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Perceptions of Social Support, Empowerment and Youth Risk Behaviors

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INTRODUCTION

Research has shown that the various relationships adolescents have influence their health behaviors. This finding holds true in research on Latino populations living in the US¹ and in other countries.² At times, relationships can lead to increased risk taking. For example peers have been shown to influence increased alcohol use^{3,4} and smoking.⁵ Additionally, peers, family members and older siblings who smoke have been shown to influence smoking behavior.⁶ Moreover, parental relations in the form of lack of monitoring has been shown to influence smoking, fighting and sexual behavior.⁷

However, relationships also can be protective,^{8,9} build resiliency,^{10,11} or lead to promotive factors.¹² For example youth with supportive relationships from parents and school showed less use of alcohol, marijuana and cigarettes.^{13,14} Additionally, youth who have more protective factors or assets have been found to have lower odds of sexual risk taking¹⁵ and

youth living in one parent homes with the specific asset of family communication have lower odds of aggression and delinquency.¹⁵

Research has demonstrated that relationships, whether risk enhancing or protective, occur across ecological levels spanning highly bonded interpersonal relationships to weaker social or community ties.^{16, 17} Applied to adolescent relationships respectively, these ties could be immediate familial relations moving out to relationships with neighbors and community members. Interestingly, research has shown that risk enhancing or protective influence can occur among strong and weak tie relationships.^{18, 19}

In relationships, particularly at the organizational, community and policy levels of the ecological model, individuals are not merely acted upon but they also act to create change within these realms. Community empowerment theory describes a “social action process by which individuals, communities, and organizations gain mastery over their lives in the context of changing their social and political environment...”²⁰ Participation in these social change processes reduces isolation,^{16, 21, 22} increases community social protective relations,^{20, 23} and has been linked to better self-reported health status.²⁴⁻²⁶ Moreover, these social ties may create positive organizational and community outcomes such as health promoting policy change.^{20, 27} In an adolescent’s life, community empowerment may take the form of youth defining and addressing school issues through collective action, and in the process may protect youth from engaging in risk behaviors, although the latter has yet to be investigated fully. Recently linkages between empowerment theory and adolescent resilience have been discussed as both fields focus on assets in youths’ lives and youths’ ability to proactively function in environmental setting.²⁸

The purpose of this study is to examine the protective influence social support has across several ecological levels and the influence community empowerment may have among middle school students living in a large city in Mexico and attending public or private school. Behavioral outcomes for this study included those measured in the Youth Risk Behavior Survey conducted in the US, and for this paper will focus specifically on self-reported physical fighting, lifetime alcohol use, lifetime tobacco use, and lifetime sexual activity.

BACKGROUND

In Mexico, as in all countries youth are making choices that influence their health. Information about violence and particularly fighting among Mexican youth is largely unavailable. Moreover, data from Hispanic middle school youth living in the US are also sparse. One recent study showed high school aged Hispanic youth living in the US report 50% of males and 33% of females having been in a physical fight.²⁹

Past research has shown that Mexican youth are using alcohol, tobacco, and engaging in sexual activity. Regarding alcohol use, Pan American Country Health Profile for Mexico (2001) indicated that growing number of youth are consuming alcohol in Mexico. For example, between 1986 and 1994 alcohol use among youth aged 12–18 years reportedly increased 18% to 74% lifetime use.³⁰

As for smoking, findings from the Global Youth Tobacco Survey estimated that 20% of students aged 12–14 years in a Mexican city located near the Texas Mexico border currently use some form of tobacco, and 17% of them smoke cigarettes.³¹ In another recent study, results indicate that 33% of youth in Mexico began smoking between the ages of 11–15 years.³² Another study of Mexican youth showed that by age 15, 50% of youth had tried alcohol or tobacco,³³ that boys began alcohol use at age 17, and cigarettes at age 18. Moreover, there is a trend for Mexican youth to smoke at an earlier age and boys are more likely than girls to smoke.³⁴

