

Copyright

by

Eden Hernandez Robles

2015

**The Dissertation Committee for Eden Hernandez Robles
certifies that this is the approved version of the following dissertation:**

**Effectiveness of Culturally Adapted Substance Use Interventions for Latino
Adolescents: A Systematic Review and Meta-analysis**

Committee:

Diana DiNitto, Supervisor

Cynthia Franklin

Yolanda Padilla

Chris Salas-Wright

Brandy Maynard

**Effectiveness of Culturally Adapted Substance Use Interventions for Latino
Adolescents: A Systematic Review and Meta-analysis**

by

Eden Hernandez Robles, B.S.W., M.S.W.

Dissertation

Presented to the Faculty of the Graduate School of
The University of Texas at Austin
in Partial Fulfillment
of the Requirements
for the Degree of

Doctor of Philosophy

The University of Texas at Austin

August 2015

Acknowledgements

I would like to thank the great people that helped me pursue my doctorate and ultimately complete my dissertation, the team who helped me with the systematic review and meta-analysis, my committee members, my mentors, the McNair Scholar Program, and especially my family.

Systematic Review and Meta-analysis Team

I would like to begin by thanking Brandy Maynard, PhD, an Assistant Professor in the School of Social Work at Saint Louis University. I had the pleasure of meeting Dr. Maynard during my career as a doctoral student. Through Dr. Chris Salas-Wright, Dr. Maynard was able to recognize the systematic reviewer in me before I recognized it in myself. Since that time she has provided me with countless hours of training in systematic review methodology and meta-analytic techniques. I was very fortunate to have Dr. Maynard teach me throughout the entire process, but I was even more fortunate to have her encourage me through my times of frustration. Furthermore, she has provided me with early career mentoring and encouraged me to submit my work to conferences and for publications. She was the second coder for the review and also monitored the methodology and data analysis of the project. I am very grateful to her for all that she has been for me and her dedication and commitment to my success as a doctoral candidate.

I thank Dr. Chris Salas-Wright, PhD, an Assistant Professor in the School of Social Work at The University of Texas at Austin. I was very fortunate that Dr. Salas-Wright joined the School of Social Work at the same time that I had successfully defended my

comprehensive exam. With his arrival to the School of Social Work, I had new opportunities to engage in research in my area of interest available to me. I am grateful to Dr. Salas-Wright for the many times he has included me in research and publication opportunities and for assisting me with expanding my professional network. I am especially grateful for the very specific feedback he has given to me and the encouragement he provides by sending me helpful articles or messages to support my work. He provided substantive expertise throughout the study and monitored the data analysis and claims of the project. I am grateful to him for his dedication and commitment to my research.

I thank Jelena Todic, a doctoral student in the School of Social work at The University of Texas at Austin. She served as a second screener of the collected articles. I am grateful to her for the time she spent to help me screen all of the collected articles and for being a friend when I needed it and it counted the most.

I thank PG Moreno, the Social Work Librarian at The University of Texas at Austin. He provided the project team consultation on setting up the systematic literature search process. He referred the team to appropriate databases and resources and offered training in research techniques. I am thankful for all that he did to assist me in my dissertation.

I thank Nate Marti, PhD, statistician in the School of Social Work at The University of Texas at Austin. He provided the project team consultation on effect size data extraction with growth curve model. He assisted the team with identifying the appropriate formulas and calculations to arrive at most precise estimate of effect sizes. I truly appreciate all that he did to teach me and to assist me in the statistical analysis of my dissertation.

Dissertation Chair and Committee Members

I would like to thank my dissertation chair Diana DiNitto, PhD, and committee members Cynthia Franklin, PhD, Yolanda Padilla, PhD, Chris Salas-Wright, PhD, and Brandy Maynard, PhD for all of their helpful feedback and support. I would like to take the time to especially thank Dr. DiNitto, Dr. Franklin, and Dr. Padilla.

I would like to begin by thanking my dissertation chair Dr. Diana DiNitto. Dr. DiNitto has been my strongest support throughout my entire career as a doctoral student. I have greatly benefited from the many years that she has dedicated to helping me grow as a researcher and educator. She has always taken the time to provide me with kind talks of encouragement and support when it has mattered the most and generously provided me with financial support to access software and workshops that contributed to my success. It is during those talks that she encouraged me to grow and recognize my full potential as a researcher and educator. As a result, I have applied for many opportunities and learned the value of applying a second time when my first attempt is not as successful. Dr. DiNitto taught me to take setbacks in stride and it is this same sage advice that I used to complete the dissertation. I cannot place a value on her mentorship and I appreciate the amount of support she has given me throughout these years. I am very grateful to Dr. DiNitto for all of her commitment and dedication to my success.

I thank Dr. Cynthia Franklin for all of her support throughout my entire doctoral career. I first met Dr. Franklin through the doctoral level course on theory in my first semester. At that level, I was very excited to examine the effectiveness of culturally adapted interventions and had many ideas as to how to develop a cultural adaptation model. Dr. Franklin supported me in my dreams and encouraged me to not lose sight of my desire

to develop a model. I appreciate her many talks of encouragement and concern as I struggled to define myself as a doctoral student. She taught me many valuable skills that I have continually used to network with leaders in my field and extend my professional network. Dr. Franklin has always had my best interest in mind and has gone the extra mile many times to help me make connections that I might not otherwise have made on my own. I am very grateful to Dr. Franklin for her unwavering commitment to my success and encouragement through the entire process.

I thank Dr. Yolanda Padilla for all of her generosity and support from before my doctoral career. I met Dr. Padilla when touring the School of Social Work as a prospective doctoral student. Dr. Padilla immediately mentored me by providing me the tools necessary to shine in my resume as a candidate for the program. Since that time, Dr. Padilla has encouraged and motivated me to produce research worthy of presentation and publication. She has also provided me with financial research support to attend conferences and network with leaders in my field of research. She has taught me the value of diligence when approaching any research topic. I appreciate all that she has done to foster my passion for research and am fortunate to have enjoyed her continuous encouragement and support. I am very grateful to Dr. Padilla and all that she does and continues to do to help support me as in my early career.

Mentors

I would like to thank wonderful mentors that I have come along the way. It is thanks to these wonderful mentors that I stand here today.

I would like to begin by thanking Yessenia Castro, PhD, an Assistant Professor in the School of Social Work at The University of Texas at Austin. It has been my great privilege to know Dr. Castro. Dr. Castro joined the School of Social Work at the time that I finished my comprehensive exam. Since meeting her I have received tremendous support from her in my doctoral career and will continue to receive her support in my postdoctoral career. She has provided me with multiple opportunities to publish, present, and conduct research. She is incredibly supportive in helping me establish mentorships with leaders in the field and is always discussing new opportunities for relevant training. Moreover, she encourages me and helps me recognize the pathways that will lead to my ultimate success. She has been most supportive in modeling excellence for me, and often reviews my materials so that I too can present my best. I am incredibly grateful to her for all of her mentoring and support.

I thank Cora LeDoux, PhD, a retired professor from the School of Social Work at Our Lady of the Lake University. I met Dr. LeDoux during my second semester as a social work student in the research methods course. Dr. LeDoux embraced my enthusiasm for research and opened my eyes to the possibility of a career as a researcher and educator. She encouraged me to apply for the McNair's Scholar Program and provided me the additional support necessary to prepare a successful application. Dr. LeDoux provided me mentorship in research and even mentored me to successfully apply for and present my research at the CSWE National Conference. She continues to support me with her words of encouragement and guidance for a successful career. I am very grateful to her for her unconditional dedication and commitment to my success.

I thank Jorge Valadez, PhD, an associate professor of philosophy from Our Lady of the Lake University. Dr. Valadez helped prepare me for an academic career by encouraging me to expand my understanding of the world and pursue the ideals of social justice for all. Dr. Valadez mentored me during my first research project with the McNair's Scholar Program. Dr. Valadez provided me mentorship by sharing his own story of struggle and success. He continues to be an inspiration to me and has strongly influenced how I view the world. I am very grateful to him for his contribution to my education.

I thank Benito Guajardo, LCSW, my field instructor during my practicum as a bachelor level social work student at the Good Samaritan Community Services in San Antonio, TX. I met Benito as a bachelor level social work student and since that day Benito has provided me non-stop encouragement and support in realizing my dreams to improve the community. I thank Benito for encouraging me to explore the role of culture in decision-making and help-seeking behaviors of the Latinos we served. He spent many hours fostering my curiosity by introducing me to community stakeholders, key informants, and the “realness” of the clients and their families. He encouraged me to step into the spotlight and advocated for me to be promoted within the organization. I would not have come into the doctoral program with as much insightfulness and practical knowledge if he had not strongly supported me. He continues to “be proud” of me. I am truly grateful for his support.

Supports

I would like to acknowledge the support of the McNair Scholars Program at Our Lady of the Lake University in San Antonio, TX, in helping me successfully pursue my

PhD. I thank the program for all of the financial support, mentoring opportunities, training in research, and workshops that they provided to me.

Family

Above all, I thank my heavenly father God. I am incredibly grateful to Him for everything that I have today. I only hope that I can live a life that is worthy of the many gifts and talents that I have received on His behalf.

I thank my family. I especially thank my mother. Words can't express what her support has meant to me. I recognize that my dream to pursue a PhD is in exact opposition to what she was taught to value and believe in as a possibility for a woman. Her love and support for me gave her the ability to see beyond what she was taught to value and believe in as a possibility for me. Instead, she believed in my ability to achieve my goal as I saw fit. I value having her in my life to talk about my frustrations and setbacks. Her encouragement is everything to me.

I thank my father for his many years of support. I understand firsthand the difficulty that is associated with helping one's children find her or his way. I remember knowing that I wanted to pursue a PhD in middle school, but it was my father who set me aside and taught me to truly believe in my ability to achieve my goals. The small talks of encouragement served me well and I am excited to have him here today to see me achieve my goals.

I thank my siblings. They have been a great support to me in helping me to remember to breathe and relax. They have opened their doors to me many times throughout this

process to help me find balance, but have always been vigilant in reminding me not to lose sight of my goals.

Finally, I thank my beautiful daughter. She is my will to move forward and my source of joy. I want to be her example of excellence and success. I am so grateful to God for sharing her precious life with me.

Effectiveness of Culturally Adapted Substance Use Interventions for Latino Adolescents: A Systematic Review and Meta-analysis

Eden Hernandez Robles, PhD

The University of Texas at Austin, 2015

Supervisor: Diana M. DiNitto

Cultural factors have been shown to have a moderating effect on substance use, thus an increasing number of substance use interventions with Latino adolescents seek to incorporate culture in an attempt to positively impact outcomes. Research on the effectiveness of culturally adapted substance use interventions, however, has produced a body of ambiguous evidence. The purpose of this systematic review is to examine the characteristics and effects of culturally adapted substance use interventions with Latino adolescents on substance use outcomes. The research question guiding this study is: What are the effects of culturally adapted interventions on substance use outcomes with Latino adolescents? A systematic search of thirteen electronic databases, five research registers, five research affiliated websites, reference lists, and a comprehensive gray literature search were undertaken to locate randomized (RCT) or quasi-experimental (QED) studies conducted between 1990 and December 2014 examining substance use outcomes of culturally adapted interventions with Latino adolescents. The search yielded 35,842 titles and abstracts, and the full texts of 108 articles were screened for inclusion. The final sample included 10 studies (7 RCT and 3 QED). Program participants were comprised of 56.5% males; 74.2% were U.S. born; and their mean age was 13.13 years. Meta-analytic results suggest significant effects of moderate magnitude on substance use outcomes at posttest

($g=0.328$; 95% CI 0.015 to 0.640, $p<0.04$), and an overall positive and moderate effect at follow-up ($g=0.516$; 95% CI 0.149 to 0.883, $p<.006$). Homogeneity analysis revealed the effect size distribution was highly heterogeneous at posttest and follow-up, indicating significant variance in magnitude of effects across studies. Moderator analysis revealed differences in mean effects on study and intervention characteristics. The risk of bias assessment revealed that most studies were at high risk for performance bias and selection bias. While culturally adapted substance use interventions demonstrated positive impacts on substance use overall, there was significant variability across studies. These findings emphasize the need for rigorously conducted studies to better discern the benefits of utilizing culturally adapted interventions for reducing substance use among Hispanic adolescents.

Table of Contents

List of Tables	xviii
List of Figures	xix
Chapter 1: Introduction	1
Chapter 2: Literature Review	5
SUBSTANCE USE AND LATINO ADOLESCENTS	5
Prevalence of substance use among Latino adolescents	6
Prevalence of substance use among Latino adolescents	8
<i>Alcohol use and genetic studies of Latinos</i>	9
SUBSTANCE USE AND LATINO ADOLESCENTS	11
Population characteristics	11
The influence of culture and substance use	13
<i>Alcohol use in historical and contemporary Mexican culture</i>	16
Cultural variables and Latino adolescent substance use	18
<i>Marianismo</i>	19
<i>Machismo</i>	20
<i>Familism</i>	21
<i>Respeto</i>	22
<i>Acculturation</i>	22
CULTURAL ADAPTATION	24
The history of cultural adaptation	24
<i>Cultural adaptation movement's influence on policy</i>	28
Approaches to cultural adaptation	31
Central components of cultural adaptations	35
<i>Linguistic relevance</i>	35
<i>Conceptual relevance</i>	36
Culturally adapted substance use interventions for Latino adolescents	37
Systematic review and meta-analysis	40
Narrative reviews	40

Systematic reviews.....	41
Meta-analysis	42
Chapter 3: Methodology	44
STUDY AIMS	44
STUDY DESIGN.....	45
STUDY ELIGIBILITY CRITERIA	45
Type of study designs	45
Type of participants	46
Type of interventions	46
Type of outcome measures	46
SEARCH METHODS	47
Electronic searches.....	48
<i>Databases</i>	48
<i>Research registers</i>	50
<i>Search terms</i>	50
<i>Internet searches</i>	51
<i>Reference lists</i>	52
<i>Personal contacts</i>	52
MANAGEMENT AND DOCUMENTATION OF SEARCH PROCESS	52
RETRIEVAL, SCREENING, AND SELECTION OF STUDIES	53
CODING AND ASSESSING ELIGIBLE STUDIES	54
Criteria for determination of independent findings	56
Coding of studies and data extraction.....	58
STATISTICAL PROCEDURES AND CONVENTIONS	59
Descriptive analysis	59
Calculation of effect sizes.....	59
<i>Calculating Cohen's d</i>	60
<i>Converting Cohen's d to Hedge's g</i>	60
<i>Extracting effect sizes from clustered samples</i>	60
<i>Calculating effect sizes from odds ratio</i>	61

<i>Calculating effect sizes from means difference</i>	61
<i>Calculating effect sizes from growth curve analysis</i>	62
Statistical procedures for pooling effect sizes	62
Test of homogeneity	63
Publication bias.....	64
Chapter 4: Results.....	65
RESULTS OF SEARCH.....	65
DESCRIPTIVE FINDINGS.....	70
Study characteristics	71
<i>Intervention funding sources</i>	74
<i>Risk of bias</i>	74
Participant characteristics	77
Intervention characteristics	79
<i>Types of interventions</i>	80
<i>Setting</i>	80
<i>Service delivery: providers and collaborations</i>	81
<i>Duration of intervention</i>	81
<i>Characteristics of culturally adapted interventions</i>	82
Substance use measures and time points	84
MEAN EFFECT OF INTERVENTIONS ON SUBSTANCE USE OUTCOMES.....	86
Mean effect of interventions at posttest.....	86
Mean effect of interventions at follow-up	88
MODERATOR ANALYSIS	89
Chapter 5: Discussion.....	92
SUMMARY OF FINDINGS.....	93
Types of culturally adapted substance use interventions and characteristics	93
Effects of culturally adapted substance use interventions	99
IMPLICATIONS FOR RESEARCH.....	102
Broad reporting of substance use.....	103

Testing cultural adaptation components	103
STRENGTHS AND LIMITATIONS	105
CONCLUSION	107
Appendices.....	110
Appendix: A.....	110
Appendix: B.....	113
Appendix: C.....	113
Appendix: D.....	117
Appendix: E.....	119
Appendix: F.....	128
Appendix: G.....	140
Appendix: I.....	144
References.....	154

List of Tables

Table 2.1: List of cultural and linguistic policy efforts by state	30
Table 3.1: Inclusion criteria for culturally adapted (CA) substance use intervention studies for Latino adolescents	47
Table 3.2: Name of databases searched	49
Table 3.3: Research registers searched	50
Table 3.4: Websites searched	51
Table 4.1: Total number of studies excluded at level 1&2 screener stage by reason	66
Table 4.2: Studies identified for systematic review and meta-analysis	70
Table 4.3: Characteristics of included studies.....	73
Table 4.4: Funding sources of included studies.....	74
Table 4.5: Participant characteristics in included studies	78
Table 4.6: Intervention characteristics of included studies.....	79
Table 4.7: Cultural adaptation characteristics of interventions included in the study	83
Table 4.8: Summary of time points.....	85
Table 4.9: Substance use measures	85
Table 4.10: Mean effect for each moderating variable	91
Table 5.1: Sources for adaptation strategies and inputs required for adapting components	98

List of Figures

Figure 4.1: Study search and selection process	67
Figure 4.2: Total percentage of risk of bias per category for included studies ...	75
Figure 4.3: Risk of bias summary of included studies	76
Figure 4.4: Forest plot: Posttest.....	96
Figure 4.5: Forest plot: Follow-up.....	76

Chapter 1: Introduction

Cross-cultural research provides strong evidence that demonstrates marked differences in behaviors, attitudes, values, orientations, and beliefs in Latinos compared to other major ethnic groups (Barrera & Alarcon 2002; Betancourt & Lopez, 1993; Carter, 2006; Carter, 1991; Delva, Allen-Meares, & Momper, 2010; Hofsted, 2001; Liebkind, 2001; Ting-Toomey, 2012). Research also suggests that culture can influence substance use (Unger et al, 2004; Heath, 1990; Heath, 2000), and there is evidence that Latino cultural values influence adolescents' substance use (Beck & Bargman, 1993; Castro et al, 2007; Gil, Wagner, & Vega, 2000; Resnicow et al, 2000; Soto et al, 2012; Unger, Ritt-Olson et al, 2002; Unger et al, 2006). Behavioral researchers draw upon this evidence as a basis for culturally adapting substance use interventions for Latinos (APA, 2003; Bernal, Bonilla, & Bellido, 1995; Castro & Alarcon, 2003; Lopez et al, 1989; Marin & Marin, 1991; McGoldrick, Pearce, & Giordano, 1982) and argue that inattention to culture in substance use interventions may result in ineffectiveness (Botvin et al, 1994; Castro & Alarcon, 2002; Fayrna & Morales, 2000). However, the process by which researchers approach cultural adaptation vastly differs (Bernal & Rodriguez, 2012). Even more importantly, the evidence that supports the effectiveness of these adaptations on behavioral outcomes for Latinos varies. The majority of reviews that have attempted to examine the effectiveness of culturally adapted interventions have relied upon a narrative review of the literature (see Jackson, 2009; Jani, Ortiz, & Aranda, 2001; Kong, Singh, & Krishnan-Sarin, 2012; Kumpfer, Alvarado, Smith, & Bellamy, 2002). Those that incorporate meta-analysis of the literature lack the systematic review methods that are important to reduce bias and errors (See Huey & Polo, 2008; Waldron & Turner, 2008). Moreover, prior reviews are either dated or are limited by the methods used to conduct the review

or synthesize the evidence, thus leading to biased or invalid results.

The purpose of this dissertation study is to examine the effectiveness of culturally adapted substance use interventions for Latino adolescents by synthesizing the effects across studies using more rigorous and transparent systematic review and meta-analytic procedures compared to prior reviews. The specific questions guiding this systematic review are:

1. What types of culturally adapted interventions are being used to reduce substance use among Latino adolescents?
2. What are the characteristics of the interventions being adapted to prevent or reduce substance use among Latino adolescents?
3. What are the effects of culturally adapted interventions on Latino adolescents' substance use?
4. Are some culturally adapted interventions more effective than others?

The findings of this dissertation will help inform the practice and policy of culturally adapted substance use interventions for Latino adolescents. Furthermore, this study aims to identify strengths, deficiencies, and gaps in the research base and inform future research.

Before delving into the background and significance of the study of culturally adapted substance use interventions for Latino adolescents, three points deserve mention. First, for the purposes of this dissertation, the ethnonym "Latino" will be used rather than "Hispanic." Nevertheless, neither "Latino" nor "Hispanic" are precisely defined terms and the specificity of Latino sub-group varies considerably in the literature. Researchers understand that the Latino population is not homogenous, but made up of different subgroups that report different rates of substance use (Caetano, Ramisetty-Mikler & Rodriguez, 2008; Delva et al., 2005). It should be

mentioned that a majority of the studies and reports referenced in the literature review of this dissertation focus on substance use among the Mexican-origin population. This may be attributed to the fact that the Mexican-origin population is the largest Latino subgroup in the United States (U.S. Census Bureau, 2014; Warner et al., 2006), and, therefore, the most readily available population to research.

Thus, the heterogeneity of the Latino population is acknowledged and within- and between-subgroup differences are reported when this information is available. Nevertheless, some ambiguity will remain. For example, most adolescent studies broadly report “Latino” or “Hispanic” substance use outcomes (Delva et al., 2005) despite the limitations in aggregating outcomes by ethnic group. Studies that do report substance use by subgroup will often report outcomes for Mexican, Puerto Rican, Cuban, and another category (most often labeled as “South/Central American” or “other”). Placing South and Central Americans or labeling “other” in the same group may possibly artificially eliminate the differences in rates of substance use that are unique to each subgroup (Delva et al., 2005). Delva et al. note that many studies that do disaggregate by Latino adolescent subgroup are limited to a specific city or school. This ambiguity is most likely reflective of the lack of standardized terminology and definitions of Latino subgroups in the field (McFadden, Taylor, Campbell, & McQuilkin, 2012) and the lack of standards for reporting outcomes of racial and ethnic minority groups and subgroups. These challenges are apparent in the search process used in the current study and are discussed in further detail in the methods section of this dissertation.

Second, the current study defines a culturally adapted substance use intervention as an intervention where modifications were made to address issues regarding cultural fit (Preedy, 2010;

Castro, Barrera, & Martinez, 2004) with the Latino adolescent population (12-18 years of age). Systematic review methods can assist in identifying the studies that culturally adapt substance use interventions for Latino adolescents. While cultural adaptation is recognized as the approach for a modification to an intervention, not all authors readily use the term "cultural adaptation" to identify the interventions that they modified. The terminology selected in the search process for culturally adapted substance use interventions mitigates challenges encountered from the variation of terminology in the field. Only select studies will be synthesized based on the study selection criteria discussed in detail in the methods section of this dissertation.

Lastly, most adolescent substance use intervention initiatives are thought to target current alcohol, tobacco, and marijuana use (Griffin & Botvin, 2011), but only a systematic review of the literature can determine which drugs are targeted in interventions with Latinos. The search process used in this dissertation identified studies that report current substance use (Hodge, Jackson, & Vaughn, 2012), and allows for the identification of intervention differences in reports of substance use outcomes. The term substance use is most often used as a description of a current state, and focus on the type of substance or substances differs considerably across writers and studies (McNeece & Johnson, 2011). Also acknowledged is that each substance produces different effects and different health-related consequences for adolescents. With these points in mind, the next section discusses the evidence on Latino adolescent substance use and the bio-psychological consequences of substance use.

Chapter 2: Literature Review

SUBSTANCE USE AND LATINO ADOLESCENTS

Adolescent substance use is a public health concern. Tobacco and alcohol use are of particular concern as research indicates that earlier initiation (at 14 years of age or younger) of these substances is often related to a progression to other illicit drug use (Kandel & Yamaguchi, 1993; Grant & Dawson, 1997; Golub & Johnson, 2001). Compared to those that initiate substance use as adults, surveys show that adults who meet criteria for substance dependence consistently report substance initiation during early adolescence (Kandel & Yamaguchi, 1993; Grant & Dawson, 1997; CASA, 2011). Compounding the issue are the multiple risk factors many adolescents face that contribute to initiation, use, and dependence.

Many familial, intrapersonal, interpersonal, and social/environmental factors increase adolescent's vulnerability to substance dependence (Brook et al., 2013) but do not necessarily cause initiation, use, or dependence. Familial factors that are related to an increased risk of substance use and subsequent dependence include a weak parent-adolescent attachment (Arria et al., 2012) and parental substance use (Rhee et al., 2003). Intrapersonal factors that increase vulnerability to substance use include mental health problems (Conway et al., 2006; Wilens et al., 2008), and interpersonal factors include peer involvement in substance use (Gillespie et al., 2007). Social and environmental factors that are related to an increased risk of substance use include living in a community with easy access to substances (Gillespie et al., 2007).

Given the over representation of Latino/Hispanic adolescents in nearly all drug use classifications (e.g., marijuana, inhalants, cocaine, and methamphetamine) (Monitoring the Future Study, 2014), additional factors may be influencing these trends such as social, psychological,

biological, and cultural variables. The following literature review addresses some of the factors that may contribute to substance use among Latino adolescents. The review begins by addressing the prevalence of substance use among Latino adolescents.

Prevalence of substance use among Latino adolescents

The Monitoring the Future (MFT) Study (2014) compares substance use among Caucasian, African American, and Latino 8th through 12th grade students. While the MFT records responses for Mexican American or Chicano, Puerto Rican, Cuban American, and other Latino adolescents, it does not account for Latino ethnic subgroup differences. Eighth, 10th, and 12th grade Latino adolescents had the highest rates of overall past year substance use compared to their White and African American counterparts. Latino adolescents had the highest rates of past year inhalant, cocaine, crack, methamphetamine, and crystal methamphetamine use compared to White and African American adolescents. Regarding past year marijuana use, Latino adolescents in the 8th, 10th, and 12th grade had the highest rates of use. However, while Latinos in both 8th and 10th grade had the highest rates of past 30-day marijuana use, among 12th graders, White adolescents had the highest rates of past 30-day marijuana use. Similarly, 8th and 10th grade Latinos had the highest rates of past 30-day alcohol use and past two-week binge drinking, but in 12th grade, White adolescents had the highest rates of alcohol use. Researchers believe that this consistent difference in substance use rates that occurs in the 12th grade is attributed to the high dropout rate of Latino students. However, even after controlling for various social and economic variables such as neighborhood of residence and family annual income, there are significant disparities in substance use rates for Latino adolescents compared to other ethnic groups (Ellickson et al, 1998; National

Institutes of Health, 1999; Resnicow et al, 2000). Research is needed to determine what other factors contribute to the disproportionately higher rates of substance use in Latino students.

According to the National Survey on Drug Use and Health (SAMHSA, 2013), Latino adolescents in the general population report lower rates of past month cigarette use, but similar rates of alcohol and marijuana compared to the national average. Among Latino adolescent subgroups, past month cigarette and alcohol use was greatest in Spanish Americans followed by Cuban Americans and Mexican Americans. Membership in two or more Latino subgroups was associated with higher self-reports of alcohol and cigarette use compared to solely identifying membership in one subgroup. While Latino adolescent past month alcohol use is similar to the national average, Latino high school students are more likely to have ever used alcohol, marijuana, and tobacco compared to their racial and ethnic counterparts (CASA, 2011). The prevalence of Latino adolescent alcohol use has sparked concern across many sectors.

Equal interest has been given to problem drinking among adolescents residing along the border. McKinnon and associates (2004) found that problematic drinking is often higher on the U.S./Mexico border. Vaeth et al. (2012) found similar evidence that the border environment contributed to higher rates of alcohol consumption among Mexican American adolescents but did not impact adult's drinking behavior. Another study indicated that Mexican American adolescents living in Los Angeles reported lower rates of alcohol use compared to Mexican adolescents residing along the Baja California border (Felix-Ortiz et al, 2001).

Mexican-origin adolescent males and females reported equal rates of drinking behaviors (Wilkinson et al., 2011). This is concerning as the gap is closing for male and female adolescents. One explanation for this is that Mexican-origin adolescents experience a shift in cultural values as

they acclimate to life in the United States. Problematic alcohol drinking behaviors in Mexican-American adolescents have also drawn researchers' attention. Wilkinson et al. (2011) explored factors that contribute to high rates of problematic alcohol consumption behaviors among Mexican-origin adolescents. Sensation-seeking behavior was linked with an increased risk for alcohol use in Mexican-origin adolescents.

Prevalence of substance use among Latino adolescents

The prevalence of substance use among adolescents is concerning given that repeated use can lead to addiction or "impaired control over drug use" (Wilcox & Erickson, 2011, p. 39), although not all substance use leads to addiction (Badiani et al, 2011; Everitt & Robbins, 2005; Pinel, 2014). Through decades of biological research, scientists have come to understand that substance use can have serious impacts on the neurological and genetic systems.

Neurological research indicates that the addictive process develops in the ventral tegmental area, the nucleus accumbens, and the frontal cortex (Wilcox & Erickson, 2011; Nestler, Hman, & Malenjka, 2001). The ventral tegmental area, the nucleus accumbens, and the frontal cortex make up the mesotelencephalic dopamine system that mediates the experience of pleasure (Pinel, 2014). Humans naturally deliver dopamine via electrical currents to this center of the brain providing intracranial self-stimulation (Pinel, 2014). Substance use increases the levels of dopamine delivered to this area, which may result in a pattern of release and reward and addiction (O'Connor et al., 2011). In other words, the act of substance use stimulates the brain producing a desirable effect, and so the behavior is continuously repeated to achieve this same effect to the extent that the behavior no longer becomes a controlled or conscious decision.

Adolescent substance use is especially problematic as the ventral tegmental area, the nucleus accumbens, and the frontal cortex are developing and are among the last to reach neuromaturational development (Jernigan & Gamst, 2005; Squeglia, Jacobus, & Tapert, 2009). Neuromaturational development “is accomplished through synaptic refinement and myelination” (Squeglia, Jacobus, & Tapert, 2009, p. 31). When fully matured, these areas help regulate cognitive control, learning, and memory, but there is indication that substance use can lead to abnormalities in the brain that impact these functions (Squeglia, Jacobus, & Tapert, 2009). Prolonged substance use raises levels of dopamine affecting the “pathways between the nucleus accumbens and the amygdala, hippo-campus, and frontal cortex, resulting in the development of substance-related cravings and increasing automaticity of the decision-to-use circuit by which substance use becomes a conditioned response rather than a conscious decision” (Monasterio, 2014, p. 568). Adolescents are particularly vulnerable as substance use affects areas of the brain that are not fully matured, thus they are vulnerable to higher levels of dopamine and other substance-induced side effects such as neuroinflammation and myelination suppression (Squeglia, Jacobus, & Tapert, 2009). However, research is still attempting to determine whether or not damage to these areas can remit with use and at which age vulnerability is greatest (Squeglia, Jacobus, & Tapert, 2009).

Alcohol use and genetic studies of Latinos

Impaired control over drug use is the defining psychosocial characteristic of addiction (Wilcox & Erickson, 2011). Cloninger’s (1999) study on the genetics of alcoholism found that alcoholism is often inherited. It is not clear how much alcohol use contributes to the inheritance of a tendency toward alcoholism. Wilcox and Erickson (2011) summarize the influence of alcohol on genetic makeup:

Genetic mutations can result in the abnormal formation of crucial brain regulatory proteins or the alteration of proteins such that they are less able to function correctly. Genetic mutations lead to the formation of altered proteins, which results in altered brain functioning that manifests as impaired control over drug use—the brain disease of dependence. (p. 40)

Scientists have discovered that alcohol-metabolizing enzymes increase the risk of alcohol dependence (Cloninger, 1999; Gelernter & Kranzier, 2009). Researchers have identified the alleles ADH1B, ALDH2, and CYP2E1 as the alcohol-metabolizing enzymes that contribute to alcohol-related diseases (Gordillo-Bastidas et al, 2010). Advances in research further indicate that Mexican Americans are at risk for possessing certain alcohol-metabolizing genes ADH1C*2, ADH1B*1, and CYP2E1 c2 alleles that effect drinking behaviors and increase risk for alcohol dependence (Konishi et al., 2003; 2004).

Konishi and colleagues (2003) compared Mexican Americans to other ethnic groups. Findings indicated that ADH3*1 allele (a protective enzyme) is lower in Mexican Americans compared to Asian Americans. The alleles ADH2*2 and ALDH2*2 (protective enzymes) were also low in Mexican Americans and similar to the levels found in African and Caucasian Americans. While all of the protective enzymes were significantly low, the enzyme CYP2E1, which enhances alcohol metabolism, was significantly higher in Mexican Americans. These findings indicate that Mexican Americans can consume greater quantities of alcohol while feeling less of its effects.

Researchers recognize that Mexican Americans are often a mixture of Spanish, indigenous Mexican, and African backgrounds. Konishi and colleagues (2003) theorized that the mixture of European and African ethnicities contributed to the allele distribution in Mexican Americans. Gordillo-Bastidas et al. (2010) contributed to this theory by comparing Huichols (indigenous

Mexicans) and Mestizos (European/indigenous mixture). Findings indicated that the Huichols had a near absence of important protective alleles, and the enzyme CYP2E1 that enhances alcohol metabolism was the highest ever documented in the world. It would appear that the presence of an indigenous background is a key risk factor in increased alcohol consumption and alcohol dependence among the Mexican origin community.

There are no other known published genetic studies specific to Latinos and alcohol or other drug use. However, the initiative to study the influence of genetics on substance use is gaining momentum. It may be that studies in the future will provide more information on how genetics influence substance use or are linked to the addictive process in Latinos. Nevertheless, this genetic disposition and susceptibility of early exposure to alcohol use are reason for great concern in the Mexican-origin adolescent population and perhaps other Latino subgroups.

SUBSTANCE USE AND LATINO ADOLESCENTS

In response to the prevalence of problematic substance use among Latino adolescents, epidemiological researchers recommend that interventions be adapted to suit the needs of the population. Researchers seem to agree that culturally adapted interventions have the potential to be more effective at reducing substance use compared to non-adapted interventions (Borges et al., 2011; Caetano, Ramisetty-Mikler, & Rodriguez, 2008; Canino et al, 2008; Castro & Coe, 2007). Therefore, it is imperative to discuss Latinos in the U.S. to contextualize the potential for culturally adapted interventions to reduce substance use rates among adolescents.

