analysis literature. One of the pioneering figures in the field, Jack Michael, defines the concept as an environmental event, operation, or stimulus condition that affects behavior by altering the magnitude or direction of effect for contingent consequences (e.g. reinforcing or punishing contingencies) (Laraway, Snycerski, Michael, & Poling, 2003). Operationally in this context, in the teenage years adolescents are exposed to stimuli that enhance the reinforcing effect of peers. The contrary is also true: there is a tendency for parents' reinforcing effect to diminish during these critical years. One possible antidote is for parents to increase positive involvement in their child's life so they can differentially change the frequencies of certain behaviors as a function of the value of the contingent punishing or reinforcing stimuli they deliver. To the extent to which they can do this, they may be able to buffer environmental influences that increase risk for certain risk behaviors (Sargent et al., 2001; Valois, Dunham, Jackson, & Waller, 1999). In children

as young as middle school, where reported alcohol rates exceed 50%, tobacco 20% and marijuana 12%, parental influence has at least been shown to reduce risks for alcohol use (Beal, Ausiello, & Perrin, 2001).

Much of the research in parenting and parenting practices has involved an assessment of the parent's behavior as reported by their children (Pelegrina, Garcia-Linares, & Casanova, 2003; Schaefer, 1965) and is usually collected through interviews and questionnaires. Such practices and measures have high face validity, but they have inherent weaknesses, as they are generally limited to self-report. Interviews and questionnaires are not ideal measures, no matter whether it is the child or the parent that responds. Alternatives to self-report measures may include direct observation, either in person or with the use of video equipment. In light of the additional expense of direct observation, select few researchers have expanded their research to include responses from both the parent and the child. The justification for this approach derives from the notion that effects of parenting practices should be centered on the children's own perspectives. Nevertheless, recent details have emerged about a learning or socialization process in which parents and children have reciprocal behavioral influences, i.e., parents influence kid's behavior, and kids also influence parent's behavior (Pelegrina et al., 2003; Stice & Barrera, 1995). From this perspective, an assessment of the parents' practices from their own point of view and that of their children may be warranted (Pelegrina et al., 2003). A more complete understanding of parental influence must be preceded by an increased understanding of the discrepancies between parents' and children's reports of parenting behaviors (Tein, Roosa, & Michaels, 1994).

Consistent with this perspective, recent studies have shown that discrepancies in perceptions between adolescents and their parents may be negatively related to adolescent adjustment (e.g., self-esteem), including increased levels of conflict and stress within the family resulting in a myriad of problem behaviors (Ohannessian, Lerner, Lerner, & Von Eye, 2000). The limited number of studies comparing parents' and children's reports of parenting behaviors reveal that parents frequently overestimate their involvement, especially in monitoring and discipline (Cottrell et al., 2003; Gonzales, Cauce, & Mason, 1996).

School Influences

Involvement in school can encompass several areas including regular attendance, academic achievement and academic clubs, sports, and other extracurricular activities. School-level variables can influence both smoking and drinking behaviors (Kim & McCarthy, 2006). Engagement in any of these school activities is negatively associated with initiating alcohol use (Simons-Morton, 2004). In general, being more active in school has been associated with an attenuated probability for participation in risky behaviors (Nelson & Gordon-Larsen, 2006). School performance has been shown to be negatively associated with smoking initiation among non-Hispanic whites and Hispanics (Kandel et al., 2004).

Peer Influences

Around the onset of puberty, peer influence becomes more salient and powerful, both because of modeling effects and peer reinforcement (Gothard, 2005). For example, having at least one smoking peer greatly increases risk for smoking initiation and progression to daily smoking (Kandel et al., 2004). The modeling mechanism involves behavioral cues, then consumption (presumed to occur) that is then reinforced by norms and behaviors of members within the peer community (Hawkins et al., 1992). This sequence of events (model-behavior-reinforcement) is referred to as a contingency.

Contingencies employed by parents sometimes compete directly with contingencies in the social or peer network (e.g., parent states you will be grounded if you return home after curfew but peers invite you to stay out late, and apply pressure to do so). The complex relationship between these competing contingencies is further compounded by the concept of MO discussed previously. At given times during adolescence peer contingencies (in direct competition w/the parent contingency) may have enhanced reinforcing effects.

Health Behavior Theories

Health behavior as a field is relatively new. Numerous theories and models have emerged during its short existence, each employing unique vocabulary to emphasize key features. Nevertheless, the most prominent health behavior theories and models have all demonstrated a propensity for highlighting such constructs as attitudes, intentions, and beliefs. This stems mostly from presumptions that internal constructs mediate behavior. Perhaps one of the most well-known health behavior theories is Albert Bandura's Social

Cognitive Theory (SCT) (Bandura, 1977). SCT stems from a larger theory called social learning theory (SLT) that has its roots in operant psychology. Both theories, SCT and operant psychology, profess that consequences such as rewards and punishment affect the likelihood that similar behaviors will occur again. One of the stark differences between these two theories is the locus of control. Operant psychology puts the locus of control in the environment and SCT focuses on internal intermediary causes for behavior, things like attitudes and emotions. The principal construct in SCT is *self-efficacy*. This construct is believed to portray one's confidence for performing a given behavior, i.e., self-assessment about perceived abilities. This cognitive construct is usually measured via self-report.

Pieters (1988) suggested that most theorists support the notion that people can access their internal states (e.g., attitudes, intentions, and beliefs), and that there is a relationship between these internal states and behavior. The prediction of behavior from attitudes has been studied extensively. Ajzen and Fishbein (1975) stated that attitudes predict and explain behavior. This belief led them to develop the Theory of Reasoned Action (RA). The RA is an explanation of the relationship between attitudes, defined as behavioral intentions, and behaviors. A person's behavior is a function of attitudes, intentions, and beliefs. This point of view is heavily supported in social psychology, but greatly contested by theorists in behavioral psychology (based in operant psychology).

Lloyd (1994) contended that attitudes and behavior share, at best, a small correlation. He states there is little evidence of a relationship between reported attitudes and observable behavior. Harrison, Mullen and Green (1992) demonstrated almost no relationship between beliefs and behavior in value-expectancy models; except for cross-sectional designs and only when important factors are not controlled. They found positive relationships between beliefs and health behaviors, but the relationship was relatively weak. Furthermore, Lloyd (1994) reported that attitudes are weak behavioral predictors. However, the dynamics of the relationship are enhanced when the order is reversed; when behaviors are considered as predictors of attitudes. Paniagua (1990) called the verbal-nonverbal relationship correspondence. Correspondences, he argues, can be developed so that the verbal (reported attitudes, intentions, etc) correspond reliably with the non-verbal (behavior). Wilson, Rusch and Lee (1992) also reported an increase in correspondence between verbal-nonverbal behaviors.

Given the difficulty of assessing attitudes, and the precarious correlation with behavior, other theories have emerged that remove the focus on intermediary constructs and place it on environmental variables and observable behavior. The most prominent among these is operant theory (Skinner, 1953). In operant theory subjects operate on their environment and consequences result. Such contingencies alter the future probabilities of that same behavior occurring. Operant theory employs a parsimonious approach in exclusively focusing on observable variables. An obvious advantage of observable variables is the ability to measure them while simultaneously measuring changes in behavior, thereby establishing temporal order. This eliminates capricious assumptions involving intervening variables so prevalent in other health behavior theories.

<center>A Behavioral Ecological Model of Substance Use</center>

The Behavior Ecological Model (BEM) (Hovell, Wahlgren, & Gehrman, 2002), a model that explains behavior in terms of antecedents and consequences is based on environmental determinants of behavior. It extends the logic of contingent relationships to cultural influences and population behavior. Antecedents gain their effectiveness to control behavior as they are tied to consequences. The BEM does not rule out mediating variables conceptually. However, it does ignore them due to inability to validate the concepts or their operational measures. The model also explicitly assumes that ignoring cognitive model variables does not compromise prediction or control of behavior. In actuality, such contingencies are not limited to just one individual. As a result, the BEM claims that antecedent, response, and consequence contingencies are in effect in populations and cultures.

The value of the BEM is its application of behavioral principles to populations, including a focus on metacontingencies formed from social and cultural interactions sometimes omitted in traditional operant models. As it pertains to adolescent substance use, the BEM enhances prediction of the environment's role in with features such as social norms and standards through behavioral cues.

Some consequences are visible to external observers, yet others may occur within the individual e.g., drug high. Peer interactions are ideal venues for reinforcement to occur, often in the form of praise with others present. Peer praise will likely increase future use. Biologic responses (euphoria) that occur simultaneously may be synergistic and establish behavioral patterns that are difficult to discontinue, and

once established, can persist absent peer praise. Density of modeling and peer reinforcement are important determinants of behavioral persistence.

Behavioral cues necessarily precede behavior, and can therefore be regarded as antecedents. Their occurrence in the everyday built and social environment is almost continuous. The ability to attend to them (i.e., strength of the antecedent) as stated previously, is related to the consequences that follow the behavior being prompted. Antecedents tend to be of two varieties, grossly defined as *distal* or *proximal*. In truth these are two points on a continuum, but they represent the temporal relationship with the behavior and ensuing consequence. Peer antecedents reliably predict substance use behaviors, because they are conceptually very proximal (e.g., a good friend invites you to smoke). Distal antecedents by definition are more general. Alcohol advertisements exemplify such antecedents.

REFERENCES

Ajzen, I., & Fishbein, M. (1975). *Belief, attitude, intention and behavior: an introduction to theory and research.* Reading, MA: Addision-Wesley.

Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice-Hall.

Beal, A. C., Ausiello, J., & Perrin, J. M. (2001). Social influences on health-risk behaviors among minority middle school students. *Journal of Adolescent Health, 28*(6), 474-480.

Centers for Disease Control and Prevention. (2006). *Youth risk behavior surveillance-United States, 2005*. *MMWR 55*(ss-5), 1-108. Atlanta, GA: U.S. Department of Health and Human Services.

Cottrell, L., Li, X., Harris, C., D'Alessandri, D., Atkins, M., Richardson, B., et al. (2003). Parent and adolescent perceptions of parental monitoring and adolescent risk involvement. *Parenting: Science and Practice, 3*(3), 179-195.

Elder, J. P., Campbell, N. R., Litrownik, A. J., Ayala, G. X., Slymen, D. J., Parra-Medina, D., et al. (2000). Predictors of cigarette and alcohol susceptibility and use among Hispanic migrant adolescents. *Preventive Medicine: An International Journal Devoted to Practice and Theory, 31*(2, Pt.1), 115-123.

Flores, G., Fuentes-Afflick, E., Barbot, O., Carter-Pokras, O., Claudio, L., Lara, M., et al. (2002). The health of Latino children urgent priorities, unanswered questions, and a research agenda. *Journal of the American Medical Association, 288*(1), 82-90.

Georgiades, K., Boyle, M. H., Duku, E., & Racine, Y. (2006). Tobacco use among immigrant and nonimmigrant adolescents: Individual and family level influences. *Journal of Adolescent Health, 38*(4), e1-e7.

Godley, M. D., Kahn, J. H., Dennis, M. L., Godley, S. H., & Funk, R. R. (2005). The stability and impact of environmental factors on substance use and problems after adolescent outpatient treatment for cannabis abuse or dependence. *Psychology of Addictive Behaviors, 19*(1), 62-70.

Gonzales, N. A., Cauce, A. M., & Mason, C. A. (1996). Interobservor agreement in the assessment of parental behavior and parent-adolescent conflict: African American mothers, daughters, and independent observers. *Child Development, 67*(4), 1483-1498.

Gothard, S. (2005). Intervening in adolescent problem behavior: a family-centered approach. *Child and Adolescent Mental Health, 10*(2), 104-105.

Harrison, J. A., Mullen, P. D., & Green, L. W. (1992). A meta-analysis of studies of the Health Belief Model with adults. *Health Education Research, 7*(1), 107-116.

Hawkins, J., Catalano, R., & Miller, J. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin, 112*(1), 64-105.

Hobbs, F., & Stoops, N. (2000). Demographic trends in the 20th century. *US Census Bureau, Census*.

Hovell, M. F., Wahlgren, D. R., & Gehrman, C. A. (2002). The Behavioral Ecological Model: Integrating public health and behavioral science. In R. DeClemente, R. Crosby & M. Kegler (Eds.), *Emerging theories in health promotion practice and research: strategies for improving public health.* (pp. 347-385). San Francisco, CA: Jossey-Bass, Inc.

Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2006). *Decline in daily smoking by younger teens has ended.* Retrieved April 16, 2007, from University of Michigan News and Information Services: Ann Arbor, MI. Web site: http://www.monitoringthefuture.org

Kandel, D., Kiros, G., Schaffran, C., & Hu, M. (2004). Racial/ethnic differences in cigarette smoking initiation and progression to daily smoking: A multilevel analysis. *American Journal of Public Health, 94*(1), 128-135.

Kaplan, C. P., Napoles-Springer, A., Stewart, S. L., & Perez-Stable, E. (2001). Smoking acquisition among adolescents and young Latinas. The role of socioenvironmental and personal factors. *Addictive Behaviors, 26*(4), 531-550.

Kauffman, J. (2000). *Characteristics of emotional and behavioral disorders of children and youth.* Upper Saddle River, NH: Merrill.

Kim, J., & McCarthy, W. J. (2006). School-level contextual influences on smoking and drinking among Asian and Pacific Islander adolescents. *Drug and Alcohol Dependence, 84*(1), 56-68.

Landrine, H., Richardson, J. L., Klonoff, E. A., & Flay, B. R. (1994). Cultural diversity in the predictors of adolescent cigarette smoking: The relative influence of peers. *Journal of Behavioral Medicine, 17*(3), 331-346.

Laraway, S., Snycerski, S., Michael, J., & Poling, A. (2003). Motivating operations and terms to describe them: some further refinements. *Journal of Applied Behavior Analysis, 36*(3), 407-414.

Leichter, H. (2004). Ethnic politics, policy fragmentation, and dependent health care access in California. *Journal of Health Politics, Policy, and Law, 29*(2), 177-201.

Lloyd, K. E. (1994). Do as I say, not as I do. *The Behavior Analyst, 17*, 131-139.

Maxwell, J. C., & Wallisch, L. S. (1998). Texas school survey of substance use among students on the border grades 4–12. *Texas Commission on Alcohol and Drug Abuse, Austin, TX.*

McKinnon, S. A., O'Rourke, K. M., Thompson, S. E., & Berumen, J. H. (2004). Alcohol use and abuse by adolescents: The impact of living in a border community. *Journal of Adolescent Health, 34*(1), 88-93.

Meschke, L., Bartholomae, S., & Zentall, S. (2002). Adolescent sexuality and parent-adolescent processes: promoting healthy teen choices. *Journal of Adolescent Health, 31*(Suppl), 264-279.

Nelson, M., & Gordon-Larsen, P. (2006). Physical activity and sedentary behavior patterns are associated with selected adolescent health risk behaviors. *Pediatrics, 117*(4), 1281-1290.

Ohannessian, C. M., Lerner, R. M., Lerner, J. V., & Von Eye, A. (2000). Adolescent-parent discrepancies in perceptions of family functioning and early adolescent self-competence. *International Journal of Behavioral Development, 24*(3), 362-372.

Paniagua, F. A. (1990). A procedural analysis of correspondence training techniques. *The Behavior Analyst, 13*, 107-119.

Park, J., Kosterman, R., Hawkins, J. D., Haggerty, K. P., Duncan, T. E., Duncan, S. C., et al. (2000). Effects of the "Preparing for the Drug Free Years" curriculum on growth in alcohol use and risk for alcohol use in early adolescence. *Prevention Science, 1*(3), 125-138.

Patterson, G. R., Chamberlain, P., & Reid, J. B. (1982). A comparative evaluation of a parent-training program. *Behavior Therapy, 13*(5), 638-650.

Patterson, G. R., & Cobb, A. (1971). A dyadic analysis of "aggressive" behaviors. In J. Hill (Ed.), *Minnesota Symposia on Child Psychology* (pp. 72-129). Minneapolis, MN: University of Minnesota.

Patterson, G. R., DeBaryshee, B., & Ramsey, E. (1989). A development perspective on antisocial behavior. *American Psychologist, 44*(2), 329-335.

Patterson, G. R., Reid, J. B., & Dishion, T. (1992). *Antisocial boy: A social interactional approach* (Vol. 4). Eugen, OR: Catalia.

Patterson, G. R., & Yoerger, K. (1997). A developmental model for late-onset delinquency. In D. W. Osgood (Ed.), *Nebraska Symposium on Motivation* (pp. 119-177). Lincoln, NE: University of Nebraska Press.