Regarding sexual activity, the Pan American Country Health Profile for Mexico (2001) indicated that 16% of live births were to teenagers, but the number of youth who report contraceptive use increased between 1986 and 1992 to about 36%.³⁰ More recent data from ADD Health survey (7–12 graders) examined the sexual initiation of immigrant youth from Mexico and Puerto Rico found that youth from Spanish speaking households were more likely to be sexually active than non-Spanish speaking households and approximately 31% of youth who self-identified as Mexican were non-virgins.³⁵

Current representative data from Mexican school-aged youth in a large Mexican city are largely unavailable. This study provides unique insight into several risk behaviors of urban middle school Mexican youth.

METHODS

Survey

Developed with the secretary of education for the state of Tamaulipas in Mexico, an adapted Youth Risk Behavior Survey in Spanish was created. Similar to the US National Youth Risk Behavior Survey conducted by CDC,²⁹ the instrument includes several behavioral risk factors items (e.g., violence and injuries, bicycle safety, tobacco use, physical activity, and nutrition) as well as additional items on social support, and empowerment. All items underwent forward/backward translation and were pilot tested in two schools. A recent study of the YRBS middle school survey showed acceptable test retest reliability using the English version of the survey.³⁶

Sampling

The finalized survey was conducted in Matamoros, Mexico (450,291 Mexican census 2005)³⁷ located directly across the US border from Brownsville, Texas. During the 2002–2003 school year there were a total of 32 middle schools, including public (n=21) and private (n=11) schools which were included in the sampling frame for this study. The secretary of education of Tamaulipas provided the sampling frame. There were 7,165 students in the seventh grade and 6,514 students in the eighth grade. A full description of the study has been provided previously;³⁸ therefore, only a brief summary focusing on middle schools will be provided. Middle schools were stratified using the total number of classes in each middle school; those with 20 or more seventh and eighth-grade classes, and those with fewer than 20 seventh and eighth-grade classes. The sampling design implemented for this cross-sectional survey was a two-stage stratified cluster design. The sample size required for

this survey was estimated using as main outcomes of interest the prevalence of violent behavior and drug use among students. These behaviors, estimated to have a prevalence of 10%, were chosen because they were expected to have the lowest prevalence of risky behaviors. Assuming a type I error level of 0.05% and a precision level of 25% from the true population value, we required a minimum of 1368 seventh and eighth grade students.

Using an estimated participation rate of 61%, we randomly selected five middle schools that had fewer than 20 seventh and eighth-grade classes and four middle schools that had 20 or more seventh and eighth-grade classes. Seeking to obtain similar weights across strata of classes, we selected all seven and eighth-grade classes from the middle schools with fewer than 20 seventh and eighth-grade classes. Two middle schools with fewer than 20 seventh and eighth-grade classes refused to participate as well as two middle schools with more than 20 seventh and eighth-grade classes refused to participate. The sample included 1233 respondents, from 9 of the 32 middle schools, representing 9% of seventh and eighth-grade students in Matamoros during 2002–2003. Youth 11 or less and 16 or more represented less than 15 cases and were excluded from all analyses in this manuscript. Final sample size for this study was $n=1181$ corresponding to a weighted sample of 13,159.

Consent Procedures

The study protocol and instrument was approved by Committee for the Protection of Human Subjects for The University of Texas Houston Health Science Center and the Ministry of Education of the State of Tamaulipas, Mexico. An active consenting procedure was used, therefore, consent forms were sent home with students and only those students whose parents returned the consent participated in the study. The questionnaires were self-administered; however trained room monitors were present. Questionnaires were administered during regularly class time. The school response rate was 100%. Based on the total number of eligible students in the school, the student response rate for seventh grade students was 44% and the student response rate for eighth grade students was 43%. Some of the reasons that consent forms were not returned or children were not allowed to participate included student forgetting forms, parents did not want their children to participate, parents were out of town leaving children with unregistered guardians.