Population characteristics

According to the U.S. Census Bureau, currently 54 million Americans identify as Latino in the United States (U.S. Census Bureau, 2014). An additional 3.7 million persons of Puerto Rican

descent reside in Puerto Rico, making the Latino population the nation's largest ethnic or racial minority. The Latino population increased by 43% since the 2000 census and is projected to grow to 132.8 million by the year 2050 (U.S. Census Bureau, 2014). Latinos are the largest ethnic minority group in the United States; only Mexico has a larger Latino population (U.S. Census Bureau, 2014). Approximately 63% of the total Latino population in the United States is of Mexican background (Acosta & de la Cruz, 2010), followed by 9.2% Puerto Rican, 3.5% Cuban, 3.3% Salvadoran, 2.8% Dominican, and the remainder of another Latino origin. The Mexican-origin population accounted for three-fourths of the total increase in the U.S. Latino population, having grown by 54% since the last census (Ennis, Rios-Vargas, & Albert, 2011). Over half (61%) of the total U.S. Mexican-origin population resides in California or Texas, and the Mexican-origin population is "the largest Latino group in 40 states" (Ennis, Rios-Vargas, & Albert, 2011, p. 8). Other popular geographical states of residence include Florida, Arizona, Colorado, Illinois, New Jersey, and New York (U.S. Census Bureau, 2014).

For the past few decades, Mexican immigrants have consistently been the largest group of Latino American immigrants to the United States (USDHS, 2012). Subsequently, greater efforts are made to track and report the immigration trends, residence, and naturalization rates of Mexican Americans compared to other Latino subgroups. Persons from Mexico make up 29.3% of all foreign-born U.S. residents, followed by persons from El Salvador (3.1%) and Cuba (2.7%) (Acosta & de la Cruz, 2010). U.S. Census Bureau reports indicate the Latino population is most heavily saturated along the U.S./Mexico border including California, Arizona, New Mexico, and Texas (Ennis, Rios-Vargas, & Albert, 2011). Wallisch and Spence's (2006) description of Mexican-origin communities in Texas indicates that the foreign-born are more likely to reside

along the Texas-Mexico border than in the rest of Texas. No similar reports for the distribution of Latino foreign-born residents in California were identified. However, of all cities in California, Los Angeles reports the highest concentration of Mexican-origin persons (U.S. Census Bureau, 2014) and those born in Mexico (Lopez, 2003). With regard to naturalization, only 22.9% of those born in Mexico become U.S. citizens and are the second least likely of all other Latino subgroups to become U.S. citizens (Acosta & de la Cruz, 2010).

The Latino population has the highest fertility rate among all ethnic and racial minorities (Pew Hispanic Center, 2011). The Mexican origin population grew by 7.2 million as a result of births. The Mexican origin population accounted for the majority of all Latino births followed by the Cuban American population. Over 34% of the Latino population is under the age of 18, and is expected to grow in the near future. It is not entirely clear what factors contribute to this boom in births, and further investigation is needed to understand this increase. However, it is expected that Latino youth will account for the majority of the future increase in this fast-growing ethnic and racial minority population (Pew Hispanic Center, 2011). Thus, preventing or intervening in substance use problems among them is critical.

The influence of culture and substance use

The development of the New World brought about a unique phenomenon marked by the interaction of all world cultures and the sharing of chemical substances and substance use practices. The indigenous population shared the pleasures of alcohol and other substances unique to the land—tobacco, cocaine, caffeine, and LSD-like drugs—with early settlers, while Spanish and other European explorers brought cannabis, alcohol, and other substances discovered in the East (Brecher, 1972). The motivating purposes of substance use differed between European and

indigenous civilizations. Whereas European settlers were reported to primarily be motivated by these substances' sensation-altering properties, indigenous populations were often said to use substances for medicinal purposes or their ability to reach heightened spiritual states in ceremony (Pego et al., 1995). Regardless of these marked differences, the trade and sale of these substances ensued and provided the New World with the much needed revenue it needed to acquire power and establish influence in the world (Roueche, 1963; Krout, 1952; Goodman, 2005). As the European settlers and indigenous civilizations mixed, new cultures formed that mixed long-standing traditions and beliefs regarding acceptable substance use that continue to evolve.

Historical records indicate that some early colonists, and even indigenous populations, in both the United States and Latin American countries encouraged abstention (DeQuincy, 1822; Cherrington, 1920; Smart & Mora, 1986), but attempts to address the non-medical use of chemical substances vastly differed in both regions. Public reactions to substance use ranged from the death penalty, prohibition, regulatory legislation on the purchase and sale of chemical substances, punitive sanctions, and movements to treat and prevent the problems that ensued. Political reactions to public outcries differed. Abstentionists from the United States may have advocated moral and health-related reasons for the regulation or prohibition of substance use, but government involvement is thought to be primarily motivated by the potential for economic gain (Boyd, 1994). It was not until the Prohibition Era in the United States that moral reasons successfully influenced governmental action. Nevertheless, more individualistic views on substance use prevailed. Latin American countries pushed early on for the harsh punishment of substance users and total abstention citing moral reasons heavily influenced by the Catholic Church (Smart & Mora, 1986). This difference in orientation may be attributed to a weaker separation of church and state and

more collectivistic orientations in Latin America. Nevertheless, regardless of cultural orientation, neither region ever successfully achieved prohibition.

Notwithstanding differences in cultural orientations, both regions also vary in their laws regarding permissible substance use. Currently, the United States imposes legal age limits for alcohol and tobacco use that are more restrictive than Latin American countries. Whereas U.S. legal limits for alcohol and tobacco use are 21 and 18 years of age, respectively, most Latin American countries' legal limits for both alcohol and tobacco use are 18 years of age. Furthermore, the United States regularly enforces legal limits (e.g., blood alcohol level for driving under the influence) and punishes those that do not adhere to the limits. Anecdotal evidence suggests that most Latin American countries do not regularly enforce the legal limits of permissible alcohol or tobacco use.

Latinos are thought to be influenced by various beliefs and values forged through the exchange of different cultures unique to each individual country. In the United States, attitudes, beliefs, and values regarding substance use have also evolved over time. For example, Golub and Johnson (2001) found that the progression of adolescent substance use from legal drugs to illicit substance use peaked with the baby boom and that the progression to illicit drugs was virtually not reported among those persons born before World War II. Thus, Golub and Johnson (2001) concluded that American socio-political and cultural factors probably influenced substance use among adolescents of that time. Researchers attempt to understand the ambiguity that arises for Latinos after they immigrate to the United States and substance use rates spike. Many highlight the need for culturally adapted interventions that seek to address this population's unique needs.

Alcohol use in historical and contemporary Mexican culture

Alcohol's historical acceptability as a remedy for health and social problems is observed in popular Mexican culture. *Dichos*, cultural sayings, are one way that the culture reflects alcohol as an acceptable remedy for many health and social problems (Burciaga, 1997). For example, the popular saying is "*para todo mal mezcal, y para todo bien tambien*" or "for all ailments, mezcal, and for all good also" or "*hay que morir borracho para no sentirse tan gacho*" or "be drunk when you die so the pain will go by" and "*contra las muchas penas, las copas llenas; contra las pocas penas, llena las copas*" or "against the many sorrows, goblets full; against a few sorrows, full goblets" (Burciaga, 1997). Examples of alcohol's acceptance as a pain remedy are also often reflected in popular songs. One such song called "*Borracheras de Amor*" or "States of Drunkenness of Love" by Los Titanes de Durango states: "*Me la paso embriagado siempre llego bien acelerado a la casa, lleno de dolor, otra vez llegue borracho*" or "I spend my time drunk, I come to the house all emotionally bothered, full of sadness, again I came home drunk."

While Mexican culture is replete with examples of alcohol as an acceptable part of life, evidence also reflects an understanding that misusing alcohol is unacceptable. One *dicho* that reflects recognition of these dangers is "*si el vino te tiene loco, dejalo poco a poco*" or "if wine makes you crazy, leave it bit by bit" (Burciaga, 1997). These *dichos* and songs also reflect the history of conflict among the Mexican population regarding alcohol use. While some evidence supports the theory that alcohol use is inherent to the Mexican culture, evidence indicates that alcohol misuse is not. For example, Hatchett and colleagues (2011) interviewed elderly Mexican-origin persons on their views of alcohol use. Not surprisingly, the results revealed that over 50% grew up learning that alcohol can be used as a medicine, but a larger proportion believed that

problematic drinking should be punished (Hatchett et al., 2011). This evidence challenges popular beliefs regarding the Mexican origin community's acceptance of alcohol use.

Regardless of whether Mexicans enter the U.S. with an acceptance of alcohol use, the fact is that the prevalence of alcohol use significantly increases with subsequent generations. Health outcomes of Latinos residing in the United States have been of substantial interest to researchers from a variety of fields. Although overall, Latinos are less likely to drink alcohol than non-Latino Whites (Perez-Stable, Marin, & Marin, 1994; Singh & Siahpush, 2002), Latinos immigrating to the United States rapidly increase in problematic drinking behaviors in subsequent generations (Clark & Hofess, 1998). The Hispanic Paradox or Latino Paradox posits that Latinos, in spite of economic and social disadvantages, have equal or better health outcomes in general than do their White counterparts (Franzini, Ribble, & Keddie, 2001). When comparing U.S. Latinos and Latino immigrants, understanding problematic drinking becomes more complicated, however. Epidemiological data indicate that Latino immigrants are healthier than U.S. Latinos, and they also have better health outcomes than subsequent generations (Abraido-Lanza, Chao, & Florez, 2005). The Latino Immigrant Paradox is often used as a framework for attempting to understand the significant changes in problematic drinking upon exposure to U.S. culture, particularly for youth among the Mexican origin community (Bacio, Mays, & Lau, 2013). As researchers continue to find evidence supporting the Latino Immigrant Paradox, identifying which factors contribute to these differences in health outcomes has increasingly become of interest.

Some Latino activists and researchers argue that the media specifically targets the Mexican American community and is to blame for the increase in its dangerous drinking habits (Alaniz & Wilkes, 1995; Kong, 2003). The alcohol industry consistently uses popular Mexican cultural

images and icons to boost sales (Alaniz & Wilkes, 1995). As a result, Latinos & Latinas for Health Justice has protested the use of alcohol during Cinco de Mayo, a Mexican holiday, and other celebrations in an attempt to reclaim the culture citing slogans such as “Our culture is not for sale.” Activists and researchers also accuse the alcohol industry of intentionally attempting to reconstruct Mexican culture to meet the needs of the market to increase market profits (Alaniz & Wilkes, 1995). This raises a question about where the phenomenon of *fiesta drinking* (Medina-Mora, Borges, & Villatoro, 2000) originated. As mentioned, *fiesta drinking* has occurred for generations (Medina-Mora, 2007). However, researchers caution that *fiesta drinking* is not specific to the Mexican-origin community. A variety of cultural groups that reside in the United States also engage in similar drinking traditions (Room & Makela, 2000). This raises the question of how much *fiesta drinking* in the United States by the Mexican-origin community is inherent to Mexican culture and how much is the by-product of acculturation to the United States and Latino-targeted marketing.

Cultural variables and Latino adolescent substance use

Research on substance use among Latinos indicates vast differences between subgroups compared to other major ethnic or racial groups. The history of each Latino subgroup’s experience with substances differs in their country of origin and with their unique immigration experiences in the United States. The prevalence of substance use and systemic inequalities and institutional racism are not unique to the Latino community (DiNitto & Robles, 2011). Immigrants and non-immigrants from various ethnic and disadvantaged groups face a multitude of risk factors that increase their likelihood for alcohol abuse and dependence (DiNitto & Robles). Since not all

Latinos are immigrants or are similarly impacted by immigration, researchers attempt to understand how values and beliefs vary among the Latino population.

The Latino identity is complex and influenced by multiple factors such as gender, familial events, place of origin, and immigration experience (Arredondo & Santiago-Rivera, 2000). However, studies suggest that *machismo* (Soto et al, 2011; Unger et al, 2002; Unger et al, 2006), *marianismo* (Unger et al, 2002; Unger et al, 2006), *familism* (Kaplan, Napoles- Springer, Stewart, & Perez-Stable, 2001; Ramirez et al, 2004; Soto et al, 2011; Unger et al, 2002), and *respeto* (Unger et al, 2006; Soto et al, 2011) serve as both protective factors and facilitators for substance use in Latino adolescents. However, research on how culture influences substance use among Latino adolescents is still underdeveloped.

Marianismo

Latino's gender socialization is of long-standing interest in substance use research. The concept of *marianismo* has a strong religious connotation (Santiago-Rivera et al., 2002), and researchers have often attempted to understand the impact of *marianismo* on substance use. Scholars tie *marianismo*, a term academics coined to explain the gender socialization of Latinas as abstinent and sober women (Lopez-Baez, 1999), to Latinas emulating the Virgin Mary, which many view as a symbol of purity and sanctity (Alaniz & Wilkes, 1995). Any deviation from this ideal image of *marianismo* would result in a woman being labeled as a *malinche*, or traitor, and her ultimate social rejection (Cypress, 1991; Alaniz & Wilkes, 1995). Hatchett et al. (2011) found that considerable stigma was associated with a Mexican-origin woman who visits a bar or engages in problematic drinking. While *marianismo* might be a factor among Mexican immigrant women, as generations pass, Mexican-origin women's self-reported drinking increases (Caetano & Clark,

1998). One theory is that entering the U.S. workforce influences Latina immigrant women's alcohol use (Rebuhn, 1998), but more empirical evidence is needed to support this relationship. However, findings from a recent study did indicate that residing in a heavily Latino neighborhood deterred Mexican-origin women from drinking problematically (Markides et al., 2012). Therefore, Mexican immigrant women's low rate of alcohol use may be related to *marianismo*. However, families that endorse traditional gender roles act as a protective barrier to substance use for Latina/Hispanic adolescents, but not among adolescent males (Soto et al, 2012; Unger et al, 2004).

Machismo

Machismo has been studied as an explanation for Latino male's problematic alcohol and substance use throughout the generations. *Machismo* is another term academics have used to explain the gender roles of Latino men as aggressive and prone to alcohol problems (Morales, 1996). Scholars may use the term *machismo* to describe problematic drinking among Hispanic men, but the term does not originate from the Spanish language. Nevertheless, scholars use the term *machismo*, but scholars and the Latino community disagree about what *machismo* means. Gordon (1989) used *machismo* to describe a man who is honorable and responsible, while other scholars tie *machismo* to the idea of a man's privilege to drink freely as long as he controls himself (Baron, 2000; Caetano et al., 1998). Researchers continue to explore *machismo's* role and its relationship to problematic alcohol use, but have experienced difficulty in empirically linking the two (Gordon, 1989; Neff, Prihoda, & Hoppe, 1991). Neff et al. (1991) found that *machismo* was related to heavy drinking in men regardless of their ethnicity. Casas (1995) linked *machismo* with substance use when a male has difficulty in fulfilling the roles prescribed to him, not as an inherent part of being a Latino male. Nevertheless, Larson and McQuiston (2008) found that Mexican

American adolescent males reported higher rates of alcohol use compared to other subgroups, and Mexican American adolescent males were more worried about developing problematic alcohol use compared to their female counterparts who also drink alcohol. Furthermore, Soto et al. (2011) found that *machismo* served as a risk factor for alcohol use among Latino male adolescents. *Machismo* may influence substance use among Latino adolescents and researchers often promote exploring this cultural concept in cultural adaptations (Larson & McQuiston, 2008; Soto et al, 2011).

Familism

Familism is another term researchers coined to explain the close bonds observed in Latino families (Marin & Marin, 1991), which includes close family friends as well as other extended family members (Unger et al, 2004). *Familism* is more empirically supported compared to other Latino cultural values such as *machismo* or *marianismo* (Villareal, Blozis, & Widaman, 2005). *Familism* has long been considered a buffer against problematic drinking and drug use (Gil et al, 2000; Ramirez et al, 2004; Unger et al, 2002). Bacio, Mays, and Lau (2013) believe *familism* is a protective factor that inhibits alcohol use particularly among recent Latino adolescent immigrants. In measuring *familism*, researchers have also linked it with lower levels of lifetime marijuana use (Ramirez et al., 2004) and a decreased likelihood of cigarette use initiation (Kaplan et al., 2004) among Hispanic/Latino adolescents. Kopak and colleagues (2012) findings indicate that while family cohesion is a protective factor for both males and females, male adolescents reported experiencing greater protection from it with regard to drug and alcohol problems. Other studies also indicate that as adolescents acculturate, strong family bonds are weakened, increasing adolescents' risk for substance use (Bacio, Mays, & Lau, 2013; Gil, Wagner, & Vega, 2000;

Santisteban & Szapocznik, 1982). Subsequently, Latinos that report problematic family relationships are also more likely to report substance use disorders (Canino et al., 2008), while those with higher levels of family intimacy are less likely to engage in binge drinking (Martyn et al., 2009). For instance, family alcohol use, a lack of cohesion within the family, and low self-esteem are recognized as risk factors for problematic alcohol use among Latino adolescents (Colon, 1998). As a result, many recommend that culturally adapted interventions for Latinos integrate *familism* in the intervention protocol (Castro & Alarcon, 2002; Bacio, Mays, & Lau, 2013; Ramirez et al., 2004).

Respeto

Respeto is a relational concept where human interactions and communication are indicative of status (Garcia, 1996). For Latinos, adolescents are expected to behave and communicate in a respectful manner to adults. Unger and colleagues (2006) found that *respeto* is both a protective and risk factor for substance use. Further investigation revealed that when the adult in the position of respect is a substance user, adolescents might imitate the behavior. However, when adolescents respect adults that are not substance users, *respeto* serves as a protective factor against substance use (Gil et al., 2000; Soto et al., 2011).

Acculturation

The literature on cultural values is frequently concerned with acculturation. Acculturation refers to the “process of changes in behavior and values by individuals” and communities when they “come in contact with a new group, nation, or culture” (Marin et al., 1984, p. 184). While early models of acculturation understood the process as a singular and one-dimensional construct (Berry, 1980; Berry 1997), research today seeks to understand the multidimensionality of the

process of change and the latent groups that surface among acculturating groups (Schwartz & Zamboanga, 2008).

In substance use research, acculturation is often explored in terms of language, social integration, and ethnic identification. Early substance use researchers found a strong relationship between substance use and acculturation (Caetano & Medina-Mora, 1998; Gil, Vega, & Dimas, 1994; Epstein, Botvin, & Diaz, 1998; & Blake, Lesky, Goodenow, & O'Donnell, 2001). These findings hold constant today as research continues to suggest that as Latino immigrant adolescents acculturate, their risk for substance use increases (Almeida, Johnson, Matsumoto, & Godette, 2012). These findings complement overall findings that suggest that less acculturated Latino immigrants are at a lower risk of substance use compared to highly acculturated immigrants (Bui, 2013).

It is interesting to note that more highly acculturated Latinos have repeatedly demonstrated greater risks of substance use regardless of immigration status. This “rule of thumb” has created a need for researchers to explore the multiple effects of acculturative variables on substance use. Most recently, Salas-Wright and colleagues (2015a) identified five acculturative subtype groups that all reported varying degrees of nicotine, alcohol, and illicit drug use disorders. Effectively, English-dominant, fully assimilated Latinos reported the highest risk ratios for all substance use disorders followed by English-dominant bicultural Latinos, while Spanish-dominant, strongly separated Latinos reported the lowest rates of substance use disorders. Moreover, bilingual/bicultural and English-dominant Latinos had a higher prevalence of experiences with discrimination; yet, English-dominant Latinos were more likely to meet criteria for alcohol, tobacco, and illicit drug dependence compared to bilingual/bicultural Latinos. Compounding these

compelling results, subsequent analysis revealed four acculturative subtype groups as identified by acculturative stress (Salas-Wright et al., 2015b). These subtypes included: (1) low acculturative stress, (2) social and linguistic stress, (3) acculturative stress fear of deportation, and (4) acculturative stress no fear of deportation. The researcher did not report a significant risk ratio for alcohol or illicit drug use disorder by acculturative stress subtype. Thus, it might be that certain acculturative variables have different moderating effects for substance use; therefore, it is essential that researchers continue to build upon exploratory research to examine what combinations of acculturative variables influence substance use behaviors.

CULTURAL ADAPTATION

The history of cultural adaptation

Etymologically, “culture” refers to “the cultivation of the soul” (Gildenhard, 2007). Since Roman times, the study of human nature, human society, and human past evolved into what is now known as anthropology (Greenwood & Stini, 1977). Subsequently, anthropologists were the first to begin using the concept of culture to describe the complex system of distinct ways that a group of people communicates and acts and interacts with other groups (Hoebel, 1966). Anthropologists recognize the importance of culture and language and how they are used to adapt and transform the human experience and carry meaningful messages (Schultz & Lavenda, 2009). The discipline has branched out into four specialties since its inception, including those who focus on cultural and linguistic anthropology. Both cultural and linguistic anthropologists approach the study of human nature and society via a holistic framework attempting to understand culture and language in a broader context. Cross-cultural research, a sub-specialization of anthropology, studies culture and language simultaneously and posits that members of larger groups learn patterns of behavior

that act as an internal integrated system for determining values, beliefs, and attitudes (Macionis & Gerber, 2010). Cross-cultural researchers hold that culture is comprised of tangible artifacts such as food, clothing, and music, while also including intangible assets like language and customs that impact behaviors. Concerning behavior and attitudes, language and customs are thought of as the center of culture (Sorrells, 2013). Yet, culture is not static simply because it is subject to historical, political, social, environmental, and geographical contexts (Dumas et al., 2002; Sorrells, 2013). Therefore, behaviors, attitudes, beliefs, and values are fluid, and the meaning of the term culture also evolves and is subject to the context of its use (Betancourt & Lopez, 1993; Triandis, 2005).

Psychology emerged from philosophy, but anthropology influences the inclusion of culture and language in attempting to understand mental processes and human behavior. From the discipline of psychology emerged psychotherapy— a European cultural phenomenon—that approached psychological issues at the individual level (Bernal & Rodriguez, 2012). Freud unknowingly made the first recorded cultural adaptation when he adapted his “id-based psychology in Europe to an ego psychology in the United States” (Bernal & Rodriguez, 2012, p. 7) to fit American values and individualistic orientation. The adaptation is most popularly recognized as a theoretical breakthrough, earning him the title as the “Father of Modern Psychology.” Cross-cultural researchers today also recognize his breakthrough as a cultural adaptation (Bernal & Rodriguez, 2012). Nevertheless, it is important to note that Freud did not recognize societal and cultural influences in his psychoanalytic theory. However, it could be argued that the shift in psychology Freud set in motion gave way to the theorists, researchers, and clinicians that united thereafter to include culture in psychological and behavioral studies.

European psychologist and theorist Eric Erickson was among the first to emphasize the

importance of society and culture on the development of the psychological self (Hergenhahn & Olson, 1999). In fact, it was during an interdisciplinary project with the department of anthropology on the Sioux Indian Reservation that Erickson began to voice the importance of social and cultural variables on personality development (Hergenhahn & Olson, 1999). As a frame of reference for his theory, he posited that human existence is dualistic in nature, balanced by the natural and biological and societal influence to be somebody. Erickson adapted the epigenetic principle—a biological concept—to explain the sequence of life stages as genetically determined and unalterable (Erickson, 1950). According to Erickson, each developmental stage is characterized by a social crisis or an important turning point that is either resolved positively or negatively. Erickson coined the terms ritualizations or ritualisms—influenced by anthropological concepts—to describe the positive or negative ways that culture influences and shapes personality development (Erickson, 1977). Ritualizations are a harmonious interplay between unfolding personality requirements and existing sanctioned societal and cultural conditions that shape beliefs, values, customs, and behaviors (Hergenhahn & Olson, 1999; Erickson, 1950; Erickson, 1977). Ritualisms are exaggerated or otherwise distorted ritualizations that are inappropriate, false, mechanical, or stereotyped (Erickson, 1950; Erickson, 1977). An example of a possible sanctioned societal and cultural condition that is both a ritualization and ritualism is *machismo*. While Erickson was the first to emphasize the influence of society and culture on human development, specifically with children and adolescents, he did not develop culturally adapted interventions.

By the 1950s many psychotherapists agreed that cultural, historical, societal, political, and environmental forces of the time influence behavior (Bernal & Rodriguez, 2012; Tseng, 1999; & Cushman, 1995). The first recorded cultural adaptations in psychotherapy began with

modifications to therapeutic models following World War II (Bernal, 2006). World War II brought many opportunities for women not otherwise available. Early adaptations accounted for societal changes such as shifts in gender-based marital expectations that occurred after the war. For example, Carl Rogers, an American psychotherapist, developed the client-centered approach to psychotherapy that aligned with the values of the wealthy and middle-class majority of the United States that is oriented to the present, independence, and equality (Bernal & Rodriguez, 2012; Rogers, 1951; Rogers, 1972). However, it is important to note that Rogers studied with Alfred Adler, a European psychotherapist and openly recognized Adler's influence on his approach to therapy. Although Adler trained under Freud, he also focused on social and interpersonal variables (Hergenhahn & Olson, 1999). Therefore, while Adler influenced Roger's approach to therapy, Rogers influenced the development of person-centered approaches to cross-cultural relations in various European countries and also South Africa and Central America (Hergenhahn & Olson, 1999).

Prior to the official inception of the science of cultural adaptation, only a select few therapists advocated for the consideration of ethnicity and race in therapy (Cushman, 1995; Kluckhohn, 1958; Kluckhohn & Strodbeck, 1961; Spiegel, 1971; Bernal, 2006). McGoldrick developed the first guide to provide a list of ethnic and racial minority cultural values to consider in therapy, thereby formally initiating the inclusion of culture in the field of psychotherapy (Bernal & Rodriguez, 2012; McGoldrick, 2005). The premise behind considering culture in psychotherapy is to increase engagement in treatment for the purpose of eliciting change in racial and ethnic minorities. Eventually, the movement evolved from merely considering culture in therapy to

developing culturally adapted interventions in order to advance the evidence base on effective practices for ethnic and racial minorities (Bernal, Bonilla, & Bellido, 1995).

Despite the growing support for culturally adapted interventions, very little research was conducted on racial and ethnic minority groups, and researchers with sufficient cultural and linguistic expertise were sparse. These two factors may have contributed to the delay of culturally adapted randomized controlled trials (RCTs) developed for racial and ethnic minorities. In fact, the first RCTs and other advanced evaluation research designs used with ethnic minorities did not surface until the mid-1990s (Task Force on Promotion and Dissemination of Psychological Procedures, 1995). Nevertheless, it is difficult to pinpoint when culturally adapted substance use interventions for Latino adolescents begin. Specifically, it is only through a systematic review that these interventions can be identified and examined.

Cultural adaptation movement's influence on policy

The cultural adaptation phenomenon in the social and behavioral sciences has also influenced policy efforts to regulate and improve health-related services to racial and ethnic minorities. In 1999, the State of New Jersey held a series of conferences discussing the importance of addressing racial and ethnic minority disparities (Graves, Like, Kelly, & Hohensee, 2007). The Office of Minority Health (2014) responded to the initiative by publishing *National Standards for Culturally and Linguistically Appropriate Services in Healthcare*, and is the first federal initiative intended to help those interested in culturally adapting services for racial and ethnic minorities. After years of political organization, New Jersey became the first state to pass legislation requiring that services to racial and ethnic minorities be culturally and linguistically appropriate (Graves, Like, Kelly, & Hohensee, 2007). Since then, only six states have passed legislation mandating

cultural and linguistic appropriate services. Table 2.1 provides a complete list of states that have passed culturally and linguistically appropriate services (CLAS) legislation or where a bill was referred to committee, died in committee, or was vetoed. States where the Latino population is over 1 million and/or the majority minority are highlighted in the table. The table also shows that the states with Latino populations over 1 million are over represented in the “died in committee” or “vetoed” column. Yet, while these states have failed to pass legislation to culturally adapt services to racial and ethnic minorities, research efforts to test culturally adapted interventions in at least two of them (Texas and Florida) have been substantial. In an effort to persuade states to adopt CLAS policies to regulate and adapt health-related services, the Affordable Care Act (ACA) explicitly requires healthcare institutions to provide culturally and linguistically appropriate services to racial and ethnic minorities.

Legislation Passed	Legislation Referred to Committee	Legislation Died in Committee	Legislation Vetoed
California**	Arizona**	Florida**	Colorado**
Connecticut*	Georgia	Illinois**	
Maryland	Hawaii	Iowa*	
New Jersey**	Indiana	Texas**	
New Mexico*	Kentucky		
Oregon*	Massachusetts		
Washington*	Minnesota		
	Missouri		
	New York**		
	Ohio		
	Oklahoma		

* Denotes Latino is state's largest minority group.
** Denotes state Latino population is over 1 million and Latino is the state's largest minority group.
Sources: U.S. Census Bureau, 2014; Office of Minority Health, 2014

Table 2.1: List of Cultural and Linguistic Policy Efforts by State

Despite federal regulations that mandate culturally and linguistically appropriate services, many states lag behind in implementing CLAS policies. The Office of Minority Health launched the National Culturally and Linguistically Appropriate Services Standards Enhancement initiative in 2010 to reflect research advances in this area (Office of Minority Health, 2014). This initiative can be scientifically supported through systematic reviews of the literature and a meta-analysis of effect sizes across interventions. Sans these approaches, research advances may be dependent on a handful of studies that do not accurately determine how, if at all, culturally adapted interventions can effectively improve outcomes and reduce disparities in substance use and other health-related behaviors.

Approaches to cultural adaptation

Cultural adaptation in present-day social and behavioral science contexts refers to the modifications made to an intervention that address issues regarding fit with target populations (Preedy, 2010; Castro, Barrera, & Martinez, 2004). A cultural adaptation is reflected in the process, materials, and/or practice behaviors by which interventions are delivered. Bernal and Rodriguez's (2012) review identified 11 different models, frameworks, and guidelines for culturally adapting interventions. Their review included both national and international models of cultural adaptation.

Each of these approaches to cultural adaptation varies in key concepts and approaches. Each model also differs in its conceptualization of the cultural adaptation process, but similarities do exist among and across these models. While some approach cultural adaptation at the therapist or at the therapist and population level, others approach adaptation at the intervention (e.g., program component) level, and others at both the therapist and intervention level. For example,

the multi-dimensional model for understanding culturally responsive psychotherapies is concerned with adapting therapist characteristics to integrate cultural meanings into therapeutic structure (Koss-Chioino & Vargas, 1992). The emphasis of this framework is on adapting therapist characteristics, manner, and style, and the choices they make when determining what tools and procedures to use while providing psychotherapy (Koss-Chioino & Vargas). The model approaches culture universally and recommends that the process of adapting therapeutic skills depends on the context in which they are practiced. In other words, the model is not guided by a predetermined set of cultural concepts but instead changes from client to client as needed. The cultural accommodation model (CAM)—also primarily concerned about adaptations at the therapist level (Leong & Lee, 2006)—also considers culture to vary from person to person. Therefore, therapists are encouraged to actively seek the specific cultural variables that emerge while engaging in treatment to improve effectiveness (Leong & Lee, 2006). Unlike the multi-dimensional model that does not list a literature review as a source for guidance in understanding the client’s culture, the CAM model recommends a literature review as part of the adaptation process. However, the model is still open to the uniqueness of each client.

The cultural sensitivity framework (Resnicow et al, 2002), the cultural adaptation process model (Domenech-Rodriguez & Wieling, 2004), the selective and directed treatment adaptation framework (Lau, 2006), the heuristic framework (Barrera & Castro, 2006), the culturally specific prevention framework (Whitbeck, 2006), and the integrated top-down and bottom-up approach to adapting psychotherapy (Hwang, 2006; & Hwang, 2009) all primarily approach cultural adaptation at the intervention level. These approaches focus on adapting program components, and each approach engages the community to ensure the program’s fit with the targeted population. The

selective and directed treatment adaptation framework is the only one of the few approaches that does not include conducting a literature review as a step in the adaptation process (Resnicow et al, 2002; Domenech-Rodriguez & Wieling, 2004; Barrera & Castro, 2006; Whitbeck, 2006; Hwang, 2009); however, this is not to say that the literature is the driving force behind cultural adaptation. Instead, each model seeks to collect new data and integrate this knowledge into the intervention protocol. Unlike the multi-dimensional and CAM model, these models are more engaged in adapting evidence-based interventions. The cultural sensitivity framework is the only approach developed to address substance use among ethnocultural minorities, and it has also been applied to other behavioral issues like nutrition (Resnicow et al., 2002).

The ecological validity framework (EVF) (Bronfenbrenner, 1989; Bernal, Bonilla, & Bellido, 1995; Bernal & Saez-Santiago, 2006), the hybrid prevention program model (Castro, Barrera, & Martinez, 2004), and the adaptation for international transport model (Kumpfer, Pinyuchon, Teixeira de Melo, & Whiteside, 2008) approach adaptation at the therapist and intervention level simultaneously. These approaches each attempt to align all components to be congruent with the culture of the target population. Castro, Barrera, and Martinez's (2004) model identifies (a) group characteristics, (b) program delivery staff, and (c) administration/community factors as the three major sources that may threaten the intervention's fit with racial and ethnic minorities (Castro, Barrera, & Martinez, 2004). The hybrid prevention program model and the ecological validity framework approach also include the location (e.g., church, community center) of the delivery of the intervention as part of the adaptation process (Bronfenbrenner, 1989; Bernal, Bonilla, & Bellido, 1995; Bernal & Saez-Santiago, 2006; Castro, Barrera, & Martinez, 2004). However, the adaptation for international transport model is the most widely implemented

internationally to culturally adapt interventions (Domenech-Rodriguez & Bernal, 2004, Kumpfer, Pinyuchon, Teixeira de Melo, & Whiteside, 2008).

The challenge and argument behind cultural adaptations is to test the assumption that an intervention is or is not equally effective across clients of different ethnic backgrounds (Falicov, 2009). Culturally adapted interventions are meant to mitigate the challenges assumed with an ethnic group's ability to successfully engage in an intervention and therefore reduce problematic disparities in substance use. Conversely, it is this assumption of differences across cultures that spark the greatest debate among the scientific community as to the effectiveness of cultural adaptations (Elliot & Mihalic, 2004; Hall, 2001). It may be that the attention to culture in interventions is strongly based on direct observations and compelled by an ethical obligation to attend to values rather than empirical support of their utility in efficaciously producing change (Kazdin, 1993; Dent et al, 1996). Others argue that given the fluid nature of culture, efforts to integrate values should be more locally based and that adolescent developmental needs are similar across major ethnic and racial groups (Elliot & Mihalic, 2004; Hall, 2001). Furthermore, there are arguments that mainstream interventions should be proven to be ineffective with ethnic minorities before attempting adaptation (Tobler, 1992; Huey & DePaul, 2008); however, those who hold this view still support the evaluation of culturally adapted interventions compared to non-adapted versions (Falicov, 2009).