Pelegrina, S., Garcia-Linares, M. C., & Casanova, P. F. (2003). Adolescents and their parents' perceptions about parenting characteristics. Who can better predict the adolescent's academic competence? *Journal of Adolescence, 26*(6), 651-665.

Pieters, R. G. M. (1988). Attitude-behavior relationships. In W. Van Raaij, G. Van Veldhoven & K. Warneryd (Eds.), *Handbook of Economic Psychology* (pp. 147-196). Netherlands: Kluwer Academic Publishers.

Power, C. Hertzman, C. (1997). Social and biological pathways linking early life and adult disease. *British Medical Bulletin, 53*(1), 210-221.

Reid, J., & Eddy, J. (1997). The prevention of antisocial behavior: Some considerations in the search for effective interventions. In D. Stoff & J. Maser (Eds.), *Handbook of antisocial behavior.* New York: Wiley.

Sargent, J. D., Beach, M. L., Dalton, M. A., Mott, L. A., Tickle, J. J., Ahrens, M. B., et al. (2001). Effect of seeing tobacco use in films on trying smoking among adolescents: Cross sectional study. *BMJ: British Medical Journal, 323*(7326), 1394.

Schaefer, E. S. (1965). Children's reports of parental behavior: An inventory. *Child Development, 36* (2), 413-424.

Simantov, E., Schoen, C., & Klein, J. (2000). Health-compromising behaviors: Why do adolescents smoke or drink?: Identifying underlying risk and protective factors. *Archives of Pediatrics & Adolescent Medicine, 154*(10), 1025-1033.

Simons-Morton, B. (2002). Prospective analysis of peer and parent influences on smoking initiation among early adolescents. *Prevention Science, 3*(4), 275-283.

Simons-Morton, B. (2004). The protective effect of parental expectations against early adolescent smoking initiation. *Health Education Research, 19*(5), 561-569.

Skinner, B. F. (1953). *Science and human behavior.* Oxford, England: Macmillan.

Stice, E., & Barrera, M. (1995). A longitudinal examination of the reciprocal relations between perceived parenting and adolescents' substance use and externalizing behaviors. *Developmental Psychology, 31*(2), 322-334.

Tein, J.-Y., Roosa, M. W., & Michaels, M. (1994). Agreement between parent and child reports on parental behaviors. *Journal of Marriage & the Family, 56*(2), 341-355.

Tolan, P., & McKay, M. (1996). Preventing serious antisocial behavior in inner-city children: An empirically based family intervention program. *Family Relations, 45*, 148-155.

Valois, R. F., Dunham, A. C., Jackson, K. L., & Waller, J. (1999). Association between employment and substance abuse behaviors among public high school adolescents. *Journal of Adolescent Health, 25*(4), 256-263.

Walker, H., Colvin, G., & Ramsey, E. (1995). *Antisocial behavior in school: Strategies and best practices*. Pacific Grove, CA: Brooks/Cole.

Wierson, M., & Forehand, R. (1994). Parent behavioral training for child noncompliance: Rationale, concepts, and effectiveness. *Current Directions in Psychological Services, 3*, 146-151.

Wilson, P. G., Rusch, F. R., & Lee, S. (1992). Strategies to increase exercise-report correspondence by boys with moderate mental retardation: collateral changes in intention-exercise correspondence. *Journal of Applied Behavior Analysis, 25*(3), 681-90.

Wu, N. S., Lu, Y., Sterling, S., & Weisner, C. (2004). Family environment factors and substance abuse severity in an HMO adolescent treatment population. *Clinical Pediatrics, 43*(4), 323-333.

CHAPTER 2

CORRELATES OF ALCOHOL AND TOBACCO USE IN LATINO ADOLESCENTS

ABSTRACT

This study identified correlates of Latino adolescents' use of alcohol and tobacco. The sample consisted of 252 Latino adolescents with latent tuberculosis infection participating in a medication adherence trial. Sequential logistic regression was used to separately predict alcohol and tobacco use. Peer modeling of alcohol use, skipping school, and parental consistency were significant correlates of alcohol use. Peer modeling of tobacco and alcohol use, age, and size of peer network were significant correlates of tobacco use. Peer variables emerged as significant correlates for alcohol and tobacco use, but more so for tobacco. Parental consistent was protective only for alcohol. Peer and parenting domains are likely areas for effective prevention efforts in Latino adolescents at risk for using alcohol or tobacco.

Keywords: adolescents, alcohol, tobacco, Latinos

INTRODUCTION

During the latter part of the 1990s and into the first half of the current decade, there have been substantial reductions in the proportion of daily smokers among adolescents in the United States. But according to a recent survey, this trend is beginning to slow, (Johnston, O'Malley, Bachman, & Schulenberg, 2006) and adolescent rates of experimentation, which may lead to daily smoking, remain over 50% (54.3%) (Centers for Disease Control & Prevention [CDC], 2006). When comparing rates by race/ethnicity, highest rates were observed among Hispanic adolescents (57.1%), followed by non-Hispanic Whites (54%) and African Americans (54.7%) (CDC, 2006). The same pattern holds true for alcohol experimentation: highest rates among Hispanic adolescents (79.4%), followed by non-Hispanic Whites (75.3%) and African Americans (69%) (CDC, 2006).

A number of risk and protective factors related to alcohol and tobacco use among adolescents have been identified in the literature. Adapting from a landmark publication by Hawkins, Catalano and Miller (1992), many risk factors fall into a class of interpersonal environmental influences in three domains: family influences, school influences, and peer influences, with an additional dimension encumbering demographic related characteristics. Evidence of these domains from the literature is first presented, followed by a description of how constructs in these domains were measured for this study.

Potential Correlates of Alcohol and Tobacco

Demographics

Previous studies reveal several demographic predictors of alcohol and tobacco use in adolescents. Among these are age (Elder et al., 2000), acculturation (Kaplan, Napoles-Springer, Stewart, & Perez-Stable, 2001; Landrine, Richardson, Klonoff, & Flay, 1994), poverty (Georgiades, Boyle, Duku, & Racine, 2006), family conflict (Godley, Kahn, Dennis, Godley, & Funk, 2005; Wu, Lu, Sterling, & Weisner, 2004) and a history of physical or sexual abuse(Simantov, Schoen, & Klein, 2000).

Parental Influences

The parent-child relationship may impact an adolescent's ability to resist drug-promoting peers (Marshal & Chassin, 2000; Patterson, DeBaryshee, & Ramsey, 1989; Patterson, Reid, & Dishion, 1992; Walker, Colvin, & Ramsey, 1995). Poor parenting practices, including inappropriate use of consequences,

may encourage risk behaviors, such as alcohol and tobacco use (Marchant, Young, & West, 2004). Beal et al. (2001) found that in a racially diverse sample of middle school-aged students, where reported alcohol rates exceed 50%, parental influence was responsible for a reduced risk of alcohol use.

School Influences

Several school-level variables are related to both smoking and drinking behaviors (Kim & McCarthy, 2006). In general terms, engagement in school activities is negatively associated with initiating alcohol use (Nelson & Gordon-Larsen, 2006; Simons-Morton, 2004). This may include clubs, sports or student government. Academic performance has been shown to be negatively associated with smoking initiation among non-Hispanic Whites and Latinos (Kandel, Kiros, Schaffran, & Hu, 2004).

Peer Influences

Around the onset of puberty, peer social reinforcement becomes a powerful socializing influence (Dishion, Nelson, & Kavanagh, 2003). Alcohol and tobacco use can be modeled frequently when prevalence is high or "norms" are supportive within a given social network. According to the Behavioral Ecological Model (BEM) (Hovell, Wahlgren, & Gehrman, 2002), the density of such models may promote imitation (Hawkins et al., 1992). Imitation may be socially reinforced as well as physically reinforced by the pharmacological features of the drug. The presence of at least one smoking peer greatly increases risk for smoking initiation and progression to daily use (Kandel et al., 2004).

Purpose

The BEM that guides the present study suggests several mechanisms by which the above-listed domains may influence adolescent risk behaviors. The model, which draws heavily upon learning theory (Skinner, 1953) suggests that powerful influences of behavior are found in the environment. Environments change within an individual's lifetime (Hovell et al., 2002), and the importance of any one specific domain or environment may change at different developmental stages. For example, the transition from preteen to adolescence is characterized by increasing independence (Collins & Laursen, 2004), probably enhancing the influence of the peer social network.

Based on an extensive review of the literature, few studies, including those that identify risk factors for alcohol and tobacco use, have used theory to guide testing of multivariate models. In addition,

few studies are specific to Latino adolescents (Elder et al., 2000; Flores et al., 2002). The purpose of this study is to use theory to identify factors that influence Latino adolescents' risks for alcohol and tobacco use. Advancements to this end may inform future interventions to curb rates of risk behavior earlier in adolescence, especially among Latino adolescents.

METHOD

Design

This study was part of a larger intervention study of exclusively Latino adolescents with latent tuberculosis infection (LTBI). For the present study, baseline data from adolescent participants were used to create a theoretical model. The same model was considered separately for its association with alcohol and tobacco use. For each substance, adolescents' use was sequentially regressed on 22 independent variables, entered in four blocks: demographics, parental influence, school influence, and peer influence.

Recruitment and Informed Consent

The sample of 252 Latino adolescents in this study were high school students ages 13 to 19. They were attending school in south San Diego County, tested positive for LTBI, and volunteered to participate in a medication adherence trial for LTBI treatment. The San Diego State University Institutional Review Board approved the study. Adolescents were ineligible to participate in the study if they had definite plans to relocate from the area within 12 months and/or to receive LTBI treatment in Mexico. After consenting, bilingual interviewers interviewed participants and completed baseline self-reported interviews.

Participants

Of the 252 participants in the study, 48.4% were male and 41.7% were foreign-born. Fifty-one percent had no medical insurance, and 32.2% had Medi-Cal (Medicaid in California) or Child Health and Disability Prevention services. The mean age of the participants was 15.9 years (SD = 1.2).

Measurement

Dependent variables

Alcohol and tobacco use we the two dependent variables assessed. Respondents were asked if they had ever used alcohol. This included beer, wine and hard liquor. Similarly, respondents were asked if they had ever used tobacco.

Independent variables

Demographic variables.

Age, gender, foreign-born status, acculturation level, and receiving an allowance were selected to represent demographic characteristics. Foreign-born status was ascertained by asking their country of birth; respondents born outside of the United States were coded as foreign-born. Acculturation was measured using the Bidimensional Acculturation Scale for Hispanics (Marin & Gamba, 1996). The acculturation scale consists of 24 questions regarding language use (e.g. How often do you speak English/Spanish?), linguistic proficiency (e.g. How well do you read in English/Spanish?), and electronic media use (e.g. How often do you listen to music in English/Spanish?). Each question had four possible responses: very poorly, poorly, well, or very well. The questions are separated into 2 domains, Hispanic (all items about Spanish usage) and non-Hispanic (all items about English usage), with 12 items in each. For each cultural domain, an average of the 12 items is calculated, obtaining a mean range of scores between 1 and 4. Scores on both domains were used to determine the level of acculturation. Acculturation categories are computed using a 2.5 cutoff score to indicate low or high level of adherence to each cultural domain. Individuals scoring higher than 2.5 in both domains are considered bicultural (Marin & Gamba, 1996).

Parenting variables.

Due to missing data regarding fathers, only information reported by the adolescents about the parenting of both parents as a unit or mother's parenting was included for analyses. These variables included several measures of mother's use of praise, punishment, and involvement in the participant's life. Mother's use of praise was measured with the following item: "Does your mother celebrate when you have done something well?" Agreement with parental rules was measured by the question: "To what extent do you agree with the rules your parents make?" (5-point scale, 1 = strongly disagree to 5 = strongly agree). And, following parental rules was measured by asking: "How often do you follow the rules your parents make?" (5-point scale, 1 = never to 5 = always). Parental involvement with adolescents was measured by asking: "Does your mother help you with your homework?" Mother's use of punishment was measured by asking two questions: "When your mother is upset with you because you did or did not do something, does she yell at you?" and "When your mother is upset with you because you did or did not do something, does

she restrict you from going out?" A measure of parents' consistent use of punishment, reinforcement and monitoring was created by summing responses to three questions about the level of consistent use of rules, punishment and rewards (Cronbach's $\alpha = 0.61$). In each case participants were asked the following question: "How consistent is your mother in her use of rules (repeated for punishment and rewards)?" (5-point scale, 1 = very inconsistent to 5 = very consistent).

School influence variables.

Academic performance was assessed by responses to: "What grades would you say you mostly receive at school?" (ranging from mostly Fs to mostly As). Two items assessed school truancy/discipline. Students were asked how many times they had been suspended from school, and how many times in the last year they had skipped/ditched. Both variables were dichotomized (0 = never, 1 = ever). Participants' level of involvement in extracurricular activities was assessed by asking the following question: "In which of the following school-related activities/events do you participate?" This question was repeated for sports, academic/social clubs, and school dances.

Peer influence variables.

Peer modeling of alcohol, tobacco and marijuana was measured by querying, "How many close friends have ever used cigarettes?" and then repeating the same format worded for alcohol and again for marijuana. All three variables were entered into the model because of research related to risk behavior clustering (Burke et al., 1997; Petridou et al., 1997; Valois, Oeltmann, Waller, & Hussey, 1999). The density of social support was also measured by asking respondents: "How many close friends do you have?" Responses were initially recorded as a raw number, and then recoded into four levels by quartiles (1 = few friends to 4 = a lot of friends).

<center>Analyses</center>

All statistical analyses were performed using SPSS 15.0 for Windows. Sequential logistic regression was used to test the predictive model separately with alcohol and again with tobacco. Variables were added sequentially to the model by block based on the BEM and their conceptual proximity to the dependent variable. The order of the blocks in the model was: 1) demographics, 2) family influence, 3) school influence, and 4) peer influence.

RESULTS

Almost 70% (69.4%) of respondents reported ever using alcohol. Reported prevalence of tobacco use was much lower at 18.7%. A unique feature of this sample is the high percentage of respondents born outside of the U.S. (58.3%), with most foreign-born respondents born in neighboring Mexico. Another important finding relates to peer modeling. Respondents reported an average of 3.6 (SD = 5.13) friends that used alcohol, 2 (M = 2.01, SD = 3.60) that used tobacco, and 1 that used marijuana (M = 1.04, SD = 2.75). Table 1 provides descriptive statistics for study sample as well as the independent variables.

Correlates of Alcohol Use

The demographic and background variables entered in Block 1 were: age, gender, acculturation, receiving an allowance, and foreign-born status. The model was not significant (Nagelkerke R^2 = 0.06). However, age was positively related to alcohol use in this block (OR = 1.419; 95% CI = 1.114 – 1.808).

Parental influence variables were entered in Block 2. This included parental consistency, agreeing with parental rules and following rules, mother yelling when she is upset, restricting privileges when you have done something bad, helping you with your schoolwork, and celebrating with you when you have done something well. With the addition of block 2, the model was significant and accounted for 18% of explained variance (based on Nagelkerke R^2), χ^2 (12, $\underline{N}$ = 243) = 33.19, $p < .05$) for alcohol use. Age, from block 1, remained significant (OR = 1.414; 95% CI = 1.096 – 1.824). Three additional variables reached significance. Two variables were related to parental rules, and both negatively associated with alcohol use: agreement with parental rules and following them (OR = 0.761; 95% CI = 0.581 – 0.996), and having a mother that helps you with your schoolwork (OR = 0.468; 95% CI = 0.253 – 0.867).

In Block 3, school influence variables were entered. These variables were: academic performance, school suspensions, skipping school during the previous 12 months, and the three questions regarding involvement in sports, academic/social clubs, and school dances. After block 3 was entered, the model was significant and accounted for 29.9% of explained variance (based on Nagelkerke R^2), χ^2 (18, $\underline{N}$ = 243) = 57.92, $p < .05$) in alcohol use. Five variables were significant in this block. They were: having a mother that helped with your schoolwork (OR = 0.478; 95% CI = 0.248 – 0.922), agreement with parental rules (OR = 0.748; 95% CI = 0.562 – 0.994), school suspensions (OR = 3.444; 95% CI = 1.045 – 11.347),

skipping school during the previous 12 months ($OR = 2.672$; 95% CI = $1.275 – 5.602$), and involvement in school dances ($OR = 0.403$; 95% CI = $0.178 – 0.912$). All significant variables were negatively associated with alcohol use, except skipping school during the previous 12 months. Age was no longer significant.