Social Support—To assess social support, 14 items were included in the survey set on a completely agree (1) to completely disagree (4) four point Likert scale. Principal component factor analysis with varimax rotation was conducted to identify social support subscales. A six factor solution explained 66.7% of the variance with factor loading at least .38 or higher. All but one factor had no other loadings at .25 or higher. One factor, with an eigenvalue less than one, had one survey item load on it and thus was dropped from all further analyses. The remaining subscales used in the analyses are described below.

Empowerment—Nine items in the survey measured empowerment on a completely agree (1) to completely disagree (4) four point Likert scale. Principal component factor analysis with varimax rotation was conducted to identify empowerment subscales. However moderate to high factor loading ($>.53$) of all items on the first unrotated factor indicated that the scale was unidimensional. The Cronbach alpha for the scale is .75. Some example items

from this scale include “Youth my age are able to make my school better” and “I am able to express my opinions to people in authority.” This scale was adapted from the Adolescent Health Attitude and Behavior Survey.³⁹

Youth Risk Behaviors—Items which measured the youth’s risk behaviors were based on the Youth Risk Behavior Survey (YRBS) (Kann et al, 2000) administered in the United States every two years by the Centers for Disease Control and Prevention. In particular the items in the Mexico youth survey were based on the middle school version of the YRBS which focus on behaviors in the past 12 months or over lifetime rather than past 30 days and specifically measured aggressive behavior (fighting in the last 12 months), alcohol use (ever drank alcohol in life), tobacco use (ever smoked even one or two puffs), and sexual behavior (ever had sexual relations). All risk behaviors in the logistic regressions were dichotomized because of small sample sizes.

Socio Demographic Characteristics—Items which measured the youth’s social and demographic characteristics were also based on the middle school version of the Youth Risk Behavior Survey (Kann et al. 2000). Youth were asked their age (11 or less, 12, 13, 14, 15, 16 or more), their gender (female, male) and how they would describe their families economic level (high, medium, low).

Data Management and Statistical Analysis—All data from the questionnaires was scanned. Data cleaning including checking for inconsistencies and verifying responses was done using SAS (version 9.1) software.⁴⁰ We computed probabilistic sampling weights to account for differential inclusion probabilities in the cluster sampling at the school level. Sampling weights were the inverse of the selection probability for the sampling ratio at each stage of selection. In Matamoros, nonresponse adjustment and ratio adjustment for seventh and eighth-grade students enrolled in all public and private middle schools were implemented using the sampling frame provided. Nonresponse adjustment accounts for students who refused to complete the questionnaire and students who were absent the day of the survey. The ratio adjustment was to ensure that the gender composition of the sample was the same as that of the total school enrollment in Matamoros. Sample design characteristics, including the clustering of students within schools and stratification of the sample, were accounted for using the sampling weights. Weighted percentages, weighted means, weighted standard errors, and weighted test statistics (chi square and t tests) were calculated using SUDAAN version 9.0.0 software⁴¹. Statistical significant associations were established using a type I error level of 0.05.

Weighted multiple logistic regression analyses were stratified by gender because of significant differences in one of the behavioral outcome and two of the independent variables found in bivariate analysis. Additionally, weighted logistic regression analyses revealed statistical significant differences in one out of six independent variables and two out of four outcome variables by socio economic status and age. In the weighted multiple logistic regression analyses, the behavioral outcome variables and the predictor variables were dichotomized. Age was included in all analyses as a continuous variable and economic status was examined for statistical significance in all models, but only forced into the model when the bivariate analysis indicated it was significant. In all cases SES was included in the

model as a continuous variable. Finally, we explored several multiplicative interaction factors between the subscales. These interactions were evaluated for their statistical significance in the weighted multiple logistic regression models using one interaction term at a time due to the limited number of degrees of freedom for the multivariate analysis.