The field remains divided about cultural adaptation. Some support it (Dent et al., 1996; Milburn et al., 1990; Sussman et al., 1995; Turner, 2000); others believe that there is little evidence to support cultural adaptations (Hansen, 1992; Dent et al., 1996; Tobler, 1992). In either case, there is little empirical evidence beyond individual reports or narrative reviews to support such

arguments. Therefore, there is little on which to draw to support arguments about the overall effectiveness of culturally adapted substance use interventions. While evidence indicates that Latino culture may influence adolescents' substance use, it is necessary to fully understand cultural adaptation's utility for interventions and impacting substance use outcomes to contribute to the ongoing debate (Falicov, 2009). Rather than subjectively assign importance to the effectiveness of culturally adapted substance use interventions for Latino adolescents, this dissertation contributes to this debate by quantitatively examining significance across studies.

Central components of cultural adaptations

The aforementioned models may differ in their approaches to culturally adapting interventions, but the main areas of concern are the same across models: to provide linguistically and conceptually relevant interventions. Linguistic relevance is an essential component to understanding all cultural adaptations. To begin, linguistic relevance is the ability to deliver an intervention in the language of the target population (Herdman, Fox-Rushby, & Badia, 1998). Linguistically relevant interventions serve to ensure effective communication among those delivering the intervention and the participants receiving the protocol. The National Standards for Culturally and Linguistically Appropriate Services (2001) recognizes bilingual staff and linguistically relevant materials as the two ways that an intervention reaches linguistic relevance.

Linguistic relevance

The literature emphasizes the need for closer attention to matching intervention approaches for Latino adolescents and their families according to their linguistic needs (Holleran, Taylor-Seehafer, Pomeroy, & Neff, 2005; Leidy et al., 2010, Marsiglia et al., 2005). Latino adolescents and their families may speak English, Spanish, or both English and Spanish. Studies indicate that

language is a barrier to participation in substance use intervention services for Latinos (O'Sullivan & Lasso, 1992; Zemore et al., 2009). Linguistically relevant interventions offer participants the opportunity to fully participate in the intervention by increasing their understanding of the intervention's purpose. Without this important adaptation, Latino participants might not fully understand information vital to their progress in the intervention or not engage in the intervention (Ludwig, 2003; Zemore et al., 2009).

A linguistically relevant intervention consists of both translation and interpretation into the Spanish language. Translation refers to the conversion of written materials into another language while interpretation is the conversion of the spoken word. Translating and interpretation require the ability to discern elements such as context or cultural idioms. There are vast differences in English and Spanish grammar and syntax and deeper conceptual meanings in phrases or terms (Herdman, Fox-Rushby, & Badia, 1998). An absolutist approach to translations or interpretations from English to Spanish does not accommodate for differences in English terms and Americanized concepts that do not exist in the Spanish language or Latino culture. Even Spanish speakers can lack knowledge of these cultural differences, which deters them from achieving an appropriate translation or interpretation (Blumenthal et al., 2006). Therefore, it is critical that interventions are also adapted to meet the conceptual needs of the ethnic group.

Conceptual relevance

Conceptual relevance is the second main component of all cultural adaptations and is highly intertwined with linguistic relevance. Cultural adaptations work from an approach that considers that conceptual domains that are relevant to the mainstream in one culture may or may not apply in another culture (Herdman, Fox-Rushby, & Badia, 1998). As such, cultural adaptations

do not assume homogeneity across cultural groups nor do they adapt interventions by indiscriminately integrating cultural variables that are listed as prescribed set of traits of a group (Bernal & Rodriguez, 2012). Instead, interventionists seek to understand the differences in values, beliefs, and attitudes of the target population vis-à-vis an emic understanding of culture. Once these observations are interpreted and evaluated, the intervention then undergoes the cultural adaptation while maintaining fidelity to the original intervention (Castro, Barrera, & Martinez, 2004). Yet cultural adaptation research requires a specific set of scientific, conceptual, linguistic, and multicultural skills that few possess (Bernal & Rodriguez, 2009; Bravo, 2003), and many empirically supported assessment tools are not validated for use with ethnic or racial minorities. Thus, few culturally adapted substance use interventions exist in comparison to mainstream interventions and researchers are challenged to develop empirically sound adaptations (Falicov, 2009). Compounding the difficulty in delivering culturally relevant interventions is the dearth of empirical evidence in the literature on the effectiveness of culturally adapted interventions (Bernal & Rodriguez, 2009; Hecht et al., 2008).

Culturally adapted substance use interventions for Latino adolescents

A systematic review of the literature revealed one systematic review and one meta-analysis related to the effectiveness of evidence based interventions for ethnic and racial minority adolescent substance use (Huey & Polo, 2008; Waldron & Turner, 2008), and one systematic review and one meta-analysis related to culturally adapted substance use interventions and for ethnic and racial minority adolescents (Hodge et al., 2012). Additionally, one narrative review related to culturally adapted interventions for ethnic and racial minority adolescents (Kong, Singh, & Krishnan-Sarin, 2012) and one review on substance abuse interventions with the Latino

population were identified (Castro et al., 2006). Although more position papers surfaced that addressed substance interventions with Latino adolescents, all are limited in the ability to address the effectiveness of cultural adaptations. Empirical support for the effectiveness of evidence-based treatments for ethnic and racial minorities, specifically Latino adolescents, on substance use outcomes is equivocal. Waldron and Turner's (2008) systematic review and meta-analysis examined the effectiveness of evidence-based psychosocial treatments for adolescent substance use, and separately analyzed Latino outcomes. These authors systematically searched three databases (PsychINFO, Medline, and Psychological Abstracts) and used a variety of search words (adolescent, substance use, substance abuse, drug use, drug abuse, addiction, intervention, and treatment).

Huey and Polo (2008) conducted a review and meta-analysis of the effectiveness of evidence based psychosocial treatments for ethnic (Latino) and racial minority adolescent substance use. Although they reviewed treatments that included culture-responsive elements, they were unable to assess the impact of culture-related modifications on differential treatment outcomes and suggest further research because the methodological designs used in the studies reviewed could not adequately detect cultural adaptations' effects on substance use outcomes for Latino or racial minority adolescents (Huey & Polo, 2008). Waldron and Turner's (2008) review and meta-analysis on the effectiveness of evidence based psychosocial treatments for adolescent substance use included multidimensional family therapy, functional family therapy, and group CBT, which emerged as well-established models for substance abuse treatment with Latinos. They concluded that research is needed to identify which adolescents may be more likely to respond to specific interventions and how treatments can be adapted or tailored to the individual needs of

adolescents to improve substance use outcomes. Hodge et al. (2012) examined culturally adapted interventions' effectiveness for addressing substance use among ethnic minority youth. Results of the meta-analysis indicated that the interventions had a small effect across all substance use measures ($g=0.118$; 95% CI=0.004 to 0.232), a small effect on recent alcohol use outcomes ($g=0.225$; 95% CI=0.015 to 0.435), but a large effect on marijuana use ($g=0.610$; 95% CI=-0.256 to 1.476). However, they do not report on effectiveness with Latino adolescents. Kong, Singh, and Krishnan-Sarin's (2012) systematic review of tobacco prevention and cessation interventions for minority adolescents found that culturally adapted preventions appeared to reduce tobacco initiation rates, but they did not provide meta-analytic evidence to substantiate the claim.

Hodge et al. (2012) examined culturally adapted interventions' effectiveness for addressing substance use among ethnic minority youth. Their analysis included a total of 10 culturally adapted interventions and measured the effectiveness of the interventions exclusively on substance use (alcohol and marijuana) outcomes. Hodge et al. included adolescents from major ethnic minority groups and interventions adapted to address outcomes for ethnic youth in their search. Search methods included a computerized search of databases, an ancestry search of selected studies (Cooper & Hedges, 1994), a search of references contained in relevant reviews, and an informal approach of contacting researchers and authors in the field for additional information (Cooper & Hedges, 1994). Results of the meta-analysis indicated that the interventions had a small significant effect on recent alcohol use outcomes but not on marijuana. The selected studies for the meta-analysis included other substance use outcomes, but these were not measured in the meta-analysis. The meta-analysis also did not reveal differences in outcome effects based on other variables such as gender, treatment setting, or attitudes towards substance use. While previous systematic reviews

and meta-analyses summarized the effectiveness of culturally adapted substance use interventions, their methodological design had limited ability to adequately detect cultural adaptation effects on substance use outcomes for Latino adolescents. This dissertation will serve to update the knowledge on the overall effectiveness of culturally adapted substance use interventions specifically for Latino adolescents.

Systematic review and meta-analysis

Reviews are intended to sum up the available literature on any given topic. Many scholars and students rely on reviews to provide detailed information of the literature on a particular topic. The two recognized types of literature reviews are narrative reviews and systematic reviews. While both review the literature, they vary in methodological rigor and utility. In fact, narrative reviews differ substantially from systematic reviews.

Narrative reviews

Narrative reviews are appropriate when few studies are available, but they are limited in their ability to synthesize vast amounts of data when there are a large number of studies (Glass et al., 1981). Narrative reviews do not follow systematic evidence-based criteria to help mitigate bias when selecting articles and often only represent the published literature on a given topic. Furthermore, narrative reviews frequently do not assess the methodological quality of the studies selected for inclusion. While narrative reviews synthesize the data, the synthesis is heavily subject to expert opinion. To correct for such bias, reviewers are cautioned to regard multiple studies “as a complex data set, no more comprehensible without statistical analysis than would be hundreds of data points in one study. Contemporary research reviewing should be more technical and statistical than narrative” (Glass et al., 1981, p. 12).

Systematic reviews

The numbers of outcome research studies and interventions have grown considerably since the 1990s and the systematic approach to reviewing the literature and synthesizing the data is widely used (Durlak, 1997, 1998, 1999, 2000; Lipsey & Wilson, 1993). Unlike narrative reviews, systematic reviews detail a comprehensive plan and search strategy to review relevant studies on a specific topic that are then synthesized in a way that is both transparent and replicable (Uman, 2011; Littell & Maynard, 2014). Most systematic reviews also incorporate a meta-analytic component to synthesize study effect sizes into a summary effect size (Petticrew & Roberts, 2006). Uman's (2011) review of systematic reviews identified eight stages of the systematic review and meta-analytic method to synthesizing the literature: (1) formulate the review question, (2) define inclusion and exclusion criteria, (3) develop search strategy and locate studies, (4) select studies, (5) extract data, (6) assess study quality, (7) analyze and interpret results, (8) disseminate findings.

Although the systematic review method with meta-analysis is superior to the narrative review, there are three precautions to be taken with this method. First, the search is guided by the researcher, which may influence which studies are identified in the search and the subsequent synthesis of effect sizes (Aschengeau & Seage III, 2007). However, the transparency and replicable nature of the search strategy does allow subsequent reviewers to build upon any given study. Therefore, reviewers should review previous systematic reviews and meta-analysis to strengthen future reviews. Secondly, reviewers may be tempted to choose published studies only. Publication is not synonymous with methodological quality (Moyer et al., 2010). Therefore, systematic reviews should not set "published studies only" as an inclusion criteria (Littell & Maynard, 2014; Higgins & Green, 2011). Given that only 50% of completed studies are published

(Dwan et al., 2008), systematic reviews should implement search methods to identify both published and unpublished studies (Littell & Maynard, 2014). The goal behind every systematic review should be to reduce bias by identifying all relevant published and unpublished studies (Littell et al., 2008; Littell & Maynard, 2014). Systematic reviews that include searches of both published and unpublished studies have the capability of fully representing the entire body of literature on a particular topic. By systematically reviewing the literature, publication bias is limited and chance effects are reduced, thereby leading to more reliable results (Higgins & Green, 2006; Littell & Maynard, 2014). Lastly, the quality of a study matters, and each study should be assessed for varying levels of bias. Bias is simply the unfair judgment of one factor over another that misrepresents the data. Each level of bias that can be assessed is discussed and defined later in the methods section of this dissertation. The Cochrane Collaboration (2013) explains the importance of assessing bias in meta-analysis.

Different biases can lead to an underestimation or overestimation of the true intervention effect. Biases can vary in magnitude: some are small (and trivial compared with the observed effect) and some are substantial (so that an apparent finding may be entirely due to bias). (p. 1)

Assessing for risk of bias can help explain the heterogeneity of intervention effect sizes across studies or weigh the precision of the review's results if the studies are homogenous but not rigorous. This systematic review includes an assessment for risk of bias, and the criteria for each assessment is listed in the methods section.

Meta-analysis

Systematic reviews often include a meta-analytic component to synthesize the data into a summary effect size (Petticrew & Roberts, 2006), "thereby providing information about the magnitude of the intervention effect" (Uman, 2011, p. 2). Meta-analysis is a secondary analysis of outcome studies in which each study's effect size or sizes are calculated (Lipsey & Wilson, 2001).

The meta-analysis statistical approach quantitatively aggregates and compares results of different individual research studies (Glass et al., 1981; Lipsey & Wilson, 2001). Combining similar outcome studies increase statistical power and can improve the precision of estimation (Yu, 2003). The statistical approach computes the effect size and variance for each study and then a weighted mean of those effect sizes (Boyd, Basic, & Bethem, 2009). It is important to assess the dispersion of effect sizes from study to study and then report the summary effect or the weighted mean of the individual effects (Boyd, Basic, & Bethem, 2009). When effect sizes are consistent across studies, the focus is on the summary effect to interpret the data (Boyd, Basic, & Bethem, 2009). If effect sizes vary modestly, then the true effect could be lower or higher than the summary effect. If the effect sizes vary substantially, the focus is on the dispersion of effects and quantifying the extent of the variance (Boyd, Basic, & Bethem, 2009). Thus, the meta-analysis rigorously evaluates the statistical significance of the summary effect and consistency of effect sizes across studies. The meta-analysis complements the systematic review by mathematically strengthening the synthesis of information.

Chapter 3: Methodology

STUDY AIMS

The aim of this dissertation is to examine the effectiveness of culturally adapted substance use interventions for Latino adolescents by employing systematic review methods and a meta-analytic approach to identifying, synthesizing, and analyzing intervention effects on substance use outcomes. As culturally adapted interventions continue to gain popularity, their utility as well as effectiveness should be examined systematically. Although the literature abounds with broad overviews and conceptual discourse about the development and usefulness of culturally adapted interventions, a meta-analytic approach will systematically and quantitatively examine effects of culturally adapted interventions to provide more valid findings on intervention effectiveness. By analyzing the effectiveness of culturally adapted interventions for Latino adolescents, the study will contribute to the ongoing discussion about the future of substance use interventions.

To accomplish this goal, the present study seeks to identify and examine the effectiveness of culturally adapted substance use interventions with Latino adolescents. The specific questions guiding this systematic review are:

1. What types of culturally adapted interventions are being used to reduce substance use among Latino adolescents?
2. What are the characteristics of the interventions being adapted to prevent or reduce substance use among Latino adolescents?
3. What are the effects of culturally adapted interventions on Latino adolescents' substance use?
4. Are some culturally adapted interventions more effective than others?

The immediate outcomes of this study will be to answer the previously stated research questions so as to describe the types, characteristics, and effects of culturally adapted interventions for Latino adolescents and substance use. The long-term goals are to advance the systematic knowledge in the field of developing effective culturally adapted interventions for Latino adolescents and substance use. The findings will enhance the understanding of how well culturally adapted interventions are working in addressing substance outcomes, inform social work practice and social policy, and provide a basis for future research.

STUDY DESIGN

Systematic review procedures were used for all aspects of the search, retrieval, selection, and coding process of published and unpublished studies meeting study inclusion criteria (see Campbell collaborations review guidelines at www.campbellcollaboration.org; Littell et al., 2008). Meta-analytic methods were used to quantitatively synthesize intervention effects (described in more detail below).

STUDY ELIGIBILITY CRITERIA

Studies were eligible for inclusion if they report the effects of a culturally adapted intervention on substance use with Hispanic or Latino adolescents in the United States.

Type of study designs

Published or unpublished studies conducted or reported between January 1990 and March 2014 that used an experimental or quasi-experimental design met eligibility criteria for this systematic review. Studies may include wait-list, active control, or a no treatment control group as a comparison condition. This systematic review does not include single-group pretest-posttest studies or other study designs. Studies may include intervention designs that fall into one of

following categories: (a) universal, (b) selective, or (c) indicated. For the purpose of this study, universal interventions are defined as interventions that address substance use regardless of risk, selective interventions are aimed at an at-risk group, and indicated interventions target high-risk individuals that show signs of a substance use disorder (Castro et al., 2006).

Type of participants

To be included in this systematic review, studies must have assessed interventions with Hispanic or Latino adolescents (ages 11-18) regardless of risk or who are current substance users. Consistent with prior studies, at least 50% of the study sample must be identified as Hispanic and/or Latino to be eligible for inclusion (Hodge, Jackson, & Vaughn, 2012).

Type of interventions

Interventions included in this systematic review were any universal, selective, or indicated prevention or intervention that used a cultural adaptation to prevent or reduce substance use (Mrazek & Haggerty, 1994; Kellam and Langevin, 2003). For the purposes of this systematic review, Resnicow et al.'s (2000) all-inclusive criteria were used to identify culturally adapted interventions: (1) at a *surface structural level*, which (a) reflects a Latino cultural or multicultural emphasis in the project title or mission, or (b) explicitly incorporates Latino cultural values, concepts, norms, and beliefs in the intervention, and (2) at a *deeper structural level* when it (a) is provided in Spanish, or (b) incorporates cultural-specific psychological and wellness factors related to health in the intervention.

Type of outcome measures

Outcomes of interest in this systematic review are substance use, i.e., current alcohol, nicotine, or illicit drug use as measured by self-report, parent report, or other report (teacher,

clinician), standardized scales, observational reports, or other valid and reliable measures at posttest or follow-up. Studies that exclusively measured attitudes toward substance use and intentions were excluded because of their inability to predict future substance use (Durlak, 1998a, 1998b). Table 3.1 summarizes the inclusion criteria for the present review and meta-analysis.

Inclusion Criteria	
Types of study designs:	RCTs and QEDs examining CA adapted universal, adaptive, and selective intervention effects on SU outcomes
Types of participants:	Hispanic or Latino adolescents ages 11-18, study sample at least 50% Hispanic or Latino
Types of interventions:	Culturally adapted substance use interventions
Types of outcome measures:	Substance use

Table 3.1: Inclusion criteria for culturally adapted (CA) substance use intervention studies for Latino adolescents

SEARCH METHODS

A comprehensive search strategy was planned to find the population of published and unpublished studies that met the study eligibility criteria. Four search strategies were used for the systematic review:

1. An electronic database search;
2. An internet-based search of the World Wide Web;
3. A reference harvesting search of all relevant primary studies, past literature reviews, and discussion articles;

4. A secondary search of all relevant primary studies through personal contacts and attendance at relevant conferences.

Discussion of each of these search strategies is provided below. The sources searched in each strategy are also reported.

Electronic searches

Electronic searches using library databases, Internet websites, and research registers were conducted to identify published and unpublished studies for inclusion (Littell et al., 2008). The dissertation author consulted with a UT Austin librarian who specializes in the behavioural and social science literature to identify all electronic sources that might contain relevant published and unpublished studies. In addition, the librarian also assisted in determining which keyword search terms to use for the present search. The following electronic sources were searched:

Databases

A total of 13 databases were searched (see Table 3.2).

Database

Academic Search Complete

Alcohol and Alcohol Problems Science Database

Bureau of Criminal Justice Statistics

CINAHL

ERIC

MEDLINE

National Archive of Criminal Justice Data

National Criminal Justice Reference Center

ProQuest Dissertations and Theses: Full Text

PsychINFO

PubMed

Social Service Abstracts

UT Digital Repository

Web of Science

Table 3.2: Name of databases searched

Research registers

An advanced Google Search to find government agencies and reputable sources that have completed research or produced publications about this population was also used as follows: 1. Enter keywords; 2. Enter site: .gov; 3. Enter site: .org; 4. Enter site: .edu. A total of seven research registers were identified (see Table 3.3).

Name of Research Register
Abstracts of Reviews of Effectiveness
Bureau of Justice Statistics
Cochrane Collaboration Library
National Youth Gang Survey
National Archive of Criminal Justice Data
Office of Juvenile Justice and Delinquency Prevention WHO
International Clinical Trials Registry Platform
Substance Abuse Mental Health Services Administration

Table 3.3: Research registers searched

Search terms

Most databases include a specialized thesaurus for multiple disciplines including the social and educational sciences. The thesauri identified which search terms produce the most hits and identify gaps in results produced by using certain search terms. The database thesauri provided information on the origin, history, and period of popular use of each selected search term and recommended additional related search terms. Some of the terms identified as suitable for the present search varied in word form (e.g., adjective or noun) such as “ethnic” or “ethnicity.” The databases recognize an asterisk after a term as a command to search for all possible variations of a term. This strategy was used to increase the number of relevant search results. Combinations of

the following terms and keywords related to the problem, outcomes, intervention, and target population were used as follows (see Appendix A for discussion of search terms):

1. Population: (Latino OR "Latin American" OR Hispanic OR "Central American" OR "South American" OR "Mexican Americans" OR "Mexican-Origin" OR "Mexican Heritage" OR "Puerto Rican" OR Dominican OR Cuban OR Salvadoran OR Guatemalan) AND (youth OR adolescent OR teen* OR child* OR "school age") AND
2. Outcome: substance OR drug OR alcohol AND
3. Intervention: cultural OR multicultural OR "cross cultural" OR ethnic* OR bicultural OR intercultural OR "cultural relevant" OR sociocultural AND
4. Type of report: intervention OR outcome OR trial OR experiment* OR evaluation OR treatment OR program OR therapy OR rehabilitation OR prevention OR services

Internet searches

An advanced Google Search was used to find websites where potentially eligible reports could also be located. A total of six websites was identified (see Table 3.4).

Name of Website
Blueprints for Healthy Youth Development
Office of Juvenile Justice and Delinquency Prevention (OJJDP) Model Program Guide
Substance Abuse and Mental Health Services Administration (SAMHSA)
Institute of Education Science What Works Clearinghouse
National Research Laboratory and Clinic
Society for Implementation Research Collaboration

Table 3.4 Websites searched

Reference lists

Employing an ancestry approach (Cooper & Hedges, 1994), reference lists of prior reviews and related meta-analyses identified through the search process were reviewed for relevant studies. The reference lists of other related studies that were collected before the present systematic review were also examined for potentially relevant reports. In total the reference lists of 12 papers were reviewed for potentially eligible studies.

Personal contacts

Personal contacts with research centers, organizations, and researchers who work in areas related to this systematic review were made by email. Emails were sent to seven individuals requesting copies of relevant published and unpublished studies (See Appendix B for copy of email format sent to authors). The dissertation author also attended some relevant conferences and went to sessions that discussed culturally adapted substance use interventions to identify potential studies and make contacts with authors working in this area. These conferences included: *National Hispanic Science Network*, *Texas Research Society on Alcoholism*, and the *Society for Social Work and Research*.

MANAGEMENT AND DOCUMENTATION OF SEARCH PROCESS

The dissertation author documented the searches of all sources in an Excel spreadsheet. Documentation of the sources searched, exact terms and limits used in the search, number of hits from each source, total number of full text documents retrieved, and number of studies included in the systematic review from each source were recorded in the spreadsheet.

RETRIEVAL, SCREENING, AND SELECTION OF STUDIES

The screening process consisted of two stages: 1) the title and abstract screening stage and 2) the full text screening stage. The dissertation author reviewed the titles and abstracts of the studies found through the search process. Studies that were obviously ineligible or irrelevant at the title/abstract review stage were screened out immediately. Studies deemed inappropriate at the title/abstract review stage were those that were not an intervention study, did not involve the target population, or did not address substance use. If there was any question as to a study's appropriateness at the title/abstract review stage, the full text document was obtained and reviewed more thoroughly at the next screening stage.

Documents not obviously ineligible or irrelevant based on the abstract review were retrieved in full text for final eligibility screening. The PDF file of each full text article retrieved was saved in an electronic folder, assigned an identification number (e.g., X Assigned ID Number-Last Name of First Author and Year), and the source and bibliographic information for each retrieved document entered into the Search Documentation Log in Excel spreadsheet form.

Once the full text copies of the studies were retrieved and documented in Excel, two reviewers independently screened each study for eligibility (Appendix C contains the screening form). The basic information needed to determine whether the study met the inclusion criteria was entered into the Search Documentation Log spreadsheet and each reviewer made a determination of inclusion or exclusion (Appendix D contains the screening code instruction form).

Following independent screening by each coder, eligibility decisions were compared between coders. Any discrepancies between the two independent reviewers regarding the inclusion decision and target of intervention (substance use) were resolved through discussion between the

two reviewers. If agreement was not reached through discussion, a third review team member (a dissertation committee member) reviewed the study and made the final determination. Any studies excluded at this stage were placed in a separate folder titled “excluded studies” and the reason for exclusion was documented into the Excluded Studies Log spreadsheet (Appendix E contains the list of excluded studies with reason for exclusion). All retained studies were saved electronically in a folder titled “Included Studies.”

CODING AND ASSESSING ELIGIBLE STUDIES

The dissertation author and a second trained coder coded all studies identified as eligible at the final screening stage using a data extraction instrument developed by the research team (Appendix F contains the data coding form). The coding instrument used for this systematic review is comprised of seven sections:

1. Source descriptors and study context;
2. Sample descriptors;
3. Intervention descriptors;
4. Research methods and quality descriptors;
5. Effect size data;
6. Fidelity;
7. Risk of bias.

First, the studies were coded for descriptors and study context to provide information about the content of the studies. The descriptive information provided in this section assisted the reviewers in describing how the studies are similar and different by organizing the data in a meaningful way. Second, the effect size data were transferred to the data extraction document to

assist the coders in organizing the data and in identifying any gaps in the data. Third, the data extraction document was used to gather information pertaining to the fidelity of the intervention. Coders listed information such as the measures that authors explicitly reported for checking treatment fidelity and whether fidelity was used in the data analysis.

Lastly, coders assessed for risk of selection bias, performance bias, detection bias, attrition bias, and reporting bias using Cochrane's risk of bias tool (Higgins et al., 2011). The coders assigned the studies a score of being at low risk, high risk, or uncertain risk of bias in each domain. Selection bias refers to the selection of study participants for analysis such that unbiased randomization is not achieved and not representative of the entire sample (Cochrane Collaboration, 2013). Ideally, researchers should randomly assign participants to interventions (sequence generation) and take step to conceal the allocations from the participants (allocation sequence concealment) (Cochrane Collaboration, 2013). The coders determined that the studies were at low risk of selection bias if all participants who would have been eligible for the intervention were included in the study and start of intervention and start of follow-up coincide for all subjects. A study is high risk if selection was related to intervention and outcome or if start of intervention and start of follow-up did not coincide or was missing from analyses. Studies were scored as uncertain risk if no such information was provided.

Performance bias refers to systematic differences between intervention groups being evaluated (Cochrane Collaboration, 2013). Studies were marked as low risk of performance bias if the researchers took reasonable steps to blind the participants and personnel delivering the intervention. Studies that did not report blinding (e.g., same school) were scored as high risk. Studies that did not report blinding were scored as uncertain risk (e.g., different school districts).

Detection bias refers to systematic differences between comparison groups in how outcomes are ascertained (Cochrane Collaboration, 2013). Blinding of outcome assessors affects outcome measurement. Studies were scored as low risk if researchers reported taking reasonable steps to reduce the assessor's knowledge of which intervention was received. Studies that did not take reasonable steps to reduce the knowledge of which intervention was received were scored as high risk.

Attrition bias is the systematic difference between groups for withdrawing from a study. A study was marked as low risk if attrition of each group was less than 20%, or there was less than a 20% difference between groups, or proportions and reasons for attrition were similar across groups, or analyses that addressed attrition were likely to have removed risk of bias (Cochrane Collaboration, 2013). Studies were marked as high risk if amount of attrition differed substantially across groups, reasons for attrition differed substantially across groups, and attrition was not addressed through appropriate analysis, or attrition could not be addressed through appropriate analysis. Studies were marked as uncertain risk if no information about attrition was reported.

Reporting bias occurs when authors selectively report outcomes that are statistically significant but do not report non-significant differences (Cochrane Collaboration, 2013). Reporting bias affects results from individual studies and may substantially affect meta-analysis results (Chan, 2005). A study received a score of high risk if some but not all relevant outcomes were reported. Studies that reported both significant and non-significant results were given a low risk of bias score.

Criteria for determination of independent findings

All codable effect sizes for substance use were extracted using an electronic version of the

preformatted abstracting form located in the coding form. Authors of included studies may have used multiple measures of the outcome variable, multiple reports of the same outcome measure, multiple follow-up time points, and possibly more than one counterfactual condition (e.g., two different comparison groups). These circumstances create statistical dependencies that violate assumptions of standard meta-analytic methods. To ensure independence of study-level effect sizes, only one effect size estimate from each independent sample on each outcome construct was included in the present meta-analysis.

Three of the ten studies included in the meta-analysis reported multiple measures of substance use (e.g., alcohol and marijuana use). Valdez and authors (2013) measured marijuana/hashish, alcohol, and other illicit drug use. Data were coded for each measure and a study level average across the measures was calculated. Hecht and authors (2003) measured tobacco, marijuana, and alcohol use, and Santisteban and authors (2011) measured marijuana and cocaine use. These authors also provided a combined substance use measure. The combined substance use measures for these studies were used in the meta-analysis. Three studies reported only combined substance use (Burrow-Sanchez and Wrona, 2012; Robbins et al., 2008; Godley & Velasquez, 1998). Two studies reported alcohol use only (Marsiglia et al., 2012; Elder et al., 2002), and two studies reported tobacco use only (Johnson et al., 2005; Guilamo-Ramos et al., 2010). Posttest time points (e.g., the first time point in which a substance use outcome was measured at the end or near the end of treatment) were recorded in all cases in which authors reported posttest measures and were used to calculate posttest effect sizes. In cases where authors measured outcomes at a follow-up time point and reported multiple follow-up points, all follow-up points were coded to determine whether a separate analysis for effect sizes comparing studies with similar follow-up points could

be conducted; however, there were not enough studies reporting similar follow-up time points to do this. Thus, for those studies that reported multiple follow-up time points, the time point that was most commonly reported across studies, a time point that fell between 6-12 months, was used to calculate an effect size.

Six of the reports represented two major studies—Keepin’ it Real and Drug Resistance Strategies. The Keepin’ it Real study was represented in two reports (Marsiglia et al., 2012; Kulis et al., 2007). The Drug Resistance Strategies study was represented in four reports (Hecht et al., 2003; Kulis et al., 2007; Kulis et al., 2005; Hecht, Graham, & Elek, 2006). According to Hecht and colleagues (2012), Keepin’ it Real is a more intensive version of the Drug Resistance Strategies program. While all reports of each study were used to extract descriptive data about each study, only one effect size from each study (i.e., each independent sample) was used in the meta-analyses.

Coding of studies and data extraction

All studies that met eligibility criteria were coded using the data coding instrument co-developed by the systematic review and meta-analysis team. To ensure reliability of coding procedures, each coder independently extracted the necessary data and entered the information into Excel. All coding discrepancies between the two coders were resolved through discussion and consensus. There was less than 10% discrepancy in critical fields between the coders and all differences in coding were resolved through discussion.

STATISTICAL PROCEDURES AND CONVENTIONS

Descriptive analysis

Descriptive analyses on all variables of interest were conducted to provide information regarding:

- Study participants' characteristics;
- Intervention characteristics;
- Study characteristics.

Descriptive information on the substantive characteristics of the study samples and methodological qualities of the interventions were calculated using the data analysis add-in of the Microsoft Excel 2011 package. The Microsoft Excel 2011 data analysis add-in allows for users to run basic descriptive statistics such as mean, median, and mode.

Calculation of effect sizes

Effect sizes were calculated for substance use outcome at pre-test and one follow-up time point. To maintain statistical independence of data, only one effect size was computed for each study at each time point. Although specific substance use outcome variables (e.g., drinking, smoking, cocaine use) were measured in some studies, some studies reported the data as one combined substance use outcome. Thus, there were not enough studies measuring and reporting the same individual substances to allow for meaningful analyses of outcomes for each type of substance. None of the final studies were excluded due to authors not reporting adequate data to calculate effect sizes.

Calculating Cohen's d

Cohen's *d* was calculated when the study reported the mean, standard deviation, and sample size for each group. The standardized mean difference effect size statistic was calculated as Cohen's *d*:

$$d = \frac{\bar{x}_1 - \bar{x}_2}{s}$$

\bar{X}_1 is the mean of the experimental group and \bar{X}_2 is the mean of the control group. For the pooled standard deviation (s^*), n_1 is the sample size of the experimental group and n_2 is the sample size of the control group. The pooled standard deviation is calculated as:

$$s^* = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}$$

The standard deviation is represented as s in this equation. The magnitude of effect sizes are defined as small ($d=0.2$), medium ($d=0.5$), or large ($d=0.8$) (Cohen, 1987).

Converting Cohen's d to Hedge's g

Hedges' *g* was employed to correct for small sample size bias (Hedges, 1981); it provides a better estimate of the variance (Grissom & Kim, 2005). The following equation was used to convert Cohen's *d* to Hedges' *g*:

$$g = [1 - 3/4N - 9]d$$

and the standard error was calculated as:

$$SE = \sqrt{n_e + n_c / n_e n_c + (d)^2 / 2(n_e + n_c)}$$

Extracting effect sizes from clustered samples

In three of the studies selected (Hecht et al., 2003; Johnson et al., 2005; Elder et al., 2002), schools (rather than individual participants) were randomized into experimental and control

conditions. After a careful review of the analytical procedures reported in each of these articles, three members of the systematic review and meta-analysis team ascertained that these three studies adjusted for clustering. Clustering occurs when effect sizes represent school or group outcomes, but not individual outcomes. However, statistical controls and methods can be implemented to adjust for clustering. After determining that these three studies adjusted for clustering, the odds ratio and means difference were converted to a standardized means difference effect size. Of the three studies, two reported an odds ratio, and the other reported the mean difference.

Calculating effect sizes from odds ratio

Odds ratios were converted to an effect size where:

$$d = \text{LogOR} \times \frac{\sqrt{3}}{\pi}$$

In this equation, the LogOR denotes the odds ratio and π is 3.14159. The effect sizes were then transformed to g using the aforementioned formula. The calculated effect sizes were used in the final analysis.

Calculating effect sizes from means difference

Cohen's d was calculated from the mean difference between experimental and control groups and the standard error. The standard error was converted to the standard deviation where:

$$SD = \frac{SE}{\sqrt{\frac{1}{N_E} + \frac{1}{N_C}}}$$

In this equation, SD denotes the standard deviation, SE denotes the standard error, N_e denotes the experimental sample, and N_c denotes the control sample. The mean estimate was then divided by the standard deviation.