Block 4 added the 4 peer influence variables: peer modeling of alcohol use, peer modeling of tobacco use, peer modeling of marijuana use, and number of close friends. Block 4 significantly contributed an additional 13% of explained variance ($p = 0.000$). Table 2 presents summary statistics for the complete model. The final regression model accounted for 42.9% of the explained variance of alcohol use (based on Nagelkerke R^2), χ^2 (22, $\underline{N} = 243$) = 88.23, $p < .05$) (G.O.F., $p = 0.747$). Parental consistency ($OR = 0.824$; 95% CI = $0.697 – 0.975$), skipping school in the previous 12 months ($OR = 2.471$; 95% CI = $1.084 – 5.633$), and peer modeling of alcohol use ($OR = 2.453$; 95% CI = $1.457 – 4.129$) were significantly related to alcohol use in the final model after controlling for previous variables. Having a mother that helps you with your schoolwork and agreement with parental rules were no longer significant in the final model.

<center>Correlates of Tobacco Use</center>

The same sequential regression approach was used to test the multivariate model using tobacco use as the dependent variable. Block 1 significantly accounted for 8.8% of the explained variance in tobacco use (based on Nagelkerke R^2), χ^2 (5, $\underline{N} = 243$) = 13.36, $p < .05$). Age was the only variable significant in this block ($OR = 1.582$; 95% CI = $1.196 – 2.092$), and was positively related to tobacco use.

As was the case for the alcohol use model, block 2 consisted of variables that were related to parenting and parenting practices. The model after block 2 was entered significantly explained 16.8% of the variance in tobacco use (based on Nagelkerke R^2), χ^2 (12, $\underline{N} = 243$) = 26.35, $p < .05$). Age ($OR = 1.626$; 95% CI = $1.214 – 2.178$) and following parental rules ($OR = 0.583$; 95% CI = $0.365 – 0.932$) were both significant in block 2. Following parental rules was negatively associated with tobacco use. Block 3 included variables related to school influence. After the addition of block 3, the model accounted for a significant 22.7% of explained variance (based on Nagelkerke R^2), χ^2 (18, $\underline{N} = 243$) = 36.15, $p < .05$). Age ($OR = 1.632$; 95% CI = $1.178 – 2.263$) was the only significant variable in block 3. Following parental rules was no longer significant. The final block (block 4) included variables representing peer influence, i.e.

peer models of risk behavior and amount of peer social support. This block accounted for a significant 16.7% of the explained variance ($p = 0.000$).

Table 3 presents the results and summary statistics for the complete model. The final model significantly accounted for 39.4% of the explained variance in tobacco use (based on Nagelkerke R^2), χ^2 (22, $\underline{N} = 243$) = 66.82, $p < .05$) (G.O.F., $p = 0.542$). Peer modeling of tobacco use ($OR = 2.695$; 95% CI = 1.464 – 4.960) and alcohol use ($OR = 1.892$; 95% CI = 1.103 – 3.246) were related to tobacco use. The number of close friends ($OR = 0.630$; 95% CI = 0.415 – 0.957) and age ($OR = 1.472$; 95% CI = 1.022 – 2.119) were also significant in the final model. All significant variables in the final model were positively associated with tobacco use, except the number of close friends.

DISCUSSION

The purpose of this study was to explore theoretical correlates of alcohol and tobacco use. The sequential regression approach allowed for a conservative estimate of each block's association with the dependent variable.

Alcohol use

In the final model, parental consistency was protective and decreased relative risk of alcohol use by 18%. In terms of increasing risk, skipping school in the last 12 months and friend's use of alcohol were both associated with an almost threefold increased risk for reported use of alcohol. Representation of significant variables from three different blocks, including the parenting block, school block, and the peer block suggest the many different areas in which alcohol use may be affected.

Tobacco use

Four variables were significant in the final model; three of them part of the peer block. The peer block clearly emerged as being most important among the correlates of tobacco use, in contrast to the multi-dimensional correlates of alcohol use.

The presence of a peer model of alcohol use doubles an adolescent's likelihood of using tobacco, and a peer model of tobacco use resulted in a threefold increase in likelihood. As a protective factor, having more close friends accounts for a 39.5% decrease in the likelihood of tobacco use. The positive association with age indicates that risk for tobacco use increases with age, an observation supported in the

literature.(Elder et al., 2000) Thus, the most precarious situation for a teenager at risk for tobacco use would include a small social network (as measured by few friends), late adolescence, and friends that use alcohol and tobacco.

Parental consistency represented parents' consistent use of contingencies and was only related to alcohol use. The observed relationship between parental consistency and alcohol use is supported by previous research (Ary et al., 1999) and underscores the important influence that parents can have in preventing alcohol use. The finding that parental consistency was only related to alcohol use and not tobacco is very interesting and may highlight some inherent differences in the nature of tobacco use versus alcohol use. A variant of this finding has been demonstrated previously, (Beal et al., 2001) but never with an exclusively Latino sample. Replicating this unique effect across ethnic groups provides confirmation of this construct selected for this analysis for theoretical reasons.

Peer influence comprised the final block, and was considered to be theoretically most proximal to the outcomes of interest, alcohol and tobacco use (Brown, 2004; Dishion et al., 2003). This was confirmed and is consistent with previous reports (Almodovar, Tomaka, Thompson, McKinnon, & O'Rourke, 2006; Beal et al., 2001; Elder et al., 2000; Kandel et al., 2004; Mowery, Farrelly, Haviland, Gable, & Wells, 2004). Comparing peer correlates for alcohol and tobacco reveals interesting findings. It appears tobacco use may fall under greater peer control based on the number of significant correlates in their respective peer blocks.

As demonstrated here and in numerous published reports, (Burke et al., 1997; Petridou et al., 1997; Valois et al., 1999) peer modeling of alcohol and tobacco use is related to adolescent use of both substances. It is plausible that similar associations exist for parent modeling of substance use. Unfortunately, the authors were unable to test such associations because no such parenting variables were measured. Also, participants in this study are at risk for an adverse health outcome, as defined by an LTBI diagnosis. To our knowledge, no published literature suggests a link between increased participation in risk behaviors of the variety studied here and an LTBI diagnosis. And, alcohol and tobacco rates reported here are lower than those reported by the Centers for Disease Control and Prevention for Latinos in the same geographical region (CDC, 2006). Nevertheless, it is unclear what effect this has on the ability for these

results to generalize to a larger sample of Latino adolescents. More reliable and valid predictors of alcohol use could be very valuable for clinicians treating adolescents with isoniazid (INH), where an interaction with concurrent alcohol use could severely damage the liver.

Based on experiences learned from this study, future studies would benefit from more precise measures of alcohol and tobacco use. The measure used in this study reflects 'ever' use, which may be too general. Preferable measures would query specific time periods (e.g., last 3 months), quantity or use at each episode and perhaps conditions under which alcohol or tobacco was used (e.g., at friend's request). It would also be important to know how often alcohol and tobacco are used simultaneously and if one serves as a prompt for the other. Furthermore, future studies along international borders should attempt to control for the social and legal influences related to alcohol and tobacco accessibility and acceptability. The only such measure available in this study proved to be underspecified, and therefore was not included in the analyses.

Despite limitations, this study demonstrates clear strengths. First, this sample of Latino adolescents came from an area of high transition as defined by their proximity to a busy international border. This is important, especially considering reports of increased risk behaviors in border communities (Maxwell & Wallisch, 1998). Additionally, comparisons between correlates of the two dependent variables reveal a high level of generalizability of the model, as defined on two dimensions. First, the model achieved almost equivalent amounts of explained variance. Second, the peer influence block was theoretically presumed to be most powerful as manifest by its position as the final block. This theoretically proposed relationship was confirmed for both alcohol and tobacco use. Based on findings reported here and in previous research, future studies would benefit from examining the dynamic between parents and peers in preventing alcohol and tobacco use. This should involve discovery of mechanisms for parents to minimize negative peer influences.

REFERENCES

Almodovar, A., Tomaka, J., Thompson, S., McKinnon, S., & O'Rourke, K. (2006). Risk and protective factors among high school students on the US/Mexico border. *American Journal of Health Behavior, 30*(6), 745-752.

Ary, D. V., Duncan, T. E., Biglan, A., Metzler, C. W., Noell, J. W., & Smolkowski, K. (1999). Development of adolescent problem behavior. *Journal of Abnormal Child Psychology, 27*(2), 141-150.

Beal, A. C., Ausiello, J., & Perrin, J. M. (2001). Social influences on health-risk behaviors among minority middle school students. *Journal of Adolescent Health, 28*(6), 474-480.

Brown, B. B. (2004). Adolescents' relationships with peers. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (2nd ed., pp. 363-394). New York: Wiley.

Burke, V., Milligan, R. A. K., Beilin, L. J., Dunbar, D., Spencer, M., Balde, E., et al. (1997). Clustering of health-related behaviors among 18-year-old Australians. *Preventive Medicine, 26*(5), 724-733.

Centers for Disease Control and Prevention. (2006). *Youth risk behavior surveillance-United States, 2005*. *MMWR 55*(ss-5), 1-108. Atlanta, GA: U.S. Department of Health and Human Services.

Collins, W., & Laursen, B. (2004). Parent-adolescent relationships and influences. In R. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (2nd ed. pp. 331-362). New York: Wiley.

Dishion, T., Nelson, S., & Kavanagh, K. (2003). The family check-up with high-risk young adolescents: preventing early-onset substance use by parent monitoring. *Behavior Therapy, 34*, 553-571.

Elder, J. P., Campbell, N. R., Litrownik, A. J., Ayala, G. X., Slymen, D. J., Parra-Medina, D., et al. (2000). Predictors of cigarette and alcohol susceptibility and use among Hispanic migrant adolescents. *Preventive Medicine: An International Journal Devoted to Practice and Theory, 31*(2, Pt.1), 115-123.

Flores, G., Fuentes-Afflick, E., Barbot, O., Carter-Pokras, O., Claudio, L., Lara, M., et al. (2002). The health of Latino children urgent priorities, unanswered questions, and a research agenda. *Journal of the American Medical Association, 288*(1), 82-90.

Georgiades, K., Boyle, M. H., Duku, E., & Racine, Y. (2006). Tobacco use among immigrant and nonimmigrant adolescents: Individual and family level influences. *Journal of Adolescent Health, 38*(4), e1-e7.

Godley, M. D., Kahn, J. H., Dennis, M. L., Godley, S. H., & Funk, R. R. (2005). The stability and impact of environmental factors on substance use and problems after adolescent outpatient treatment for cannabis abuse or dependence. *Psychology of Addictive Behaviors, 19*(1), 62-70.

Hawkins, J., Catalano, R., & Miller, J. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin, 112*(1), 64-105.

Hovell, M. F., Wahlgren, D. R., & Gehrman, C. A. (2002). The Behavioral Ecological Model: Integrating public health and behavioral science. In R. DeClemente, R. Crosby & M. Kegler (Eds.), *Emerging theories in health promotion practice and research: strategies for improving public health.* (pp. 347-385). San Francisco, CA: Jossey-Bass, Inc.

Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2006). *Decline in daily smoking by younger teens has ended*. Retrieved April 16, 2007, from University of Michigan News and Information Services: Ann Arbor, MI. Web site: http://www.monitoringthefuture.org

Kandel, D., Kiros, G., Schaffran, C., & Hu, M. (2004). Racial/ethnic differences in cigarette smoking initiation and progression to daily smoking: A multilevel analysis. *American Journal of Public Health, 94*(1), 128-135.

Kaplan, C. P., Napoles-Springer, A., Stewart, S. L., & Perez-Stable, E. (2001). Smoking acquisition among adolescents and young Latinas. The role of socioenvironmental and personal factors. *Addictive Behaviors, 26*(4), 531-550.

Kim, J., & McCarthy, W. J. (2006). School-level contextual influences on smoking and drinking among Asian and Pacific Islander adolescents. *Drug and Alcohol Dependence, 84*(1), 56-68.

Landrine, H., Richardson, J. L., Klonoff, E. A., & Flay, B. R. (1994). Cultural diversity in the predictors of adolescent cigarette smoking: The relative influence of peers. *Journal of Behavioral Medicine, 17*(3), 331-346.

Marchant, M., Young, K., & West, R. (2004). The effects of parental teaching on compliance behavior of children. *Psychology in the Schools, 4*, 337-350.

Marin, G., & Gamba, R. (1996). A new measurement of acculturation for Hispanics: The bidimensional acculturation scale for Hispanics (BAS). *Hispanic Journal of Behavioral Science, 18*(3), 297-316.

Marshal, M., & Chassin, L. (2000). Peer influence on adolescent alcohol use: The moderating role of parental support and discipline. *Applied Developmental Science, 4*(2), 80-88.

Maxwell, J. C., & Wallisch, L. S. (1998). Texas school survey of substance use among students on the border grades 4–12. *Texas Commission on Alcohol and Drug Abuse, Austin, TX*.

Mowery, P. D., Farrelly, M. C., Haviland, M. L., Gable, J. M., & Wells, H. E. (2004). Progression to established smoking among us youths. *American Journal of Public Health, 94*(2), 331-337.

Nelson, M., & Gordon-Larsen, P. (2006). Physical activity and sedentary behavior patterns are associated with selected adolescent health risk behaviors. *Pediatrics, 117*(4), 1281-1290.

Patterson, G. R., DeBaryshee, B., & Ramsey, E. (1989). A development perspective on antisocial behavior. *American Psychologist, 44*(2), 329-335.

Patterson, G. R., Reid, J., & Dishion, T. (1992). *Antisocial boys: A social interactional approach* (Vol. 4). Eugen, OR: Catalia.

Petridou, E., Zavitsanos, X., Dessypris, N., Frangakis, C., Mandyla, M., Doxiadis, S., et al. (1997). Adolescents in high-risk trajectory: Clustering of risky behavior and the origins of socioeconomic health differentials. *Preventive Medicine, 26*(2), 215-219.

Simantov, E., Schoen, C., & Klein, J. (2000). Health-compromising behaviors: Why do adolescents smoke or drink?: Identifying underlying risk and protective factors *Archives of Pediatrics & Adolescent Medicine, 154*(10), 1025-1033.

Simons-Morton, B. G. (2004). The protective effect of parental expectations against early adolescent smoking initiation. *Health Education Research*, *19(*5), 561-569.

Skinner, B. F. (1953). *Science and human behavior*. Oxford, England: Macmillan.

Valois, R. F., Oeltmann, J. E., Waller, J., & Hussey, J. R. (1999). Relationship between number of sexual intercourse partners and selected health risk behaviors among public high school adolescents. *Journal of Adolescent Health*, 25(5), 328-335.

Walker, H., Colvin, G., & Ramsey, E. (1995). *Antisocial behavior in school: Strategies and best practices*. Pacific Grove, CA: Brooks/Cole.

Wu, N. S., Lu, Y., Sterling, S., & Weisner, C. (2004). Family environment factors and substance abuse severity in an HMO adolescent treatment population. *Clinical Pediatrics, 43*(4), 323-333.

Table 2.1 *Characteristics of the study sample (N = 252)*

Variables	M	SD	Range	Variables	M	SD	Range
Alcohol[a]	0.69	0.46	0 – 1	Agree w/parent's rules[d]	3.46	1.17	1 – 5
Tobacco[a]	0.19	0.49	0 – 1	Follow parent's rules[d]	3.92	0.80	1 – 5
Foreign-born[a]	0.42	0.49	0 – 1	School performance-grades[e]	3.48	1.59	1 – 9
Gender[b]	0.48	0.50	0 – 1	Suspended from school[a]	0.17	0.37	0 – 1
Age	15.91	1.22	13 – 19	Skipped school[a]	0.38	0.49	0 – 1
Acculturation[c]	0.81	0.58	0 – 2	Participate sports-school[a]	0.71	0.46	0 – 1
Allowance[a]	0.48	0.50	0 – 1	Participate clubs-school[a]	0.74	0.44	0 – 1
Parental consistency	11.04	2.37	3 – 15	Participate dances-school[a]	0.73	0.45	0 – 1
Yell at you-Mother[a]	0.46	0.50	0 – 1	# close friends	6.63	9.22	0 – 61
Restrict you-Mother[a]	0.46	0.50	0 – 1	# friends use tobacco	2.01	3.60	0 – 30
Help w/homework-Mother[a]	0.47	0.50	0 – 1	# friends use alcohol	3.60	5.13	0 – 30
Celebrate-Mother[a]	0.62	0.49	0 – 1	# friends use marijuana	1.04	2.75	0 – 30

[a]0 = no, 1 = yes. [b]0 = female, 1 = male. [c]0 = Hispanic, 1 = bicultural, 2 = assimilated. [d]1 = strongly disagree, 2 = somewhat disagree, 3 = neither agree nor disagree, 4 = somewhat agree, 5 = strongly agree. [e]1 = A's, 2 = A's & B's, 3 = B's, 4 = B's & C's, 5 = C's, 6 = C's & D's, 7 = D's, 8 = D's & F's, 9 = F's.