RESULTS

Univariate and Bivariate Results

The mean for each subscale for all but one scale were approximately midpoint with good dispersion of responses (Table 2). The only scale mean that showed skewness and less dispersion was perceived social support from family. All but 12 girls and all but 3 boys agreed with their family giving them support. Statistically significant differences were found by gender on perceived social support from friends ($P=.0000$) and perceived social support from other adults ($P=.02$) (Table 2). There was a marginally statistical significant association between gender on perceived social support from family. No significant statistical differences were found by age on the independent variables. Finally, a statistically significant difference was found by economic status on the perceived social support from parent/teacher interactions about school scale ($P=.02$).

Approximately one third of our sample of middle school students reported agreement with participating in a fight in past 12 months, drinking alcohol and smoking cigarettes in lifetime (Table 3). Moreover, 8% of sample reported having sex in lifetime. As expected there were some statistically significant differences by age and tobacco use ($P=.013$) and age and sexual activity ($P=.03$). Fighting differed significantly by gender ($P=.06$). The association between fighting and economic status was statistically significantly different ($P=.001$). The association between gender and tobacco use, gender and sexual activity and tobacco use and economic status were considered marginally statistically significant ($P=.06$, $P=.09$, $P=.07$ respectively).

Adjusted Odds Ratios for Female Students—For all the multiple logistic regression models for females the variable of perceived social support from family was left in the model because all but 12 girls reported agreement with this scale. This variable represents an important source of support as shown by little variation in the responses and therefore is left in to control for its influence (Table 4).

Fighting among Girls

Unlike other outcome variables, age and economic status were not statistically significant although borderline in this model for girls when examining the outcome of fighting. For girls who report disagreement with support from parent/teacher interactions about school the odds of fighting was higher [AOR=3.5 95% CI: (1.05, 11.69)] than for girls who report agreement with support from parent/teacher interactions about school. The effect of family support was sizable [AOR=2.17 95% CI: (.82, 5.76)] but due to the fact that only 2.5% of the girls reported disagreement with family support, this association is not statistically significant. No interaction terms were significant in this model.

Alcohol Use Among Girls

For every year increase in age, the odds of drinking increase by a factor of 49%. For girls who disagreed that they had support from parent/teacher interactions about school the odds of drinking was higher [AOR=3.52 95% CI: (2.27, 5.48)] than for girls who agreed they had support from parent/teacher interactions about school. The effect of family support was small [AOR=1.03 95% CI: (.35, 3.04)] but due to the fact that only 2.5% of the girls reported disagreement with family support, which resulted in large variance 1. For girls who disagreed they had support from other adults the odds of drinking were lower [AOR=.36 95% CI: (.17, .77)] than for girls who agreed they had support from other adults.

Tobacco Use among Girls

For every year increase in age, the odds of using tobacco increase by a factor of 64%. Even though SES was not statistically significant, it was maintained in the model to control for potential confounding. For girls who disagreed that they had support from parent/teacher interactions about school, the odds of smoking was higher [AOR=4.32 95% CI: (2.43, 7.68)] than for girls who agreed they had support from parent/teacher interactions about school. The effect of family support was small [AOR=1.18 95% CI: (.31, 4.46)] but due to the fact that only 2.5% of the girls reported disagreement with family support, which resulted in a large variance, this association is not statistically significant.

Sexual Activity among Girls

We did not observed any statistically significant differences perhaps due to the fact that 2.5% of the girls sample who report not having family support and less than 5% report having sexual behavior.

Adjusted Odds Ratios for Male Students—For all of the multiple logistic regression models the family support variable was excluded because all but three boys indicated agreement with family support.

Fighting among Boys

Age was not statistically significant in the model examining the outcome of boys fighting. The interaction term between support from friends with support from other adults was statistically significant. Boys who report disagreement with both friend support and other adult support are more likely [AOR=3.56 95% CI: (1.11, 11.46)] to fight as compared to boys who agree with one or both friend and other adult support.