Calculating effect sizes from growth curve analysis

One study (Robbins et al., 2008) used a growth curve analysis and reported the beta estimates of the intercept, linear slope, and quadratic slope. The standard error of the beta estimate (intercept) was also provided. Given this information, three members of the systematic review and meta-analysis team determined that the mean for both the experimental and control group could be extracted through the following equations:

$$M_E = B_{\text{Intercept Combined Mean}} + B_{\text{Intercept (1)}} + B_{\text{Linear Slope (1 x T)}} + B_{\text{Quadratic (1 x T}^3)} - B_{\text{Linear Combined Slope (T)}} + B_{\text{Quadratic Combined (T}^3)}$$

$$M_C = B_{\text{Intercept Combined Mean}} + B_{\text{Intercept (0)}} + B_{\text{Linear Slope (0 x T)}} + B_{\text{Quadratic (0 x T}^3)} - B_{\text{Linear Combined Slope (T)}} + B_{\text{Quadratic Combined (T}^3)}.$$

The standard error was extracted from the standard error of the B coefficient. The standard deviation was calculated from the standard error. Once the means were extracted and the standard deviation was calculated, the control group mean was subtracted from the experimental group mean and divided by the standard deviation to provide d . Cohen's d was converted to Hedge's g and the variance was calculated using the formulas previously noted.

Statistical procedures for pooling effect sizes

A random effects model was assumed (Pigott, 2012; Wilson, 2013). The random effects model assumes heterogeneity between studies and that variability is due to subject level sampling error or other random components (Lipsey & Wilson, 2001) and is therefore unsystematic (Hedges, 1992). The review team anticipated that there would be significant variability among studies due to sampling error or other random components such as intervention length/duration, cultural adaptation design, or participant ethnic sub-group membership. It was postulated that the excess variability would be random and not easily explained by characteristics of the source studies.

Test of homogeneity

A test of homogeneity (Q -test) to compare the observed variance to what would be expected from sampling error was conducted (Pigott, 2012). The Q statistic is a chi-square distribution with $k-1$ degrees of freedom (k =the number of effect sizes) (Hedges & Olkin, 1985). The Q statistic is calculated by adding the squared deviation of each study's effect size from the mean effect size, weighting their contribution by its inverse variance. The p value and degrees of freedom (df) of the Q statistic is interpreted as significant or non-significant. The Q statistic indicates whether the variability between effect sizes is greater than what would be expected by sampling error alone (Lipsey & Wilson, 2001). However, the Q statistic does not report the extent of heterogeneity (Huedo-Medina et al., 2006). Therefore, a statistically significant Q statistic is indicative of the presence, but not the extent, of heterogeneity. The I^2 statistic is also used to describe the percentage of total variation across studies due to heterogeneity rather than chance (Pigott, 2012; Higgins & Thompson, 2002). The I^2 statistic is calculated as $I^2=100\% \times (Q-df)/Q$. In interpreting I^2 , 0% to 40% may be considered as heterogeneity not being important and 30% to 60%, 50% to 90%, and 75% to 100% as moderate, substantial, and considerable heterogeneity, respectively (Higgins & Green, 2011). However, these are rough estimates of heterogeneity. A forest plot was also constructed displaying study-level mean effect sizes and 95% confidence intervals for the included studies to provide opportunity for visual analysis of the precision of the estimated effect sizes, detection of studies with extreme effects, and information regarding the studies' heterogeneity (Hedges & Piggot, 2001).

Publication bias

Publication bias occurs when authors and editors choose only to publish studies that demonstrate a significant affect or that supports the study hypothesis or conventional wisdom (Cooper, 1998). Publication bias may lead to an upward bias in the effect sizes reported in meta-analysis (Lipsey and Wilson, 2001). Thus, the dissertation author diligently sought to locate both published and unpublished studies to minimize the occurrence of publication bias (Cooper, 1998; Lipsey & Wilson, 2001). Publication bias should be examined by assessing the symmetry of a funnel plot where each study's relative effect size and sample size is plotted. A more symmetrical funnel plot indicates a lesser likelihood that publication bias exists. Should the funnel plot indicate the possibility of publication bias, Trim and Fill methods may be one option to adjust for this bias (Cooper, Hedges, & Valentine, 2009). However, the use of funnel plots or other techniques such as regression to assess publication bias with fewer than 10 studies is not indicated (Card, 2012). Thus, the present study did not assess for publication bias.

Chapter 4: Results

RESULTS OF SEARCH

From June 2014 to November 2014, multiple search strategies were used to obtain a current sample of published and unpublished studies (See Appendix G for the project timeline; Appendix H contains a copy of the search log). The database and website searches yielded a total of 34,249 titles and abstracts. These titles and abstracts were read to assess their relevance to the present systematic review and meta-analysis. Email inquiries were sent to seven researchers in the field. This search strategy yielded 22 studies from two of the researchers. Additionally, one researcher stated that another relevant study is being currently conducted, but no reports were ready for distribution for inclusion in this review. A search of five research registers yielded one relevant study and five websites yielded 15 studies. A search of references in the included studies and twelve relevant prior reviews were searched. A total of 35,842 titles and abstracts were thus identified and reviewed for relevance to the present study. Following this exhaustive search process, and after removing duplicates, the full text of 108 unique reports were retrieved for screening.

Two reviewers independently screened the 108 reports using a screening form to assess the reports for eligibility to move onto full coding. The first screener identified 15 studies for coding and the second screener identified 18 studies for coding. Two other members from the review team mitigated screener discrepancies. A total of 91 studies were excluded at the screener level, and 17 studies went on for coding (See Table 4.1 for a summary of number of studies excluded by reason for exclusion). Of the 91 studies, 57 were excluded at the first level of the Study Screening Form. Of those 57 studies, 23 were excluded because their primary intervention goal was not to prevent

or reduce substance use. The other 34 studies were excluded because they were not intervention outcome studies (i.e., they were qualitative, theoretical, and/or epidemiological). A total of 34

Reason for Exclusion	Total
<i>Level 1 Screener Stage</i>	
Publication Type	34
Outcome Measure	23
<i>Level 2 Screener Stage</i>	
Study Design	7
Ethnicity	4
Age	15
Attitudes or Beliefs	8
Total Excluded at Screener Stage	91

studies were excluded at the second level of the Study Screening Form. Seven studies were excluded because they used a single group pre/post design and four were excluded because fewer than 50% of study participants were Latinos. Another 15 studies did not meet the age criteria for the present study, and eight studies reported substance use attitudes or beliefs. Two coders fully coded the remaining 17 studies.

Table 4.1: Total number of studies excluded at level 1&2 screener stage by reason

Of these 17, three studies were excluded from the final review and analysis at the coding stage. One study was excluded because while the intervention reported on substance use, its main goal was improving mental health outcomes (Gonzalez et al., 2012). The second study excluded reported school level data, which was not comparable to individual level substance use data (Botvin et al., 1992). The third study excluded did not include a true comparison group (Stevenson et al., 1998). Six of the remaining fourteen study articles collected were duplicate reports of two major studies. Therefore, the present review and meta-analysis reports findings of ten major studies

reflected in fourteen articles. The flowchart below (see Figure 4.1) illustrates the above-described study search and selection process.

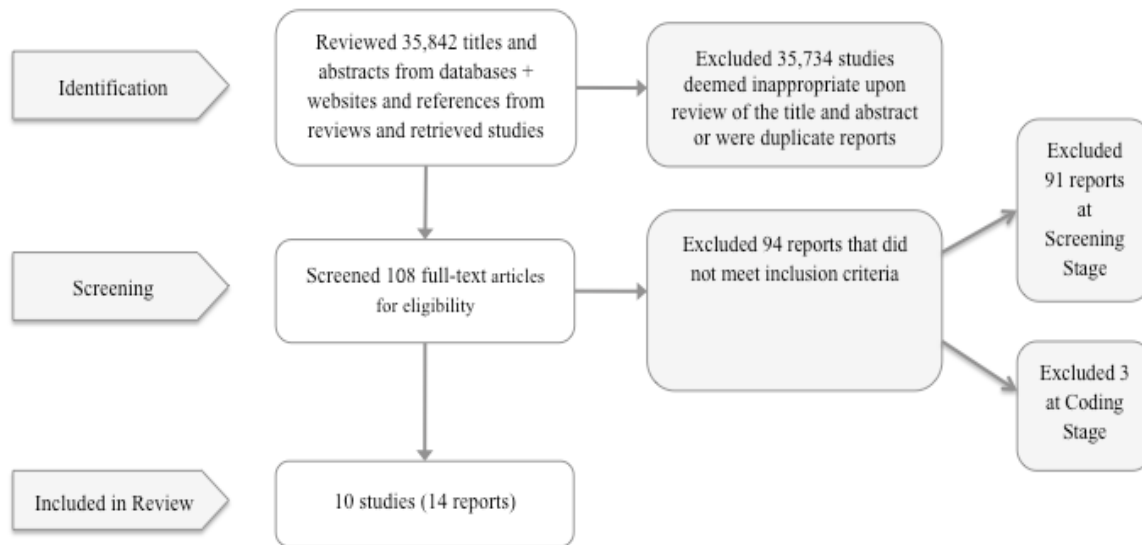


Figure 4.1: Study search and selection process

The 10 studies report similar settings and mean age of participants but a wider range of total percentage of Latino participants. Fifty percent of the studies were conducted in a school setting; 20% were conducted in other settings including the home and community; and the coders were unable to determine the location of the intervention for three of the studies. In 60% of the studies, the participants' mean age ranged from 11.3–15.6 years of age; in the remaining 40% of the studies, mean age was not reported. While those studies do not report a mean age, they do report an age range that met the inclusion criteria for the current systematic review. Forty percent of the studies exclusively targeted Latino adolescents, but only one of these studies identified Mexican Americans as the specific Latino ethnic subgroup that was targeted (Valdez et al., 2003). The remaining 60% reported separate outcomes for Latino adolescents or interaction

effects of ethnicity with substance use outcomes. Of the studies, 50% reported intervention effects on combined substance use outcomes, but only two of those studies provided intervention effects on specific substance use outcomes (e.g., alcohol, marijuana, tobacco, cocaine). Of the studies that reported intervention effects for specific substance use outcomes, alcohol (40%), tobacco (40%), and marijuana (30%) use were the most widely reported substances. Table 4.2 summarizes the studies identified for the systematic review and meta-analysis.

Study	Intervention Name	Primary Setting	N	Mean Age	% Latino	Outcome(s) Reported	Measurement Instrument(s)	Effect Size Data
Godley & Velasquez (1998)	Logan Square Prevention Project	Mixed settings	667	Missing	77%	Substance use	The authors developed a 10 item survey that measured lifetime, past year, and past 30-day use of eight different drugs.	Posttest 0.086; SE 0.055
Robbins et al. (2008)	Structural Ecosystems Therapy	Mixed settings	660	15.6	59%	Substance use	The authors used the Adolescent Drug Abuse Diagnosis (ADAD; Friedman & Utada, 1989) to measure the frequency of past 30-day alcohol, marijuana, cocaine, and other drug use.	Posttest 0.089; SE 0.230 Follow-up 0.340; SE 0.180

Table 4.2: Studies identified for systematic review and meta-analysis

Valdez et al. (2013)	Adapted Brief Strategic Family Therapy	Missing	116	15.3	100%	Marijuana, alcohol, other illicit drug use	The authors used the Center for Substance Abuse Treatment's Government Performance and Results Act (GPRA) Client Outcome Questionnaire to measure past 30-day use of alcohol, marijuana, and other illicit drugs.	Posttest 1.959; SE 0.201 Follow-up 2.191; SE 0.245
Santisteban, Mena, & McCabe (2011)	Culturally Informed and Flexible Family-based Treatment for Adolescents (CIFFTA)	Missing	25	Missing	100%	Marijuana, cocaine, combined substance use	The authors measured substance use through adolescent self-report.	Follow-up 0.766; SE 0.402
Burrows-Sanchez & Wrona (2012)	Accommodated Cognitive Behavioral Therapy	Missing	35	15.5	100%	Substance use	The authors used the Timeline Follow Back (TLFB) (Sobell & Sobell, 1992) to measure history and pattern of past 90-day substance use including alcohol and excluding tobacco.	Posttest - 0.411; SE 0.365
Guilamo-Ramos et al. (2010)	Project Towards no Tobacco Use (modified) + Linking Lives for Mothers	School	1096	12.1	74.20%	Tobacco use	The authors measured tobacco use through adolescent self-report.	Follow-up 0.300; SE 0.135

Table 4.2 cont.

Elder et al. (2002)	Sembrando Salud	School	3157	Missing	100%	Alcohol use (also measured tobacco use, but insufficient data to report)	The authors selected items from the California Tobacco Survey (Pierce et al, 1996) to measure past 30-day alcohol and tobacco use (and susceptibility to smoking and alcohol use).	Posttest 0.105; SE 0.138
Johnson et al. (2005)	Project FLAVOR (Fun Learning About Vitality, Origins, and Respect)	School	190	11.3	59%	Tobacco use	The authors measured past 30-day tobacco use through adolescent self-report.	Follow-Up 0.505; SE 0.226
Marsiglia et al. (2012)	Keepin' it REAL	School	565	12.3	73.50%	Alcohol use	The authors measured past 30-day alcohol, tobacco, and marijuana use through adolescent self-report.	Follow-Up 0.324; SE 0.140
Hecht et al. (2008)	KiR DRS	School	6035	Missing	54.97%	Tobacco, marijuana, alcohol, combined substance use	The authors developed a 12-item survey to measure past 30-day alcohol, cigarette, and marijuana use.	Posttest 0.048; SE 0.026 Follow-up 0.073; SE 0.026

Table 4.2 cont.

DESCRIPTIVE FINDINGS

Descriptive information regarding study characteristics, participant characteristics, and intervention characteristics are summarized for all 10 studies reported in the 14 reports included in the review. In total, findings are reported for the 12,546 adolescents who participated in 10

studies of interventions intended to prevent or reduce substance use in Latino adolescents. Seven were randomized controlled trials (RCT) and three were quasi-experimental design studies (QED).

Study characteristics

The studies included in this systematic review were published/dated between 1990 and 2014. Half of the included studies were published within the last five years, one study was dated between 1990 and 1999, and the remaining four studies (40%) were dated between 2000 and 2009. All were published in peer-reviewed journals. The mean sample size across all studies was 1,255 adolescents, with a range of 25 to 6,035 adolescents.

All studies were conducted in the United States. The majority of the studies (90%) were conducted in states where Latinos are the minority majority ethnic group. Two were conducted in California, two in Florida, two in Arizona, one in New York, one in Illinois, one in Texas, and one in Utah. All 10 studies reported specifically recruiting in Latino dominant communities and schools. Two studies (Elder et al., 2002; Valdez et al., 2013) specifically targeted Latino adolescents only.

Researchers and practitioners from a variety of disciplines authored the studies included in this systematic review. Nine of the studies reflected interdisciplinary efforts between researchers in academia and at major research centers. These interdisciplinary efforts included two or more of the following schools: social work, psychology, communication arts and sciences, public health, sociology, psychiatry/medicine and nursing. One study (Godley & Velasquez, 1998) reflects an interdisciplinary effort between community practitioners. Two studies were evaluations of the development of one program (Marsiglia et al., 2003; Hecht et al., 2012) in Arizona during two different time periods authored by the same research team.

Attrition was a problem with three (30%) of the studies included in the synthesis. Authors of all three studies that experienced attrition greater than 20% explained that lost cases were due to one or more of the following three issues: 1) missing data/school records; 2) mobility of students (moving, withdrawing from school, etc.); and 3) refusing further follow-up. One study also reported parental deaths as a reason for attrition (Johnson et al., 2005). However, four (40%) studies reported attrition rates of less than 20%, and for the remainder of the studies (20%), attrition rates could not be determined from information provided in the reports. One study identified the treatment design (no waitlist), linguistic relevancy, and availability and location of the study as possible reasons for its higher retention rate (Burrow-Sanchez & Wrona, 2012).

Of the 10 studies, four (40%) reported control groups receiving the non-adapted version of the intervention (Burrow-Sanchez & Wrona, 2012; Guilamo-Ramos et al., 2010; Santisteban, Mena, & McCabe, 2011; Robbins et al., 2008). In one study, the control group received a placebo—a first aid/home safety educational program (Elder et al., 2002). Three (30%) of the studies reported that control groups received a wait list condition (Godley & Velasquez, 1998; Marsiglia et al., 2012; Johnson et al., 2012), and two (20%) reported treatment as usual (Valdez et al., 2013; Hecht et al., 2008). Of the 10 studies, five (50%) reported significant pre-test differences between the treatment and control/comparison groups, and three (30%) reported no significant differences, while the remaining two studies (20%) did not report pre-test scores; however, 30% of studies that reported significant pre-test differences used statistical controls to determine differences by ethnic group. Table 4.3 provides a summary of the study characteristics of the included studies.

Characteristic	N (%)	Characteristic	N (%)
Study Year		Attrition Rates	
1990-1999	1 (10%)	< 20%	4 (40%)
2000-2009	4 (40%)	> 20%	3 (30%)
2010-2014	5 (50%)	Not given	3 (30%)
Peer Reviewed Journal	10 (100%)	Control Group Experience	
Sample Size		Non-adapted version	4 (40%)
20-49	2 (20%)	Placebo/attention	1 (10%)
100-199	2 (20%)	Treatment as usual	2 (20%)
200+	6 (60%)	Nothing or wait list	3 (30%)
Study Location		Pre-test Differences	
Arizona	2 (20%)	Significant differences	5 (50%)
California	2 (20%)	No significant differences	3 (30%)
Florida	2 (20%)	Not reported	2 (20%)
Illinois	1 (10%)		
New York	1 (10%)		
Texas	1 (10%)		
Utah	1 (10%)		
Researchers' Discipline(s)			
Social Work	3 (30%)		
Psychology	1 (10%)		
Public Health	1 (10%)		
Medicine/Nursing	3 (30%)		
Communication Arts & Sciences	1 (10%)		
Unable to determine	1 (10%)		

Table 4.3: Characteristics of included studies

Intervention funding sources

All studies included in this systematic review were funded. The funding sources represent a variety of institutes and centers; most were federal entities, while some were state agencies. The National Institute on Drug Abuse providing funding for at least 4 (40%) of the studies. Table 4.4 lists the funding sources identified.

California Tobacco-Related Disease Research Program
Center for Disease Control
Illinois Department of Alcoholism and Substance Abuse
National Cancer Institute
National Center on Minority Health and Health Disparities
National Institute on Drug Abuse
National Institutes of Health
Substance Abuse and Mental Health Services Administration US Center for Substance Abuse Prevention

Table 4.4: Funding sources of included studies

Risk of bias

Two coders independently assessed the risk of bias in each study using the Cochrane Collaboration's 'Risk of Bias' tool as a guideline (Higgins et al., 2011). Coders met to review coding agreement and any discrepancies were discussed and resolved by consensus (see Appendix I for the risk of bias of each study). Concerning selection bias, 70% of the studies were assessed as high risk for sequence generation, and 90% scored as high risk for allocation concealment. Approximately 90% of the studies scored as high risk for performance bias. Whereas the majority of the studies were assessed as high risk for selection bias and performance bias, 60% of the studies were scored as low-risk for detection bias. Risk for attrition bias (30%) was also comparatively lower compared to other types of bias. Selective outcome reporting was also relatively low (20%). Figure 4.2 contains the total percentage of bias per each category. Figure 4.3 contains a summary of risk of bias within and across the included studies.

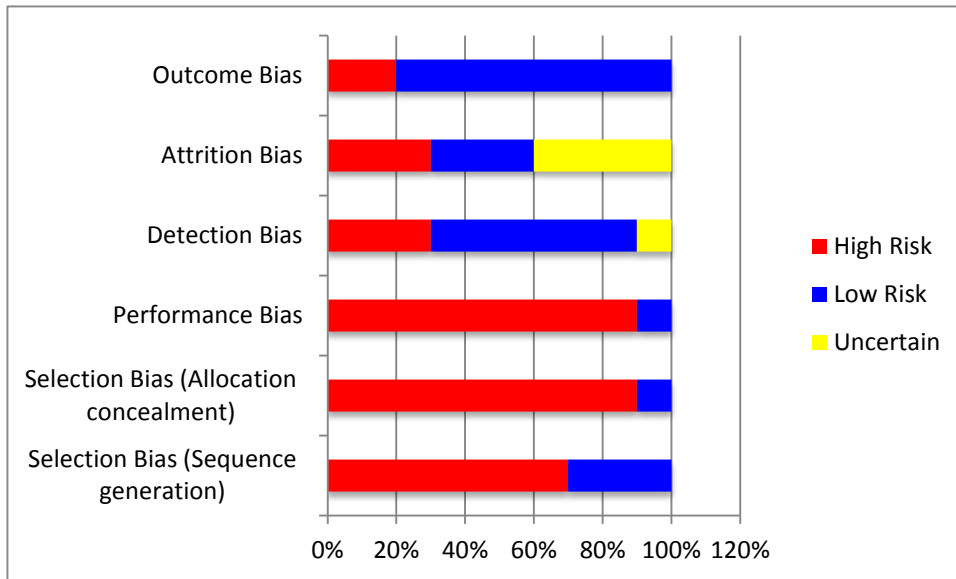


Figure 4.2: Total percentage of risk of bias per category for included studies

	Sequence Generation (Selection Bias)	Allocation Concealment (Selection Bias)	Blinding of Participants and Personnel (Performance Bias)	Blinding of Outcome Assessment (Detection Bias)	Incomplete Outcome Data (Attrition Bias)	Selective Outcome Reporting (Reporting Bias)
Godley (1998)	-	-	-	-	?	-
Valdez (2013)	-	?	?	?	?	+
Santisteban (2011)	-	-	-	-	+	+
Burrow-Sanchez (2012)	-	-	-	-	+	+
Elder (2002)	-	-	-	+	-	+
Guilamo-Ramos (2010)	+	-	-	+	-	+
Johnson (2005)	+	-	-	+	-	+
Robbins (2008)	+	-	-	+	?	-
Marsiglia (2012) Kulis (2007)	-	-	-	+	+	+
Hecht (2003) Kulis (2007) Kulis (2005) Hecht (2006)	-	-	-	+	+	+

Key

- High Risk of Bias
- + Low Risk of Bias
- ? Uncertain

Figure 4.3: Risk of bias summary of included studies

Participant characteristics

While some of the studies did not provide the exact treatment or experimental sample sizes, approximately 5,592 adolescents received the experimental condition in the studies. The mean age of participants in the treatment group in all studies combined was 13.13 years of age, and males and females were equally represented. Half (50%) of the participants were middle school students and half (50%) represented a mixture of grade levels. The majority of the studies reported low-income adolescents as the main study participants.

All studies purposefully recruited and engaged Latino adolescents. Three (30%) of the studies recruited a Latino sample size of 50-60%, three (30%) studies reported a Latino sample size of 70-80%, and four (40%) that all (100%) participants were Latino. Only 6 (60%) of the studies identified the Latino subgroups represented in their samples, and the remaining 4 (40%) studies did not separate Latino subgroups. Mexican Americans were identified in 5 (50%) of the studies and Puerto Ricans in 1 (10%) study. Two (20%) studies labeled “other” Latinos as a separate category, while the remainder of the studies (20%) did not specify subgroups in this way. Although the Robbin’s (2008) study broadly identified the adolescent participants as Hispanic American, a supplemental report for the study identified parent ethnicity as ranging from Columbian, Cuban, Dominican, Nicaraguan, Puerto Rican, and “other” Hispanic (Dillon et al., 2005). The majority (60-70%) of the studies did not provide data on ethnic markers such as nativity status or language used at home. Of the studies that did provide such data, the majority of the adolescents were born in the U.S., while the majority of the parents were born in another country, and the majority spoke Spanish at home. Table 4.5 summarizes the characteristics of the participants of the included studies.

Characteristic	N (%)	Characteristic	N (%)
Mean Age	13.13	Adolescents Born in US	
Middle school (6-8)	5 (50%)	< 50%	4 (40%)
Mixed	5 (50%)	Not reported	6 (60%)
Rates of Gender by Study		Parents Born in US	
< 50% Female	4 (40%)	> 50%	3 (30%)
< 50% Male	4 (40%)	< 50%	1 (10%)
Not given	2 (20%)	Not reported	6 (60%)
Socio-economic Status*		Language Spoken in Home	
Low income (Federal Guidelines)	3 (30%)	> 50% English	2 (20%)
Family income < \$10,000	3 (30%)	< 50% English	1 (10%)
Family income < \$25,000	3 (30%)	Not reported	7 (70%)
Family income < \$35,000	1 (10%)		
Rates of Hispanics by Study			
50% - 60%	3 (30%)		
70% - 80%	3 (30%)		
90% - 100%	4 (40%)		

*This category includes studies that reported "low income."

Table 4.5: Participant characteristics in included studies

Intervention characteristics

The interventions in this systematic review represent a broad range of intervention types, providers, settings, durations, and cultural adaptation characteristics. Because this systematic review is examining all culturally adapted substance use interventions for adolescents (not only those provided in school settings), the interventions included in the review target adolescents in a variety of settings. While some studies had more than one experimental group, only the culturally adapted group was selected for inclusion in the analysis and will be included in the description of intervention characteristics. Table 4.6 summarizes the intervention characteristics. Totals may add to more than ten, because studies may have included more than one intervention format.

Characteristic	N (%)	Characteristic	N (%)
Intervention Type		Intervention Format	
BSFT or SFT	2 (20%)	Adolescent and provider (one-on-one)	3
CBT	1 (10%)	Group of adolescents and provider	7
Education	5 (50%)	Parents and provider	3
Network of Services	1 (10%)	Groups of parents and provider	4
Skills Training	1 (10%)	Adolescents and parents with provider	3
Duration of Intervention		Focal Format	
No. of weeks		Group of adolescents and provider	
1-10	2 (20%)	Adolescents and parents with provider	3
11-20	4 (40%)	Multiple format program	3
21-30	1 (10%)		
Unable to Determine	3 (30%)	Service Providers	
No. of sessions		Trained interventionist	
1-10	4 (40%)	Community worker	
11-20	2 (20%)	Teacher	
21-30	1 (10%)	Police	
31-40	1 (10%)	Trained parent volunteer	
		Trained educator	
Intervention Design		Primary Setting	
Universal	4 (40%)	School	
Indicated	4 (40%)	Community-based organization	
Selective	2 (20%)	Mixed settings	
		Unable to determine	

Table 4.6: Intervention characteristics of included studies

Types of interventions

The majority (70%) of the interventions addressed substance use through education or skills training. Other interventions tested include Brief Structured Family Therapy or Structured Family Therapy (20%), and Cognitive Behavioral Therapy (10%). The intervention format varied among the studies, and some included multiple formats. Seventy percent (70%) of the interventions were delivered to a group of adolescents by one provider, and 30% of the adolescents received the intervention exclusively from the provider. In addition, 40% of the studies included parents as a part of the intervention, but only 30% of the adolescents received intervention sessions together with their parents. The level of parental involvement in the interventions varied tremendously from being included in the recruitment of adolescents to therapy sessions to being a secondary target of the intervention. However, adolescents were the focal point of all studies.

Setting

The majority of the interventions were conducted in a single setting, but some were conducted in multiple settings. The setting sometimes varied depending on the adolescent's and/or family's needs and preferences. Of those that were conducted in a single setting, the majority of the interventions were conducted in a school setting. For the remaining interventions, services were provided in a combination of settings, including some combination of school, community-based organization, and home settings. The Keepin' it Real (10%) study included public service announcements (PSAs) and billboards as an intervention method, but the primary intervention was delivered in the classroom setting (Hecht, 2003). Three (30%) interventions were conducted in a combination of settings or the setting varied across sites implementing the intervention. In three (30%) studies, the setting was not identified in the report.

Service delivery: providers and collaborations

Trained interventionists (e.g. social workers, psychologists), police officers, community workers, teachers and other school personnel were involved in the provision of services to adolescents in the included studies. In interventions where behaviors in addition to substance use were targeted, multiple providers from various disciplines may have been involved with the adolescent and/or family. If there was more than one provider from more than one discipline, the category of “multiple providers” was utilized.

Duration of intervention

When possible, the duration of the intervention was coded in both hours and weeks of intervention and the total number of sessions provided; however, not all studies reported this information. The majority of the interventions were ongoing and lasted 16 weeks; however, one intervention occurred in two days and was coded as one week in duration for the sake of uniformity (Guilamo-Ramos et al., 2010). The duration of the interventions evaluated in the studies ranged from 1-28 weeks, with a mean of 12.37 weeks (n=8). The duration of the intervention was not reported in three of the studies. The number of sessions participants received also varied across the studies. The majority of the interventions were eight sessions, but one study did not report the number of sessions delivered. The number of sessions ranged from 2-32 sessions, with a mean of 12.26 sessions (n=9). Six (60%) studies did not provide information about frequency of contact with the adolescent. Of the studies that did provide information about contact frequency, three (30%) reported that adolescents participated at least once weekly, and one (10%) reported twice weekly participation. Four (40%) studies reported frequency of contact between parents and provider as being less than weekly, two (20%) studies reported weekly contact with parents, and two (20%)

reported no contact. The remaining 3 (30%) studies did not provide enough information to determine the level of contact between provider and parent.

Characteristics of culturally adapted interventions

The systematic review includes cultural adaptations of four (40%) universal, two (20%) selective, and four (40%) indicated substance use intervention designs. The frameworks, models, and guidelines used for culturally adapting the interventions included one noted in the literature review of this dissertation and some not previously mentioned. Three (30%) studies did not identify a framework or model for culturally adapting the interventions. The strategies used to culturally adapt the substance use interventions included the following:

- Focus groups/individual interviews,
- Community participation,
- Literature reviews,
- Employing bilingual staff,
- Expert opinion, and
- Pilot testing culturally adapted material.

Three (30%) studies did not specifically address the research strategies used to culturally adapt the interventions but did identify the framework used to adapt them. A literature review (70%) was the most widely used strategy for cultural adaptation, followed by expert opinion (50%), focus groups/individual interviews (30%), and pilot testing culturally adapted material (10%).

Various components of the interventions were culturally adapted. These components included:

- Changes to intervention content,

- Providing intervention in English and Spanish,
- Incorporating cultural values into content,
- Changing the nature of therapeutic service delivery,
- Participant/therapist ethnic matching, and
- Naming the intervention to reflect culture.

The majority of the studies reported incorporating cultural values into intervention content (90%), followed by making changes to intervention content (60%), providing the intervention in English and Spanish (40%), changing the nature of the therapeutic service delivery (20%), participant/therapist ethnic matching (10%), and the name of the intervention (10%). Table 4.7 summarizes the interventions' cultural adaptation characteristics.

Characteristic	Frequency		N (%)
Components Adapted		Cultural Adaptation	
Changes to Intervention Content	6	Adaptive Framework	1 (10%)
Provides Intervention in English and Spanish	4	Culturally-grounded Narrative-based Framework	2 (20%)
Incorporates Cultural Values	9	Ecological Framework	2 (20%)
Changes to Nature of Service Delivery	2	Cultural Accommodation Model for Substance Abuse Treatment	1 (10%)
Participant/Therapist Ethnic Matching	1	Integrated Framework	1 (10%)
Name of Intervention	1	Unable to Determine	3 (30%)
Focus groups/Individual Interviews	4		
Community Participation	3		
Literature Review	7		
Employing Bilingual Staff	4		
Expert Opinion	5		
Pilot Testing	1		
Not Identified	3		

Table 4.7: Cultural adaptation characteristics of interventions included in the study

Substance use measures and time points

Two meta-analyses were conducted to examine the effects of culturally adapted interventions on substance use outcomes for Latino/Hispanic adolescents. One meta-analysis was conducted to synthesize effects of interventions at posttest in order to examine intervention effects immediately following the intervention. A second meta-analysis was conducted to synthesize effects at follow-up, i.e., to examine longer-term effects of interventions on substance use outcomes. The mean effects of the intervention and analysis of heterogeneity of intervention effects at posttest and follow-up are reported below. Table 4.8 summarizes the time points of the studies. Table 4.9 summarizes the substance use measures.

Study	Posttest	Follow-up										
		2 Mos	3 Mos	4 Mos	6 Mos	8 Mos	12 Mos	14 Mos	15 Mos	18 Mos	24 Mos	
Godley (1998)	X								X			
Valdez (2003)	X				X							
Santisteban (2011)						X						
Burrow-Sanchez (2012)	X		X									
Elder (2002)	X							X				X
Guilamo-Ramos (2010)										X		
Johnson (2005)								X				
Robbins (2008)	X				X						X	
Marsiglia (2012); Kulis (2007b)												X
Hecht (2003); Kulis (2007a); Kulis (2005); Hecht (2006)	X	X					X		X			

Note: Time points used in meta-analysis are bolded.

Table 4.8: Summary of time points

Study	Substance Use	Other Illicit Drug Use	Alcohol Use	Marijuana Use	Tobacco Use	Cocaine Use
Godley (1998)	X					
Valdez (2003)		X	X	X		
Santisteban (2011)	X			X		X
Burrow-Sanchez (2012)	X					
Elder (2002)			X		X	
Guilamo-Ramos (2010)					X	
Johnson (2005)					X	
Robbins (2008)	X					
Marsiglia (2012) & Kulis (2007b)	X		X	X	X	
Hecht (2003) & Kulis (2007a) & Kulis (2005) & Hecht (2006)	X		X	X	X	

Table 4.9: Substance use measures

MEAN EFFECT OF INTERVENTIONS ON SUBSTANCE USE OUTCOMES

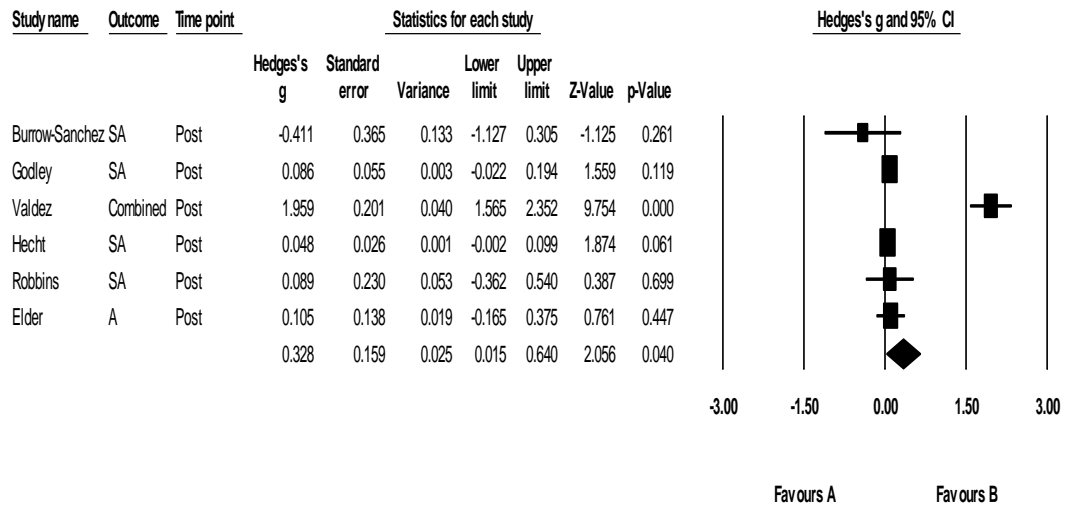
The following sections provide summaries of the mean effect sizes of interventions on posttest and follow-up substance use outcomes. The forest plots provide a visual display of the effect sizes and confidence intervals for each study and the overall effect size and confidence intervals. Analyses of homogeneity and heterogeneity are also reported.