Table 2.2 *Final Stage in Sequential Logistic Regression, Alcohol Use Correlates (n=243)*

Variable	*B*	SE	Exp (*B*)	*p*	95% CI Lower	95% CI Upper
Gender	-0.093	0.368	0.912	0.801	0.444	1.873
Country of birth	-0.060	0.370	0.941	0.870	0.456	1.944
Age	0.053	0.161	1.055	0.740	0.769	1.446
Acculturation	0.148	0.329	1.159	0.653	0.608	2.210
Receive allowance	0.033	0.363	1.034	0.927	0.507	2.107
Parental consistency	-0.193	0.085	0.824	0.024	0.697	0.975
Mom yells at you	-0.455	0.383	0.634	0.235	0.299	1.345
Mom restricts	0.096	0.375	1.101	0.797	0.528	2.295
Mom helps w/homework	-0.571	0.367	0.565	0.120	0.275	1.160
Mom celebrates	0.538	0.394	1.712	0.173	0.790	3.707
Agree w/parent rules	-0.236	0.161	0.789	0.141	0.576	1.082
Follow parent rules	-0.138	0.244	0.871	0.573	0.540	1.406
Academic performance	0.079	0.120	1.082	0.512	0.855	1.371
Suspended at school	1.135	0.675	3.112	0.092	0.829	11.673
Skipped school previous 12 months	0.905	0.420	2.471	0.031	1.084	5.633
School involvement-sports	-0.126	0.407	0.882	0.758	0.397	1.960
School involvement-academic/social clubs	0.541	0.416	1.718	0.193	0.760	3.884
School involvement-school dances	-0.698	0.467	0.498	0.135	0.199	1.242
Peer tobacco modeling	0.511	0.321	1.666	0.112	0.888	3.127
Peer alcohol modeling	0.897	0.266	2.453	0.001	1.457	4.129
Peer marijuana modeling	-0.113	1.001	0.893	0.910	0.126	6.439
Number of peers/friends	-0.284	0.169	0.753	0.093	0.541	1.049
Constant	2.509	2.923	12.299	0.391		

Note: This table describes the complete model with all blocks entered. Statistics in the columns are unstandardized logistic regression coefficients (B), associated standard errors (SE), odds ratios of the individual coefficients (Exp (*B*)), associated p values (*p*), and 95% confidence intervals of Exp (*B*).

Table 2.3 *Final Stage in Sequential Logistic Regression, Tobacco Use Correlates (n=242)*

Variable	B	SE	Exp (B)	p	95% CI Lower	CI Upper
Gender	0.522	0.462	1.685	0.259	0.681	4.170
Country of birth	0.213	0.470	1.238	0.650	0.493	3.110
Age	0.386	0.186	1.472	0.038	1.022	2.119
Acculturation	0.771	0.413	2.162	0.062	0.962	4.857
Receive allowance	0.457	0.443	1.579	0.302	0.663	3.763
Parental consistency	-0.061	0.099	0.941	0.540	0.775	1.143
Mom yells at you	0.296	0.433	1.345	0.494	0.576	3.143
Mom restricts	-0.334	0.477	0.716	0.483	0.281	1.822
Mom helps w/homework	-0.339	0.452	0.712	0.453	0.294	1.728
Mom celebrates	-0.192	0.483	0.825	0.691	0.320	2.126
Agree w/parent rules	-0.048	0.196	0.954	0.809	0.649	1.401
Follow parent rules	-0.483	0.292	0.617	0.098	0.348	1.094
Academic performance	0.184	0.140	1.202	0.189	0.914	1.580
Suspended at school	0.727	0.506	2.068	0.151	0.768	5.570
Skipped school previous 12 months	0.125	0.460	1.133	0.786	0.460	2.792
School involvement-sports	-0.423	0.494	0.655	0.392	0.249	1.726
School involvement-academic/social clubs	0.213	0.518	1.237	0.618	0.449	3.412
School involvement-school dances	0.225	0.494	1.253	0.649	0.475	3.301
Peer tobacco modeling	0.991	0.311	2.695	0.001	1.464	4.960
Peer alcohol modeling	0.638	0.275	1.892	0.021	1.103	3.246
Peer marijuana modeling	-0.830	0.794	0.436	0.296	0.092	2.068
Number of peers/friends	-0.462	0.213	0.630	0.030	0.415	0.957
Constant	-7.933	3.653	0.000	0.030		

Note: This table describes the complete model with all blocks entered. Statistics in the columns are unstandardized logistic regression coefficients (*B*), associated standard errors (SE), odds ratios of the individual coefficients (Exp (*B*)), associated p values (*p*), and 95% confidence intervals of Exp (*B*).

CHAPTER 3

DISCREPANCIES IN LATINO PARENTING PRACTICES AND THE ASSOCIATION WITH

GATEWAY DRUG USE

ABSTRACT

This study compared reports from parents and their adolescent regarding the parents' parenting behaviors and examined how these reports differentially correlate with gateway drug use. The sample consisted of 252 Latino adolescents. Sequential regressions were used to test two multivariate models: (a) parents' reports about their own behavior, and (b) adolescents' reports about their parents' behavior. Parents' model explained 35% of the variance in adolescents' reported gateway drug use and the parenting block was not significant. The adolescents' model explained 38% of the variance, and the parenting block was significant ($p < 0.05$). Results revealed differences in parent and child reports of parenting behaviors and that only adolescents' reports of parenting contributed to significantly explained variance in gateway drug use.

Keywords: Latino adolescents, parenting, gateway drugs

INTRODUCTION

The best-known risk factors for adolescent use of gateway drugs are related to peer and school influences (Hagenhoff, Lowe, Hovell, & Rugg, 1987; Hester & Kaiser, 1998; Walker, 1997). An additional dimension sometimes overlooked is that of parenting practices (Patterson, DeBaryshee, & Ramsey, 1989; Patterson, Reid, & Dishion, 1992; Walker, Colvin, & Ramsey, 1995). This dimension may be overshadowed by strong peer and school influences, but some studies report that parenting practices account for as much as 40% of the variance in adolescent's risk behaviors (Patterson et al., 1989; Tolan & McKay, 1996; Walker et al., 1995).

A summary of the parenting literature reveals that common errors in parenting practices include inconsistent and poor timing of reinforcement and inappropriate timing and type of punishment (Kauffman, 2000; Reid & Eddy, 1997; Wierson & Forehand, 1994). The Behavioral Ecological Model (BEM) (Hovell, Wahlgren, & Gehrman, 2002) that guides the current study, indirectly contends that parents should be actively involved in arranging contingencies in their child's environment. When used appropriately, these parenting strategies can establish pro-social skills, influence peer relationships and support adolescents to avoid alcohol, tobacco and other drugs (ATOD) (Meschke, Bartholomae, & Zentall, 2002).

Discrepancies in Parent-Child reporting

Measurement error is an unavoidable part of research, no matter how reliable and valid the instrument and despite quality control measures (Brennan, 2001). This is especially true when measuring parental influence. In rare instances in the literature when both parents and their children report about parenting behaviors, parents demonstrate a tendency to overestimate (as compared to the child) their involvement, especially with regards to monitoring and discipline (Cottrell et al., 2003; Gonzales, Cauce, & Mason, 1996). In fact, multiple studies report correlations between parents' and children's reports of parenting behaviors as low as r = 0.11 (Pelegrina, Garcia-Linares, & Casanova, 2003; Schwarz, Barton-Henry, & Pruzinsky, 1985). Notwithstanding, the convention of asking parents to report about their own behavior is face valid and probably represents one of the most reliable sources, despite the incongruence with the child's reports (Barnes & Farrell, 1992). However, because both sources of information are only approximations of the actual events, both should be considered when researching the effects of parenting.

One justification for measuring the child's responses is based on the view that the child's perception of parenting practices influences his/her behavior (Pelegrina et al., 2003). Yet, arguments to the contrary suggest parents are in a better position to report about their own behavior. Assessment of the parents' practices from both perspectives may be warranted in light of this controversy (Pelegrina et al., 2003). A more complete understanding of the parental influence requires an improved understanding of the discrepancies between parents' and children's reports of parenting behaviors (Tein, Roosa, & Michaels, 1994). Most of the research in discrepant reports between parents and adolescents has not been replicated across cultures and ethnicities (Gonzales et al., 1996; Spera, 2006).

The purpose of this study was to identify whether parent or adolescent reports of parenting practices explains more variance in adolescent gateway drug use, and to compare variables that emerge as significant in the respective models developed for this analysis.

METHOD

Design

This study was part of a larger intervention study of Latino adolescents with latent tuberculosis infection (LTBI). For the present study, baseline data from adolescents and one parent (primary caregiver) were used to create sequential regression models. Two separate models were created, one for parents and a second for adolescents. In each case, adolescents' gateway drug use was sequentially regressed on 14 independent variables, entered in four blocks: demographics, parental influence, school influence, and peer influence. Blocks were added sequentially to the respective models based on conceptual proximity to the dependent variable, with the most proximal variables (peer influence) added last.

Screening, Recruitment, and Informed Consent

The sample of 252 Latino adolescents in this study were high school students ages 13 to 19. They were attending school in south San Diego County, tested positive for LTBI, and volunteered to participate in a medication adherence trial for LTBI treatment. The San Diego State University Institutional Review Board approved the study. Adolescents were ineligible to participate in the study if they had definite plans to relocate from the area within 12 months and/or to receive LTBI treatment in Mexico. After consenting, bilingual interviewers interviewed participants and completed baseline self-reported interviews.

Participants

Table 1 shows the study sample's demographic characteristics. Of the 252 Latino participants in the study, 48.4% were male and 41.7% were foreign born. Fifty-one percent had no medical insurance, and 32.2% had Medi-Cal (Medicaid in California) or Child Health and Disability Prevention services. The mean age of participants was 15.9 years (SD = 1.2). The mean years of education for participating parents was just over 9 years (M = 9.42, SD = 3.5), and their average age was 42.5 years (SD = 7.6).

Measurement

Dependent variable

The main dependent variable of interest was adolescent gateway drug use. Much of the published literature considers gateway drug use to involve alcohol, tobacco and marijuana (Chen et al., 2002; Ellickson, Hays, & Bell, 1992; Fleming, Leventhal, Glynn, & Ershler, 1989; Hall & Lynskey, 2005). A similar approach was employed for this study. Respondents were asked if they had ever used alcohol (yes/no). This included beer, wine and hard liquor (each asked in separate questions). Respondents were also asked if they had ever used tobacco (yes/no) and finally, if they had ever used marijuana (yes/no). The three alcohol variables were combined to create an alcohol scale (Cronbach's α = 0.713). Next, the alcohol variables were combined with tobacco and marijuana to create a gateway drug use scale (Cronbach's α = 0.719). Any use of alcohol resulted in a value of 1, use of alcohol and either tobacco or marijuana was coded as 2, and use of alcohol, tobacco and marijuana resulted in a value of 3. No student reported using tobacco alone.

Independent variables

Parent demographic variables

Parents' demographic information included age, the number of languages spoken, and annual household income. Parents were asked to report how many languages they speak. They were also asked to report their annual household income. This information was obtained by asking parents, 'Including all sources, can you please estimate your households' total income for last year.

Adolescent demographic variables

Age, gender, foreign-born status, acculturation, and receiving an allowance (yes/no) were all selected from the demographics section of the adolescent baseline interview. Foreign-born status was ascertained by asking the country of birth. Respondents born outside of the United States were coded as foreign-born. Acculturation was measured using the bidimensional acculturation scale (BAS) for Hispanics (Marin & Gamba, 1996). The acculturation scale consists of 24 questions regarding language use (eg, How often do you speak English/Spanish?), linguistic proficiency (eg, How well do you read in English/Spanish?), and electronic media use (eg, How often do you listen to music in English/Spanish?). Each question had four possible responses, very poorly, poorly, well, or very well. The questions are separated into 2 domains, Hispanic (all items about Spanish usage) and non-Hispanic (all items about English usage), with 12 items in each. For each cultural domain, an average of the 12 items is calculated, obtaining a mean range of scores between 1 and 4. Scores on both domains were used to determine the level of acculturation. Acculturation categories are computed using a 2.5 cutoff score to indicate low or high level of adherence to each cultural domain. An individual scoring higher than 2.5 in both domains was considered bicultural (Marin & Gamba, 1996).

Parenting variables

Only information about the mother's parenting was included in analyses because of missing values for fathers. These variables included measures of mother's use of praise, punishment, and involvement in the participant's life, including joining parent groups at school and helping with homework.

Reported by parents.

Mother's use of praise was measured with the following item: "Do you celebrate when (child's name) does something well?" Mother's use of punishment was estimated by asking: "When you are upset with (child's name) because of something he/she did or did not do, do you yell at (child's name)?' Parental involvement with their adolescent was measured by asking: "Do you help with (child's name) homework?" and "Do you join parent groups at (child's name) school?"

Reported by adolescents.

Adolescents were asked an identical set of questions regarding their parents' parenting practices, but were reported by the adolescent. Mother's use of praise was measured with the following item: "Does

your mother celebrate when you have done something well?" Mother's use of punishment was measured by asking: "When your mother is upset with you because you did or did not do something, does she yell at you?" Parental involvement with the adolescent was measured by asking two questions: "Does your mother help you with your homework?" and "Does your mother join parent groups at school?"

School influence variables

Academic performance was assessed by responses to: "What grades would you say you mostly receive at school?" (ranging from 'mostly Fs' to 'mostly As'). Two items assessed school truancy/discipline. Students were asked how many times they had been suspended from school, and how many times in the last year they had skipped/ditched school. Both variables were highly skewed, and therefore dichotomized (0 = never, 1 = ever). To assess the participants' level of involvement in extracurricular activities, they were asked, "In which of the following school-related activities/events do you participate?" Participants reported their participation by responding yes/no to each of the following: sports, academic/social clubs, and school dances.

Peer influence variables

Peer modeling of gateway drug use was measured with the following three items: "How many of your close friends have ever used cigarettes?"; "…ever used alcohol?"; and "…ever used marijuana?" These three variables were then combined to make one measure of friends' gateway drug use (Cronbach's $\alpha = 0.676$). The density of social support was measured by asking respondents: "How many (raw #) close friends do you have?" This variable was not normally distributed and was therefore recoded into four levels based on quartiles (1 = few friends to 4 = a lot of friends).

Analyses

All statistical analyses were performed using SPSS 15.0 for Windows. Sequential regressions were used to test two models: one for parents and a second for adolescents. Variables were added sequentially to the respective models by block based on the BEM and their conceptual proximity to the dependent variable. The first block was comprised of parent and adolescent demographic variables, block 2 included parenting variables, block 3 represented school influence variables, and block 4 included peer influence variables.

RESULTS

Bivariate analyses

Table 2 presents the discrepancies between parent and adolescent reports on the four items selected to estimate parental influence. In preliminary analyses, each of these variables was assessed independently for its association with gateway drug use. None of the variables reported by parents reached significance, whereas two of four of the variables reached significance when reported by the adolescent. These findings justified a comparison of parent and adolescent predictive models of gateway drug use, while controlling for possible confounding variables.

Table 3 shows that just fewer than seventy percent (69.4%) of adolescents in this study reported gateway drug use. Forty-seven percent reported using alcohol only, 13.5% used alcohol and tobacco, 3.6% used just alcohol and marijuana, and 3.6% used all three substances. No respondent reported using just tobacco.

Parents' model

Demographic variables were entered in block 1 and accounted for a significant 9.0% of the variance in gateway drug use ($F = 2.285$, $p = 0.030$). This block included the parents' age, parents' marital status, number of languages the parent speaks and annual household income. Variables reported by the adolescent include age, number of siblings, acculturation, and gender. Age of the adolescent was the only significant variable in this block ($p = 0.003$), with older adolescents being more likely to use gateway drugs.

Block 2, the family influence block was not significant, contributing only 0.8% of explained variance. Variables in this block were only reported by the parent and included celebrating when the child does well, yelling when the child behaves poorly, helping with homework and joining parent groups at the adolescent's school. Adolescent's age (from block 1) remained significant with the addition of the second block ($p = 0.005$).