Alcohol Use among Boys

Age was not statistically significant but remains in the model to control for potential confounding. Among boys who report disagreement with a sense of empowerment the odds of drinking is higher [AOR=1.39 95% CI: (1.04, 1.87)] than for boys who report agreement with a sense of empowerment. Finally, among boys who report disagreement with support from neighbors the odds of drinking is higher [AOR=1.73 95% CI: (1.09, 2.74)] than for boys who report support from neighbors.

Tobacco Use among Boys

Even though age and economic status were not statistically significant, they were maintained in the model to control for potential confounding. Among boys who report disagreement with a sense of empowerment the odds of smoking is higher [AOR=1.78 95% CI: (1.29, 2.45)] than for boys who report agreement with a sense of empowerment.

Sexual Activity among Boys

Age was not statistically significant but remains in the model to control for potential confounding. Among boys who report disagreement with support from parent/teacher interactions about school the odds of sexual activity is higher [AOR=2.08 95% CI: (1.29, 3.35)] than for boys who report agreement with support from parent/teacher interactions about school.

DISCUSSION

This study examined the protective influence of perceived social support and empowerment on risk behaviors among a sample of middle school students from Matamoros, Mexico. The findings indicate that social support from the ecological levels most immediate to the youth (family and teachers) are protective against risky behaviors (fighting, alcohol and tobacco use for girls, and sexual activity for boys). Social support from ecological levels most removed from the youth (neighbors and other adults) appear to have mixed influence on risk behaviors. Finally, a youth's sense of empowerment plays a protective role for alcohol use and tobacco use among boys.

This study demonstrates that for Mexican girls support from parent/teacher interactions about school is important in protecting against fighting, alcohol use and tobacco use. Among boys, the odds of having sex was higher if there was disagreement with support from parent/teacher interactions about school. Other research has also found that school support is an influence on risk behaviors.⁴² Clearly, school support is an important influence in Mexican children of this age. Strategies to maintain over time and enhance feelings of support from parent/teacher interactions about school among youth may be an effective strategy for curbing participation in risk behaviors.

A scale measuring empowerment or a person's confidence regarding collective action across several ecological levels (school, neighborhood, community) was also included in this study. Results indicate that for girls disagreement with a sense of empowerment has no effect on risk behaviors. However, boys who disagree with a sense of empowerment were more likely to use alcohol and tobacco. These results suggest that boys who feel a lack of power cope by turning to alcohol and tobacco – both substances capable of altering one's mood.

The logistic regression model for sexual activity among Mexican girls was a unique and interesting model. Moreover, the number of girls who reported having sexual activity was very small (n=25). In this model there were no main effect variables that were significant. Therefore, sexual activity among Mexican girls aged 12–15 can not be explained by lack of perceived social support or lack of empowerment. One might hypothesize that forced sexual activity may be a likely explanation for sexual behavior among young girls, but

unfortunately this study asked no questions regarding forced sex. A question that was asked in the survey however was age at first intercourse. Of the 25 girls who reported sexual activity, 11 reported having first sexual intercourse between the ages of 8 and 12, 14 responded that they had had sex after age 12, and one had missing information. Research has shown that the proportion of non-voluntary sexual activity at younger ages is higher than at older ages.⁴³ Laumann, 1996 1483/id;) In our study, approximately 56.6% (weighted percentage) of the girls who responded affirmatively to having sex initiated sex at 12 years or younger. Certainly this finding warrants further investigation regarding whether the sex act was forced and the relationship existing between the partners. Our study clearly showed that younger aged girls who report having sex do not have the same protective and risk factors influencing their sexual activity as do the behaviors of fighting, alcohol and tobacco use.

Another interesting finding for girls was found in reduced odds of drinking when the girls reported disagreement with support from other adults. We interpret this finding in light of the high percentage of girls who report family support to mean that girls who are receiving support from a close proximity source such as family are not seeking support outside these realms from other adults. Therefore, they have the support they need from family, report disagreement with support from other adults and also do not report engaging in alcohol use behaviors.

Among the boys, one interaction term was significant, that of social support from friends with social support from other adults. Disagreement with friend support in the presence of other adult support increased odds of fighting. Therefore, even in the presence of family support, Mexican boys who do not have friend support and other adult support are more likely to report fighting.