Mean effect of interventions at posttest

The overall mean effect size for posttest substance use outcomes assuming a random effects model and correcting for small sample sizes using Hedge's g was 0.328 (95% CI 0.015 to 0.64, $p < 0.04$), demonstrating an overall positive and moderate effect of interventions at posttest on substance use outcomes. The homogeneity of the effect size distribution was assessed for the posttest period. The results of the statistical test for homogeneity at posttest was highly significant ($Q=90.889$, $df = 5$, $p < .000$), thus the null hypothesis of homogeneity was rejected. A significant Q indicates that there is substantial variance among the effects, more so than would be expected from sampling error. The results of the statistical test for heterogeneity at posttest indicated high heterogeneity ($I^2=94.499$). I^2 indicates that the total variation between the results of the studies is due to heterogeneity and not due to chance. Refer to forest plot in Figure 4.4.

Figure 4.4: Forest Plot: Posttest

Meta Analysis

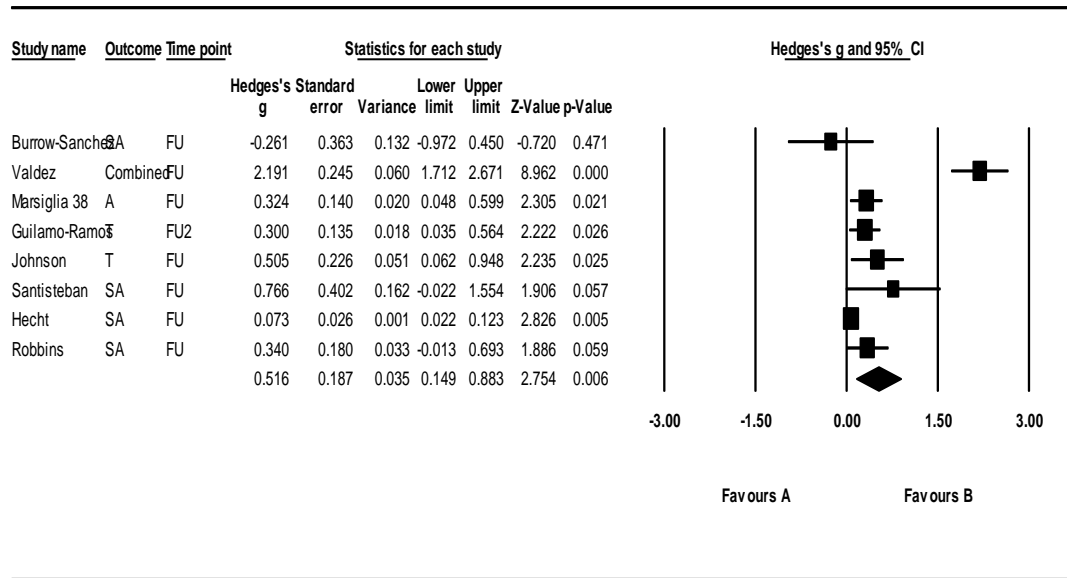


Meta Analysis

Mean effect of interventions at follow-up

The overall mean effect size for follow-up substance use outcomes assuming a random effects model and correcting for small sample sizes using Hedge's g was 0.516 (95% CI 0.149 to 0.883, $p < .006$), demonstrating an overall positive and moderate effect of interventions on substance use outcomes. Refer to the forest plot in Figure 4.5. The results of the statistical test for homogeneity at follow-up was highly significant ($Q=87.091$, $df = 7$, $p < .000$), thus the null hypothesis of homogeneity was rejected. The results of the statistical test for heterogeneity at follow-up again indicated high heterogeneity ($I^2=91.962$).

Meta Analysis



Meta Analysis

Figure 4.5: Forest plot: follow-up

MODERATOR ANALYSIS

Due to the high degree of heterogeneity, moderator analyses were conducted to examine whether study characteristics could account for the differences in mean effects between studies. Using ANOVA, a moderator analysis examines whether certain variables are related to the effect size. The Q statistic is interpreted in moderator analyses. The Q statistic (the total heterogeneity) in a moderator analysis is equal to the total between-group and total within group heterogeneity (Card, 2012). Similar to regression models, the p value is used to determine the statistical significance of the relationship between the variable of interest and the magnitude of the effect size. Because of the small number of studies, the number of moderator analyses were limited to those in which there was enough variability on the variable across studies and those that were theoretically important: level of intervention and type of comparison group. A moderator analysis (fixed effects) was used to evaluate posttest and follow-up effects by intervention type and type of comparison group. A mixed effects model combines the moderator analysis and the estimate of variance in effect sizes (Card, 2012).

The levels of the interventions were categorized into three groups: universal ($n=3$), selective ($n=1$), and indicated ($n=4$). The number of studies included in the moderator analysis of level of intervention at posttest was two that received a universal intervention, one that received a selective intervention, and three that received an indicated intervention. The number of studies included in the moderator of comparison groups at follow-up was three that received a universal intervention, one that received a selective intervention, and four that received an indicated intervention. The moderator analyses at posttest ($k=6$; $Q=1.413$; $df = 3$; $p=0.702$) and follow-up ($k=8$; $Q = 0.756$; $df =2$; $p=0.685$) showed no significant differences between the three groups of

studies; thus, there is no relationship between the level of intervention examined in the studies and the magnitude of the effect size (note that k =number of studies). The type of intervention did not account for the variation between studies.

The type of intervention the comparison group received was categorized into four groups: non-adapted version of intervention ($n=4$), placebo ($n=1$), treatment as usual ($n=2$), and nothing ($n=2$). The number of studies included in the moderator of comparison groups at posttest was one that received nothing, two that received treatment as usual, one that received a placebo, and two that received the non-adapted version. The number of studies included in the moderator analysis of comparison groups at follow-up was two that received nothing (i.e., no intervention), two that received treatment as usual, and four that received the non-adapted version of the intervention. A moderator analysis of both weighted average effect sizes of type of comparison group at posttest ($k=6$; $Q=0.577$; $df = 2$; $p=0.749$) and at follow-up ($k=8$; $Q=1.096$; $df=2$; $p=0.578$) showed no significant differences (note that k =number of studies). The type of comparison group did not account for the variation between studies. Table 4.10 provides the mean effects for each group on each moderating variable.

Variable add #	# of studies	Mean Effect	Variable	# of studies	Mean Effect
Comparison Group at Post-test			Comparison Group at Follow-up		
Nothing	4	0.086	Nothing	4	0.374
Treatment as Usual	1	0.993	Treatment as Usual	1	1.118
Non-cultural Version of Intervention	2	0.105	Non-cultural version of the intervention	2	0.295
Placebo	2	-0.080		2	
Type of Intervention at Post-test			Type of Intervention at Follow-up		
Universal	3	0.055	Universal	3	0.225
Selective	1	0.105	Selective	1	0.324
Indicated	4	0.564	Indicated	4	0.771

Table 4.10: Mean effect for each moderating variable

Chapter 5: Discussion

While the research community has demonstrated a growing interest in culturally adapted substance use interventions for Latino adolescents, few such interventions have been developed and even fewer have been rigorously tested. In this systematic review and meta-analysis, the earliest study was conducted in 1991 and published in 1998 (Godley & Velasquez, 1998), followed by Elder and colleagues' (2002) study conducted from 1996 to 1999. Valdez and colleagues 2013 publication of their study findings is the most recent. Only Godley and Velasquez (1998) and Elder and colleagues (2002) specify the year that their study was conducted. Seven of the studies were published from 2003-2012, but it is uncertain when the data were collected. The small number of available studies that met inclusion criteria for this meta-analysis is indicative of the state of research on culturally adapted substance use interventions.

This systematic review and meta-analysis synthesizes the 10 included studies by 1) recording the types of culturally adapted interventions that are being used to reduce substance use among Latino adolescents, 2) exploring the characteristics of the interventions being adapted to prevent or reduce substance use with Latino adolescents, and 3) examining the effects of culturally adapted interventions on Latino adolescent substance use. The summary of the findings of these studies requires three basic understandings. First, the 10 studies represent a wide variety of different types of culturally adapted interventions that are being used to reduce substance use among Latino adolescents. The culturally adaptive frameworks, models, or guidelines used to adapt these interventions are not always clearly identified or described in the studies. Second, the small number of studies that met criteria for inclusion in the present systematic review and meta-

analysis did not allow for a subsequent analysis to determine which cultural adaptations were more effective than the others. Therefore, the summary of findings of the types and characteristics of culturally adapted substance use interventions intends to inform future research rather than to provide recommendations for practice or policy development.

Third, overall, culturally adapted substance use interventions for Latino adolescents are effective, yet the results indicate that the effects are highly heterogeneous. There are a number of reasons that could contribute to the heterogeneity of these effect sizes. Many of the studies do not report complete data that would be helpful in subsequent analyses to determine what contributes to the effects of these studies on substance use outcomes. The recommendations made in the summary of the findings of the effects of culturally adapted interventions on Latino adolescent substance use focuses on providing recommendations for future research.

SUMMARY OF FINDINGS

Types of culturally adapted substance use interventions and characteristics

The present systematic review identified similar characteristics across studies and several strategies for culturally adapting substance use interventions. The systematic review includes cultural adaptations of four (40%) universal, two (20%) selective, and four (40%) indicated substance use intervention designs. Seven of those studies identified the different types of culturally adaptation frameworks, models, or guidelines used for adapting substance use interventions for Latino adolescents. The remaining three studies were identified as cultural adaptations by the dissertation author, but did not identify a specific framework, model, and/or guidelines for adapting the intervention. While these studies did not identify a specific adaptation

model, they did discuss the specific cultural values they considered while adapting the intervention.

The ten studies varied in how they discussed the cultural adaptations from the very specific, to a more vague description of adaptation. Of the more specific definitions of cultural adaptation, only one study identified a model previously identified in the literature review. Burrow-Sanchez & Wrona (2012) identified the Cultural Accommodation Model (CAM) as the guiding model for their culturally adapted substance use intervention. It is interesting to note that no other studies identified using any of the other frameworks, models, or guidelines identified in the systematic review. In another case, Santisteban and colleagues (2011) broadly reported using an “adaptive” framework but did not provide detail as to how the adaptation came about.

Five of the studies were adapted using many of the concepts found in the Ecological Validity Framework (EVF). Valdez and colleagues (2003) and Robbins and colleagues (2008) discussed adapting the Brief Structural Family Therapy model. The adaptations they discuss incorporated many of the ecological components considered in the EVF. Hecht et al. (1993, 2003) in the Keepin’ it Real and DRS studies reported using a culturally grounded narrative-based framework (Hecht et al., 1993, 2003) and also discuss many ecological considerations when approaching the adaptation. Guilamo-Ramos and colleagues (2010) used an integrated framework for adaptation that incorporates many theories and also mirrors many of the concepts found in the EVF. Although the approaches to adaptation are similar to the ecological components found in EVF, the frameworks for adaptation are not always as clear in concept or adaptation steps as the EVF.

There are gaps between culturally adaptive models, frameworks and guidelines, and practice. In this systematic review and meta-analysis, the variety and lack of specificity of the types of culturally adapted substance use interventions and the frameworks or models used to carry out such adaptations added to the uncertainty of the findings. The study had aimed to examine whether some culturally adapted substance use interventions were more effective than others at reducing substance use, but the lack of consistent identification of frameworks, models, or guidelines reported prevented this and leaves many questions unanswered for the time being. It would be more helpful if researchers specify the steps taken to culturally adapt the intervention and the concepts guiding the adaptation or consistently provide reference to the specific culturally adaptive framework, model, or guidelines used to adapt the intervention.

Literature reviews (70%) followed by expert opinion (50%) were the most highly cited strategies for culturally adapting substance use interventions. Both the literature reviews and expert opinions served as the primary guide for the authors of those studies to determine which values to incorporate. Only one (10%) study reported pilot testing the cultural adaptation; in four (40%) studies, focus groups and in depth individual interviews were conducted, and in three (30%) studies, the community was involved in the adaptation. While no clear rules exist as to how to approach cultural adaptation, it seems counterintuitive that there was not greater involvement of the target population across the studies.

Ninety percent (90%) of the studies reported incorporating cultural values into the intervention content as a component of the cultural adaptation. Not surprisingly, *familism* and *respeto* were the values most often incorporated into the interventions. This is simply because *respeto* is often associated with family. While *respeto* was incorporated in three of the

interventions studied, and *familism* was incorporated in seven of the interventions studied, the methods used to incorporate these cultural values varied.

For *familism*, Robbins and colleagues (2008), Santisteban, Mena, and McCabe (2011), and Valdez and colleagues (2013) added an integrated family component to the intervention. It is important to note that in these interventions, sound clinical approaches that have proven efficacy over time were also adapted. Robbins et al. (2008) and Valdez et al. (2013) adapted Brief Strategic Family Therapy (BSFT), and Santisteban, Mena, and McCabe (2011) adapted Cognitive Behavioral Therapy (CBT). Burrow-Sanchez and Wrona (2012) also adapted a CBT intervention, but their approach greatly differed from Santisteban et al.'s (2011) approach. Burrow-Sanchez and Wrona's (2012) incorporation consisted of consistent phone contact and mailings to parents concerning their adolescent's involvement in the intervention. Both Elder and colleagues (2002) and Guilamo-Ramos and colleagues (2010) incorporated a parent-training component to the intervention, while Johnson incorporated *familism* and *respeto* simultaneously into adolescent sessions by addressing the importance of respecting and honoring family. On the other hand, Hecht and colleagues (2003) and Marsiglia and colleagues (2012) incorporated *familism* and *respeto* by adding culturally infused messages to videos that were later shown to the adolescents. Such approaches to adaptation and differences in conceptualizations of how to incorporate cultural values into interventions merit further evaluation as data become available.

While practitioners should seek to practice in a culturally sensitive and competent manner (NASW, 2001), culturally adapting substance use interventions is a labor-intensive process that requires access to multiple sources and stakeholders. Practitioners would need to be prepared to deal with the multiple tangible and non-tangible costs associated with cultural adaptations. For

example, the consistent trend in strategies to produce culturally adapted substance use interventions is by conducting a literature review. Conducting a thorough literature review requires full access to academic databases, and can take weeks or months to complete. A thorough literature review is feasible for research centers and university-affiliated researchers that are able to access multiple databases through their respective institutions, and have the ability to hire research assistants that are able to dedicate their time to this type of task. However, conducting such a literature review at the practitioner level may be extremely difficult as many agencies lack the financial resources necessary to access databases (journal subscriptions begin at \$500 and access to individual articles begins at \$30) or cannot dedicate sufficient staff time to searching these databases and producing reviews.

Expert opinion (50%) is also a costly adaptation strategy depending on whose opinions are sought since consultation fees may cost thousands of dollars, and the ability to engage top researchers often requires belonging to the right networks (e.g., organizations, associations), which often have hefty membership costs or conference fees. Thus, these strategies might not be as feasible for practitioners seeking to culturally adapt and rigorously study interventions. Table 5.1 summarizes the sources used to carry out each adaptation strategy and the inputs required for adapting components as identified through the studies included in the systematic review and meta-analysis.

Adaptation Strategies					
	Literature review	Interviews	Community participation	Expert opinion	Pilot testing
Likely sources used	<ul style="list-style-type: none"> • Epidemiological studies • Culturally adapted intervention studies • Literature reviews • Systematic reviews and meta-analysis 	<ul style="list-style-type: none"> • Focus group interviews • Individual Interviews 	<ul style="list-style-type: none"> • Professionals • Key informants 	<ul style="list-style-type: none"> • Researchers • Consultants • Workgroups 	<ul style="list-style-type: none"> • Population Sample
Components Adapted					
	Changes to Intervention Content	Providing Intervention in English and Spanish	Incorporating Cultural Values	Changes to Nature of Service Delivery	Participant/Therapist Ethnic Matching
Inputs	<ul style="list-style-type: none"> • Develop manual • Translate Manual 	<ul style="list-style-type: none"> • Bilingual and bicultural staff • Translation services • Printing 	<ul style="list-style-type: none"> • Adding family component • Changes to intervention • Training 	<ul style="list-style-type: none"> • Securing and coordinating with participants locations to deliver services • Utilizing multiple methods to contact participants including phone call, text, email, and mail-outs. 	<ul style="list-style-type: none"> • Hiring bilingual and bicultural therapists • Training bilingual and bicultural therapists

Table 5.1: Sources for adaptation strategies and inputs required for adapting components

This summary of the many types and characteristics of culturally adapted interventions leaves questions to be answered as to their frameworks, models, and guidelines for cultural adaptation, their conceptualizations of how to incorporate cultural values into intervention, and the feasibility of duplicating these cultural adaptations in practice. It is of the utmost importance that researchers report specific details of the adaptive approaches used and identify the cultural values reflected in the intervention. Systematic reviewers will need to continue to monitor progress in this area of research. Researchers and systematic reviewers alike should seek to increase community-based research and include practitioners seeking to delivery culturally relevant interventions to Latino adolescents.

Effects of culturally adapted substance use interventions

This meta-analysis demonstrated an overall positive effect of culturally adapted substance use interventions at posttest and follow-up. Across six of the included studies, the random effects weighted average effect size was $g=0.328$ at posttest, and $g=0.516$ at follow-up. Average effect sizes across the moderating variable of comparison group ranged from -0.80 to 1.118 , and 0.055 to 0.771 for type of intervention. All of these values represent a small to large magnitude of effect sizes (Cohen, 1987). However, the moderating analyses failed to achieve significance. The lack of statistical significance may be associated with the small number of studies; thus, these findings should be viewed cautiously.

Hodge et al.'s (2012) systematic review and meta-analysis of culturally adapted substance use intervention models for ethnic and racial minority adolescents demonstrated a small effect across all substance use measures and time points ($g=0.118$), and also a small aggregate effect size of $g=0.225$; 95% CI: 0.015 to 0.435 , $p=0.036$ by comparison group. Unlike the present systematic

review, they study all the groups combined (Latino, African American, and Native American adolescents). In fact, their review did not include any of the studies included in the present systematic review and meta-analysis. Two major reasons for this notable difference may have to do with the differences in search terms, and the difference in inclusionary criteria. Their findings indicated a small effect size for Latino, African American, and Native American adolescents participating in culturally adapted substance use interventions, and like the present study, the results of their systematic review and meta-analysis leave many questions open about the effectiveness of culturally adapted substance use interventions by ethnic or racial groups. In addition, the number of studies included in their analysis was also relatively small ($n=10$); thus their results should also be viewed with caution.

While Hodge et al. (2012) were not able to examine the moderating effects of ethnicity or race in their systematic review, a related meta-analysis noted differences of weighted average effect sizes across ethnic groups participating in culturally adapted mental health interventions (Griner & Smith, 2006). Whereas effect sizes for African Americans were $d=0.45$; 95% CI 0.26 to 0.64, effect sizes for Native Americans were $d=0.65$; 95% CI 0.36 to 0.95, and effect sizes for Latinos were $d=0.56$; 95% CI 0.38 to 0.75 (Griner & Smith, 2006). Thus, there were noted differences across ethnic groups where effects were stronger for Native Americans followed by Latinos and then African Americans. The importance of the finding of the present systematic review concerning effectiveness with Latinos implies that researchers should continue to examine ethnic group status.

The present systematic review attempted to collect further data concerning acculturation status and sub-ethnic group. Very few studies provided data regarding acculturative or sub-ethnic

group characteristics, thus it was not possible to conduct a moderator analysis at this level. It is interesting to note that four of the studies (Hecht et al., 2003; Johnson et al., 2005; Valdez et al., 2013; Burrow-Sanchez & Wrona, 2012) noted the importance of comparing ethnic subgroups and/or acculturation status in future studies in the discussion sections of their articles. If researchers do indeed compare and report these differences and similarities in the future, then future systematic reviewers will be able to test these differences, thereby making a significant contribution to the literature. One example of how these analyses are helpful is a sub-analysis of the Keepin' it Real studies, which found that this culturally adapted intervention had more beneficial effects on substance use outcomes for highly acculturated Latino adolescents than for less acculturated adolescents (Marsiglia et al., 2005). These findings contrast with Griner and Smith's (2006) meta-analytic findings that also revealed differences ($k=14$; $Q=3.3$; $p=0.07$), but low acculturated participants experienced greater effects than did moderate to highly acculturated participants ($d=0.81$ vs. $d=0.41$, respectively). Thus, it is possible that variables such as level of acculturation and sub-ethnic group membership contributed to the heterogeneity across the studies in the present meta-analysis.

Also noteworthy, four of the studies (Burrow-Sanchez & Wrona, 2012; Hecht et al., 2003; Robbins et al., 2003; Valdez et al., 2013) discussed the importance of understanding local composition on culturally adapted substance use interventions for Latino adolescents. Of the four studies, Burrow-Sanchez and Wrona (2012) and Valdez and colleagues (2013) outline the specific strategies they used to gain a deeper understanding of the local community composition including ethnicity, history, and socioeconomic status. These strategies included focus group interviews and building relationships within the communities. The information gathered was used to adapt service

delivery or study recruitment strategies. With regard to intervention focus on a particular ethnic subgroup, only the Keepin' it Real studies (Hecht et al., 2003; Marsiglia et al., 2012) and Valdez and colleagues (2013) specifically identify Mexican American adolescents as their target group.

Although on average culturally adapted substance use interventions were found to be moderately effective, there was significant heterogeneity. Therefore, these findings may not be generalizable to all culturally adapted interventions and caution must be exercised in recommending specific strategies for adapting substance use interventions or incorporating values in substance use interventions for Latino adolescents. The significance of the main (intervention's) effect is questionable given the high degree of heterogeneity across the studies. A host of unknown variables could be contributing to the heterogeneity. More work is necessary to determine what is contributing to the heterogeneity.

Since cultural adaptations are time consuming and include many tangible and intangible costs, it is extremely important to clarify whether they are indeed effective, and, if so, the extent of their effectiveness, and with which subgroups. Until then, practitioners should proceed with caution when utilizing culturally adapted interventions.

IMPLICATIONS FOR RESEARCH

The present systematic review and meta-analysis raise some concerns and also recommendations for the future of culturally adapted substance use interventions with Latino adolescents. In particular, there are two main concerns; one is in regard to the lack of standardization in reporting data, and the other is the need to test culturally adapted components. Recommendations for reporting substance use outcomes and issues regarding cultural adaptations

with Latino adolescents, specifically on testing the components of cultural adaptation, are also provided below.

Broad reporting of substance use

There is a lack of standardization in reporting substance use outcomes across culturally adapted substance use intervention studies. Approximately 60% of the studies reported combined substance use, but 30% of the studies did not report separate outcomes for alcohol, tobacco, marijuana, or other illicit drug use. Robbins et al. (2008) measured marijuana and cocaine use (as reported in Dillon et al.'s [2005] subsequent study), but they did not report the intervention effects on specific substance use outcomes. It is not certain whether the other studies also measured specific substance use but did not report this information. Unless information for individual substances is reported, intervention effects on those specific outcomes cannot be determined (e.g., alcohol, tobacco, marijuana, cocaine use separately). For the studies that reported intervention effects on specific and combined substance use outcomes, there were differences in effect sizes across substance use outcomes. Furthermore, Hodge, Jackson, and Vaughn's (2012) meta-analysis found significant intervention effects on alcohol but not marijuana use. Thus, reporting results for substance use as a general category may possibly distort between and within group differences for specific types of substance use. The effects of culturally adapted interventions on specific and combined substance use is recommended.

Testing cultural adaptation components

Researchers have broadly examined the effectiveness of cultural adaptations on Latinos as group. However, these reports do not address the unique factors that moderate the effectiveness of these interventions. Few researchers do follow-up analyses to test what conditions may contribute

to intervention effectiveness such as language, sub group ethnicity, age, gender, acculturation, or other factors.

As previously discussed, cultural adaptation is not always clearly defined in the reports. It is not always clear what framework, model, or guideline is being used to adapt the program. Very few researchers provide references to articles or manuals that outline the steps used to culturally adapt these interventions. In the future, those who culturally adapt interventions should provide greater transparency about how the intervention was adapted. The model, guideline, or framework used to adapt the intervention should be clearly stated in the report.

Researchers should seek to examine the moderating variables that contribute to the effectiveness of the program on substance use outcomes. This includes determining what adaptations are most effective and with whom by sub-group ethnicity, gender, or language. To increase the effectiveness of cultural adapted interventions needs, it is necessary to determine what exactly is effective about the cultural adaptations. Studies should seek to examine what specific components are effective and under what circumstances. For example, providing program materials in Spanish is a recognized cultural adaptation. Demographic information informs us that in many Latino households, Spanish is the primary language spoken, and this evidence is the rationale behind providing program materials in Spanish. While some adolescents and their parents may need materials in Spanish, not all require this type of assistance. Solely adapting program materials to be linguistically relevant logically would be effective with only those adolescents and parents that require or prefer Spanish language materials. Other components might also only be effective under special circumstances.

STRENGTHS AND LIMITATIONS

Although related reviews have been done in the past, this study differed from them in a few ways. First, this review applied a more systematic and transparent process for searching, retrieving, and coding studies related to culturally adapted substance use interventions and Latinos to be included in the review than previous authors reported. A systematic and transparent process limits bias and reduces chance effects (Higgins & Green, 2006) and allows for expansion of this systematic review as additional studies become available (Higgins & Green, 2006).

Second, this systematic review improved upon previous reviews by focusing on Latino and Latino subgroup adolescents rather than including members of several ethnic groups (e.g., Latino, Black, Native American) in a single group as prior reviews have done. Epidemiological researchers have often identified important differences between or among ethnic groups, thus revealing the importance of examining Latinos separately. Authors in the field of substance use and culture also stress the importance of ethnic group and subgroup differences. While both researchers and others have called for a more specific examination of specific subethnic group substance use with Latino adolescents in assessment, treatment, and outcome research, often studies do not include these distinctions. This limitation may be due to difficulties in recruiting or incorporating sufficient sample sizes of members of the subgroups. Thus, this systematic review focused on studies of interventions targeting substance use for Latino adolescents (however, unable to look at Latinos by subgroup).

Third, this systematic review evaluated whether the research base is an adequate representation of all culturally adapted substance use interventions. The terminology related to cultural adaptations can greatly vary with very few specifically identifying the conceptual model

or framework used to adapt. Terminology specific to a framework, model, or guideline for cultural adaptation is often used interchangeably (i.e., authors may use different terms to mean the same thing). The search attempted to identify all cultural adaptations regardless of how they defined or failed to define the process. During the search, some of the variations included the use of terms such as “orientation,” “adaptation,” and “relevant.” The studies included in this systematic review were also compared against interventions reported in prior reviews, but few specific matches were identified.

While this study contributes to the literature, it also has significant limitations. First, the relatively small number of studies that met inclusion criteria does not likely represent the potentially vast pool of culturally adapted substance use interventions currently being utilized with Latino adolescents. Therefore, the systematic review cannot be generalized to the universe of programs in existence. A member of the systematic review and meta-analysis team attempted to identify all published and unpublished studies on this topic. However, since all of the studies included in this systematic review were published (i.e., no unpublished study was identified), the possibility of publication bias is increased. Several researchers in the field were contacted and asked to share additional relevant studies. Only one researcher responded and informed the team that a study was currently being conducted, but that the data was not ready to be analyzed. It is uncertain how many culturally adapted substance use interventions are currently being utilized and how many are being studies, but it would be most helpful to compare more of these interventions on many factors, including their effectiveness.

Second, there was significant heterogeneity across effect sizes; thus, the interventions included in this synthesis may be too diverse to be pooled. An analysis to identify moderating

variables that could explain more of the variance was not possible. There were not enough studies with similar characteristics to conduct a meaningful moderator analysis.

Third, in the present meta-analysis, no power analysis was conducted prior to the systematic review to get a sense of effect sizes and sample sizes that are similar to the meta-analysis of interest. Borenstein et al. (2009) recommend conducting a power analysis for meta-analyses prior to conducting the review. A power analysis for meta-analyses would help determine the precision of the effect size. However, even if a power analysis had been conducted prior to the study, the ten studies in the present sample would probably not yield enough power to detect a moderately large or small effect size (Borenstein et al., 2009).

Finally, a comprehensive search method was utilized to locate and retrieve all relevant studies, but this still may not reflect all the literature available. While the search strategy consisted of a diverse range of search terms for Latino adolescents and their ethnic subgroup categories, the search terms for substance use was not as diverse. The search for substance use interventions was modeled after prior reviews, and while it is likely that all interventions related to substance use were retrieved, it may not reflect all interventions for specific substance use. With the lack of standardization of terminology and the tendency of terminology to reflect current trends in the field, it is increasingly difficult to ascertain whether or not each and every study is located. Nevertheless, the team compared the current systematic review to related previous reviews and were able to determine that relevant studies were retrieved using the present search term strategy.

CONCLUSION

This dissertation addressed an important gap in the literature on substance use interventions by examining the effectiveness of culturally adapted substance use interventions for Latino

adolescents. Previous literature was enhanced by identifying which models, frameworks, and guidelines are being used to carry out cultural adaptations of substance use interventions with Latino adolescents and using more rigorous systematic and quantitative synthesis techniques than prior reviews. The review also makes the first known attempt at identifying the specific processes by which interventionists and researchers in this field are integrating culture into interventions.

Substance use among Latino adolescents is a recognized problem, but the literature on culturally adapted substance use interventions for Latino adolescents is disparate. Utilizing a systematic review method and meta-analysis, the dissertation addresses this issue to better understand “what works” in order to more effectively guide practice and policy. The descriptions of culturally adapted substance use interventions have focused on the effectiveness of these interventions, but they have not clearly separated the components of adaptations that contribute to their effectiveness. This makes it challenging to know what, if anything, works to reduce substance use. For this reason, practitioners and policy makers should use extreme caution when using the “evidence” that is available to make decisions regarding policies and services. Experts continue to recommend culturally adapted substance use interventions for Latino adolescents, thereby lending an air of credibility to these interventions. Despite this, the relatively small number of studies that were found and met inclusionary criteria indicates that there is still scant evidence on what components contribute to the effectiveness of culturally adapted substance use interventions.

This systematic review and meta-analysis has provided an inventory of the current evidence on outcomes of culturally adapted substance use interventions for Latino adolescents. Given that culturally adapted substance use interventions are relatively new, the study methodology provided a means to more systematically uncover deficiencies and gaps that can help

strengthen the science in this field. This initial systematic review and quantitative assessment can guide researchers and practitioners who develop culturally adapted substance use interventions for Latino adolescents. Clearly defining the steps taken to culturally adapt substance use interventions and the conceptual framework used to guide the cultural adaptation will add to the transparency and the ability to replicate these designs. Thus, these advances will provide the mechanisms necessary to assess their effectiveness and contribute to their ability in reducing substance use outcomes.

It is critical that researchers question the current state of cultural adaptation science and substance use research. It is imperative that researchers take a critical look at the questions, methods, assumptions, theories, and perspectives that have guided, and perhaps limited, the research on culturally adapted substance use interventions. The development of culturally adapted substance use interventions has been guided by research on the causes and correlates of substance use, with interventions designed to target variables that have been identified through that body of research. The field must examine the specific components that contribute to the effectiveness of these interventions in order for new more effective interventions to be developed and delivered.

The opportunity for great knowledge to be gained depends on the ability of the field to question the current knowledge surrounding cultural adaptations. Only by critically examining how these interventions are being developed and what components work with which Latinos can such advances be made. The field must challenge the largely untested but pervasive recommendation to adapt interventions for Latinos if it is to move forward and alleviate the problem of substance use and create a better understanding of how interventions can impact substance use outcomes.

Appendices

Appendix: A

Discussion of Search Terms

Population

Ethnicity. The search was intended to locate all relevant studies on Latino adolescents. The search accounted for the different subgroups and the various ethnonyms found in the research literature. The research team consulted with an expert librarian and developed a strategy to identify all articles relevant to this population. The librarian also reviewed the databases to determine what search terms would produce the most results. As a result, the dissertation author learned that there are differences in how researchers refer to this particular ethnic group and the subgroups. For example, the term *Mexican-origin* encompasses all persons with traceable origins to Mexico regardless of generational status or birthplace, while *Mexican-American* identifies individuals born in the United States who have traceable racial/ethnic origins to Mexico or those who are from Mexico that become Americans. The term *Mexican* is often used to define those born in Mexico. Similar ethnonyms are also used to identify other Latino subgroups in the research literature. Expanding the literature search to identify articles that report studies on various Latino subgroups allowed the team to enhance the search on culturally adapted substance use interventions.

Latinos in the United States come from a wide range of differing Latin American countries. Each of these countries has a unique distinctive background. Similarly, each Latino subgroup's history in the United States is unique. As substance use research has advanced, studies seek to identify different patterns of use and abuse *within* the Latino population. Early

researchers reported Latinos' substance use with little reference to Latino subgroups' unique history and background with alcohol. Researchers today acknowledge that the Latino population is not homogenous, but made up of different subgroups that report different rates of use, abuse, and dependence (Caetano, Ramisetty-Mikler & Rodriguez, 2008; Delva et al., 2005). With these points in mind, the dissertation author chose the search terms: Latino, Latin American, Hispanic, Central American, South American, Mexican American, Mexican-Origin, Mexican Heritage, Puerto Rican, Dominican, Cuban, Salvadoran, and Guatemalan to systematically review the literature.

Adolescents. The search was intended to locate all articles on Latino adolescents and substance use. In this study, adolescents were defined as being 11-18 years of age. The rationale for selecting this age range is largely due to the fact that most interventions are targeted to middle school and high school age students. Middle school (6th grade to 8th grade) students are typically 11-14 years of age. High school students (9th to 12th grade) are typically 14-18 years of age. Nevertheless, the study was not limited to school-based interventions.