The next block (block 3) represented school influence and was reported by the adolescent. The only new variable added in this block was skipping school in the previous 12 months. This block significantly added 2.5% of explained variance (F change = 4.458, $p = 0.036$). Skipping school in the past

year was significantly related to gateway drug use ($p = 0.036$) and adolescent's age remained significant in the third block ($p = 0.031$). With inclusion of the third block, the model explained 12.2% of the variance in gateway drug use.

Block 4 included variables related to peer influence, which included the number of close friends and how many friends used gateway drugs. This block significantly added 21.9% of explained variance (F change = 26.354, $p < 001$). Having more close friends was negatively associated (protective) with gateway drug use ($p = 0.001$). Also, peer models of gateway drug use resulted in a significant positive association with reported use ($p < 0.001$). Adolescent's age was no longer significant in the final model. After entering the fourth block, the full model explained 34.1% of variance in gateway drug use. Table 4 presents the summary statistics for the complete model by block. All variables were eligible to remain in the model based on results from collinearity diagnostics.

Adolescent's model

Block 1 (demographic variables) accounted for a significant 8.6% of the variance in gateway drug use ($F = 2.147$, $p = 0.042$). As in the parent's model, adolescent's age was the only significant variable in this block ($p = 0.002$).

Block 2 (family influence) was marginally significant and added 5.2% of explained variance (F change = 2.363, $p = 0.055$). In contrast to the parent model in which parent-reported variables were included in this block, only adolescent-reported variables were added. Having a mother that yells at you was related to increased risk for gateway drug use ($p = 0.016$). Age remained significant in this block ($p = 0.005$). With the addition of block 2, the model accounted for 13.8% of explained variance.

The third block involved variables related to the school environment. This block added a significant 2.3% of explained variance (F change = 4.261, $p = 0.041$). Skipping school in the past year was associated with increased risk for gateway drug use ($p = 0.041$) as were age ($p = 0.036$) and having a mother that yells at you ($p = 0.023$). At this point, the model accounted for 16.1% of explained variance in gateway drug use.

The final block (#4) was related to peer influence. These variables significantly added an additional 20.0% of explained variance (F change = 23.915, $p < 001$). Table 5 presents the summary

statistics for the complete model by block. Again, all variables were left in the model based on collinearity diagnostics. The final regression model accounted for 36.1% of the explained variance in gateway drug use ($F = 6.172$, $p < 0.001$). As was the case for the parent's model, adolescent's age was no longer significant in the final model. The number of close friends was negatively associated with gateway drug use ($p = 0.001$). Peer models of gateway drug use were also associated with reported use ($p < 0.001$). Having a mother who yells at you was marginally significant ($p = 0.060$). Having a mother who joins parent groups at school reached significance for the first time and was negatively associated with gateway drug use ($p = 0.027$).

DISCUSSION

The purpose of this study was to compare parent and adolescent reports about parents' parenting behaviors, and to do so in the context of multivariate models for gateway drug use. The BEM guided the selection of variables in each of the two models. Overall, the model based on adolescents' report explained more variance than the model based on parents' report. The parenting block, the block defining the key difference between the two models, was only significant in the adolescent's model. The adolescents' report of parenting also resulted in more components of subsequent blocks reaching significance, seemingly increasing the precision of he overall predictive model. These discrepancies between parent and adolescent reports suggest a need for additional measures, or more refined measures of parenting practices.

Parent's model

The value of the sequential regression approach is tied to its ability to reveal relationships among variables as they are added to the model. As such, brief consideration of each block is warranted. For example, age and skipping school were significantly related to gateway drug use when they entered the model in their respective blocks, but were no longer significant in the final model. After controlling for other variables, the initial association with age and skipping school was essentially mitigated. By contrast, parental involvement at school (joining parent groups at school) was not significant initially, but reaches significance as a correlate of gateway drug use in the final model resulting in decreased risk for gateway drug use for more involved parents.

When parents report about their own parenting behaviors, none of these variables reach significance. The entire parental influence block is not significant as it enters the model, and in the final model. The final block represents peer influence. Its position as the final block in the sequential regression approach indicates a theory based assumption that it has the strongest association with gateway drug use. The effects of peer influence are well documented in published literature, (Almodovar, Tomaka, Thompson, McKinnon, & O'Rourke, 2006; Beal, Ausiello, & Perrin, 2001; Elder et al., 2000; Kandel, Kiros, Schaffran, & Hu, 2004; Mowery, Farrelly, Haviland, Gable, & Wells, 2004) and results presented here confirm that. Risk for gateway drug use decreases as the social network increases in size as represented here by an increase in the reported number of close friends, and peer use of gateway drugs was strongly related to reported use.

<center>Adolescent's model</center>

The data source for the parental influence block is the defining feature between the two models. As previously mentioned, this block was not significant in the parent's model. However, when adolescents' report about their parent's parenting behaviors the block was significant, both upon entrance in the model and in the final model. When reported by adolescents, parental involvement in the adolescent's school life and having a mother that yells at you (as reported by the adolescent) were significant. Lack of parental involvement in school has been shown previously to be associated with adolescent behavior problems, (Connell, Spencer, & Aber, 1994; Ramirez-Valles, Zimmerman, & Newcomb, 1998) and yelling is a well-known family stressor and supports the finding reported here (McCubbin, Needle, & Wilson, 1985). Other significant variables were identical between the two models. That is, having a lot of close friends (negative association), and peers that model gateway drug use.

The discrepancy between adolescent and parent reports is an innovative finding, and suggests that adolescents may provide a more accurate estimate of parenting practices than do parents. Other studies have shown that discrepancies in perceptions between adolescents and their parents may be negatively related to adolescent adjustment, including increased levels of conflict and stress within the family resulting in problem behaviors (Ohannessian, Lerner, Lerner, & Von Eye, 2000). Although this study's objective was not to test how discrepancies predict problem behaviors in adolescents, adolescent perceptions should

be considered with or preferentially over that of parent's estimates of their parenting practices. To this end, Barnes and Farrell (1992) suggest that reliance on one respondent in the family represents a common methodological shortfall in many studies, especially when there is not perfect agreement between adolescent and parental perspectives. Findings reported here suggest that in addition to nonconcordance between parents and adolescents, there is a difference in the predictive value of these reports.

In terms of impact on future studies, it should be noted that the true parenting behaviors in this study remain unknown. That is, both parent and adolescent reports are subject to error and may include biases. Pelegrina et al. (2003) state that adolescents assess certain family characteristics more negatively than their parents, whereas the parents' self-reports tend to exaggerate certain dimensions, such as acceptance and discipline. Future studies of the influence of parenting behaviors should incorporate more state of the art objective observational procedures to advance the current state of the science and determine the true parents' parenting practices. To the extent that such procedures and innovations are incorporated, scientific understanding of parental influence on children will be clarified.

The findings from this study should be interpreted in the context of the sample's limitations. The study sample, though entirely Latino, was not population-based and only represented data from mothers. Whereas these findings may not be generalizable to the Latino population at large, they do speak to the need for the development of more refined measures of parenting practices. Nevertheless, the use of an entirely Latino sample of parents (mothers) and adolescent dyads represents an important feature of this study, making it a valuable addition to extant literature.

ACKNOWLEDGEMENTS

REFERENCES

Almodovar, A., Tomaka, J., Thompson, S., McKinnon, S., & O'Rourke, K. (2006). Risk and protective factors among high school students on the US/Mexico border. *American Journal of Health Behavior, 30*(6), 745-752.

Barnes, G. M., & Farrell, M. P. (1992). Parental support and control as predictors of adolescent drinking, delinquency, and related problem behaviors. *Journal of Marriage & the Family, 54*(4), 763-776.

Beal, A. C., Ausiello, J., & Perrin, J. M. (2001). Social influences on health-risk behaviors among minority middle school students. *Journal of Adolescent Health, 28*(6), 474-480.

Brennan, R. L. (2001). *Generalizability theory*. New York, NY: Springer-Verlag Publishing.

Chen, X., Unger, J. B., Palmer, P., Weiner, M. D., Johnson, C. A., Wong, M. M., et al. (2002). Prior cigarette smoking initiation predicting current alcohol use: Evidence for a gateway drug effect among California adolescents from eleven ethnic groups. *Addictive Behaviors, 27*(5), 799-817.

Connell, J. P., Spencer, M. B., & Aber, J. L. (1994). Educational risk and resilience in African-American youth: Context, self, action, and outcomes in school. *Child Development, 65*(2), 493-506.

Cottrell, L., Li, X., Harris, C., D'Alessandri, D., Atkins, M., Richardson, B., et al. (2003). Parent and adolescent perceptions of parental monitoring and adolescent risk involvement. *Parenting: Science and Practice, 3*(3), 179-195.

Elder, J. P., Campbell, N. R., Litrownik, A. J., Ayala, G. X., Slymen, D. J., Parra-Medina, D., et al. (2000). Predictors of cigarette and alcohol susceptibility and use among Hispanic migrant adolescents. *Preventive Medicine: An International Journal Devoted to Practice and Theory, 31*(2, Pt.1), 115-123.

Ellickson, P. L., Hays, R. D., & Bell, R. M. (1992). Stepping through the drug use sequence: Longitudinal scalogram analysis of initiation and regular use. *Journal of Abnormal Psychology, 101*(3), 441-451.

Fleming, R., Leventhal, H., Glynn, K., & Ershler, J. (1989). The role of cigarettes in the initiation and progression of early substance use. *Addictive Behaviors, 14*(3), 261-272.

Gonzales, N. A., Cauce, A. M., & Mason, C. A. (1996). Interobservor agreement in the assessment of parental behavior and parent-adolescent conflict: African American mothers, daughters, and independent observers. *Child Development, 67*(4), 1483-1498.

Hagenhoff, C., Lowe, A., Hovell, M. F., & Rugg, D. (1987). Prevention of the teenage pregnancy epidemic: A social learning theory approach. *Education & Treatment of Children, 10*(1), 67-83.

Hall, W. D., & Lynskey, M. (2005). Is cannabis a gateway drug? Testing hypotheses about the relationship between cannabis use and the use of other illicit drugs. *Drug and Alcohol Review, 24*(1), 39-48.

Hester, P., & Kaiser, A. (1998). Early intervention for the prevention of conduct disorder: Research issues in early identification, implementation, and interpretation of treatment outcome. *Behavioral Disorders, 24*, 57-65.

Hovell, M. F., Wahlgren, D. R., & Gehrman, C. A. (2002). The Behavioral Ecological Model: Integrating public health and behavioral science. In R. DeClemente, R. Crosby & M. Kegler (Eds.), *Emerging*

theories in health promotion practice and research: strategies for improving public health. (pp. 347-385). San Francisco, CA: Jossey-Bass, Inc.

Kandel, D., Kiros, G., Schaffran, C., & Hu, M. (2004). Racial/ethnic differences in cigarette smoking initiation and progression to daily smoking: A multilevel analysis. *American Journal of Public Health, 94*(1), 128-135.

Kauffman, J. (2000). *Characteristics of emotional and behavioral disorders of children and youth.* Upper Saddle River, NH: Merrill.

Marin, G., & Gamba, R. (1996). A new measurement of acculturation for Hispanics: The bidimensional acculturation scale for Hispanics (BAS). *Hispanic Journal of Behavioral Science, 18*(3), 297-316.

McCubbin, H. I., Needle, R. H., & Wilson, M. (1985). Adolescent health risk behaviors: Family stress and adolescent coping as critical factors. *Family Relations, 34*(1), 51-62.

Meschke, L., Bartholomae, S., & Zentall, S. (2002). Adolescent sexuality and parent-adolescent processes: promoting healthy teen choices. *Journal of Adolescent Health, 31(Suppl)*, 264-279.

Mowery, P. D., Farrelly, M. C., Haviland, M. L., Gable, J. M., & Wells, H. E. (2004). Progression to established smoking among US youths. *American Journal of Public Health, 94*(2), 331-337.

Ohannessian, C. M., Lerner, R. M., Lerner, J. V., & Von Eye, A. (2000). Adolescent-parent discrepancies in perceptions of family functioning and early adolescent self-competence. *International Journal of Behavioral Development, 24*(3), 362-372.

Patterson, G. R., DeBaryshee, B., & Ramsey, E. (1989). A development perspective on antisocial behavior. *American Psychologist, 44*(2), 329-335.

Patterson, G. R., Reid, J., & Dishion, T. (1992). *Antisocial boys: A social interactional approach* (Vol. 4). Eugen, OR: Catalia.

Pelegrina, S., Garcia-Linares, M. C., & Casanova, P. F. (2003). Adolescents and their parents' perceptions about parenting characteristics. Who can better predict the adolescent's academic competence? *Journal of Adolescence, 26*(6), 651-665.

Ramirez-Valles, J., Zimmerman, M. A., & Newcomb, M. D. (1998). Sexual risk behavior among youth: Modeling the influence of prosocial activities and socioeconomic factors. *Journal of Health and Social Behavior, 39*(3), 237-253.

Reid, J., & Eddy, J. (1997). The prevention of antisocial behavior: Some considerations in the search for effective interventions. In D. Stoff & J. Maser (Eds.), *Handbook of antisocial behavior.* New York: Wiley.

Schwarz, J. C., Barton-Henry, M. L., & Pruzinsky, T. (1985). Assessing child-rearing behaviors: A comparison of ratings made by mother, father, child, and sibling on the CRPBI. *Child Development, 56*(2), 462-479.

Spera, C. (2006). Adolescents' perceptions of parental goals, practices, and styles in relation to their motivation and achievement. *Journal of Early Adolescence, 26*(4), 456-490.

Tein, J.-Y., Roosa, M. W., & Michaels, M. (1994). Agreement between parent and child reports on parental behaviors. *Journal of Marriage & the Family, 56*(2), 341-355.

Tolan, P., & McKay, M. (1996). Preventing serious antisocial behavior in inner-city children: An empirically based family intervention program. *Family Relations, 45*, 148-155.

Walker, H. (1997). First steps to prevent antisocial behavior. *Teaching Exceptional Children, 30*, 16-19.

Walker, H., Colvin, G., & Ramsey, E. (1995). *Antisocial behavior in school: Strategies and best practices*. Pacific Grove, CA: Brooks/Cole.

Wierson, M., & Forehand, R. (1994). Parent behavioral training for child noncompliance: Rationale, concepts, and effectiveness. *Current Directions in Psychological Services, 3*, 146-151.

Table 3.1 *Characteristics of the Study Sample (N = 252)*

Variables	M	SD	Range	α
Age-Adolescent	15.91	1.22	13 – 19	
Gender[a]	0.48	0.50	0 - 1	
Age-Parent	42.46	7.62	20 – 76	
Acculturation[b]	0.81	0.58	0 – 2	
Number languages spoken-Parent	1.34	0.47	1 – 2	
Household income[c]	4.08	1.47	1 – 7	
Number siblings	1.74	1.26	0 – 10	
Skipped school in past year[d]	0.38	0.49	0 – 1	
Number close friends	1.48	1.07	0 – 3	
Number friends that use gateway drugs	6.63	9.22	0 – 61	0.719

[a]Gender: 0 = *female*, 1 = *male*. [b]Acculturation: 0 = *Hispanic*, 1 = *bicultural*, 2 = *assimilated*.
[c]Household income: 1 = *0*, 2 = *$1 - $10k*, 3 = *$10k - $19k*, 4 = *$20k - $29k*, 5 = *$30k - $39k*,
6 = *$40k - $49k*, 7 = *$50k+*. [d]Skipped school in past year: 0 = *no*, 1 = *yes.*

Table 3.2 *Parent and Adolescent Report of Parenting Variables (N = 252)*

Variables	Reported by		
	Parent, % (n)	Adolescent, % (n)	[a]Concordance, % (n)
Yell at child when s/he has done something bad	61.1 (154)	46.2 (115)	59.8 (149)
Help child with her/his homework	34.9 (88)	47.4 (118)	63.5 (158)
Join parent groups at child's school	42.5 (107)	19.8 (49)	63.2 (156)
Celebrate when your child has done something well	78.9 (198)	62.2 (155)	63.7 (158)

[a]Concordance: [parent yes = adolescent yes + parent no = adolescent no]/total.