Age was found to be an important variable in examining the effects of two risk behaviors among girls (alcohol use and tobacco use). In most research on adolescent health, as age increases so does the agreement with partaking in risk behaviors⁴⁴. Surprisingly however, this study found that among boys aged 12–15 years in middle school, age was not significant predictor of risk behavior.

Finally another important finding for adolescent health research is that support from friends was insignificant in every model for girls and boys. Friend support among these middle school student neither increased nor decreased the odds of risk behaviors. Examining this influence at the high school level is proposed for future research among a sample of Mexican students.

This study also provides important information regarding the overall prevalence of risk behaviors of Mexican youth. The risk behaviors of Mexican students in this study, all of whom live in a large Mexican city are either lower or comparable to that of risk behaviors found among US middle school students from large cities.⁴⁵

Finally, this study coincides with research that Mexican families have a high sense of interdependence and support (familismo).^{46, 47} Past research has found that children in a Mexican families have a great sense of obligation to the family that is expressed through

helping the family on a daily basis⁴⁸ with tasks such as caring for siblings and translating information.⁴⁹ In this study, we found that youth reported agreement with family support almost unanimously. For girls, the impact of family support was apparent in all outcome models although not statistically significant presumably because of the small sample of girls (n=12) who disagreed that family support was present. For middle school boys family support was overwhelmingly agreed to be present in their lives and therefore because of lack of variability was removed from the risk behavior model, but certainly cannot be removed from the interpretation of these data as it is a constant presence in their lives.

There are limitations to this study. As this is cross sectional data, the association reported may not provide causal relationships. Additionally, other researchers have found that these behaviors influence each other. For example, one study found that 11% of youth who were drinkers and drug users were involved in fights⁵⁰. Therefore, youth may engage in more than one behavior. Another limitation is inherent in self-reported survey methodology. In order for the student to feel comfortable in reporting sensitive information about their behaviors we obtained anonymous self-reported data. The drawback of this method is an inability to contact the individual students to clarify missing or confusing response patterns. As a result the sample size varied for different variables as shown in tables 2 and 3.

This study provides insight into the behaviors of youth in Matamoros, Mexico, which to date is sparse. Moreover, these data indicate that relationships among family and school for middle school children who are attending public and private schools no matter their economic status provides protective influences. Moreover, this study shows that an ecological perspective of working with Mexican youth to prevent risk behaviors is appropriate particularly where the youth themselves, their families and their school environments can be engaged in maintaining healthy behaviors.

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Reference List

1. Mulvaney-Day NE, Alegria M, Sribney W. Social cohesion, social support, and health among Latinos in the United States. *Soc Sci Med.* 2007; 64(2):477–95. [PubMed: 17049701]
2. Springer A, Parcel G, Baumler E, et al. Supportive social relationships and adolescent health risk behavior among secondary school students in El Salvador. *Soc Sci Med.* 2006; 62(7):1628–40. [PubMed: 16169644]
3. O'Malley PM, Johnston LD, Bachman JG. Alcohol use among adolescents. *Alcohol Health Res World.* 1998; 22(2):85–93. [PubMed: 15706782]
4. Almodovar A, Tomaka J, Thompson S, et al. Risk and protective factors among high school students on the US/Mexico border. *Am J Health Behav.* 2006; 30(6):745–52. [PubMed: 17096630]
5. Hoffman BR, Monge PR, Chou CP, et al. Perceived peer influence and peer selection on adolescent smoking. *Addict Behav.* 2006; 32(8):1546–54. [PubMed: 17188818]
6. Bricker JB, Peterson AV, Robyn AM, et al. Close friends', parents', and older siblings' smoking: reevaluating their influence on children's smoking. *Nicotine Tob Res.* 2006; 8(2):217–26. [PubMed: 16766414]