Interventions

Intervention. The search was intended to locate all articles on interventions that compare the unadapted version to a cultural adaptation. With these points in mind, the dissertation author chose the terms: cultural OR multicultural OR "cross cultural" OR ethnic* OR bicultural OR intercultural OR "cultural relevant" OR sociocultural.

Type. The search was intended to locate all relevant articles on randomized controlled trials and quasi-experimental designs. Berk and Freedman's (2003) response to the meta-analytic statistical approach claimed that findings are illusory as the analysis uses studies from

randomized experiments and observational studies and assumes standardized effects. This is problematic because participants are not drawn at random and effect size is based on pooled variance or adjusted variance. Setting criteria to only include randomized controlled trials and quasi-experimental designs helps to mitigate this challenge. With these points in mind, the dissertation author chose the terms: intervention, outcome, trial, experiment*, evaluation, treatment, program, therapy, rehabilitation, prevention, and services.

Outcomes

Substance Use. The search was intended to locate all articles on interventions that seek to prevent or reduce current or past month substance use. Current or past month substance use is defined as consuming alcohol or drugs within the past 30 days. The Substance Abuse and Mental Health Services Administration (SAMHSA, 2010) defines *current use* as having had at least one drink or drug in the past 30 days. With these points in mind, the dissertation author chose the terms: substance, drug, and alcohol.

Appendix: B

Email Sent to Authors

Hello >Insert Name<>,

I am in the process of conducting a systematic review on the effects of culturally adapted substance use interventions for adolescents. I am writing to you because of your expertise and research related to interventions for adolescents. While the review team has undergone an extensive search in multiple databases, research registries, and websites, we would like to be exhaustive in our search so are contacting experts to find additional published studies we may have missed or unpublished studies that are not accessible via the methods we have already used.

We are looking for studies examining effects of culturally adapted interventions for adolescents that meet the following criteria:

- *Uses a randomized or quasi-experimental design*
- *Includes primarily Hispanic (at least 50% of the sample) youth ages 12-18*
- *Measures a substance use or externalizing behavior outcome*
- *Conducted in 1990 or later*

We have the following intervention studies you authored/co-authored in our database:

XXX

If you have additional studies or are aware of other published or unpublished studies that may meet the review inclusion criteria, we would very much appreciate it if you could forward the report or the bibliographic information. If you are aware of others who have done or are currently doing research in this area, we would appreciate your forwarding this email to them.

You can send reports or additional information you think would be helpful to eden.robles@utexas.edu Please also feel free to contact me via email or on my cell phone [\(XXX\)XXX.XXXX](tel:(XXX)XXX.XXXX) if you have questions.

Thank you,

Eden Hernandez Robles, MSW, PhD Candidate
School of Social Work
The University of Texas at Austin

Appendix: C

Screening Form

Systematic Review - Study Screening Form

SECTION A - BIBLIOGRAPHICAL INFORMATION

- A1. Study ID#: ___ ___ ___ [STID]
- A2. If this is a supplemental report of a study that has already been identified, report ID # (begin with #2) ____ [RID]
- A3. Date of Screening: ___ - ___ - ____ [SCDATE]
- A4. Coder Initials ____ [CODER]
- A5. Primary author: _____ [PAUTH]
- A6. Bibliographic info (APA format): [BIB]

LEVEL 1 SCREEN:

- A7. What kind of paper is this?
- 1. Outcome/program/intervention evaluation
 - 2. Review of substance use intervention outcome studies – IF CHECKED THEN STOP
 - 3. Theoretical or position paper, editorial or book review – IF CHECKED THEN STOP
 - 4. Practice guidelines or treatment manual – IF CHECKED THEN STOP
 - 5. Qualitative – IF CHECKED THEN STOP
 - 6. Epidemiological – IF CHECKED THEN STOP
- A8. Is the intervention involving solely a medical treatment or solely a pharmacotherapy treatment?
- 0. No
 - 1. Yes – IF CHECKED THEN STOP
 - 99. Cannot tell
- A9. Is this paper about an intervention with a primary goal of preventing or treating a substance use problem.
- 0. No – IF CHECKED THEN STOP

- 1. Yes
- 2. Unsure, written in foreign language - IF CHECKED THEN STOP
- 99. Cannot tell

A10. Is this paper about a culturally adapted substance intervention?

- 0. No – IF CHECKED THEN STOP
- 1. Yes
- 99. Cannot tell

A11. Does the intervention primarily target ADHD, sexual risky behaviors, or truancy?

- 0. No – **IF CHECKED - GO TO LEVEL 2 SCREEN**
- 1. Yes – IF CHECKED THEN STOP
- 99. Cannot tell - – **IF CHECKED - GO TO LEVEL 2 SCREEN**

LEVEL 2 SCREEN:

A12. Is this study a:

- 1. RCT
- 2. QED
- 3. Single group pre-post test design – IF CHECKED THEN STOP
- 4. Case study – IF CHECKED THEN STOP
- 5. Other: _____ – IF CHECKED THEN STOP
- 99. Cannot tell

A13. Does this study include adolescents from 12-18 years of age?

- 0. No – IF CHECKED THEN STOP
- 1. Yes
- 99. Cannot tell

A14. Does this study include adolescents under 12 or over 18 years of age?

- 0. No
- 1. Yes – IF CHECKED THEN STOP
- 99. Cannot tell

A15. Does this study include at least 50% sample of Hispanics or Latinos?

- 0. No – IF CHECKED THEN STOP
- 1. Yes
- 99. Cannot tell

A16. Does this study measure substance use as an outcome?

- 0. No – IF CHECKED THEN STOP

- 1. Yes
- 99. Cannot tell

A17. Was this study conducted (not looking at publication date) between 1990 and present?

- 0. No – IF CHECKED THEN STOP
- 1. Yes
- 99. Cannot tell

A18. Is this study eligible for the review?

- 0. No: Reason _____
- 1. Yes
- 99. Need more information to make decision

Comments:

Appendix: D

Screening Instruction Form

Item #	Item Title	Screening Code Instructions					
A1	Study ID#:	Enter X01 – X113					
A2	Report ID #:	(If Applicable)					
A3	Date of Screening:	Enter 2 Digit Month/Day/Year					
A4	Coder Initials:	Enter First/Last Name Initials					
A5	Primary Author:	Last name of 1 st Author					
A6	Bibliographic Info:	Enter Article Information APA Format					
A7	Paper Type	1 = Outcome	2 = Review	3 = Theoretical, Conceptual, Book Review	4 = Practice guidelines or treatment manual	5 = Qualitative Study	6 = Epidemiologi cal
A8	Medical	0 = No	1 = Yes	99 = Cannot Tell			
A9	Treat SU	0 = No	1 = Yes	2 = Foreign Language	99 = Cannot Tell		
A10	Cultural	0 = No	1 = Yes	99 = Cannot Tell			
A11	Target ADHD, Sex Risk, Truancy	0 = No	1 = Yes	99 = Cannot Tell			
A12	Study Type	1 = RCT	2 = QED	3 = Pre/Post Non- Experimental	4 = Case Study	5 = Other (Enter)	99 = Cannot Tell
A13	12-18 years	0 = No	1 = Yes	99 = Cannot Tell			
A14	Under 12 or over 18 years	0 = No	1 = Yes	99 = Cannot Tell			
A15	At least 50% Hispanic	0 = No	1 = Yes	99 = Cannot Tell			

<i>A16</i>	Measure SU outcomes	0 = No	1 = Yes	99 = Cannot Tell			
<i>A17</i>	1990 - present	0 = No	1 = Yes	99 = Cannot Tell			
<i>A18</i>	Eligible	0 = No	1 = Yes	99 = Cannot Tell			
	Comments						

Appendix: E

List of Excluded Studies

Excluded Studies		
ID	Study Citation	Reason for Exclusion
X-01	Kaplan, C. P., Turner, S. G., Piotrkowski, C., & Silber, E. (2009). Club Amigas: A promising response to the needs of adolescent Latinas. <i>Child & Family Social Work, 14</i> (2), 213-221.	Primary goal not SU
X-02	Botvin, G. J., Schinke, S. P., Epstein, J. A., & Diaz, T. (1994). Effectiveness of culturally focused and generic skills training approaches to alcohol and drug abuse prevention among minority youths. <i>Psychology of Addictive Behaviors, 8</i> (2), 116.	<50% Latino
X-04	Costantino, G., & Malgady, R. G. (1994). Storytelling through pictures: Culturally sensitive psychotherapy for Hispanic children and adolescents. <i>Journal of Clinical Child Psychology, 23</i> (1), 13-20.	Primary goal not SU
X-05	Huey Jr, S. J., & Polo, A. J. (2008). Evidence-based psychosocial treatments for ethnic minority youth. <i>Journal of Clinical Child & Adolescent Psychology, 37</i> (1), 262-301.	Review of substance use outcome studies
X-07	Komro, K. A., Perry, C. L., Veblen-Mortenson, S., Farbaksh, K., Kugler, K. C., Alfano, K. A., Dudovitz, B. Williams, C. & Jones-Webb, R. (2006). Cross-cultural adaptation and evaluation of a home-based program for alcohol use prevention among urban youth: The "Slick Tracy Home Team Program." <i>Journal of Primary Prevention, 27</i> (2), 135-154.	<50% Latino
X-08	Komro, K. Perry, C., Veblen-Mortenson, S., Farbaksh, K., Toomey, T., Stigler, M., Jones-Webb, R., Kugler, K., Pasch, K., & Williams, C. (2008). Outcomes from a randomized controlled trial of a multi-component alcohol use preventive intervention for urban youth: Project Northland Chicago. <i>Addiction, 103</i> (4), 606-618.	<50% Latino
X-09	Malgady, R. G., Rogler, L. H., & Costantino, G. (1990). Hero/heroine modeling for Puerto Rican adolescents: A preventive mental health intervention. <i>Journal of Consulting and Clinical Psychology, 58</i> (4), 469.	Primary goal not SU
X-10	Cervantes, R. C., & Goldbach, J. T. (2012). Adapting evidence-based prevention approaches for Latino adolescents: The Familia Adelante Program-Revised. <i>Psychosocial Intervention, 21</i> (3), 281-290.	Qualitative study
X-11	Cervantes, R., Goldbach, J., & Santos, S. M. (2011). Familia Adelante: A multi-risk prevention intervention for Latino families. <i>The Journal of Primary Prevention, 32</i> (3-4), 225-234.	Single group pre/post
X-12	Santisteban, D. A., Coatsworth, J. D., Perez-Vidal, A., Mitrani, V., Jean-Gilles, M., & Szapocnik, J. (1997). Brief Structural/Strategic Family	Single group pre/post

	Therapy with African American and Hispanic high risk youth. <i>SAMHSA</i> , 1-42.	
X-13	Santisteban, D. A., & Mena, M. P. (2009). Culturally Informed and Flexible Family-Based Treatment for Adolescents: A tailored and integrative treatment for Hispanic youth. <i>Family Process</i> , 48(2), 253-268.	Primary goal not SU
X-15	Bernal, G., & Domenech Rodriguez, M. M. (2009). Advances in Latino family research: Cultural adaptations of evidence-based interventions. <i>Family Process</i> , 48(2), 169-178.	Theoretical or position paper
X-16	Cervantes, R., Goldbach, J., & Santos, S. M. (2011). Familia Adelante: A multi-risk prevention intervention for Latino families. <i>The Journal of Primary Prevention</i> , 32(3-4), 225-234.	Single group pre/post
X-17	Szapocznik, J., Santisteban, D., Rio, A., Perez-Vidal, A., Santisteban, D., & Kurtines, W. M. (1989). Family effectiveness training: An intervention to prevent drug abuse and problem behaviors in Hispanic adolescents. <i>Hispanic Journal of Behavioral Sciences</i> , 11(1), 4-27.	Publication Date
X-19	Valentine, J., Gottlieb, B., Keel, S., Griffith, J., & Ruthazer, R. (1998). Measuring the effectiveness of the Urban Youth Connection: The case for dose-response modeling to demonstrate the impact of an adolescent substance abuse prevention program. <i>Journal of Primary Prevention</i> , 18(3), 363-387.	Not culturally adapted
X-20	Ayón, C., Peña, V., & Naddy, M. B. G. (2014). Promotoras' efforts to reduce alcohol use among Latino youths: Engaging Latino parents in prevention efforts. <i>Journal of Ethnic And Cultural Diversity in Social Work</i> , 23(2), 129-147.	Single group pre/post
X-21	Santisteban, D. A., Mena, M. P., & McCabe, B. E. (2011). Preliminary results for an adaptive family treatment for drug abuse in Hispanic youth. <i>Journal of Family Psychology</i> , 25(4), 610.	Qualitative study
X-22	Burrow-Sanchez, J. J., Martinez Jr, C. R., Hops, H., & Wrona, M. (2011). Cultural accommodation of substance abuse treatment for Latino adolescents. <i>Journal of Ethnicity in Substance Abuse</i> , 10(3), 202-225.	Primary goal not SU
X-23	Unger, J. B. (2014). Cultural influences on substance use among Hispanic adolescents and young adults: Findings from Project RED. <i>Child Development Perspectives</i> , 8(1), 48-53.	Epidemiological
X-25	Gil, A. G., Wagner, E. F., & Tubman, J. G. (2004). Culturally sensitive substance abuse intervention for Hispanic and African American adolescents: Empirical examples from the Alcohol Treatment Targeting Adolescents in Need (ATTAIN) Project. <i>Addiction</i> , 99(s2), 140-150.	Does not meet age criteria
X-26	Gosin, M., Marsiglia, F. F., & Hecht, M. L. (2003). Keepin'it REAL: A drug resistance curriculum tailored to the strengths and needs of pre-adolescents of the southwest. <i>Journal of Drug Education</i> , 33(2), 119-142.	Practice guidelines
X-27	Waters, J. A., Fazio, S. L., Hernandez, L., & Segarra, J. (2001). The story of CURA, a Hispanic/Latino drug therapeutic community. <i>Journal of Ethnicity in Substance Abuse</i> , 1(1), 113-134.	Review of substance use outcome studies

X-28	Lee, C. S., López, S. R., Colby, S. M., Rohsenow, D., Hernández, L., Borrelli, B., & Caetano, R. (2013). Culturally adapted motivational interviewing for Latino heavy drinkers: Results from a randomized clinical trial. <i>Journal of ethnicity in substance abuse</i> , 12(4), 356-373.	Does not meet age criteria
X-30	Alvarez, J., Jason, L. A., Olson, B. D., Ferrari, J. R., & Davis, M. I. (2007). Substance abuse prevalence and treatment among Latinos and Latinas. <i>Journal of Ethnicity in Substance Abuse</i> , 6(2), 115-141.	Review of substance use outcome studies
X-31	Zhen-Duan, J., & Taylor, M. J. (2014). The use of an eco-developmental approach to examining substance use among rural and urban Latino/a youth: Peer, parental, and school influences. <i>Journal of Ethnicity in Substance Abuse</i> , 13(2), 104-125.	Epidemiological
X-32	Allen, M. L., Garcia-Huidobro, D., Hurtado, G. A., Allen, R., Davey, C. S., Forster, J. L., & Svetaz, M. V. (2012). Immigrant family skills-building to prevent tobacco use in Latino youth: Study protocol for a community-based participatory randomized controlled trial. <i>Trials</i> , 13(1), 242.	Practice guidelines
X-33	Donlan, W., Lee, J., & Paz, J. (2009). Corazón de Aztlan: Culturally competent substance abuse prevention. <i>Journal of Social Work Practice in the Addictions</i> , 9(2), 215-232.	Single group pre/post
X-34	Kataoka, S. H., Stein, B. D., Jaycox, L. H., Wong, M., Escudero, P., Tu, W., Zaragoza, C. & Fink, A. (2003). A school-based mental health program for traumatized Latino immigrant children. <i>Journal of the American Academy of Child & Adolescent Psychiatry</i> , 42(3), 311-318.	Primary goal not SU
X-35	Cortes, A. (2014). Building the self-esteem of Latino/a adolescents via culturally relevant films (Order No. 1527690). Available from ProQuest Dissertations & Theses Full Text. (1530198421). Retrieved from http://ezproxy.lib.utexas.edu/login?url=http://search.proquest.com/docview/1530198421?accountid=7118	Primary goal not SU
X-36	Rivera, S. (2007). Culturally-modified trauma-focused treatment for Hispanic children: Preliminary findings (Order No. 3287436). Available from ProQuest Dissertations & Theses Full Text. (304716917). Retrieved from http://ezproxy.lib.utexas.edu/login?url=http://search.proquest.com/docview/304716917?accountid=7118	Primary goal not SU
X-39	Estrada, Y. (2012). Parental acculturation, family functioning, and preventive intervention outcome among Hispanic youth and their families (Order No. 3508220). Available from ProQuest Dissertations & Theses Full Text. (1017883220). Retrieved from http://ezproxy.lib.utexas.edu/login?url=http://search.proquest.com/docview/1017883220?accountid=7118	Study of moderating effect
X-40	Smokowski, P. R., & Bacallao, M. (2008). Entre dos mundos/between two worlds: youth violence prevention for acculturating Latino families. <i>Research on Social Work Practice</i> , 19(2), 165-178.	Primary goal not SU

X-41	Flicker, S. M., Waldron, H. B., Turner, C. W., Brody, J. L., & Hops, H. (2008). Ethnic matching and treatment outcome with Hispanic and Anglo substance-abusing adolescents in family therapy. <i>Journal of Family Psychology, 22</i> (3), 439-447.	Not culturally adapted
X-42	Enriquez, M., Kelly, P. J., Cheng, A. L., Hunter, J., & Mendez, E. (2012). An intervention to address interpersonal violence among low-income Midwestern Hispanic-American teens. <i>Journal of Immigrant and Minority Health, 14</i> (2), 292-299.	Primary goal not SU
X-43	Coatsworth, J. D., Pantin, H., & Szapocznik, J. (2002). Familias Unidas: A family-centered eco-developmental intervention to reduce risk for problem behavior among Hispanic adolescents. <i>Clinical Child and Family Psychology Review, 5</i> (2), 113-132.	Practice guidelines
X-44	Gray, C. M., & Montgomery, M. J. (2012). Links between alcohol and other drug problems and maltreatment among adolescent girls: Perceived discrimination, ethnic identity, and ethnic orientation as moderators. <i>Child Abuse & Neglect, 36</i> (5), 449-460.	Epidemiological
X-45	Baca, L. M., & Koss-Chioino, J. D. (1997). Development of a culturally responsive group counseling model for Mexican American adolescents. <i>Journal of Multicultural Counseling and Development, 25</i> (2), 130-141.	Practice guidelines
X-46	Hopson, L. M. (2006). Effectiveness of culturally grounded adaptations of an evidence-based substance abuse prevention program with alternative school students (Order No. 3284685). Retrieved from Dissertations & Theses @ University of Texas - Austin; ProQuest Dissertations & Theses Full Text. (304983580). Retrieved from http://ezproxy.lib.utexas.edu/login?url=http://search.proquest.com/docview/304983580?accountid=7118	Does not meet age criteria
X-47	Marsiglia, F. F., Yabiku, S. T., Kulis, S., Nieri, T., & Lewin, B. (2010). Influences of school Latino composition and linguistic acculturation on a prevention program for youths. <i>Social Work Research, 34</i> (1), 6-19.	Primary goal not SU
X-48	Prado, G. (2005). The efficacy of three interventions to prevent substance use and sex initiation in subgroups of Hispanic adolescents. Retrieved from Dissertations from ProQuest. Paper 2299. http://scholarlyrepository.miami.edu/dissertations/2299	Primary goal not SU
X-49	Sharkey, J. D., Sander, J. B., & Jimerson, S. R. (2010). Acculturation and mental health: Response to a culturally-centered delinquency intervention. <i>Journal of Criminal Justice, 38</i> (4), 827-834.	Primary goal not SU
X-50	Mata, H. J. (2011). Development and evaluation of a personalized normative feedback intervention for Hispanic youth at high risk of smoking. <i>ETD Collection for University of Texas, El Paso</i> . Paper AAI3489985. http://digitalcommons.utep.edu/dissertations/AAI3489985	Not culturally adapted
X-51	Ceballo, R., Ramirez, C., Maltese, K. L., & Bautista, E. M. (2006). A bilingual "neighborhood club": Intervening with children exposed to urban violence. <i>American Journal of Community Psychology, 37</i> (3-4), 167-174.	Primary goal not SU

X-53	Litrownik, A. J., Elder, J. P., Campbell, N. R., Ayala, G. X., Slymen, D. J., Parra-Medina, D., Zavala, F. & Lovato, C. Y. (2000). Evaluation of a tobacco and alcohol use prevention program for Hispanic migrant adolescents: promoting the protective factor of parent-child communication. <i>Preventive Medicine, 31</i> (2), 124-133.	Primary goal not SU
X-56	Belknap, R. A., Haglund, K., Felzer, H., Pruszynski, J., & Schneider, J. (2013). A theater intervention to prevent teen dating violence for Mexican-American middle school students. <i>Journal of Adolescent Health, 53</i> (1), 62-67.	Primary goal not SU
X-58	Graham, J. W., Johnson, C. A., Hansen, W. B., Flay, B. R., & Gee, M. (1990). Drug use prevention programs, gender, and ethnicity: Evaluation of three seventh-grade Project SMART cohorts. <i>Preventive Medicine, 19</i> (3), 305-313.	Epidemiological
X-59	Szapocznik, J., Lopez, B., Prado, G., Schwartz, S. J., & Pantin, H. (2006). Outpatient drug abuse treatment for Hispanic adolescents. <i>Drug and Alcohol Dependence, 84</i> , S54-S63.	Theoretical or position paper
X-60	Lalonde, B., Rabinowitz, P., Shefsky, M. L., & Washienko, K. (1997). La Esperanza del Valle: Alcohol prevention novelas for Hispanic youth and their families. <i>Health Education & Behavior, 24</i> (5), 587-602.	Single group pre/post
X-62	Delgado, M. (1997). Strengths-based practice with Puerto Rican adolescents: Lessons from a substance abuse prevention project. <i>Children & Schools, 19</i> (2), 101-112.	Qualitative study
X-64	Lee, C. S., López, S. R., Hernández, L., Colby, S. M., Caetano, R., Borrelli, B., & Rohsenow, D. (2011). A cultural adaptation of motivational interviewing to address heavy drinking among Hispanics. <i>Cultural Diversity and Ethnic Minority Psychology, 17</i> (3), 317.	Pre/Post Test Design
X-65	Santisteban, D. A., Mena, M. P., & Abalo, C. (2013). Bridging diversity and family systems: Culturally informed and flexible family-based treatment for Hispanic adolescents. <i>Couple and Family Psychology: Research and Practice, 2</i> (4), 246.	Practice guidelines
X-66	Cunningham, P. B., Foster, S. L., & Warner, S. E. (2010). Culturally relevant family-based treatment for adolescent delinquency and substance abuse: understanding within-session processes. <i>Journal of Clinical Psychology, 66</i> (8), 830-846.	Practice guidelines
X-67	Crunkilton, D., Paz, J. J., & Boyle, D. P. (2005). Culturally competent intervention with families of Latino youth at risk for drug abuse. <i>Journal of Social Work Practice in the Addictions, 5</i> (1-2), 113-131.	Pre/Post Test Design
X-68	Holleran, L. K., Taylor-Seehafer, M. A., Pomeroy, E. C., & Neff, J. A. (2005). Chapter 10: Substance Abuse Prevention for High-Risk Youth: Exploring Culture and Alcohol and Drug Use. <i>Alcoholism Treatment Quarterly, 23</i> (2-3), 165-184.	<50% Latino
X-69	Springer, J. F., Sale, E., Kasim, R., Winter, W., Sambrano, S., & Chipungu, S. (2005). Effectiveness of culturally specific approaches to substance abuse prevention: Findings from CSAP's national cross-site evaluation of high	National multi-site evaluation

	risk youth programs. <i>Journal of Ethnic and Cultural Diversity in Social Work</i> , 13(3), 1-23.	
X-70	Cervantes, R. C., Ruan, K., & Duenas, N. (2004). Programa shortstop: A culturally focused juvenile intervention for Hispanic youth. <i>Journal of Drug Education</i> , 34(4), 385-405.	Does not meet age criteria
X-71	McCabe, K., Yeh, M., Lau, A., & Argote, C. B. (2012). Parent-child interaction therapy for Mexican Americans: Results of a pilot randomized clinical trial at follow-up. <i>Behavior Therapy</i> , 43(3), 606-618.	Primary goal not SU
X-73	Yabiku, S. T., Marsiglia, F. F., Kulis, S., Parsai, M. B., Becerra, D., & Del-Colle, M. (2010). Parental monitoring and changes in substance use among Latino/a and non-Latino/a preadolescents in the southwest. <i>Substance Use & Misuse</i> , 45(14), 2524-2550.	Review of substance use outcome studies
X-74	Chartier, K. G., Negroni, L. K., & Hesselbrock, M. N. (2010). Strengthening family practices for Latino families. <i>Journal of Ethnic & Cultural Diversity in Social Work</i> , 19(1), 1-17.	Does not meet age criteria
X-76	Tomaka, J., Palacios, R., Morales-Monks, S., & Davis, S. E. (2012). An evaluation of the BASICS alcohol risk reduction model among predominantly Hispanic college students. <i>Substance Use & Misuse</i> , 47(12), 1260-1270.	Not culturally adapted
X-77	Viets, V. L. (2007). CRAFT: Helping Latino families concerned about a loved one. <i>Alcoholism Treatment Quarterly</i> , 25(4), 111-123.	Primary goal not SU
X-78	Martinez Jr, C. R., & Eddy, J. M. (2005). Effects of culturally adapted parent management training on Latino youth behavioral health outcomes. <i>Journal of Consulting and Clinical Psychology</i> , 73(5), 841.	Does not measure SU as outcome
X-79	Barrera Jr, M., Castro, F. G., & Steiker, L. K. H. (2011). A critical analysis of approaches to the development of preventive interventions for subcultural groups. <i>American Journal of Community Psychology</i> , 48(3-4), 439-454.	Theoretical or position paper
X-80	Chen, A. C. C., Gance-Cleveland, B., Kopak, A., Haas, S., & Gillmore, M. R. (2010). Engaging families to prevent substance use among Latino youth. <i>Journal for Specialists in Pediatric Nursing</i> , 15(4), 324-328.	Theoretical or position paper
X-81	Parsai, M., Voisine, S., Marsiglia, F. F., Kulis, S., & Nieri, T. (2008). The protective and risk effects of parents and peers on substance use, attitudes, and behaviors of Mexican and Mexican American female and male adolescents. <i>Youth & Society</i> , 40(3), 353-376.	Primary goal not SU
X-82	Garcia, C., Pintor, J., Vazquez, G., & Alvarez-Zumarraga, E. (2013). Project Wings, a Coping Intervention for Latina Adolescents A Pilot Study. <i>Western Journal of Nursing Research</i> , 35(4), 434-458.	Primary goal not SU
X-83	Kulis, S. S., Marsiglia, F. F., Kopak, A. M., Olmsted, M. E., & Crossman, A. (2012). Ethnic Identity and Substance Use Among Mexican-Heritage Preadolescents Moderator Effects of Gender and Time in the United States. <i>The Journal of Early Adolescence</i> , 32(2), 165-199.	Primary goal not SU

X-84	Daniels, J., Crum, M., Ramaswamy, M., & Freudenberg, N. (2009). Creating REAL MEN: description of an intervention to reduce drug use, HIV risk, and rearrest among young men returning to urban communities from jail. <i>Health Promotion Practice, 12</i> (1), 44-54.	Practice guidelines
X-85	Ndiaye, K., Hecht, M. L., Wagstaff, D. A., & Elek, E. (2009). Mexican-heritage preadolescents' ethnic identification and perceptions of substance use. <i>Substance Use & Misuse, 44</i> (8), 1160-1182.	Primary goal not SU
X-87	Marsiglia, F. F., Kulis, S., Yabiku, S. T., Nieri, T. A., & Coleman, E. (2011). When to intervene: Elementary school, middle school or both? Effects of keepin'it REAL on substance use trajectories of Mexican heritage youth. <i>Prevention Science, 12</i> (1), 48-62.	Does not meet age criteria
X-90	Cervantes, R. C., & Pena, C. (1998). Evaluating Hispanic/Latino programs: Ensuring cultural competence. <i>Alcoholism Treatment Quarterly, 16</i> (1-2), 109-131.	Theoretical or position paper
X-91	Pantin, H., Schwartz, S. J., Sullivan, S., Coatsworth, J. D., & Szapocznik, J. (2003). Preventing substance abuse in Hispanic immigrant adolescents: An ecodevelopmental, parent-centered approach. <i>Hispanic Journal of Behavioral Sciences, 25</i> (4), 469-500.	Practice guidelines
X-92	Lopez, S. G., Garza, R. T., & Gonzalez-Blanks, A. G. (2012). Preventing smoking among Hispanic preadolescents: Program orientation, participant individualism-collectivism, and acculturation. <i>Hispanic Journal of Behavioral Sciences, 0739986311435901</i> .	Does not meet age criteria
X-93	Tapia, M. I., Schwartz, S. J., Prado, G., Lopez, B., & Pantin, H. (2006). Parent-centered intervention: A practical approach for preventing drug abuse in Hispanic adolescents. <i>Research on Social Work Practice, 16</i> (2), 146-165.	Practice guidelines
X-94	Sussman, S., Yang, D., Baezconde-Garbanati, L., & Dent, C. W. (2003). Drug Abuse Prevention Program Development Results among Latino and Non-Latino White Adolescents. <i>Evaluation & the health professions, 26</i> (4), 355-379.	Not culturally adapted
X-95	Paz, J. (2002). Culturally competent substance abuse treatment with Latinos. <i>Journal of Human Behavior in the Social Environment, 5</i> (3-4), 123-136.	Theoretical or position paper
X-96	Kaye, L. B., Tucker, C. M., Bragg, M. A., & Estampador, A. C. (2011). Low-income children's reported motivators of and barriers to healthy eating behaviors: a focus group study. <i>Journal of the National Medical Association, 103</i> (9), 941.	Qualitative study
X-97	Shillington, A. M., & Clapp, J. D. (2003). Adolescents in public substance abuse treatment programs: The impacts of sex and race on referrals and outcomes. <i>Journal of Child & Adolescent Substance Abuse, 12</i> (4), 69-91.	Review of substance use outcome studies
X-98	Shetgiri, R., Kataoka, S., Lin, H., & Flores, G. (2010). A randomized, controlled trial of a school-based intervention to reduce violence and substance use in predominantly Latino high school students. <i>Journal of the National Medical Association, 103</i> (9-10), 932-940.	Not culturally adapted

X-99	Polansky, J. M., Buki, L. P., Horan, J. J., Ceperich, S. D., & Burows, D. D. (1999). The effectiveness of substance abuse prevention videotapes with Mexican American adolescents. <i>Hispanic Journal of Behavioral Sciences, 21</i> (2), 186-198.	Not culturally adapted
X-101	Ramirez, A. G., Gallion, K. J., Espinoza, R., McAlister, A., & Chalela, P. (1997). Developing a media-and school-based program for substance abuse prevention among Hispanic youth: A case study of Mirame!/Look at me!. <i>Health Education & Behavior, 24</i> (5), 603-612.	Practice guidelines
X-102	Kumpfer, K. L., Pinyuchon, M., de Melo, A. T., & Whiteside, H. O. (2008). Cultural adaptation process for international dissemination of the Strengthening Families Program. <i>Evaluation and the Health Professions, 31</i> (2), 226-239.	Practice guidelines
X-103	Kumpfer, K. L., Alvarado, R., Smith, P., & Bellamy, N. (2002). Cultural sensitivity and adaptation in family-based prevention interventions. <i>Prevention Science, 3</i> (3), 241-246.	Theoretical or position paper
X-104	Shorkey, C., Windsor, L. C., & Spence, R. (2009). Assessing culturally competent chemical dependence treatment services for Mexican Americans. <i>Journal of Behavioral Health Services & Research, 36</i> (1), 61-74.	Qualitative study
X-105	Gonzalez-Blanks, A. G., Lopez, S. G., & Garza, R. T. (2012). Collectivism in Smoking Prevention Programs for Hispanic Preadolescents: Raising the Ante on Cultural Sensitivity. <i>Journal of Child & Adolescent Substance Abuse, 21</i> (5), 427-439.	Does not meet age criteria
X-106	Cordaro, M., Tubman, J. G., Wagner, E. F., & Morris, S. L. (2012). Treatment process predictors of program completion or dropout among minority adolescents enrolled in a brief motivational substance abuse intervention. <i>Journal of Child & Adolescent Substance Abuse, 21</i> (1), 51-68.	Not culturally adapted
X-108	Sargent, J. D., Tanski, S., Stoolmiller, M., & Hanewinkel, R. (2010). Using sensation seeking to target adolescents for substance use interventions. <i>Addiction, 105</i> (3), 506-514.	Epidemiological
X-109	Jackson, K. M. (2010). Progression through early drinking milestones in an adolescent treatment sample. <i>Addiction, 105</i> (3), 438-449.	Not culturally adapted
X-110	Blanco-Vega, C. O., Castro-Olivo, S. M., & Merrell, K. W. (2007). Social-Emotional Needs of Latino Immigrant Adolescents: A Sociocultural Model for Development and Implementation of Culturally Specific Interventions. <i>Journal of Latinos and Education, 7</i> (1), 43-61.	Theoretical or position paper
X-111	Ames, S. C., Rock, E., Hurt, R. D., Patten, C. A., Croghan, I. T., Stoner, S. M., Decker, P. Offord, K. & Nelson, M. (2008). Development and feasibility of a parental support intervention for adolescent smokers. <i>Substance Use & Misuse, 43</i> (3-4), 497-511.	Not culturally adapted
X-112	Nesman, T. M. (2007). A participatory study of school dropout and behavioral health of Latino adolescents. <i>Journal of Behavioral Health Services & Research, 34</i> (4), 414-430.	Qualitative study

X-113	Yabiku, S., Kulis, S., Marsiglia, F. F., Lewin, B., Nieri, T., & Hussaini, S. (2007). Neighborhood effects on the efficacy of a program to prevent youth alcohol use. <i>Substance Use & Misuse</i> , 42(1), 65-87.	Primary goal not SU
-------	---	---------------------

Appendix: F

Data Coding Form

Data Coding Form

A1. Study ID: _____

Author: _____

Date of Coding: _____

Year: _____

Coder: _____

SECTION A: SOURCE DESCRIPTORS AND STUDY CONTEXT

A2. Type of report (SELECT ONE)

[PUBTP]

- 1. Journal article
- 2. Book/book chapter
- 3. Gov't report, Federal, state, local
- 4. Conference proceedings
- 5. Thesis or Dissertation
- 6. Unpublished report (non-gov. tech report, convention paper, etc)
- 7. Other: (specify) _____

SECTION B: SAMPLE DESCRIPTORS

Description of Participants (Mean of Treatment and Comparison groups)

B1. Mean age of participants _____ [T-AGE]
(use age range if not enough information to determine)

B2. Grade level of participants (Treatment and Comparison groups) [T-GRD]

- 1. Middle school (6-8)
- 2. High school (9-12)
- 3. Dropout
- 4. Mixed
- 99. Not enough information to determine

B3. Race/ethnicity- [T-RACE]

Hispanic % _____ (use 999 if not enough information to determine)

B4. Sex [T-SEX]
% Males _____ (use 999 if not enough information to determine)

- B5. Predominant Socio-economic status (Family Income) [T-SES]
- 1. Less than \$10,000
 - 2. Less than \$25,000
 - 3. Less than \$35,000
 - 4. Greater than \$35,000
 - 99. Not enough information to determine

- B6. What were the criteria for participants to be included in the study? [T-CRI]
(Check all that apply)
- B6.1. Language Requirement
 - B6.2. Age Requirement
 - B6.3. DSMIV-TR Criteria
 - B6.4. Ethnic Identification
 - B6.5. Other (specify): _____
 - B6.99. Not enough information to determine

- B6a. What were the criteria for substance use to be included in the study?
- B6.1. Required participants to meet a threshold criteria for substance use (specify): _____
 - B6.2. At-Risk of Substance Use
 - B6.3. No criteria specified
 - B6.99. Not enough information to determine

- B7. What were the ethnic identification and language indicators recorded? [T-ETN]
- B7.1. % Adolescents Born in US _____ (use 999 if not enough information to determine)
- B7.2. % Parents Born in US _____ (use 999 if not enough information to determine)
- B7.3. % English Primary Language Reported Spoken at Home _____ (use 999 if not enough information to determine)

SECTION C: TREATMENT/INTERVENTION DESCRIPTORS

- C1. What is the name of the intervention received by treatment group? [TX-NAME]
(indicate N/A if authors did not state)
- C2. What level of substance use intervention does this study adapt? [TX-LEVEL]
(Check all that apply)
- C2.1. Universal
 - C2.2. Selective
 - C2.3. Indicated
 - C2.99. Not able to determine
- C2a. What research strategies were used to adapt the intervention? [TX-STRAT]

(Check all that apply)

- C2.1. Focus groups/individual interviews
- C2.2. Community participation
- C2.3. Literature review
- C2.4. Employing bilingual staff
- C2.5. Expert Opinion
- C2.6. Other (specify): _____
- C2.99. Not able to determine

C3. What components of the intervention were culturally adapted? [TX-COMP]

(Check all that apply)

- C3.1. Changes to intervention content
- C3.2. Provides intervention in English and Spanish
- C3.3. Incorporates Cultural Values
- C3.4. Changes to nature of therapeutic service delivery
- C3.5. Participant/Therapist ethnic matching
- C3.6. Name of Intervention
- C3.7. Other (specify): _____
- C3.99. Not able to determine

C4. How clearly did the author operationalize treatment procedures? [TX-OPER]

- 1. Very clear and well defined (or provides reference to program manual/material that does define the treatment)- treatment could be replicated based on description
- 2. Provided general information about the program; replication would be difficult due to lack of specificity in describing specific processes or content
- 3. Little description of the program; would be very difficult to replicate based on information provided.
- 4. No description of the program was provided.