Table 3.3 *Use of Gateway Drugs (N = 251)*

Condition	n	%
None	77	30.7
Alcohol	118	47.0
Alcohol and Tobacco	34	13.5
Alcohol and Marijuana	9	3.6
Alcohol, Tobacco and Marijuana	13	5.2

Table 3.4 *Predictors of Gateway Drug Use: Contributions of Each Variable Block to Changes in R^2 (Parent's Model) (N = 236)*

	Block 1			Block 2			Block 3			Block 4		
Variable	B	SE B	β	B	SE B	β	B	SE B	β	B	SE B	B
Age	0.16	0.05	0.24**	0.16	0.06	0.22**	0.12	0.06	0.19*	0.06	0.05	0.09
Gender	0.04	0.13	0.02	0.04	0.13	0.02	0.06	0.13	0.04	0.14	0.11	0.08
Income	0.03	0.04	0.05	0.03	0.04	0.06	0.03	0.04	0.05	0.03	0.04	0.05
Parent's age	0.00	0.01	0.02	0.00	0.01	0.02	0.00	0.01	0.02	0.00	0.01	0.01
Acculturation	0.13	0.11	0.09	0.13	0.11	0.09	0.11	0.11	0.08	0.18	0.10	0.13
# of siblings	-0.07	0.05	-0.12	-0.087	0.05	-0.13	-0.07	0.05	-0.12	-0.00	0.04	-0.02
# languages spoken	0.14	0.14	0.08	0.15	0.14	0.09	0.17	0.14	0.09	0.20	0.12	0.12
Yell at you				0.13	0.13	0.07	0.15	0.13	0.19	0.08	0.11	0.05
Help you with homework				-0.07	0.14	-0.04	-0.06	0.14	-0.03	-0.12	0.12	-0.07
Join parent groups-school				0.04	0.13	0.02	0.07	0.13	0.04	0.08	0.17	0.05
Celebrate				-0.02	0.16	-0.01	-0.03	0.16	-0.01	0.03	0.14	0.01
Skipped school in past year							0.28	0.14	0.17*	0.09	0.12	0.06
# close friends										-0.18	0.05	-0.23***
# friends use gateway drugs										0.31	0.05	0.49***
R^2		0.09			0.98			0.12			0.35	
F for change in R^2		2.29*			0.34			4.46*			26.35***	

Table 3.4 *Predictors of Gateway Drug Use: Contributions of Each Variable Block to Changes in R^2 (Parent's Model) (N = 236)(continued)*

Note: A sequential regression strategy was used in the analysis in which blocks of variables were added to the regression equation sequentially. R^2 refers to the overall regression equation after each block has been entered into the model; F for change in R^2 describes the contribution of each individual block. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 3.5 *Predictors of Gateway Drug Use: Contributions of Each Variable Block to Changes in R^2 (Adolescent's Model) (N = 233)*

Variable	Block 1			Block 2			Block 3			Block 4		
	B	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*B*
Age	0.17	0.05	0.24**	0.15	0.05	0.22**	0.12	0.06	0.17*	0.06	0.05	0.08
Gender	0.02	0.13	0.01	0.05	0.13	0.03	0.06	0.13	0.04	0.15	0.11	0.09
Income	0.03	0.04	0.05	0.04	0.04	0.07	0.03	0.04	0.06	0.04	0.04	0.08
Parent's age	0.00	0.01	0.01	0.00	0.01	0.04	0.01	0.01	0.04	0.00	0.01	0.02
Acculturation	0.13	0.11	0.09	0.12	0.11	0.08	0.10	0.11	0.07	0.17	0.10	0.12
# of siblings	-0.07	0.05	-0.11	-0.07	0.05	-0.11	-0.06	0.05	-0.09	0.00	0.04	0.00
# languages spoken	0.11	0.14	0.06	0.20	0.14	0.11	0.21	0.14	0.12	0.24	0.12	0.14
Yell at you				0.31	0.13	0.19*	0.29	0.13	0.18*	0.25	0.11	0.15*
Help you with homework				-0.06	0.13	-0.04	-0.02	0.13	-0.01	0.00	0.12	0.00
Join parent groups-school				-0.21	0.16	-0.10	-0.24	0.16	-0.12	-0.35	0.14	-0.17*
Celebrate				-0.08	0.14	-0.05	-0.09	0.14	-0.05	-0.03	0.12	-0.02
Skipped school in past year							0.28	0.14	0.16*	0.12	0.12	0.07
# close friends										-0.18	0.05	-0.24**
# friends use gateway drugs										0.30	0.04	0.48***
R2	0.09			0.14			0.16			0.38		
F for change in R2	2.15*			2.36*			4.26*			26.31***		

Table 3.5 *Predictors of Gateway Drug Use: Contributions of Each Variable Block to Changes in R^2 (Adolescent's Model) (N = 233) (continued)*

Note: A sequential regression strategy was used in the analysis in which blocks of variables were added to the regression equation sequentially. R^2 refers to the overall regression equation after each block has been entered into the model; F for change in R^2 describes the contribution of each individual block. *p < .05. **p < .01. ***p < .001.

CHAPTER 4

AN EXPLORATORY ECOLOGICAL ANALYSIS OF RETAILER DISPERSION AND GATEWAY

DRUG USE AMONG LATINO ADOLESCENTS

ABSTRACT

Recent reports reveal gender differences related to acquisition of alcohol and tobacco by adolescents. But few studies explore these differences in the context of the built environment. The purpose of this study was to explore the role of the built environment in the context of recognized social learning predictors and their association with gateway drug use by gender in a sample of Latino adolescents. Gateway drug use data came from 226 Latino adolescents along the California/Mexico border. Variables from the built and social environments were included in multivariate models for boys and girls. Decreasing distance to the nearest retailer was associated with low SES based on census classifications of neighborhood characteristics. Only for girls was increased distance to the nearest retailer associated with gateway drug use. Gender differences are important and may indicate gender-specific cultures and parenting practices imposed on girls in high-risk neighborhoods. Future studies should explore this possibility further with more complete measures of parenting and assessment of proximal tobacco and alcohol retailers.

Keywords: GIS, gateway drugs, built environment, Latinos

INTRODUCTION

Adolescent gateway drug use continues to be a serious problem, contributing to immediate and long-term health consequences and costs to society (Simantov, Schoen, & Klein, 2000). Decades of research on uptake of these substances have identified significant individual and social-level risk factors. However, ecological influences have only recently been explored. Recent advancements in software programs that use geographic information systems (GIS) technology (Gruenewald, Freisthler, Remer, LaScala, & Treno, 2006) provide the necessary tools to conduct innovative exploratory analyses of ecological influences on gateway drug use.

Recent reports regarding adolescent tobacco acquisition suggest that drug products are usually provided by three common sources: a stranger who buys them, family or friends who buy or give them, or a retailer who sells them (often illegally) (Gilpin et al., 2004; Klonoff, Klonoff, & Landrine, 2004). Some studies indicate it is easy for adolescents to buy both alcohol (Freisthler, Gruenewald, Treno, & Lee, 2003) and tobacco (Gilpin et al., 2004). Indeed, the California Department of Public Health and Tobacco Control (2004) reports that one of the simplest ways for adolescents to buy tobacco is in their local neighborhood store. Data from the American Lung Association indicate that 33% to 50% of San Diego County retailers sell to adolescents ("Unpublished Data," 2004).

At least three issues should be considered with respect to retailer impact on substance use. First, adolescents are sensitive to cost, including the cost of time spent traveling to purchase products in other neighborhoods (Hyland et al., 2003). They may also have unreliable transportation and limited spending money. Frequent use or use of multiple substances (alcohol + tobacco + marijuana) may require more disposable income than would be true for youth who use drugs infrequently or only use one substance, e.g., alcohol. Youth who use drugs frequently or many different drugs may have less disposable income to invest and would be more sensitive to the distance from home to a retail business from which alcohol or tobacco could be purchased.

Second, substances for first time use are usually not purchased by the adolescent experimenter, (DiFranza & Coleman, 2001; Emery, Gilpin, White, & Pierce, 1999) and instead may be provided at parties

or group gatherings. Users under these conditions may be less influenced by retailer proximity to their home.

Third, retailer presence may provide a critical link to facilitate social processes in a given neighborhood. For example, modeling is a known risk factor for substance use, and seeing other adolescents purchase and use alcohol and tobacco may prompt consumption (DiFranza & Coleman, 2001). The effects of retailer dispersion (e.g., density or proximity) may be due to increased availability to substances, but it may also relate to increased opportunities for modeling, imitation by substance use, which can then be reinforced by peers.

<center>An Environmental Approach to Adolescent Substance Use</center>

In their introduction of a community systems approach, Treno & Holder (1997) identify a limitation with group/individual-level prevention efforts. Mainly, such approaches are effective when the conditions that give rise to undesirable behavior lie solely within the target group, or individual, e.g., lack of knowledge. Indeed, education and awareness prevention efforts have historically been very popular (Saltz, 1997). Nevertheless, efforts that focus entirely at such levels fail to demonstrate long-term results in circumstances where behavioral determinants extend beyond the individual, e.g., policies, alcohol and tobacco access, peer modeling, etc. Uptake and consumption of substances during adolescence is the result of many influences outside the purview of the individual.

Despite the rational for environmental approaches, and the compelling evidence of environmental correlates associated with risky substance use practices, (Bousman et al., 2005; Clapp, Lange, Min, Shillington, Johnson, & Voas, 2003; Clapp, Reed, Holmes, Lange, & Voas, 2006; Patterson, 2008) proven interventions are still limited in number. Indeed, structural environmental factors rarely makes it past the stage of a theoretical construct to inclusion in analytical models (Pokorny, Jason, & Schoeny, 2003). This is in part due to the relevant infancy-stage of development (Clapp et al., 2003; Clapp, Holmes, Reed, Shillington, Freisthler, & Lange, 2007). Notwithstanding this infancy, various theoretical models have emerged that attempt to address these environmental influences. The Behavioral Ecological Model (BEM) is based on the notion that behavioral determinants reside in the environment. Operational measures of Intrapersonal factors are difficult to validate and therefore excluded from the model that also explicitly

assumes that ignoring such individual-level variables does not compromise prediction or control of behavior, thereby placing behavioral causes in the environment (Hovell, Wahlgren, & Gehrman, 2002).

Study Rationale

In light of reports describing gender differences with respect to tobacco acquisition, (Robinson, Klesges, & Zbikowski, 1998) and the recent reports about the relationship between retailer presence and high risk behaviors, (Hyland et al., 2003; Novak, Reardon, Raudenbush, & Buka, 2006; Schneider, Reid, Peterson, Lowe, & Hughey, 2005) surprisingly little work has been done to highlight differences on this dimension between boys and girls. The purpose of this exploratory study based on the BEM and previous work by Pokorny et al. (2003) was to compare gender differences on the relationship between gateway drug use and variables representing both structural and social environments.

METHOD

Design

Alcohol, tobacco and marijuana use variables were selected from a cross-sectional interview of Latino adolescents along the California/Mexico border in San Diego County. Demographic and peer modeling variables were also selected from the interview. A measure of alcohol and tobacco retailer dispersion was calculated from retailer location data obtained through the San Diego County Department of Environmental Health Food & Housing Division (DEH). Gateway drug use was regressed using least squares regression on 8 independent variables representing both structural (e.g., distance to the nearest alcohol and tobacco retailer) and social environmental influences (e.g., peer gateway drug use modeling).

Screening, Recruitment, and Informed Consent

The sample of 226 Latino adolescents in this study were students ages 13 to 19, attending high school in south San Diego County, who tested positive for latent tuberculosis infection (LTBI), volunteered to participate in a medication adherence trial, and planned to receive treatment of their infection in the United States (US). Data were collected between 2004 and 2005. Participation in this study was limited to adolescents with a residential address in the US. After obtaining informed consent, trained bilingual staff completed a baseline interview in the participant's home.

Participants

Just fewer than 50% (49.6%) of participants were male and 42.9% were foreign born (see Table 1). The mean age of participants was 15.9 years (SD = 1.2).

Measurement

Dependent Variable

The main dependent variable of interest was adolescent gateway drug use, which includes alcohol, tobacco, and marijuana. This measure has been used in previous studies (Chen et al., 2002; Ellickson, Hays, & Bell, 1992; Fleming, Leventhal, Glynn, & Ershler, 1989; Hall & Lynskey, 2005).Respondents were asked if they had ever used beer. This question was repeated for wine and hard liquor, and these three variables were combined to create an alcohol use scale (Cronbach's α = 0.713). Respondents were then asked if they had ever used tobacco, and lastly, if they had ever used marijuana. The alcohol scale was combined with tobacco and marijuana to create a gateway drug use scale (Cronbach's α = 0.719). Use of alcohol resulted in a value of 1, use of alcohol and tobacco was coded as 2, and use of alcohol, tobacco and marijuana resulted in a value of 3. No participant reported using tobacco or marijuana alone.

Independent variables

Demographic variables

Age, gender, and acculturation were selected to represent demographic characteristics. Acculturation was measured using the Bidimensional Acculturation Scale for Hispanics (Marin & Gamba, 1996). The acculturation scale consists of 24 questions regarding language use (e.g., How often do you speak English/Spanish?), linguistic proficiency (e.g., How well do you read in English/Spanish?), and electronic media use (e.g., How often do you listen to music in English/Spanish?). Each question had four possible responses: very poorly, poorly, well, or very well. The questions were separated into 2 domains, Hispanic (all items about Spanish usage) and non-Hispanic (all items about English usage), with 12 items in each. For each cultural domain, an average of the 12 items was calculated, obtaining a mean range of scores between 1 and 4. Scores on both domains were used to determine the level of acculturation. Acculturation categories were computed using a 2.5 cutoff score to indicate low or high level of adherence

to each cultural domain. Individuals scoring higher than 2.5 in both domains were considered bicultural (Marin & Gamba, 1996).

Participant Walking Neighborhoods

The participant residential address was geocoded in ArcView 9.2. Geocoding refers to the process of creating a point along a roadway segment that defines the location of any given address. A quarter-mile street network buffer was then created around each participant's residential location or point. This buffer was intended to reflect the "walking neighborhood," or those locations where the participant could easily walk to access various nearby alcohol and tobacco retailers. Currently no standard exists to define a buffer size that appropriately reflects "neighborhood;" however, given the typically limited travel choices of adolescents, the area within a 5-minute walk of his/her home can reasonably be considered a highly accessible area. The quarter mile distance was developed assuming a walking speed of 3.4 miles/hour (Knoblauch, Pietrucha, & Nitzburg, 1996). One previous study used a circular buffer of 0.5 miles (Pollack, Cubbin, Ahn, & Winkleby, 2005). Buffers created using distances along the street network, such as that employed in the current study, exclude areas of the urban environment that are not accessible via roadways, and are generally considered to more accurately reflect those locations that are truly accessible.

Neighborhood Characteristics.

US Census Bureau data were obtained from San Diego Geographic Information Source (SanGIS) (2007), and used to identify neighborhood characteristics. Items were selected using an adaptation of an approach employed by Sampson, Raudenbush, & Earls (1997) and mostly represent indicators of neighborhood poverty (Sampson, Morenoff, & Earls, 1999; Sampson et al., 1997). The values used in this study were: 1) percentage of families living below the poverty level, 2) percentage of unemployment, 3) percentage of adults (25 and older) with a high school diploma, 4) percentage of owner occupied homes, 5) percentage of the population under 18 years of age, 6) percentage of homes headed by a single mother, and 7) percentage of Hispanics.

The neighborhood characteristic variables from SanGIS were available by Census Block Groups (CBGs), a census geography that reflects aggregations of several Census Blocks. Since the participant's neighborhood buffers were irregular and did not fall exactly on the boundaries of the CBGs, it was

necessary to estimate Census variable values within each participant's buffer using a method referred to as "apportioning". This procedure involves calculating the proportion of each CBG that overlaps with a neighborhood buffer and then using that percentage to factor each respective Census variable. For example, if a participant's neighborhood buffer included 25% of one CBG, 55% of another, and 20% of a third CBG, then these percentages were used to weight the census values associated with each CBG to develop a unique value more closely aligned with the boundaries of the neighborhood buffer. This is a recognized approach to adjusting Census data (available only in limited geographies) so that it more accurately reflects a unique, non-census geography (S. Ryan, personal communication, February15, 2008).

Retailer Variable

The DEH maintains a database of all county retailers that apply for food permits. This study analyzed retailers from the 2004 database, and was limited to convenience stores. Retailers that did not sell alcohol and tobacco were removed. The retailer address was geocoded using ArcView 9.2 and then used to create a measure of retailer dispersion: distance to nearest retailer from each participant's residential location. Distance to the nearest retailer was calculated using the Network Analyst function in ArcView, which is capable of finding and then measuring the distance of the shortest roadway path between a given participant's residential point and the nearest retailer point. This variable demonstrated a non-normal distribution and required transformations to reach normality.