7. Springer AE, Sharma S, de Guardado AM, et al. Perceived parental monitoring and health risk behavior among public secondary school students in El Salvador. *Scientific World Journal*. 2006; 6:1810–4. [PubMed: 17195877]
8. Griffin KW, Botvin GJ, Scheier LM, et al. Common predictors of cigarette smoking, alcohol use, aggression, and delinquency among inner-city minority youth. *Addict Behav*. 2003; 28(6):1141–8. [PubMed: 12834656]
9. Hawkins JD, Catalano RF, Miller JY. Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: implications for substance abuse prevention. *Psychol Bull*. 1992; 112(1):64–105. [PubMed: 1529040]
10. Kumpfer KL, Bluth B. Parent/child transactional processes predictive of resilience or vulnerability to “substance abuse disorders”. *Subst Use Misuse*. 2004; 39(5):671–98. [PubMed: 15202804]
11. Kegler MC, Oman RF, Vesely SK, et al. Relationships among youth assets and neighborhood and community resources. *Health Educ Behav*. 2005; 32(3):380–97. [PubMed: 15851545]
12. Fergus S, Zimmerman MA. Adolescent resilience: a framework for understanding healthy development in the face of risk. *Annu Rev Public Health*. 2005; 26:399–419. [PubMed: 15760295]
13. Resnick MD. Resilience and protective factors in the lives of adolescents. *J Adolesc Health*. 2000; 27(1):1–2. [PubMed: 10867345]
14. Pharris MD, Resnick MD, Blum RW. Protecting against hopelessness and suicidality in sexually abused American Indian adolescents. *J Adolesc Health*. 1997; 21(6):400–6. [PubMed: 9401859]
15. Oman RF, Vesely SK, Aspy CB. Youth assets, aggression, and delinquency within the context of family structure. *Am J Health Behav*. 2005; 29(6):557–68. [PubMed: 16336110]
16. Kawachi I, Berkman LF. Social ties and mental health. *J Urban Health*. 2001; 78(3):458–67. [PubMed: 11564849]
17. Berkman, LF. The relationship of social networks and social support to morbidity and mortality. In: Cohen, S.; Syme, SL., editors. *Social Support and Health*. Orlando: Academic Press; 1985. p. 241–62.
18. Schwartzler, RL. Possible impact of social ties and support on morbidity and mortality. In: Veiel, HOF.; Baumann, U., editors. *The Meaning and Measurement of Social Support*. New York: Hemisphere; 1992. p. 65–84.
19. Cohen, S.; Kaplan, JR.; Manuk, SB. Social support and coronary heart disease. In: Shumaker, SA.; Czajkowski, SM., editors. *Social Support and Cardiovascular Disease*. New York: Plenum; 1994. p. 86–118.
20. Wallerstein N. Powerlessness, empowerment, and health: implications for health promotion programs. *Am J Health Promot*. 1992; 6(3):197–205. [PubMed: 10146784]
21. Boneham MA, Sixsmith JA. The voices of older women in a disadvantaged community: issues of health and social capital. *Soc Sci Med*. 2006; 62(2):269–79. [PubMed: 16039027]
22. Minkler M. Building supportive ties and sense of community among the inner-city elderly: the Tenderloin Senior Outreach Project. *Health Educ Q*. 1985; 12(4):303–14. [PubMed: 4077543]
23. Labonte R. Health promotion and empowerment: reflections on professional practice. *Health Educ Q*. 1994; 21(2):253–68. [PubMed: 8021151]
24. Parker EA, Lichtenstein RL, Schulz AJ, et al. Disentangling measures of individual perceptions of community social dynamics: results of a community survey. *Health Educ Behav*. 2001; 28(4):462–86. [PubMed: 11465157]
25. Kawachi I, Berkman LF. Social ties and mental health. *J Urban Health*. 2001; 78(3):458–67. [PubMed: 11564849]
26. Kim D, Kawachi I. A multilevel analysis of key forms of community- and individual-level social capital as predictors of self-rated health in the United States. *J Urban Health*. 2006; 83(5):813–26. [PubMed: 16810567]
27. Zimmerman MA, Ramirez-Valles J, Suarez E, et al. An HIV/AIDS prevention project for Mexican homosexual men: an empowerment approach. *Health Educ Behav*. 1997; 24(2):177–90. [PubMed: 9079577]
28. Ostaszewski K, Zimmerman MA. The effects of cumulative risks and promotive factors on urban adolescent alcohol and other drug use: a longitudinal study of resiliency. *Am J Community Psychol*. 2006; 38(3–4):237–49. [PubMed: 17004127]