C5. Is this a manualized program (did researchers or implementers use a written manual or guide to implement the program/intervention)? [TX-MAN]

- 0. No
- 1. Yes
- 2. Unsure

C6. Were the implementers trained on the program? [TX-TRAIN]

- 0. No
- 1. Yes, comprehensive training was provided
- 2. Yes, some training was provided
- 3. Unsure

C7. Did implementers receive ongoing supervision or coaching? [TX-SUPER]

- 0. No
- 1. Yes, the supervision component is built into the program implementation
- 2. Yes, supervision provided for purposes of the study, but not normally a part of the intervention.
- 3. Some oversight was provided, but not systematic
- 4. Unsure

C8. Describe the goal of the program/intervention [TX-GOAL]
(indicate N/A if authors did not state)

C9. What was the primary setting of the program? [TX-SET]

- C9.1. School
- C9.2. Community-based organization
- C9.3. Church
- C9.4. Mixed
- C9.5. Other (specify) _____
- C9.99. Not enough information to determine

C10. Who provided the services? (SELECT ALL THAT APPLY) [TX-SVPRO]

- C10.1. Trained interventionist (e.g. social worker, psychologist)
- C10.2. Community worker
- C10.3. Teacher
- C10.4. Other school personnel
- C10.5. Other (specify) _____
- C10.99. Not enough information to determine

C11. Role of the evaluator/author/research team or staff in the program. [TX-RE/ROLE]

- 1. Researcher delivered the treatment
- 2. Researcher involved in planning or designing the treatment
- 3. Researcher independent of treatment- research role only
- 99. Cannot tell

C12. What type of intervention did the treatment group receive? [TX-INTREC]
(SELECT ALL THAT APPLY)

- C12.1. CBT
- C12.2. BSFT or SFT

- C12.3. BMI or MI
- C12.4. Education (specify focus): _____
- C12.5. Other (specify): _____
- C12.99. Cannot tell

C13. Treatment Format: [TX-FORM]

- 1. Adolescent and provider (one-on-one)
- 2. Group of adolescents and provider
- 3. Adolescent and parent
- 4. Parents and provider
- 5. Groups of parents and provider
- 6. Adolescents and parents with provider
- 7. Groups of families and provider
- 99. Not enough information to determine

C14. Focal Format- From question C8 above, select the ONE [TX-FOCFORM]
format type that is considered the focal format of the intervention.
If there is no single format that can be identified as the focal format,
code 88 for multiple format program.

- 1. Adolescent and provider (one-on-one)
- 2. Group of adolescents and provider
- 3. Parents and provider
- 4. Groups of parents and provider
- 5. Adolescents and parents with provider
- 6. Groups of families and provider
- 88. Multiple format program

C15. What was the duration of treatment? [TX-DUR]

C15.a. # of wks participant received intervention: _____
(use 999 if not enough information to determine)

C15.b. # of session participant received intervention: _____
(use 999 if not enough information to determine)

C15.c. # of hrs intervention received per session: _____
(use 999 if not enough information to determine)

C16. Frequency of contact between participants and provider [TX-FRQP&PRV]
(times per week attending) (mean participation)

- 1. Less than weekly
- 2. Weekly

- 3. Twice weekly
- 4. 3-4 times weekly
- 5. Daily
- 6. Other (specify): _____
- 99. Not enough information to determine

C17. Frequency of contact between parents and provider: [TX-FRQPG&PRV]

- 1. Less than weekly
- 2. Weekly
- 3. Twice weekly
- 4. 3-4 times weekly
- 5. Daily
- 6. Other (specify): _____
- 7. No contact
- 99. Not enough information to determine

C18. How was funding received for the research? (Check all that apply) [TX-FUNDING]

- C18.1. Government
- C18.2. Community
- C18.3. School
- C18.4. Participant Fee
- C18.5. No external funding
- C18.6. Other (specify): _____
- C18.99. Not enough information to determine

Comparison Group Condition Description

C19. What did the control/comparison group receive? [TX-COMPTX]

- C19.1. Nothing or wait list
- C19.2. "Treatment as usual": Specify _____
- C19.3. Placebo/Attention
- C19.4. A specified treatment: Specify _____
- C19.5. Other (specify): _____

C20. Describe what happened to the control/comparison group [TX-COMPDESC]

SECTION D: RESEARCH METHODS AND QUALITY

D1. Research design type [RE-DES]

(must check 1-4 and if a retrospective study, also check 5)

- 1. Experimental Design with Random assignment
- 2. Quasi-experimental design - Regression Discontinuity or time series
- 3. Quasi-experimental design - Comparison group, with Pre-test

- 4. Quasi-experimental design - Comparison group, no Pre-test
 - 5. Retrospective
- D2. Unit of assignment to conditions [RE-ASSGN]
- D21. Individual student
 - D2.2. Group/Cluster: (specify): _____
 - D2.3. Other (specify): _____
 - D2.99. Not enough information to determine
- D3. Results of statistical comparisons of pretest differences [RE-STCOMP]
- 1. No comparisons made
 - 2. No statistically significant differences
 - 3. Significant differences judged unimportant by coder
 - 4. Significant differences judged important by coder
- D4. If groups were non-equivalent, were statistical controls used? [RE-NESTCON]
- 0. No
 - 1. Yes
 - 2. N/A
- D5. Was there more than 20% attrition in either/both groups? [RE-ATT]
- D5.0. No
 - D5.1. Yes - in treatment group only
 - D5.2. Yes - in comparison group only
 - D5.3. Yes - in both groups
 - D5.4.99. Not enough information to determine
 - D5.5. N/A- performed ITT analysis (imputed missing data)

EFFECT SIZE LEVEL CODING- PRELIMINARY DATA

- E1. Construct measured (check all that apply) [EFF-CONST]
- E1.a. Was substance use measured?
- 0. Not measured
 - 1. Measured, but not enough data to calculate ES
 - 2. Measured with data for ES- dichotomous
 - 3. Measured with data for ES- continuous
- E1.b. Was illicit drug use measured?
- 0. Not measured
 - 1. Measured, but not enough data to calculate ES
 - 2. Measured with data for ES- dichotomous
 - 3. Measured with data for ES- continuous

E1.c. Was alcohol use measured?

- 0. *Not measured*
- 1. *Measured, but not enough data to calculate ES*
- 2. *Measured with data for ES- dichotomous*
- 3. *Measured with data for ES- continuous*

E1.d. Was marijuana use measured?

- 0. *Not measured*
- 1. *Measured, but not enough data to calculate ES*
- 2. *Measured with data for ES- dichotomous*
- 3. *Measured with data for ES- continuous*

E1.e. Was tobacco use measured?

- 0. *Not measured*
- 1. *Measured, but not enough data to calculate ES*
- 2. *Measured with data for ES- dichotomous*
- 3. *Measured with data for ES- continuous*

E1.f. Was cocaine use measured?

- 0. *Not measured*
- 1. *Measured, but not enough data to calculate ES*
- 2. *Measured with data for ES- dichotomous*
- 3. *Measured with data for ES- continuous*

SECTION E: EFFECT SIZE LEVEL CODING SHEET

Dependent Measures Descriptors

EFFECT SIZE LEVEL CODING

E2. Complete for each outcome measured at each time frame

[EFF-OUT]

<i>Outcome</i>	<i>Instrument</i>	<i>Valid?</i>	<i>Source (participant, clinician)</i>	<i>Timing of measurement (end of treatment, 3 month, etc.)</i>	<i>Tx analytic sample size</i>	<i>Control group analytic sample size</i>

Effect Size Data (Continuous Outcomes)

Outcome	Intervention Group		Control Group		Between group analysis
	Baseline Mean (SD)	Posttest Mean (SD)	Baseline Mean (SD)	Posttest Mean (SD)	Values for t, F, other (if means and SDs not reported)

Effect size data- Dichotomous Outcomes (complete for each outcome)

- E3. Treatment group; number successful _____ [EFF-ESTXNS]
E4. Comparison group; number successful _____ [EFF-ESCGNS]
E5. Treatment group; proportion successful _____ [EFF-ESTXPS]
E6. Comparison group; proportion successful _____ [EFF-ESCGPS]
E7. χ^2 value with $df=1$ _____ [EFF-ESCHI]
E8. Correlation coefficient _____ [EFF-ESCC]

Effect Size

- E9. Calculated effect size _____ [EFF-ES]
E10. Calculated standard error of the effect size _____ [EFF-ESSE]

Decision Rule/Notes

-
- F1. Should this study be retained for the meta-analysis? [DEC]
 1. Retain for review
 1. Do NOT retain for review
 3. Unsure – more information needed

Reason(s) study not to be included in the review:

Fidelity

G1. Was fidelity measured in this study?

[FID]

- 0. No
- 1. Yes (continue)

G2. Author's description of why fidelity was monitored

[DESCFID]

- 1. Ensure treatment was delivered as intended
- 2. Improve treatment delivery
- 3. Establish reliability and validity of findings
- 4. Measure amount of contamination across groups
- 5. Other (specify): _____
- 6. Not reported

G3. Measures author explicitly reported that were used to

[FIDMEAS]

check for treatment fidelity (check all that apply)

- G3.1. Questionnaire or self-administered check-list (completed by the implementer)
- G3.2. Researcher administered checklist/questionnaire (completed by the researcher)
- G3.3. Researcher observations
- G3.4. Audio/video tapes
- G3.5. Interview of implementers
- G3.6. Measure treatment dose
- G3.7. Other
- G3.8. Not reported

G4. How many times did author measure fidelity (total)?

[TIMESFID]

G5. At what frequency did author measure fidelity? (i.e. weekly, monthly)?

[FIDFREQ]

G6. Did author provide copy in the study of the form/questionnaire

[QUESTINC]

that was used to measure/monitor fidelity?

- 0. No
- 1. Yes

G7. Was fidelity used in data analysis (i.e. used as a moderator variable)

[FIDAN]

- 0. No
- 1. Yes
- 2. Not reported

If yes, describe how it was used: _____

Risk of Bias

H1. *Do authors specify the method used to generate the allocation sequence*

[Selection Bias]

or to conceal the allocation sequence?

H1.1. Sequence generation

- 0. Low Risk
- 1. High Risk
- 2. Uncertain

Support for judgment:

H1.2. Allocation concealment

- 0. Low Risk
- 1. High Risk
- 2. Uncertain

Support for judgment:

H2. *Did the authors report blinding of participants and personnel*

[Performance Bias]

to assignment?

H2. Blinding of participants and personnel

- 0. Low Risk
- 1. High Risk
- 2. Uncertain

Support for judgment:

H3. *Did the authors report procedures designed blind evaluator to minimize*

[Detection Bias]

bias from rater expectation?

H3. Blinding of outcome assessment

- 0. Low Risk
- 1. High Risk
- 2. Uncertain

Support for judgment:

H4. *Did authors report attrition over 20%?*

[Attrition Bias]

H4. Incomplete outcome data

- 0. Low Risk
- 1. High Risk
- 2. Uncertain

Support for judgment:

H5. *Did authors report expected outcomes?*

[Reporting Bias]

H5. Selective outcome reporting

- 0. Low Risk
- 1. High Risk
- 2. Uncertain

Support for judgment:

Appendix: G

Project Timeline

Project Timeline																		
Activity	PY - 2014												PY - 2015					
	Q1			Q2			Q3			Q4			Q5			Q6		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Search for Existing Meta-analysis	■																	
Review Existing Meta-analysis		■																
Set Research Questions for Current Study			■															
Establish Inclusion and Exclusionary Criteria			■															
Identify Data Sources to Search				■														
Develop List of Words for Search				■														
Review and Revise List of Words for Search with Librarian and Experts' Panel				■														
Pre-test Search Words and Modify				■														
Register Search with PROSPERO					■													
Systematic Search of Literature						■			■									
Develop Screening Form											■							
Pre-test Screening Form and Modify											■							
Screening of Articles - Screener #1												■						
Screening of Articles - Screener #2													■					
Resolve Discrepancies														■				
Develop Coding Form													■					
Pre-Test Coding Form and Modify														■				
Coding of Included Studies - Coder #1															■			
Coding of Included Studies - Coder #2																■		
Resolve Discrepancies																	■	
Statistical Analysis of Data																		■
Preparation and Submission of Final Report																		
Register Final Report with PROSPERO																		
Preparation and Submission of Manuscripts to Peer-Reviewed Journals and Research Conferences																		■

Appendix: H

Search Log

	Database/Source	Number of hits	Number of studies to retrieve full text	Notes
Authors/ Organizations	Author's name suppressed	0	0	
	Author's name suppressed	0	0	
	Author's name suppressed	1	1	
	Author's name suppressed	0	0	
	Author's name suppressed	0	0	
	Author's name suppressed	0	0	
	Author's name suppressed	1	21	
Databases	Academic Search Complete (5.14.14)	85,095	42	Original Search terms: Latino OR Hispanic; Search terms yielded many unrelated topics; Search not completed reached 5095; Team regrouped and refined search terms.
	Academic Search Complete (6.16.14)	814	22	Complete
	CINAHL (6.16.14)	279	15	Complete
	ERIC (6.16.14)	362	10	Complete
	Medline (6.17.14)	2,983	11	Complete
	PsychInfo (7.15.14)	1,298	17	Complete
	PubMed (7.18.14)	1,329	20	Complete
	National Criminal Justice Reference Center (8.6.14)	15	0	Complete
	National Archive of Criminal Justice Data or Bureau of Criminal Justice Statistics (8.6.14)	36	0	Complete
	Social Service Abstracts	237	3	Complete
	ProQuest Dissertations & Theses Full Text (8.7.14)	19,800	7	Complete; ProQuest search engine retrieves many unrelated studies. However, the search results highlights the keywords that are found in the study. Thus, it is easier/faster to sort through the results. Needed to simplify the search terms.
	Web of Science (10.11.14)	851	27	Complete; ILS request on 10.11.14 for: A randomized, controlled trial of a school-based intervention to reduce violence and substance use in predominantly Latino high school students & culturally adapted programs and substance abuse treatment? & Integrating cultural variables into drug abuse prevention and treatment with racial/ethnic minorities & Cultural sensitivity in substance use prevention
UT Digital Repository (10.11.14)	1,150	0	Complete; Does not allow for all of the search terms to be used at once. Had to break down the search terms into categories.	

Research Registers	Cochrane Collaboration Library (11.14.14)	139	0	Complete
	Database of Abstracts of Reviews of Effectiveness (11.14.14)	679	1	Complete
	WHO International Clinical Trials Registry Platform (11.14.14)	0	0	Complete
	Office of Juvenile Justice and Delinquency Prevention (11.14.14)	0	0	Complete
	National Youth Gang Survey (11.14.14)	0	0	Complete
Websites	Blueprints for Healthy Youth Development (11.14.14)	2	0	Complete: Did not provide articles. Provided information of programs and contact information.
	Substance Abuse and Mental Health Services Administration (SAMHSA) (11.14.14)	0	0	Complete
	Institute of Education Science What Works Clearinghouse (11.14.14)	0	0	Complete
	NRLC-group.net/ (11.14.14)	172	0	Complete
	SIRC (11.14.14)	540	15	Complete. Website provides a pdf of list of publications. Requested 1 article, will need to email author for 1 article that is IN PRESS. Nov. 20 - received 1 article requested. Pending email response on 1 article.
Prior Reviews/ Position Papers/ Bibliographies	Castro, F. G., Barrera Jr, M., Pantin, H., Martinez, C., Felix-Ortiz, M., Rios, R., & Lopez, C. (2006). Substance abuse prevention intervention research with Hispanic populations. <i>Drug and Alcohol Dependence</i> , 84, S29-S42.	8	0	Primary studies, variables, critical review of prior reviews: participants, objectives, methodology, reliable coding procedures, review procedures, data extraction, appendix of tables
	Smith, T. B., & Griner, D. (2006). Culturally adapted mental health interventions: A meta-analytic review. <i>Psychotherapy</i> , 43(4), p. 531-548.	7	4	Includes findings from dissertation "culturally adapted mental health treatments: a meta-analysis" by Derek Griner.
	Guerrero, E. G., Marsh, J. C., Khachikian, T., Amaro, H., & Vega, W. A. (2013). Disparities in Latino substance use, service use, and treatment: Implications for culturally and evidence-based interventions under health care reform. <i>Drug and Alcohol Dependence</i> , 133(3), 805-813.	0	0	
	Hodge, D. R., Jackson, K. F., & Vaughn, M. G. (2010). Culturally sensitive interventions for health related behaviors among Latino youth: A meta-analytic review. <i>Children and Youth Services Review</i> , 32(10), 1331-1337.	0	0	
	Hodge, D. R., Jackson, K. F., & Vaughn, M. G. (2010). Culturally sensitive interventions for health related behaviors among Latino youth: A meta-analytic review. <i>Children and Youth Services Review</i> , 32(10), 1331-1337.	7	3	

Hodge, D. R., Jackson, K. F., & Vaughn, M. G. (2010). Culturally sensitive interventions and health and behavioral health youth outcomes: A meta-analytic review. <i>Social Work in Health Care, 49</i> (5), 401-423.	5	2	
Jackson, K. F. (2009). Building cultural competence: A systematic evaluation of the effectiveness of culturally sensitive interventions with ethnic minority youth. <i>Children and Youth Services Review, 31</i> (11), 1192-1198.	3	0	
Bernal, G., & Sáez-Santiago, E. (2006). Culturally centered psychosocial interventions. <i>Journal of Community Psychology, 34</i> (2), 121-132.	2	0	
Carney, T., & Myers, B. (2012). Effectiveness of early interventions for substance-using adolescents: findings from a systematic review and meta-analysis. <i>Substance Abuse Treatment Prevention Policy, 7</i> (1), 25.	0	0	
Waldron, H. B., & Turner, C. W. (2008). Evidence-based psychosocial treatments for adolescent substance abuse. <i>Journal of Clinical Child & Adolescent Psychology, 37</i> (1), 238-261.	0	0	
Jani, J. S., Ortiz, L., & Aranda, M. P. (2009). Latino outcome studies in social work: A review of the literature. <i>Research on Social Work Practice, 19</i> (2), 179-194.	2	0	
Yuen, R. (2004). The effectiveness of culturally tailored interventions: A meta-analytic review. Doctoral Dissertation, Loyola University of Chicago, Chicago, IL.	5	0	

Appendix: I

Risk of Bias of Included Studies

Risk of Bias Table CA/SU Review

Study Name(s): Hecht (2003), Kulis (2007), Kulis (2005), & Hecht (2006)

Type of Bias	Judgment	Support for Judgment
Selection Bias		
Sequence Generation	High Risk	The authors used a quasi-experimental design and participants were not randomly assigned.
Allocation Concealment	High Risk	
Performance Bias		
Blinding of Participants and Personnel	High Risk	The authors did not report blinding of participants or personnel.
Detection Bias		
Blinding of Outcome Assessment	Low Risk	The authors used self-report assessments instead of assessors.
Attrition Bias		
Incomplete Outcome Data	Low Risk	The authors used imputation method for missing data.
Reporting Bias		
Selective Outcome Reporting	Low Risk	The authors appear to report all relevant outcomes.

Risk of Bias Table
CA/SU Review

Study Name(s): Marsiglia (2012) & Kulis (2007)

Type of Bias	Judgment	Support for Judgment
Selection Bias		
Sequence Generation	High Risk	The authors used a quasi-experimental design and participants were not randomly assigned.
Allocation Concealment	High Risk	
Performance Bias		
Blinding of Participants and Personnel	High Risk	The authors did not report blinding of participants or personnel.
Detection Bias		
Blinding of Outcome Assessment	Low Risk	The authors used self-report assessments instead of assessors.
Attrition Bias		
Incomplete Outcome Data	Low Risk	The authors used imputation method for missing data.
Reporting Bias		
Selective Outcome Reporting	Low Risk	The authors appear to report all relevant outcomes.

Risk of Bias Table
CA/SU Review

Study Name: Robbins (2008)

Type of Bias	Judgment	Support for Judgment
Selection Bias		
Sequence Generation	Low Risk	The authors described random sequence generation using a program, but provided no information on concealment.
Allocation Concealment	High Risk	
Performance Bias		
Blinding of Participants and Personnel	High Risk	The authors did not report blinding of participants or personnel.
Detection Bias		
Blinding of Outcome Assessment	Low Risk	The authors reported blinding of assessors.
Attrition Bias		
Incomplete Outcome Data	Uncertain	The authors did not report <i>n</i> of analytic sample. The authors reported differential attrition for African American sample but not for Hispanics.
Reporting Bias		
Selective Outcome Reporting	High Risk	The authors report outcome of substance use. The authors published a related report where they measure cocaine and marijuana use in the same study, but do not report treatment effects on use.

Risk of Bias Table
CA/SU Review

Study Name: Johnson (2005)

Type of Bias	Judgment	Support for Judgment
Selection Bias		
Sequence Generation	Low Risk	The authors described random sequence generation by computer, but provided no information on concealment.
Allocation Concealment	High Risk	
Performance Bias		
Blinding of Participants and Personnel	High Risk	The authors did not report blinding of participants or personnel.
Detection Bias		
Blinding of Outcome Assessment	Low Risk	The authors used self-report assessments instead of assessors.
Attrition Bias		
Incomplete Outcome Data	High Risk	The authors report significant attrition in both groups.
Reporting Bias		
Selective Outcome Reporting	Low Risk	The authors appear to report all relevant outcomes.

Risk of Bias Table
CA/SU Review

Study Name: Guilamo-Ramos (2010)

Type of Bias	Judgment	Support for Judgment
Selection Bias		
Sequence Generation	Low Risk	The authors described random sequence generation by computer, but provided no information on concealment.
Allocation Concealment	High Risk	
Performance Bias		
Blinding of Participants and Personnel	High Risk	The authors did not report blinding of participants or personnel.
Detection Bias		
Blinding of Outcome Assessment	Low Risk	The authors used self-report assessments instead of assessors.
Attrition Bias		
Incomplete Outcome Data	High Risk	The authors report significant attrition in both groups.
Reporting Bias		
Selective Outcome Reporting	Low Risk	The authors appear to report all relevant outcomes.

Risk of Bias Table
CA/SU Review

Study Name: Elder (2002)

Type of Bias	Judgment	Support for Judgment
Selection Bias		
Sequence Generation	High Risk	The authors did not provide any information about how random assignment was carried out other than "random assignment of schools to the two intervention conditions."
Allocation Concealment	High Risk	
Performance Bias		
Blinding of Participants and Personnel	High Risk	The authors did not report blinding of participants or personnel.
Detection Bias		
Blinding of Outcome Assessment	Low Risk	The authors reported blinding of trained assessors.
Attrition Bias		
Incomplete Outcome Data	High Risk	The authors reported attrition over 20% for comparison group at 2-year follow-up.
Reporting Bias		
Selective Outcome Reporting	Low Risk	The authors appear to report all relevant outcomes.

Risk of Bias Table
CA/SU Review

Study Name: Burrow-Sanchez (2012)

Type of Bias	Judgment	Support for Judgment
Selection Bias		
Sequence Generation	High Risk	The authors reported, "16-18 adolescents were randomized into one of two conditions," but did not provide any detail on how this was done.
Allocation Concealment	High Risk	
Performance Bias		
Blinding of Participants and Personnel	High Risk	The authors did not report blinding of participants or personnel.
Detection Bias		
Blinding of Outcome Assessment	High Risk	The authors did not report whether or not assessors were blinded.
Attrition Bias		
Incomplete Outcome Data	Low Risk	The authors reported that all participants were included in the analysis.
Reporting Bias		
Selective Outcome Reporting	Low Risk	The authors reported the substance use and feasibility outcomes and other variables measured were used as moderators.

Risk of Bias Table
CA/SU Review

Study Name: Santisteban (2011)

Type of Bias	Judgment	Support for Judgment
Selection Bias		
Sequence Generation	High Risk	The authors reported participants "were randomized," but did not provide detail of how this was done.
Allocation Concealment	High Risk	
Performance Bias		
Blinding of Participants and Personnel	High Risk	The authors did not report blinding of participants or personnel.
Detection Bias		
Blinding of Outcome Assessment	High Risk	The authors did not report whether or not assessors were blinded.
Attrition Bias		
Incomplete Outcome Data	Low Risk	The authors reported 3 of the 28 participants were lost to attrition (2 in experimental group and 1 in comparison group).
Reporting Bias		
Selective Outcome Reporting	Low Risk	The authors appear to report data for all relevant outcomes.

Risk of Bias
Table
CA/SU Review

Study Name: Valdez (2013)

Type of Bias	Judgment	Support for Judgment
Selection Bias		
Sequence Generation	High Risk	The authors' method of randomization uses a computerized random number generator. Authors provided no information about concealment.
Allocation Concealment	Uncertain	
Performance Bias		
Blinding of Participants and Personnel	Uncertain	The authors did not report blinding of participants or personnel.
Detection Bias		
Blinding of Outcome Assessment	Uncertain	The authors did not blind assessors.
Attrition Bias		
Incomplete Outcome Data	Uncertain	The authors report a high amount of attrition from both groups (27% and 22% at posttest and 44% and 40% at 6 month follow-up), although low differential attrition. Authors reported they conducted an ITT analysis, but did not present the results of that analysis. Demographic comparisons at baseline are based on initial sample, but baseline comparisons of outcomes appear to be based on analytic sample.
Reporting Bias		
Selective Outcome Reporting	Low Risk	The authors appear to report all relevant outcomes.

Risk of Bias
Table
CA/SU Review

Study Name: Godley (1998)

Type of Bias	Judgment	Support for Judgment
Selection Bias		
Sequence Generation	High Risk	The authors did not use random assignment.
Allocation Concealment	Uncertain	
Performance Bias		
Blinding of Participants and Personnel	Uncertain	The authors did not report blinding of participants or personnel.
Detection Bias		
Blinding of Outcome Assessment	Uncertain	The authors did not report whether or not assessors were blinded.
Attrition Bias		
Incomplete Outcome Data	Uncertain	The authors did not report attrition.
Reporting Bias		
Selective Outcome Reporting	High Risk	The authors measured alcohol, tobacco, and other drug use but reported one outcome of "substance use."

References

- Abraido-Lanza, A. F., Chao, M. T., & Florez, K. R. (2005). Do healthy behaviors decline with greater acculturation?: Implications for the Latino mortality paradox. *Social Science & Medicine (1982)*, *61*(6), 1243.
- Acosta, Y., & de la Cruz, P. (2011, September). *The foreign born from Latin America and the Caribbean: 2010*. Washington, DC: U.S. Census Bureau.
- Alderete, E., Vega, W. A., Kolody, B., & Aguilar-Gaxiola, S. (2000). Effects of time in the United States and Indian ethnicity on DSM-III-R psychiatric disorders among Mexican Americans in California. *The Journal of Nervous and Mental Disease*, *188*(2), 90-100.
- Alaniz, M. L., & Wilkes, C. (1995). Reinterpreting Latino culture in the commodity form: The case of alcohol advertising in the Mexican American community. *Hispanic Journal of Behavioral Sciences*, *17*(4), 430-451.
- Alghatrif, M., Markides, K. S., Kuo, Y. F., Ray, L. A., & Moore, A. A. (2012). The effect of prevalent cardiovascular conditions on the association between alcohol consumption and mortality among older Mexican American men. *Ethnicity & Disease*, *23*(2), 168-174.
- Almeida, J., Johnson, R.M., Matsumoto, A., Godette, D.C. (2012). Substance use, generation and time in the United States: The modifying role of gender for immigrant urban adolescents. *Social Science & Medicine Journal*, *75*(12): 2069–2075
- Alvarez, J., Jason, L. A., Olson, B. D., Ferrari, J. R., & Davis, M. I. (2007). Substance

- abuse prevalence and treatment among Latinos and Latinas. *Journal of Ethnicity in Substance Abuse*, 6(2), 115-141.
- Alvidrez, J., Azocar, F., & Miranda, J. (1996). Demystifying the concept of ethnicity for psychotherapy researchers. *Journal of Consulting and Clinical Psychology*, 64(5), 903-908.
- American Psychological Association, Thomas A. Widiger, & American Psychiatric Association. Task Force on DSM-IV. (1997). *DSM-IV Sourcebook* (Vol. 3). American Psychiatric Pub.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.
- Arria, A. M., Mericle, A. A., Meyers, K., & Winters, K. C. (2012). Parental substance use impairment, parenting and substance use disorder risk. *Journal of Substance Abuse Treatment*, 43(1), 114-122.
- Aschengrau, A., & Seage III, G. (2007). *Essentials of epidemiology in public health*. Boston, MA: Jones and Bartlett.
- Avila, E. (1999). *Woman who glows in the dark: A curandera reveals traditional Aztec secrets of physical and spiritual health*. New York: Penguin Putnam.
- Bacio, G. A., Mays, V. M., & Lau, A. S. (2013). Drinking initiation and problematic drinking among Latino adolescents: Explanations of the Immigrant Paradox. *Psychology of Addictive Behaviors*, 27(1), 14-22.
- Badiani, A., Belin, D., Epstein, D., Calu, D., & Shaham, Y. (2011). Opiate versus psychostimulant addiction: The differences do matter. *Nature Reviews*

Neuroscience, 12(11), 685-700.

- Baldwin, J. R., Faulkner, S. L., & Hecht, M. L. (2006). A moving target: The illusive definition of culture. In J.R. Baldwin, S.L. Faulkner, M.L. Hecht, & S.L. Lindsley (Eds.), *Redefining culture: Perspectives across the disciplines*, (3-26). Mahwah, New Jersey: Lawrence Erlbaum Associates, Inc.
- Beck, K. H., & Bargman, C. J. (1993). Investigating Hispanic adolescent involvement with alcohol: A focus group interview approach. *Health Education Research*, 8(2), 151–158.
- Belenko, S. R. (Ed.). (2000). *Drugs and drug policy in America: A documentary history*. Westport, CT: Greenwood Press.
- Bernal, G., Bonilla, J., & Bellido, C. (1995). Ecological validity and cultural sensitivity for outcome research: Issues for the cultural adaptation and development of psychosocial treatments with Hispanics. *Journal of Abnormal Child Psychology*, 23, 67–82. doi:10.1007/BF01447045
- Bernal, G. (2006). Intervention development and cultural adaptation research with diverse families. *Family Process*, 45(2), 143-151.
- Bernal, G., & Rodriguez, D. M. (2009). Advances in Latino family research: Cultural adaptations of evidence-based interventions. *Family Process*, 48(2), 169-178.
- Bernal, G. E., & Rodríguez, D. M. (2012). *Cultural adaptations: Tools for evidence-based practice with diverse populations*. American Psychological Association.
- Berry, J. (2006). Acculturation. In P. Wong and L. Wong (eds.) *Handbook of multicultural perspectives on stress and coping*. (pp. 287-298).