Parental Consistency

A measure of parents' consistent use of punishment, reinforcement and monitoring was created by summing responses to three questions about the level of consistent use of parental rules, punishment and rewards (Cronbach's $\alpha = 0.61$). In each case, participants were asked the following question: "How consistent are your parents in their use of rules (repeated for punishment and rewards)?" (5-point scale, 1 = very inconsistent to 5 = very consistent), resulting in a possible score for parental consistency ranging from 3 to 15.

School Truancy

A school truancy variable was selected from the interview and included here as a crude indicator of involvement in the school environment. Respondents were asked how many times in the last year they had skipped/ditched school. This variable was dichotomized (0 = never, 1 = ever).

Peer Modeling

Peer modeling of gateway drug use was measured with the following three items: "How many of your close friends have ever used cigarettes?"; "…ever used alcohol?"; and "…ever used marijuana?" These three variables were combined to make one measure of peer modeling of gateway drug use (Cronbach's $\alpha = 0.68$).

Cohort

Data collection for youth attending 7 high schools was spread over the course of two academic school years. While participating schools were part of the same district, schools in the first cohort (year 1) were generally located further from the California/Mexico border. Figure 1 shows that neighborhood characteristics for respondents closest to the border (cohort 2) were consistently from lower income neighborhoods (or consistently indicated more socioeconomic deprivation). For this reason, a cohort variable was included in regression analyses.

Analyses

All statistical analyses were performed using ArcGIS suite version 9.2 and SPSS 15.0 for Windows. Pearson correlations were used to estimate the association between neighborhood indicators (community characteristics) and the two measures of retailer dispersion. Next, Gateway drug use was regressed on 8 independent variables to explore the association of retailer dispersion. Males and females were considered separately.

RESULTS

Table 1 shows that 29.3% of respondents reported never using gateway drugs, and almost 50% (49.8%) reported using alcohol. Nearly 16% of the sample reported using alcohol and tobacco, and 5.3% used alcohol, tobacco, and marijuana.

Neighborhood Characteristics

Table 2 shows the correlation between neighborhood characteristics and retailer dispersion. Increasing distance between a participant's home and the nearest retailer was significantly associated with a decrease in the percentage of families living below poverty (-), unemployment (-), population under 18 years of age (-), households headed by single mothers (-), percentage of Hispanics (-), and an increase in the percentage of adults (25 and older) with high school diplomas (+) and the percentage of owner-occupied homes (+). This pattern between retailer dispersion and neighborhood characteristics is reflective of U.S. urban development patterns and housing preferences whereby single-family, single-use neighborhoods typically have higher property values and higher socio-economic status of residents. Retailers also tended to concentrate near high traffic volume roadways, which is generally a lower income neighborhood and considered a less desirable residential location.

Retailer Dispersion and Use of Alcohol and Tobacco

Males

Table 3 displays the results of the regression analyses. Among males, four variables reached significance: acculturation, parental consistency, skipping school in the previous 12 months, and peer modeling. Gateway drug use was associated with increasing acculturation score ($p = 0.047$), decreasing parental consistency ($p = 0.038$), skipping school in the previous 12 months ($p = 0.029$), and peer modeling ($p < 0.001$). This model explained a significant 36.2% of the variance in male gateway drug use ($F_{8, 111} = 6.963$; $p < 0.001$). None of the structural environmental variables reached significance.

Females

Among females, five variables reached significance. They were: acculturation, parental consistency, peer modeling, distance to the nearest retailer, and proximity to the border. Acculturation ($p = 0.014$), parental consistency ($p = 0.028$) and peer modeling ($p < 0.001$) demonstrated the same direction of influence for females as males.

Two structural environmental variables reached significance for females. Cohort 2 i.e., proximity to the California/Mexico border ($p = 0.005$), and increasing distance to the nearest alcohol and tobacco retailer ($p = 0.015$) were both associated with increased likelihood for reporting gateway drug use. The

model for females significantly explained 40.2% of the variance in gateway drug use ($F_{8, 114} = 8.225$; $p < 0.001$).

DISCUSSION

The purpose of this exploratory study was to examine the association between gateway drug use and structural and social environmental variables by gender among a sample of Latino adolescents. The finding that neighborhoods closer to retailers are associated with less favorable neighborhood characteristics has multiple implications. First, it is a confirmation of recent studies, (Leatherdale, & Strath, 2007; Novak et al., 2006; Pollack et al., 2005; Schneider et al., 2005) and it extends previous literature in a border county and geographical area with high proportions of Hispanic people. Second, to the extent that retailer data used in this study demonstrated associations consistent with previous findings in the literature it provides evidence of generalizability.

The finding that distance to the nearest retailer was positively associated with gateway drug use is puzzling. Gateway drug use among girls was lowest in areas closest to alcohol and tobacco retailers, and remained unchanged for males. This difference observed by gender represents a new finding. One possible explanation relates to parental control and the differential factors that define the gender specific cultures of boys and girls. For example, girls in areas closest to retailers (and deprived SES areas) may come under greater parental control to counter anticipated effects of living in a high-risk environment i.e., parents monitor their daughters more than their sons. This may result in lower rates of gateway drug use for females that reside in areas regarded as high-risk. A similar finding was reported by Wahlgren et al. (1997) in which high-risk adolescents were less likely than low-risk adolescents to initiate smoking following a counseling intervention, ostensibly resulting from extra attention devoted to prevention efforts as a function of their high-risk status.

Continuing with this logic, girls in high-risk neighborhoods, such as those close to retailers, may interact less with their environment. Young males may not be subjected to the same level of parental control, and may enjoy support to interact freely with their nearby environment. A recent study by Norman et al. (2006) demonstrated differential rates of physical activity and interactivity between boys and girls with environmental features such as retailers. Given this context, young males would tend to access nearby

retailers via walking in a manner that young females would not. Proximity to nearby retailers may have less influence on females if they are prevented from accessing them. Future studies should be designed to test parents' differential control of males and females in high-risk environments.

This study took place close to the border, one of high transition with one of the worlds' busiest border crossing (U.S. Department of Transportation, 2001). The culture with respect to substance use is more accepting in Mexico compared to San Diego, CA (Martinez-Donate et al., 2008). The increased risk for girls from cohort 2 to use gateway drugs may be an indication of this cross-border influence. Anecdotally, we believe more students from cohort 2 spent significant amounts of time in Mexico, some on a daily basis. Students returning to Mexico alone after school have considerable amounts of unmonitored time while in transit. It is plausible that parents of girls residing in Mexico and attending school in the US were more restrictive of their after school time. The only opportunity in such cases for risk behaviors to occur would be under the influence of the home environment, closer to the border if not in Mexico. This should be the focus of additional research.

<center>Limitations</center>

The design employed in this study enabled a conservative estimate of the relationship between gateway drug use and variables from the structural and social environment. Attempts were made to represent significant theoretical domains, but the analytical model employed here is underspecified as many of the variables expected to influence adolescent's behavior were not available e.g., family members' use of gateway drugs. Furthermore, measures utilized in this cross-sectional study were not designed a-priori for the questions they are attempting to answer. For this reason, no direct measure of purchasing was included, and the conclusions of this study should not be misinterpreted to suggest that substances were necessarily purchased in areas of shortest distances from residence to the nearest retailer. Ecological studies in the future should attempt to assess the direct exposure to retailers to increase the likelihood that relationships found at the ecological level reflect individual exposure to retailers.

The distinct trends observed by gender provide general support for continued research in this area. The BEM emphasis for future studies includes additional focus on the potential modifying effect of modeling on retailer dispersion. Retailer presence may be nothing more than a marker for substance use

modeling, including point-of-sale advertisements i.e., venue for modeling and observing substance use behaviors. Since marijuana is an illegal substance not sold commercially at retailers like alcohol and tobacco, including it as part of the dependent variable begins the process of evaluating effects of this modeling process on substances other than alcohol or tobacco. New models of environmental influences should account for these mediating and moderating processes, as well as other neighborhood features that provide the empirical evidence for modifying retailer policies, public transportation (Pollack et al., 2005) and other means of access to retail sources of alcohol, tobacco or marijuana and test such modifications effect on adolescents' use of gateway drugs.

Several aspects of this study define the significance to the current literature. First, this study employed a novel approach to explore the role of the built environment. Technology utilized in this study will become more precise and easier to use, and early studies based on this technology will provide important foundational work for future research. Second, this study continues important lines of research, with a segment of the population traditionally understudied (Flores et al., 2002) and integrates an important area of emerging research, the structural environment.

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

REFERENCES

Bousman, C. A., Blumberg, E. J., Shillington, A. M., Hovell, M. F., Ji, M., Lehman, S., et al. (2005). Predictors of substance use among homeless youth in San Diego. *Addictive Behaviors, 30*(6), 1100-1110.

California Department of Public Health and Tobacco Control. (2004). *California Retailers and Youth Tobacco Laws* Retrieved December 31, 2007, from Web site: http://www.dhs.ca.gov/tobacco/documents/pubs/RetailerPresentation.pdf

Chen, X., Unger, J. B., Palmer, P., Weiner, M. D., Johnson, C. A., Wong, M. M., et al. (2002). Prior cigarette smoking initiation predicting current alcohol use: Evidence for a gateway drug effect among California adolescents from eleven ethnic groups. *Addictive Behaviors, 27*(5), 799-817.

Clapp, J. D., Holmes, M. R., Reed, M. B., Shillington, A. M., Freisthler, B., & Lange, J. E. (2007). Measuring college students' alcohol consumption in natural drinking environments: field methodologies for bars and parties. *Evaluation Review, 31*(5), 469-489.

Clapp, J. D., Lange, J., Min, J. W., Shillington, A., Johnson, M., & Voas, R. (2003). Two studies examining environmental predictors of heavy drinking by college students. *Prevention Science, 4*(2), 99-108.

Clapp, J.D., Reed, M.B., Holmes, M.R., Lange, J.E., & Voas, R.B. (2006). Drunk in public, drunk in private: the relationship between college students, drinking environments and alcohol consumption. *The American Journal of Drug and Alcohol Abuse, 32*, 275-285.

DiFranza, J. R., & Coleman, M. (2001). Sources of tobacco for youths in communities with strong enforcement of youth access laws. *Tobacco Control, 10*(4), 323-328.

Ellickson, P. L., Hays, R. D., & Bell, R. M. (1992). Stepping through the drug use sequence: Longitudinal scalogram analysis of initiation and regular use. *Journal of Abnormal Psychology, 101*(3), 441-451.

Emery, S., Gilpin, E. A., White, M. M., & Pierce, J. P. (1999). How adolescents get their cigarettes: implications for policies on access and price. *Journal of the National Cancer Institute, 91*, 184-186.

Fleming, R., Leventhal, H., Glynn, K., & Ershler, J. (1989). The role of cigarettes in the initiation and progression of early substance use. *Addictive Behaviors, 14*(3), 261-272.

Flores, G., Fuentes-Afflick, E., Barbot, O., Carter-Pokras, O., Claudio, L., Lara, M., et al. (2002). The health of Latino children urgent priorities, unanswered questions, and a research agenda. *Journal of the American Medical Association, 288*(1), 82-90.

Freisthler, B., Gruenewald, P. J., Treno, A., & Lee, J. (2003). Evaluating alcohol access and the alcohol environment in neighborhood areas. *Alcoholism: Clinical and Experimental Research, 27*(3), 477-484.

Gilpin, E. A., White, M. M., White, V. M., Distefan, J. M., Trinidad, D. R., James, L., et al. (2004). Tobacco control successes in California: A focus on young people. *Results from the California Tobacco Surveys, 1990-2002*.

Gruenewald, P. J., Freisthler, B., Remer, L., LaScala, E. A., & Treno, A. (2006). Ecological models of alcohol outlets and violent assaults: crime potentials and geospatial analysis. *Addiction, 101*(5), 666-677.

Hall, W. D., & Lynskey, M. (2005). Is cannabis a gateway drug? Testing hypotheses about the relationship between cannabis use and the use of other illicit drugs. *Drug and Alcohol Review, 24*(1), 39-48.

Hovell, M. F., Wahlgren, D. R., & Gehrman, C. A. (2002). The Behavioral Ecological Model: Integrating public health and behavioral science. In R. DeClemente, R. Crosby & M. Kegler (Eds.), *Emerging theories in health promotion practice and research: strategies for improving public health.* (pp. 347-385). San Francisco, CA: Jossey-Bass, Inc.

Hyland, A., Travers, M. J., Cummings, K. M., Bauer, J., Alford, T., & Wieczorek, W. F. (2003). Tobacco outlet density and demographics in Erie County, New York. *American Journal of Public Health,* 93(7), 1075-1076.

Klonoff, E. A. & Landrine, H. (2004). Predicting youth access to tobacco: the role of youth versus store-clerk behavior and issues of ecological validity. *Health Psychology, 23*(5), 517-524.

Knoblauch, R., Pietrucha, M., & Nitzburg, M. (1996). Field studies of pedestrian walking speeds and start-up time. *Transportation Research Record, 1538*, 27-38.

Leatherdale, S. T., & Strath, J. M. (2007). Tobacco retailer density surrounding schools and cigarette access behaviors among underage smoking students. *Annals of Behavioral Medicine, 33*(1), 105-111.

Marin, G., & Gamba, R. (1996). A new measurement of acculturation for Hispanics: The bidimensional acculturation scale for Hispanics (BAS). *Hispanic Journal of Behavioral Science, 18*(3), 297-316.

Martinez-Donate, A. P., Hovell, M. F., Hofstetter, C. R., Gonzalez-Perez, G. J., Kotay, A., & Adams, M. A. (2008). Crossing borders: the impact of the California tobacco control program on both sides of the US-Mexico border. *American Journal of Public Health, 98*(2), 258-267.

Norman, G. J., Nutter, S. K., Ryan, S., Sallis, J. F., Calfas, K. J., & Patrick, K. (2006). Community design and access to recreational facilities as correlates of adolescent physical activity and body-mass index. *Journal of Physical Activity and Health, 3*(Suppl 1), S118-S128.

Novak, S. P., Reardon, S. F., Raudenbush, S. W., & Buka, S. L. (2006). Retail tobacco outlet density and youth cigarette smoking: a propensity-modeling approach. *American Journal of Public Health, 96*(4), 670-676.

Patterson, G. R. (2008). A comparison of models for interstate wars and for individual violence. *Perspectives on Psychological Science, 3*(3), 203-223.

Pokorny, S. B., Jason, L. A., & Schoeny, M. E. (2003). The relation of retail tobacco availability to initiation and continued smoking. *Journal of Clinical Child and Adolescent Psychology, 32*(2), 193-204.

Pollack, C. E., Cubbin, C., Ahn, D., & Winkleby, M. (2005). Neighbourhood deprivation and alcohol consumption: Does the availability of alcohol play a role? *International Journal of Epidemiology, 34*(4), 772-780.

Robinson, L. A., Klesges, R. C., & Zbikowski, S. M. (1998). Gender and ethnic differences in young adolescents' sources of cigarettes. *Tobacco Control, 7*(4), 353-359.

Saltz, R. F. (1997). Evaluating specific community structural changes: examples from the assessment of responsible beverage service. *Evaluation Review, 21*(2), 246-267.

Sampson, R. J., Morenoff, J. D., & Earls, F. (1999). Beyond social capital: Spatial dynamics of collective efficacy for children. *American Sociological Review, 64*(5), 633-660.

Sampson, R. J., Raudenbush, S. W., & Earls, F. (1997). Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science, 277*(5328), 918-924.

San Diego Geographic Information Source. Retrieved February 21, 2008, from the Joint Powers Agency of the City of San Diego and County of San Diego, San Diego, CA. Web site: http://sangis.org.

Schneider, J. E., Reid, R. J., Peterson, N. A., Lowe, J. B., & Hughey, J. (2005). Tobacco outlet density and demographics at the tract level of analysis in Iowa: Implications for environmentally based prevention initiatives. *Prevention Science, 6*(4), 319-325.

Simantov, E., Schoen, C., & Klein, J. D. (2000). Health-compromising behaviors: why do adolescents smoke or drink?: Identifying underlying risk and protective factors. *Archives of Pediatrics & Adolescent Medicine, 154*(10), 1025-1033.

Treno, A. J., & Holder, H. D. (1997). Evaluating efforts to reduce community-level problems through structural rather than individual change: A multicomponent community trial to prevent alcohol-involved problems. *Evaluation Review, 21*(2), 133-139.

U.S. Department of Transportation. (2001) *North American trade and travel trends.* Retrieved July 14, 2008, from Web site: http://www.bts.gov/publications/ north_american_trade_and_travel_trends/entire.pdf

Unpublished Data. (2004). American Lung Association.