- Betancourt, H., & Lopez, S. R. (1993). The study of culture, ethnicity, and race in American psychology. *American Psychologist*, 48(6), 629.
- Blake, S., Lesky, R., Goodenow, C., & O'Donnell, L. (2001). Recency of immigration, substance use, and sexual behavior among Massachusetts adolescents. *American Journal of Public Health*, 91(5), 794-798.
- Borges, G., Breslau, J., Orozco, R., Tancredi, D. J., Anderson, H., Aguilar-Gaxiola, S., & Medina Mora, M. (2011). A cross-national study on Mexico-US migration, substance use and substance use disorders. *Drug and Alcohol Dependence*, 117(1), 16-23. doi:10.1016/j.drugalcdep.2010.12.022
- Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. (2009). Power analysis for meta-analysis. In M. Borenstein, L. Hedges, J. Higgins, & Rothstein, H., *Introduction to meta-analysis*. West Sussex, UK: John Wiley & Sons, Ltd, Chichester. doi: 10.1002/9780470743386.ch29
- Botvin, G. J., Schinke, S. P., Epstein, J. A., & Diaz, T. (1994). Effectiveness of culturally focused and generic skills training approaches to alcohol and drug abuse prevention among minority youths. *Psychology of Addictive Behaviors*, 8(2), 116.
- Bravo, M. (2003). Instrument development: Cultural adaptations for ethnic minority research. In G. Bernal, J. Trimble, F. Burlew, & F. Leung (Eds.), *Handbook of ethnic and racial minorities in psychology* (pp. 220–232). Newberry, CA: Sage.
- Bronfenbrenner, U. (1989). Ecological systems theory. *Annals of Child Development*, 6, 187–249.

- Brook, J. S., Lee, J. Y., Rubenstone, E., Finch, S. J., Seltzer, N., & Brook, D. W. (2013). Longitudinal determinants of substance use disorders. *Journal of Urban Health, 90*(6), 1130-1150.
- Brown, C. H., Sloboda, Z., Faggiano, F., Teasdale, B., Keller, F., Burkhart, G., Vigna-Taglianti, F., Howe, G., Masyn, K., Wang, W., Muthen, B., Stephens, P., Grey, S., & Perrino, T. (2013). Methods for synthesizing findings on moderation effects across multiple randomized trials. *Prevention Science, 14*(2), 144-156.
- Bui, H.N. (2013). Racial and ethnic differences in the immigrant paradox and substance use. *Journal of Immigrant Minority Health 15*:866–881
- Burciaga, J. A. (1997). *In few words/En pocas palabras: A compendium of Latino folk wit and wisdom*. San Francisco: Mercury House.
- Burrow-Sanchez, J. J., Martinez Jr, C. R., Hops, H., & Wrona, M. (2011). Cultural accommodation of substance abuse treatment for Latino adolescents. *Journal of Ethnicity in Substance Abuse, 10*(3), 202-225.
- Caetano, R., Ramisetty-Mikler, S., & Rodriguez, L. (2008). The Hispanic Americans baseline alcohol survey (HABLAS): DUI rates, birthplace, and acculturation across Hispanic national groups. *Journal of Studies on Alcohol & Drugs, 69*(2), 259-265.
- Caetano, R., Ramisetty-Mikler, S., & Rodriguez, L. (2008). The Hispanic Americans Baseline Alcohol Survey (HABLAS): Rates and predictors of alcohol abuse and dependence across Hispanic national groups. *Journal of Studies on Alcohol & Drugs, 69*(3), 441-448.

- Canino, G., Vega, W., Sribney, W., Warner, L., & Alegria, M. (2008). Social relationships, social assimilation, and substance use disorders among adult Latinos in the U.S. *Journal of Drug Issues*, 38(1), 69-101.
- Carter, P. L. (2006). Straddling boundaries: Identity, culture, and school. *Sociology of Education*, 79(4), 304-328.
- Carter, R. T. (1991). Cultural values: A review of empirical research and implications for counseling. *Journal of Counseling & Development*, 70(1), 164-173.
- Casas, J.M., Wagenheim, B.R., Banchemo, R., & Mendoza-Romero, J. (1995). Hispanic masculinity: Myth or psychological schema meriting clinical consideration. In A. Padilla (Ed.), *Hispanic psychology: Critical issues in theory and research* (pp. 231-244). Thousand Oaks, CA: Sage Publications, Inc.
- Castro, F. G., & Alarcón, E. H. (2002). Integrating cultural variables into drug abuse prevention and treatment with racial/ethnic minorities. *Journal of Drug Issues*, 32(3), 783-810.
- Castro, F. G., Barrera Jr., M., & Martinez Jr., C. R. (2004). The cultural adaptation of prevention interventions: Resolving tensions between fidelity and fit. *Prevention Science*, 5(1), 41 - 45.
- Castro, F. G., & Coe, K. (2007). Traditions and alcohol use: A mixed methods analysis. *Cultural Diversity and Ethnic Minority Psychology*, 13(4), 269.
- Castro, F. G., Garfinkle, J., Naranjo, D., Rollins, M., Brook, J. S., & Brook, D. W. (2007). Cultural traditions as “protective factors” among Latino children of illicit drug users. *Substance Use and Misuse*, 42(4), 621–642.

- Cervantes, R. C., & Cordova, D. (2011). Life experiences of Hispanic adolescents: Developmental and language considerations in acculturation stress. *Journal of Community Psychology, 39*(3), 336-352.
- Chalmers, I., Hedges, L. V., & Cooper, H. (2002). A brief history of research synthesis. *Evaluation & The Health Professions, 25*(1), 12-37.
- Chapman, S. (2008). *Public health advocacy and tobacco control: Making smoking history*. John Wiley & Sons.
- Chen, A. C. C., Gance-Cleveland, B., Kopak, A., Haas, S., & Gillmore, M. R. (2010). Engaging families to prevent substance use among Latino youth. *Journal for Specialists in Pediatric Nursing, 15*(4), 324-328.
- Cherrington, E. H. (1920). *The evolution of prohibition in the United States of America: A chronological history of the liquor problem and the Temperance Reform in the United States from the earliest settlements to the consummation of national prohibition*. Westerville, Ohio: American Issue Press.
- Cicero, M. T. (1737). *Tusculanes* (Vol. 3).
- Conway, K. P., Compton, W., Stinson, F. S., & Grant, B. F. (2006). Lifetime comorbidity of DSM-IV mood and anxiety disorders and specific drug use disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Clinical Psychiatry, 67*(2), 247.
- Cuéllar, I., Arnold, B., & Gonzalez, G. (1995). Cognitive referents of acculturation: Assessment of cultural constructs in Mexican Americans. *Journal of Community*

Psychology, 23(4), 339-356.

Cushman, p. (1995). *Constructing the self, constructing America: A cultural history of psychotherapy*. Reading, MA: Addison-Wesley.

Davey, J., Turner, R. M., Clarke, M. J., & Higgins, J. P. (2011). Characteristics of meta-analyses and their component studies in the Cochrane Database of Systematic Reviews: A cross-sectional, descriptive analysis. *BMC Medical Research Methodology*, 11(1), 160.

Delva, J., Allen-Meares, P., & Momper, S. L. (2010). *Cross-cultural research*. Oxford University Press.

Delva, J., Wallace, J. M., O'Malley, P. M., Bachman, J. G., Johnston, L. D., & Schulenberg, J. E. (2005). The epidemiology of alcohol, marijuana, and cocaine use among Mexican American, Puerto Rican, Cuban American, and other Latin American eighth-grade students in the United States: 1991–2002. *American Journal of Public Health*, 95(4), 696–702. doi:10.2105/AJPH.2003.037051

Dent, C. W., Sussman, S., Ellickson, P., Brown, P., & Richardson, J. (1996). Is current drug abuse prevention programming generalizable across ethnic groups?. *American Behavioral Scientist*, 39(7), 911-918.

DiNitto, D. & Robles, E. H. (2011). Ethnicity, culture, and substance use disorders. In C. A. McNeece and D. M. DiNitto. *Chemical dependency: A systems approach* (4th ed., pp. 285-335). Boston: Allyn & Bacon.

Dumas, J. E., Rollock, D., Prinz, R. J., Hops, H., & Blechman, E. A. (1999). Cultural sensitivity: Problems and solutions in applied and preventive intervention.

- Applied and Preventive Psychology*, 8, 175-196.
- Durlak, J. A. (1998a). Primary prevention mental health programs for children and adolescents are effective. *Journal of Mental Health*, 7(5), 463-469.
- Durlak, J. A. (1998b). Common risk and protective factors in successful prevention programs. *American Journal of Orthopsychiatry*, 68(4), 512-528.
- Dwan, K., Altman, D. G., Arnaiz, J. A., Bloom, J., Chan, A. W., Cronin, E., Decullier, E., Easterbrook, P., Von Elm, E., Gamble, C., Gherzi, D., Ioannidis, J. P., Simes, J., & Williamson, P. R. (2008). Systematic review of the empirical evidence of study publication bias and outcome reporting bias. *PloS one*, 3(8), e3081.
- Ellickson, P., Bui, K., Bell, R. & McGuigan, K. A. (1998). Does early drug use increase the risk for dropping out of high school? *Journal of Drug Issues* 28, 357-380.
- Elliot, D. S. & Mihalic, S. (2004). Issues in disseminating and replicating effective prevention programs. *Prevention Science*, 5, 47-53.
- Epstein, J., Botvin, G., & Diaz, T. (1998). Linguistic acculturation and gender effects on smoking among Hispanic youth. *Prevention Medicine*, 27, 583-589.
- Everitt, B. J., & Robbins, T. W. (2005). Neural systems of reinforcement for drug addiction: from actions to habits to compulsion. *Nature neuroscience*, 8(11), 1481-1489.
- Falicov, C. (2009). On the wisdom and challenges of culturally attuned treatments for Latinos. *Family Process*, 48, 295–312.
- Faryna, E. L., & Morales, E. (2000). Self-efficacy and HIV-related risk behaviors among multiethnic adolescents. *Cultural Diversity and Ethnic Minority Psychology*, 6(1),

42.

- Flato, C. (2010). Acculturation, alcohol expectancies, and alcohol use among Mexican-American adolescents. *Dissertation Abstracts International*, 71.
- Flores-Hughes, G. (2006). The Origin of the Term "Hispanic". *Harvard Journal of Hispanic Policy*, 19, 81.
- Garcia, W. (1996). Respeto: A Mexican base for interpersonal relationships. In W. B. Gudykunst, S. Ting-Toomey, & T. Nishida (Eds.), *Communication in personal relationships across cultures* (pp. 137–155). Thousand Oaks, CA: Sage.
- Garcia-Goyco, O. (2007). The Mapa de Cuauhtinchan No. 2 and the Cosmic Tree in Mesoamerica, the Caribbean, and the Amazon-Orinoco Basin (S. Sessions, Trans.). In D. Carrasco & S. Sessions (eds.), *Cave, city, and eagles nest: An interpretive journey through the Mapa de Cuautinchan* (pp. 357-388). China: Everbest Printing Company, Ltd.
- Germán, M., Gonzales, N. A., & Dumka, L. (2009). Familism values as a protective factor for Mexican-origin adolescents exposed to deviant peers. *The Journal of Early Adolescence*, 29(1), 16-42.
- Gil, A., Vega, W., & Dimas, J. (1994). Acculturative stress and personal adjustment among Hispanic adolescent boys. *Journal of Community Psychology*, 22:43-54.
- Gil, A. G., Wagner, E. F., & Vega, W. A. (2000). Acculturation, feminism, and alcohol use among Latino adolescent males: Longitudinal relations. *Journal of Community Psychology*, 28(4), 443-458.
- Gildenhard, I. (2007). *Paideia Romana: Cicero's Tusculan Disputations*. Cambridge: The

Cambridge Philological Society.

- Gillespie, N. A., Kendler, K. S., Prescott, C. A., Aggen, S. H., Gardner, C. O., Jacobson, K., & Neale, M. C. (2007). Longitudinal modeling of genetic and environmental influences on self-reported availability of psychoactive substances: alcohol, cigarettes, marijuana, cocaine and stimulants. *Psychological Medicine*, *37*(7), 947-959.
- Golub, A., & Johnson, B. D. (2001). Variation in youthful risks of progression from alcohol and tobacco to marijuana and to hard drugs across generations. *American Journal of Public Health*, *91*(2), 225.
- Goodman, J. (2005). *Tobacco in history: The cultures of dependence*. Routledge.
- Graves, D. L., Like, R. C., Kelly, N., & Hohensee, A. (2007). Legislation as intervention: A survey of cultural competence policy in health care. *J. Health Care L. & Policy*, *10*, 339.
- Greenwood, D., & William, S. (1977). *Nature, culture, and human history*. New York: Harper & Row.
- Griffin, K. W., & Botvin, G. J. (2010). Evidence-based interventions for preventing substance use disorders in adolescents. *Child and Adolescent Psychiatric Clinics of North America*, *19*(3), 505–526. doi:10.1016/j.chc.2010.03.005
- Grissom, R. J., & Kim, J. J. (2005). *Effect sizes for research: A broad practical approach*. Mahwah, NJ: Erlbaum.
- Guilamo-Ramos, V., Jaccard, J., Johansson, M., & Tunisi, R. (2004). Binge drinking among Latino youth: Role of acculturation-related variables. *Psychology of*

- Addictive Behaviors*, 18(2), 135.
- Haberstroh, S., Gee, R., & Arredondo, R. (2008). Community-based interventions for addressing alcohol and tobacco dependence in Latino communities: Adapting consensually derived guidelines. *Alcoholism Treatment Quarterly*, 26(4), 464-479.
- Hall, G.C.N. (2001). Psychotherapy research with ethnic minorities: Empirical, ethical, and conceptual issues. *Journal of Consulting and Clinical Psychology*, 69, 502-510.
- Hansen, W. B. (1992). School-based substance abuse prevention: A review of the state of the art in curriculum, 1980–1990. *Health education research*, 7(3), 403-430.
- Heath, D. B. (1987). Anthropology and alcohol studies: current issues. *Annual Review of Anthropology*, 99-120.
- Heath, D. (1990). Anthropological and sociocultural perspectives on alcohol as a reinforcer. In W .M. Cox (Ed.), *Why people drink: Parameters of alcohol as a reinforcer*. New York: Gardner Press.
- Heath, D. B. (2000). *Drinking occasions: Comparative perspectives on alcohol and culture*. Ann Arbor, MI: Routledge & Sheridan Books.
- Hedrick, Tace. (2003). *Mestizo Modernism: Race, Nation, and Identity in Latin American Culture, 1900–1940*. New Brunswick, NJ: Rutgers University Press.
- Herdman, M., Fox-Rushby, J., & Badia, X. (1998). A model of equivalence in the cultural adaptation of HRQoL instruments: the universalist approach. *Quality of Life Research*, 7(4), 323-335.
- Higgins, J., Altman, D. G., Gøtzsche, P. C., Jüni, P., Moher, D., Oxman, A. D., & Sterne, J. A. (2011). The Cochrane Collaboration’s tool for assessing risk of bias in

randomized trials. *BMJ*, 343. doi: 10.1136/bmj.d5928

Higgins, J. P. T., & Green, S. (2011). The Cochrane Collaboration. *Cochrane handbook for systematic reviews of interventions*, 4(6).

Hodge, D. R., Jackson, K. F., & Vaughn, M. G. (2012). Culturally sensitive interventions and substance use: A meta-analytic review of outcomes among minority youths. *Social Work Research*, *svs008*.

Hoebel, E. A. (1966). *Anthropology: The study of man*. McGraw-Hill.

Hofstede, G. H. (Ed.) (2001). *Culture's consequences: Comparing values, behaviors, institutions and organizations across nations*. Thousand Oaks, CA: Sage.

Horevitz, E., & Organista, K. C. (2013). The Mexican health paradox expanding the explanatory power of the acculturation construct. *Hispanic Journal of Behavioral Sciences*, *35*(1), 3-34.

Huey Jr., S. J., & Polo, A. J. (2008). Evidence-based psychosocial treatments for ethnic minority youth. *Journal of Clinical Child & Adolescent Psychology*, *37*(1), 262-301.

Jackson, K. F. (2009). Building cultural competence: A systematic evaluation of the effectiveness of culturally sensitive interventions with ethnic minority youth. *Children & Youth Services Review*, *31*(11), 1192-1198.

Jani, J. S., Ortiz, L., & Aranda, M. P. (2009). Latino outcome studies in social work: A review of the literature. *Research on Social Work Practice*, *19*(2), 179-194.

Jernigan, T. L., & Gamst, A. C. (2005). Changes in volume with age consistency and interpretation of observed effects. *Neurobiology of aging*, *26*(9), 1271-1274.

- Johnston, L. (2010). *Monitoring the future: National results on adolescent drug use: Overview of key findings*. DIANE Publishing.
- Kam, J. A., Matsunaga, M., Hecht, M. L., & Ndiaye, K. (2009). Extending the theory of planned behavior to predict alcohol, tobacco, and marijuana use among youth of Mexican heritage. *Prevention Science, 10*(1), 41-53.
- Kaplan, C., Napoles-Springer, A., Stewart, S., & Perez-Stable, E. (2001). Smoking acquisition among adolescents and young Latinas: the role of socio environmental and personal factors. *Addictive Behaviors, 26*(4), 531–550.
- Kazdin, A. E. (1993). Adolescent mental health: prevention and treatment programs. *American Psychologist, 48*(2), 127.
- Kellam, S.G., Langevin, D.S., 2003. A framework for understanding “evidence” in prevention research and programs. *Prevention Science 4*, 137–153.
- Kerr, M. H., Beck, K., Downs Shattuck, T., Kattar, C., & Uriburu, D. (2003). Family involvement, problem and prosocial behavior outcomes of Latino youth. *American Journal of Health Behavior, 27*(Supplement 1), S55-S65.
- Kim, J.S. (2008). Examining the effectiveness of solution-focused brief therapy: A meta-analysis. *Research on Social Work Practice, 18*, 107-116.
- Kong, G., Singh, N., & Krishnan-Sarin, S. (2012). A review of culturally targeted/tailored tobacco prevention and cessation interventions for minority adolescents. *Nicotine & Tobacco Research, 118*.
- Kopak, A. M. (2013). The relative importance of immigrant generation for Mexican Americans’ alcohol and tobacco use from adolescence to early adulthood. *Journal*

- of Immigrant and Minority Health*, 15(3), 569-576.
- Kopak, A. M., Chen, A. C. C., Haas, S. A., & Gillmore, M. R. (2012). The importance of family factors to protect against substance use related problems among Mexican heritage and White youth. *Drug and Alcohol Dependence*, 124(1), 34-41.
- Kulis, S., Marsiglia, F. F., Elek, E., Dustman, P., Wagstaff, D. A., & Hecht, M. L. (2005). Mexican/Mexican American adolescents and Keepin' it REAL: An evidence-based substance use prevention program. *Children & Schools*, 27(3), 133-145.
- Kulis, S., Marsiglia, F. F., & Nieri, T. (2009). Perceived ethnic discrimination versus acculturation stress: influences on substance use among Latino youth in the Southwest. *Journal of Health and Social Behavior*, 50(4), 443-459.
- Lalonde, B., Rabinowitz, P., Shefsky, M. L., & Washienko, K. (1997). La Esperanza del Valle: Alcohol prevention novelas for Hispanic youth and their families. *Health Education & Behavior*, 24(5), 587-602.
- Lau, A. S. (2006). Making the case for selective and directed cultural adaptations of evidence-based treatments: Examples from parenting training. *Clinical Psychology: Science and Practice*, 13, 295–310. doi:10.1111/j.1468-2850.2006.00042.x
- Leidy, M. S., Guerra, N. G., & Toro, R. I. (2010). A review of family-based programs to prevent youth violence among Latinos. *Hispanic Journal of Behavioral Sciences*, 32(1), 5-36.
- Leong, F. T. I. (1996). Toward an integrative model for cross-cultural counseling and psychotherapy. *Applied and Preventive Psychology*, 5, 189–209. doi:10.1016/

S0962-1849(96)80012-6

- Leong, F. T. L., & Lee, S. H. (2006). A cultural accommodation model of psychotherapy: Illustrated with the case of Asian Americans. *Psychotherapy: Theory, Research, Practice, Training, 43*, 410–423. doi:10.1037/0033-3204.43.4.410
- Ley, A. (2010, August 9). Experts: Improved access to standard health care could erode use of folk medicine, *The Brownsville Herald*. p. 1
- Liebkind, K. (2001). *Blackwell handbook of social psychology: Intergroup processes*. R. Brown & S. L. Gaertner (Ed.). Malden, MA: Blackwell Publishers.
- Littell, J. H., & Maynard, B. R. (2014). Proceedings from SSWR '14: *The science of research synthesis: Limiting bias and error in reviews*. San Antonio, TX: SSWR.
- Littell, J. H., Corcoran, J., & Pillai, V. (2008). *Systematic reviews and meta-analysis*. New York: Oxford University Press.
- López, S. R., Grover, K. P., Holland, D., Johnson, M. J., Kain, C. D., Kanel, K., Mellins, C., & Rhyne, M. C. (1989). Development of culturally sensitive psycho-therapists. *Professional Psychology: Research and Practice, 20*, 369– 376.
- Macionis, J., & Gerber, L. (2010). *Sociology*. (7th Ed.). Toronto, Ontario: Pearson CA Inc.
- Marin, G., & Marin, B. V. (1991). *Research with Hispanic populations*. Sage Publications, Inc.
- Marsiglia, F. F., Kulis, S., Parsai, M., Villar, P., & Garcia, C. (2009). Cohesion and conflict: Family influences on adolescent alcohol use in immigrant Latino families. *Journal of Ethnicity in Substance Abuse, 8*(4), 400-412.

- Martyn, K. K., Loveland-Cherry, C. J., Villarruel, A. M., Cabriaes, E. G., Zhou, Y., Ronis, D. L., & Eakin, B. (2009). Mexican adolescents' alcohol use, family intimacy, and parent-adolescent communication. *Journal of Family Nursing, 15*(2), 152-170.
- McGoldrick, M., Giordano, J., & Pearce, J. K. (1982). *Ethnicity and family therapy*. New York, NY: Guilford press.
- 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.
- Mendoza, M. R., & Medina-Mora, M. E. (2005). Alcohol consumption among Mexican women: Implications in a syncretic culture. *Alcohol, Gender and Drinking Problems, 125*.
- Milburn, N. G., Gary, L. E., Booth, J. A., & Brown, D. R. (1991). Conducting epidemiologic research in a minority community: Methodological considerations. *Journal of Community Psychology, 19*(3), 313-317.
- Monasterio, E. B. (2014). Adolescent Substance Involvement Use and Abuse. *Primary Care: Clinics in Office Practice, 41*(3), 567-585.
- Moyer, A., Schneider, S., Knapp-Oliver, S. K., & Sohl, S. J. (2010). Published versus unpublished dissertations in psycho-oncology intervention research. *Psycho-Oncology, 19*(3), 313-317.
- Mrazek, P., & Haggerty, R. (1994). *Reducing risks for mental disorders: Frontiers for*

- preventive intervention research*. Washington, DC: National Academy Press.
- Myers, R., Chou, C. P., Sussman, S., Baezconde-Garbanati, L., Pachon, H., & Valente, T. W. (2009). Acculturation and substance use: Social influence as a mediator among Hispanic alternative high school youth. *Journal of Health and Social Behavior*, 50(2), 164-179.
- NASW Standards for Cultural Competence in Social Work Practice*. (2001).
http://www.socialworkers.org/sections/credentials/cultural_comp.asp
- National Institutes of Mental Health. (1999). *Strategic plan on reducing health disparities*. Rockville, MD: Author.
- Newcomb, M. D., & Bentler, P. M. (1988). *Consequences of adolescent drug use: Impact on the lives of young adults*. Sage Publications, Inc.
- O'Connor, E. C., Chapman, K., Butler, P., & Mead, A. N. (2011). The predictive validity of the rat self-administration model for abuse liability. *Neuroscience & Biobehavioral Reviews*, 35(3), 912-938.
- Office of Minority Health. (2014). *CLAS legislation map*. Retrieved from:
<https://www.thinkculturalhealth.hhs.gov/Content/LegislattingCLAS.asp>
- Paulson, D. S. (2012). Some basic points concerning meta-analysis. *Clinical laboratory science: Journal of the American Society for Medical Technology*, 26(1), 30-38.
- Paz, J. (2002). Culturally competent substance abuse treatment with Latinos. *Journal of Human Behavior in the Social Environment*, 5(3-4), 123-136.
- Peele, S. (1984). The cultural context of psychological approaches to alcoholism: Can we control the effects of alcohol?. *American Psychologist*, 39(12), 1337.

- Pego, C. M., Hill, R. F., Solomon, G. W., Chisholm, R. M., & Ivey, S. E. (1995). Tobacco, culture, and health among American Indians: A historical review. *American Indian Culture and Research Journal*, 19(2), 143-164.
- Petticrew, M., & Roberts, H. (2008). *Systematic reviews in the social sciences: A practical guide*. John Wiley & Sons.
- Pigott, T. (2012). *Advances in meta-analysis*. Springer Science & Business Media.
- Pinel, J. (2014). *Biopsychology*. Chicago: Pearson Education Limited.
- Population Assessment of Tobacco Health. (2015). About the study. Retrieved from <https://pathstudyinfo.nih.gov/UI/HomeMobile.aspx>
- Preedy, V. R. (2010). *Handbook of disease burdens and quality of life measures*. New York: Springer.
- Ramirez, J. R., Crano, W. D., Quist, R., Burgoon, M., Alvaro, E. M., & Grandpre, J. (2004). Acculturation, familism, parental monitoring, and knowledge as predictors of marijuana and inhalant use in adolescents. *Psychology of Addictive Behaviors*, 18(1), 3–11.
- Resnicow, K., Soler, R., Braithwaite, R. L., Ahluwalia, J. S., & Butler, J. (2002). Cultural sensitivity in substance use prevention: Bridging the gap between research and practice in community-based substance abuse prevention. *Journal of Community Psychology*, 28, 271–290.
- Rhee, S. H., Hewitt, J. K., Young, S. E., Corley, R. P., Crowley, T. J., & Stallings, M. C. (2003). Genetic and environmental influences on substance initiation, use, and problem use in adolescents. *Archives of General Psychiatry*, 60(12), 1256-1264.

- Romero, A. J., Martinez, D., & Carvajal, S. C. (2007). Bicultural stress and adolescent risk behaviors in a community sample of Latinos and non-Latino European Americans. *Ethnicity and Health, 12*(5), 443-463.
- Salas-Wright, C. P., Clark, T. T., Vaughn, M. G., & Córdova, D. (2015). Profiles of acculturation among Hispanics in the United States: links with discrimination and substance use. *Social Psychiatry and Psychiatric Epidemiology, 50*(1), 39-49.
- Salas-Wright, C.P., Robles, E.H., Vaughn, M.G., Córdova, D., & Figueroa, R.P. (2014). Toward a typology of acculturative stress: Findings from a national sample of Hispanic immigrants. *Hispanic Journal of Behavioral Sciences*.
- Schultz, E. A., Lavenda, R. H., & Dods, R. R. (2005). *Cultural anthropology: A perspective on the human condition*. New York: Oxford University Press.
- Smart, R. G. & Mora, M. E. M. (1986). Alcohol-control policies in Latin America and other countries. *Annals of the New York Academy of Sciences, 472*(1), 211-218.
- Sorrells, K. (2012). *Intercultural communication: Globalization and social justice*. Sage Publications.
- Soto, C., Unger, J. B., Ritt-Olson, A., Soto, D. W., Black, D. S., & Baezconde-Garbanati, L. (2011). Cultural values associated with substance use among Hispanic adolescents in southern California. *Substance Use & Misuse, 46*(10), 1223-1233.
- Squeglia, L. M., Jacobus, J., & Tapert, S. F. (2009). The influence of substance use on adolescent brain development. *Clinical EEG and Neuroscience, 40*(1), 31-38.

- Substance Abuse and Mental Health Services Administration. (2014). *Results from the 2013 National Survey on Drug Use and Health: Summary of National Findings*, NSDUH Series H-48, HHS Publication No. (SMA) 14-4863. Rockville, MD: Substance Abuse and Mental Health Services Administration.
- Szaflarski, M., Cubbins, L. A., & Ying, J. (2011). Epidemiology of alcohol abuse among US immigrant populations. *Journal of Immigrant and Minority Health, 13*(4), 647-658.
- Teruya, S. A., & Bazargan-Hejazi, S. (2013). The immigrant and Hispanic paradoxes a systematic review of their predictions and effects. *Hispanic Journal of Behavioral Sciences, 35*(4), 486-509.
- Tobler, N. S. (1992). Drug prevention programs can work: Research findings. *Journal of Addictive Diseases, 11*(3), 1-28.
- Ting-Toomey, S. (2012). *Communicating across cultures*. Guilford Press.
- Triandis, H. (2007). Culture and psychology: A history of the study of their relationship. In S. Kitayama & D. Cohen (Eds.), *Handbook of Cultural Psychology* (pp. 59–76). New York, NY: Guilford press.
- Turner, C. (2000). Cultural considerations in family-based primary prevention programs in drug abuse. *Journal of Primary Prevention, 18*(3), 285-303.
- Turner, L., Boutron, I., Hróbjartsson, A., Altman, D. G., & Moher, D. (2013). The evolution of assessing bias in Cochrane systematic reviews of interventions: celebrating methodological contributions of the Cochrane Collaboration. *Systematic Review, 2*(79), 10-1186.

- Uman, L. S. (2011). Systematic Reviews and Meta-Analyses. *Journal of the Canadian Academy of Child and Adolescent Psychiatry*, 20(1), 57–59.
- Unger, J. B., Baezconde-Garbanati, L., Shakib, S., Palmer, P. H., Nezami, E., & Mora, J. (2004). A cultural psychology approach to “drug abuse” prevention. *Substance Use and Misuse*, 39(10), 1779–1820.
- Unger, J. B., Ritt-Olson, A., Teran, L., Huang, T., Hoffman, B. R., & Palmer, P. (2002). Cultural values and substance use in a multiethnic sample of California adolescents. *Addiction Research and Theory*, 10(3), 257–279.
- Unger, J. B., Shakib, S., Gallaher, P., Ritt-Olson, A., Mouttapa, M., & Palmer, P. H. (2006). Cultural/interpersonal values and smoking in an ethnically diverse sample of Southern California adolescents. *Journal of Cultural Diversity*, 13(1), 55–63.
- Unger, J. B., Thing, J., Soto, D. W., & Baezconde-Garbanati, L. (2014). Associations between ethnic labels and substance use among Hispanic/Latino adolescents in Los Angeles. *Substance Use & Misuse*, 49(8), 1007-1016.
- U.S. Census Bureau. (2014, September 8). *Facts for Features: Hispanic Heritage Month* (Report No. CB14-FF.22). Retrieved from:
http://www.census.gov/content/dam/Census/newsroom/facts-for-features/2014/cb14ff-22_hispanic.pdf
- US Department of Health and Human Services. (2001). National standards for culturally and linguistically appropriate services in health care. *Washington, DC: USDHHS, OPHS, Office of Minority Health. Harris, KJ, JS Ahluwalia, KS Okuyemi, JR Turner, MN Woods, K. Resnicow, & CL Backinger, 447-458.*

- Valdez, A., Cepeda, A., Parrish, D., Horowitz, R., & Kaplan, C. (2013). An adapted brief strategic family therapy for gang-affiliated Mexican American adolescents. *Research on Social Work Practice, 23*(4), 383-396.
- Vega, W. A., Alderete, E., Kolody, B., & Aguilar-Gaxiola, S. (2000). Adulthood sequela of adolescent heavy drinking among Mexican Americans. *Hispanic Journal of Behavioral Sciences, 22*(2), 254-266.
- Vega, W. A., Alderete, E., Kolody, B., & Aguilar-Gaxiola, S. (1998). Illicit drug use among Mexicans and Mexican Americans in California: The effects of gender and acculturation. *Addiction, 93*(12), 1839-1850.
- Vega, W. A., Gil, A. G., & Kolody, B. (2002). What do we know about Latino drug use? Methodological evaluation of state databases. *Hispanic Journal of Behavioral Sciences, 24*(4), 395-408.
- Vega, W. A., & Sribney, W. (2003). Parental risk factors and social assimilation in alcohol dependence of Mexican Americans. *Journal of Studies on Alcohol and Drugs, 64*(2), 167.
- Vigil, D. (1979). Adaptation strategies and cultural life styles of Mexican American adolescents. *Hispanic Journal of Behavioral Sciences, 1*(4), 375-392.
- Villarreal, R., Blozis, S. A., & Widaman, K. F. (2005). Factorial invariance of a Pan-Hispanic familism scale. *Hispanic Journal of Behavioral Sciences, 27*(4), 409–425.

- Wallace, J. M., & Bachman, J. G. (1991). Explaining racial/ethnic differences in adolescent drug use: The impact of background and lifestyle. *Social Problems, 38*, 333-357.
- Warner, L. A., Valdez, A., Vega, W. A., de la Rosa, M., Turner, R. J., & Canino, G. (2006). Hispanic drug abuse in an evolving cultural context: An agenda for research. *Drug and Alcohol Dependence, 84*, 8-16.
- West, J. H., Blumberg, E. J., Kelley, N. J., Hill, L., Sipan, C. L., Schmitz, K. E., Ryan, S., Clapp, J. & Hovell, M. F. (2010). Does proximity to retailers influence alcohol and tobacco use among Latino adolescents?. *Journal of Immigrant and Minority Health, 12*(5), 626-633.
- Whitbeck, I. B. (2006). Some guiding assumptions and a theoretical model for developing culturally specific preventions with Native American people. *Journal of Community Psychology, 34*, 183–192. doi:10.1002/jcop.20094
- Wilkinson, A. V., Shete, S., Spitz, M. R., & Swann, A. C. (2011). Sensation seeking, risk behaviors, and alcohol consumption among Mexican origin youth. *Journal of Adolescent Health, 48*(1), 65-72.
- Yan, F. A., Beck, K. H., Howard, D., Shattuck, T. D., & Kerr, M. H. (2008). A structural model of alcohol use pathways among Latino youth. *American Journal of Health Behavior, 32*(2), 209-219.
- Yoshii, A., Plaut, D. A., McGraw, K. A., Anderson, M. J., & Wellik, K. E. (2009). Analysis of the reporting of search strategies in Cochrane systematic reviews. *Journal of the Medical Library Association: JMLA, 97*(1), 21.

Yu, C. (2002). Meta-analysis and effect size. Retrieved April 30, 2002, from

<http://seamonkey.ed.asu.edu/~alex/teaching/WBI/es.html>

Zamboanga, B. L., Schwartz, S. J., Jarvis, L. H., & Van Tyne, K. (2009). Acculturation and substance use among Hispanic early adolescents: Investigating the mediating roles of acculturative stress and self-esteem. *The Journal of Primary Prevention*, 30(3-4), 315-333.