Wahlgren, D. R., Hovell, M. F., Slymen, D. J., Conway, T. L., Hofstetter, C. R., & Jones, J. A. (1997). Predictors of tobacco use initiation in adolescents: a two-year prospective study and theoretical discussion. *Tobacco Control, 6*(2), 95-103.

Table 4.1 *Characteristics of the study sample (N =226)*

Variables	M	SD	Range	α
Age	15.91	1.20	13-19	
Gender[a]	0.50	0.50	0-1	
Acculturation[b]	0.81	0.57	0-2	
Foreign-born[c]	0.43	0.49	0-1	
Parental consistency	11.09	2.34	3-12	0.61
Cohort[d]	0.59	0.49	0 – 1	
Park in neighborhood[e]	0.25	0.44	0 – 1	
Skipped school in past year[f]	0.39	0.49	0 – 1	
Peer modeling	2.39	1.38	1-8	0.68

[a]Gender: 0 = *female*, 1 = *male*. [b]Acculturation: 0 = *hispanic*, 1 = *bicultural*, 2 = *assimilated*. [c]Foreign-born: 0 = *no*, 1 = *yes*. [d]Cohort: 0 = *cohort 1*, 1 = *cohort 2*. [e]Park in neighborhood: 0 = *no*, 1 = *yes*. [f]Skipped school in past year: 0 = *no*, 1 = *yes*.

Table 4.2 *Reported gateway drug use (n = 226)*

Substance(s)	Total, % (n)	Male, % (n)	Female, % (n)
None	29.3 (66)	32.4 (36)	26.3 (30)
Alcohol	49.8 (112)	46.8 (52)	52.6 (60)
Alcohol + Tobacco	15.6 (35)	14.4 (16)	16.7 (19)
Alcohol + Tobacco + Marijuana	5.3 (12)	6.3 (7)	4.4 (5)

Note: No study participants reported just tobacco or marijuana.

Table 4.3 *Correlations between measures of retailer dispersion and neighborhood characteristics (n = 226)*

| Variables	1	2	3	4	5	6	7	8	9
1. % families below poverty	–								
2. % unemployed	0.33***	–							
3. % high school grad., adults over 25	-0.66***	-0.57***	–						
4. % owner occupied home	-0.62***	-0.39***	0.55***	–					
5. % of population under 18	0.54***	0.32***	-0.62***	-0.50***	–				
6. % homes led by single mother	0.65***	0.31***	-0.57***	-0.78***	0.78***	–			
7. % Hispanics of total population	0.62***	0.29***	-0.60***	-0.49***	0.71***	0.70***	–		
8. Distance to nearest retailer[a]	-0.33***	-0.16*	0.31***	0.40***	-0.27***	-0.28***	-0.17**	–	
9. Retailer density[b]	0.07	-0.01	0.02	-0.25***	-0.04	0.06	-0.12	-0.40***	–
M	0.18	0.05	0.23	0.48	0.31	0.18	0.66	1925.0	0.01
SD	0.11	0.02`	0.08	0.27	0.07	0.07	0.21	1581.0	0.02

[a]Distance in feet
[b]# Retailers/Acreage
*$p < .05$. **$p < .01$. ***$p < .001$

Table 4.4 *Summary of Regression Analyses for Variables Predicting Gateway Drug Use by Gender*

Variable	Girls, n =114			Boys, n = 111		
	B	*SE B*	*β*	*B*	*SE B*	*β*
Parental consistency	-0.060	0.027	-0.179*	-0.063	0.030	-0.173*
Age	-0.019	0.053	-0.031	0.030	0.062	0.043
Acculturation	0.294	0.117	0.198*	0.232	0.115	0.164*
Park (in buffer)	0.271	0.142	0.153	0.196	0.173	0.099
Distance to nearest retailer	0.009	0.004	0.204**	-0.001	0.004	-0.018
Cohort	0.374	0.129	0.229**	0.250	0.142	0.147
Skipped school in past year	0.210	0.138	0.132	0.348	0.157	0.195*
Friend model gateway drugs	0.216	0.043	0.416***	0.322	0.063	0.444***
R^2		0.402			0.362	
F		8.225***			6.963***	

*$p < .05$. **$p < .01$. ***$p < .001$

Graph 4.1 *Neighborhood Characteristics by Cohort*

Graph 4.1 *Neighborhood Characteristics by Cohort*
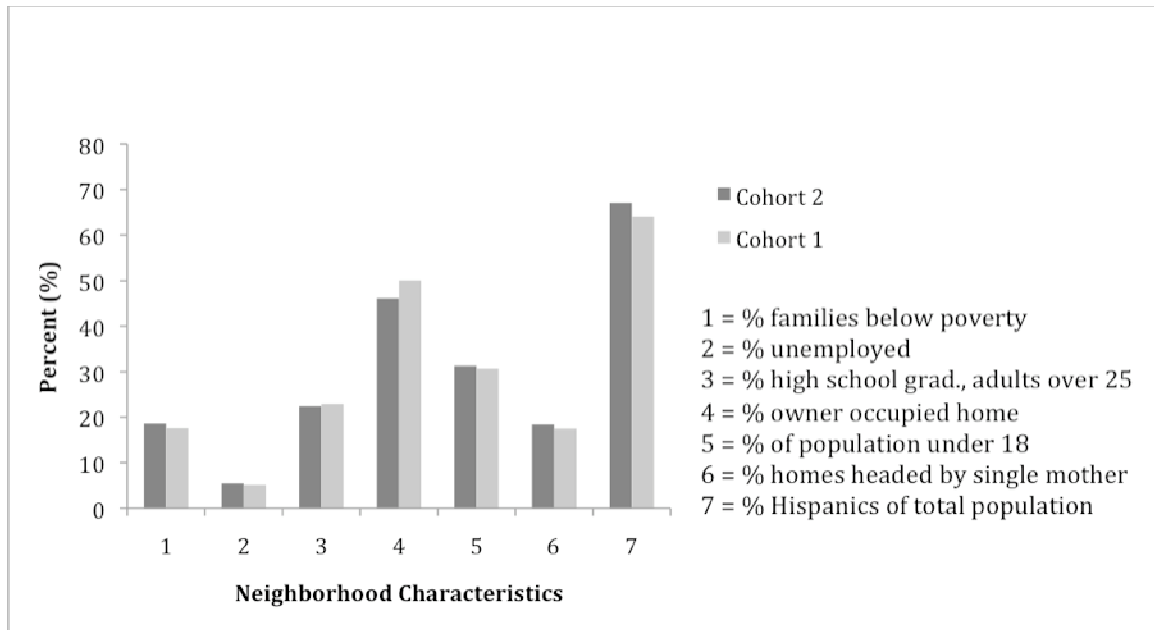
CHAPTER 5

DISCUSSION AND SIGNIFICANCE

DISCUSSION AND SIGNIFICANCE

Each paper included in this dissertation employs a distinct methodological approach and aims to answer a different question. Notwithstanding their differences, they share a common theme: risk behaviors among Latino adolescents, specifically alcohol, tobacco and marijuana use. The purpose of Paper 1 was to identify correlates of alcohol and tobacco use. Correlate variables were selected based on the BEM (Hovell, Wahlgren, & Gehrman, 2002) and reflect constructs emphasized in learning (i.e., operant) theory (Skinner, 1953). The hierarchical model enabled a conservative exploration of the theoretical determinants of alcohol and tobacco use as additional variables were added to the model. After controlling for many other variables from the previous domains, items from the peer domain emerged as significant across both dependent variables, a direct confirmation of the theoretical approach being tested in the sequential regression technique.

Paper 2 extended the outcomes to include marijuana use. This involved a creative approach to isolate discrepancies between reports of parents' parenting behaviors among parent and child dyads, and then to compare the predictive strength of each data source with gateway drug use. Paper 2 fills a gap in the current literature. As reported by Spera (2006), plenty of research has assessed parenting styles, but little has been (Simantov, Schoen, & Klein, 2000) replicated across cultures, ethnicities, and socioeconomic status (SES) groups (Gonzales, Cauce, & Mason, 1996).

Most investigators studying parental influence recognize that adolescent and parental perspectives may be quite different (Barnes & Farrell, 1992), and most studies have relied on only one respondent in the family. The unique features of this study sample provided a venue for comparing the predictive validity between parent and adolescent reports and use of gateway drugs. It was pertinent to the overarching medication adherence community trial to query adolescent respondents and their primary caregiver with respect to parenting practices. Opportunities for comparisons of this variety are rarely available. Results reported here should have a distinct measurement implication.

The finding that parental reports were not as predictive as adolescent reports is to be expected. However, interpreting the findings and their implications can be complicated, primarily because the true parenting values remain unknown. Notwithstanding, there are two meaningful implications resulting from

these findings. First, the identification of incongruence between parent and adolescent reports and the difference in their predictive validity. These findings provide evidence that these two data sources cannot be considered equivalent. Second, these findings raise questions about the importance of perceptions. For example, adolescent perceptions about their parents' parenting behaviors may be more important than parental perceptions about their own behaviors. Two possible rationales emerge: 1) parental reporting errors are uniformly overestimates and therefore less believable. It is unclear if parents can maintain objectivity in self-evaluating. They have a high vested interest in being seen as effective parents and their ability to report objectively may be compromised, and 2) adolescent behavioral practices may conform to the perceived desires of the parent according to how much the child perceives intense parental control, restriction, or involvement.

Papers 1 and 2 were organized based on adaptations from a landmark publication by Hawkins et al. (1992) in which influential adolescent risk domains were identified. These domains have been corroborated in subsequent research and included demographic related characteristics, family influence, school level influences, and peer influences. Variables used in analyses for papers 1 and 2 were selected based on the BEM, and then organized sequentially into risk domains discussed in the Hawkins paper. Notwithstanding, these risk behavior categories are likely non-inclusive of all risk behavior domains of significance, namely features in the built environment. At the time of their 1992 publication, Hawkins et al. could not have explored the built environment to the same degree of specificity that current methodologies allow. For example, variables from the built environment, like those included in paper 3, would have been much less precise in previous decades. Studies that utilize current technologies and contribute to the body of literature that incorporate such methodologies will be important in years to come.

Paper 3 represents an exploratory study, the likes of which may help to shape the way researchers assess previously unstudied risk domains, i.e., the built environment. Despite methodological limitations associated with ecological analyses and the cross-sectional design, results from this study extend our current focus of environmental variables and suggest that we do so in the context of known social-predictors of drug use. Findings from papers 1 and 2 were replicated for both males and females. Parental consistency and peer modeling were both significantly related to gateway drug use. The rational for

creating separate regression models for males and females stems from evidence of gender differences regarding interactivity with the built environment. This rational was supported by demonstrating that distance to the nearest retailer was significant for females and not males. Interpreting these findings will almost assuredly be left to future research studies, but ideas are suggested in the last section of this document.

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

The BEM guided this research. While nonprescriptive in nature, the model implicitly calls for the inclusion of variables from multiple domains. Some of these variables were available in complete form, some incomplete variables, and still some variables were unavailable. As a result, the analytical models were in general, probably underspecified in the sense that I would have liked to have more, and better, variables that fit the theory. Inasmuch as the data were collected with only some of these analytical purposes in the design, many variables were not present, and still others could be improved upon. All measures in this study were self-report measures collected via interviews, save the variables from the built environment created using GIS software.

Self-report measures have inherent sources of error, including recall bias and the opportunity for misrepresenting true values for reasons of social desirability. Notwithstanding their error, improvements could be made to improve their interpretability. For example, dichotomous measures of alcohol use on an 'ever' basis do not adequately discriminate use that was purely experimentation versus weekly or daily use of alcohol. While peer modeling emerged as a significant correlate of ever using alcohol (as did tobacco and marijuana), it is also possible that peers influence alcohol use at other frequencies too. That relationship is not clarified in this study. Furthermore, other contextual variables were not included, such as parental use of alcohol, tobacco, or marijuana. Parental use could mediate their adolescent's to the extent that they model risk behaviors.

In general, findings related to parenting should be interpreted in the context of the type and number of parenting items included in these studies. The items included in these papers represent a limited set of parenting items; they may or may not represent all of the parenting behaviors possible, and their generalizability is unclear. For example, joining parent groups at the child's school may indicate a high

level of involvement in other areas also. But the generalizability of this item, and others included in analyses, was not measured.

The ecological nature of paper 3 precludes conclusive statements about the role of alcohol and tobacco retailers in neighborhoods. No direct measure of acquisition was included. This meant that I could not be certain respondents were necessarily purchasing substances from retailers closest to their home. Improvements on this dimension should include items designed to ascertain information about purchasing and/or acquiring behaviors, and whether they consumed these substances or acquired them for a third party, etc.

Finally, does this obscure sample of Latino adolescents living along the US/Mexico border generalize to a larger population of Latinos? Adolescents in this study sample were recruited based on their latent tuberculosis infection (LTBI) diagnosis. Associations between LTBI and use of alcohol, tobacco, or marijuana have not been shown previously. As such, study sample adolescents were not expected to differ substantially from their peers. Indeed, sample characteristics were similar to the larger set of adolescents recruited for the tuberculosis screening (n = 4,753), most of which were negative. To the extent the findings reported in these studies are consistent with extant literature (e.g., peer modeling) there is a rational basis to believe that other findings, even if new, may be of substantial import. The true test of generalizability will be measured in the replication of these findings, or variants of them in future studies.

<div align="center">Future Research and Intervention Implications</div>

As with much research, the final product raises equally as many questions as answers. Questions that in turn generate new research agendas and future directions. Results from paper 1 suggest that future studies investigate with more depth the nature of alcohol and tobacco uptake among adolescents, including an exploration of the differences between the two substances. For example, are family influences really more important in determining alcohol use than tobacco? If so, what aspects of that influence? Part of clarifying these differences may include more precise measures related to alcohol and tobacco use. For example, the quantity, frequency, and conditions under which it was consumed. Such items may help to discriminate between low-risk experimentation (e.g., wine consumed for religious purposes) and high-risk experimentation or use (e.g., smoking or drinking at a party with friends). These discriminations are

important as the set of risk factors for the respective behaviors are different. Nevertheless, these findings suggest that tobacco prevention interventions be focused entirely on influences in the peer domain. Whereas alcohol prevention efforts must be multidimensional, addressing family, school and peer influence domains.

In the event future science confirms family and parental influences are valid intervention targets for alcohol prevention (as compared to tobacco), researchers should be aware of the potential incongruence between reports from parents and their own children about parenting practices. Such findings should serve as impetuses for the creation of new measures, or at least the application of existing measures that minimize error, e.g., direct observation.

The added dimension of paper 3 in this dissertation, especially considering its classification as an exploratory study, generates many unanswered questions. Upon first inspection, it is confusing to think that females living in high-risk areas (low SES) report lower rates of gateway drug use. This may be an example of the built environment interacting with the social environment, on multiple levels. Determining these mechanisms will most definitely require continued research in this area, and the ability to balance technology and theory. Future measures may include such things as markers of neighborhood social acceptability of drug use, and parental involvement. Once again, I see parents as a key influence in this process. A new research agenda moving forward should include inspection of differential parental controls of males versus females in high-risk neighborhoods. With future refinements and sequential iterations in future studies, measures, results, and intervention implications will become more precise and prescriptive, making meaningful behavior change through intervention more achievable.

REFERENCES

Barnes, G. M., & Farrell, M. P. (1992). Parental support and control as predictors of adolescent drinking, delinquency, and related problem behaviors. *Journal of Marriage & the Family, 54*(4), 763-776.

Gonzales, N. A., Cauce, A. M., & Mason, C. A. (1996). Interobservor agreement in the assessment of parental behavior and parent-adolescent conflict: African American mothers, daughters, and independent observers. *Child Development, 67*(4), 1483-1498.

Hawkins, J., Catalano, R., & Miller, J. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin, 112*(1), 64-105.

Hovell, M. F., Wahlgren, D. R., & Gehrman, C. A. (2002). The Behavioral Ecological Model: Integrating public health and behavioral science. In R. DeClemente, R. Crosby & M. Kegler (Eds.), *Emerging theories in health promotion practice and research: Strategies for improving public health.* (pp. 347-385) San Francisco, CA: Jossey-Bass, Inc.

Simantov, E., Schoen, C., & Klein, J. (2000). Health-compromising behaviors: why do adolescents smoke or drink?: Identifying underlying risk and protective factors. *Archives of Pediatrics & Adolescent Medicine, 154*(10), 1025-1033.

Skinner, B. F. (1953). *Science and human behavior.* Oxford, England: Macmillan.

Spera, C. (2006). Adolescents' perceptions of parental goals, practices, and styles in relation to their motivation and achievement. *Journal of Early Adolescence, 26*(4): 456-490.