29. Eaton DK, Kann L, Kinchen S, et al. Youth risk behavior surveillance—United States, 2005. *MMWR Surveill Summ.* 2006; 55(5):1–108. [PubMed: 16760893]
30. Pan American Health Organization. Health in Americas 1998 Mexico (on-line). Available at: <http://www.paho.org/english/sha/prflmex.htm>. Accessed June 4, 2007
31. Office on Smoking and Health National Center for Chronic Disease Prevention and Health Promotion. Global Youth Tobacco Survey(GYTS) Mexico – Nuevo Laredo Fact Sheet (on-line). Available at: http://www.cdc.gov/tobacco/Global/GYTS/factsheets/paho/2003/mexiconuevolaredo_factsheet.htm. Accessed June 4, 2007
32. Rasmussen-Cruz B, Hidalgo-San MA, Nuno-Gutierrez BL, et al. Tobacco consumption and motives for use in Mexican university students. *Adolescence.* 2006; 41(162):355–68. [PubMed: 16981622]
33. Herrera-Vazquez M, Wagner FA, Velasco-Mondragon E, et al. Onset of alcohol and tobacco use and transition to other drug use among students from Morelos, Mexico. *Salud Publica Mex.* 2004; 46(2):132–40. [PubMed: 15176575]
34. Lotrean LM, Sanchez-Zamorano LM, Valdes-Salgado R, et al. Consumption of higher numbers of cigarettes in Mexican youth: the importance of social permissiveness of smoking. *Addict Behav.* 2005; 30(5):1035–41. [PubMed: 15893101]
35. Guilamo-Ramos V, Jaccard J, Pena J, et al. Acculturation-related variables, sexual initiation, and subsequent sexual behavior among Puerto Rican, Mexican, and Cuban youth. *Health Psychol.* 2005; 24(1):88–95. [PubMed: 15631566]
36. Zullig KJ, Pun S, Patton JM, et al. Reliability of the 2005 middle school Youth Risk Behavior Survey. *J Adolesc Health.* 2006; 39(6):856–60. [PubMed: 17116516]
37. Instituto Nacional de Estadística Geográfica e Informática (INEGI). Sistemas Nacionales Estadístico y de Información Geográfica. II conteo de población y vivienda 2005 (on-line). Available at: http://www.inegi.gob.mx/lib/olap/general_ver3/MDXQueryDatos.asp?#Regreso&c=7247. Accessed June 4, 2007
38. Perez A, Reininger BM, Aguirre Flores MI, et al. Physical activity and overweight among adolescents on the Texas-Mexico border. *Rev Panam Salud Publica.* 2006; 19(4):244–52. [PubMed: 16723065]
39. Reininger B, Evans AE, Griffin SF, et al. Development of a youth survey to measure risk behaviors, attitudes and assets: examining multiple influences. *Health Educ Res.* 2003; 18(4):461–76. [PubMed: 12939128]
40. MS Windows. , editor. SAS Statistical Software [computer program]. Cary NC: SAS Institute Inc; 2004.
41. SUDAAN. Software for the Statistical Analysis of Correlated Data Version 9.0.0 [computer program]. Research Triangle Park, NC: 2005.
42. Resnick MD, Bearman PS, Blum RW, et al. Protecting adolescents from harm. Findings from the National Longitudinal Study on Adolescent Health. *JAMA.* 1997; 278(10):823–32. [PubMed: 9293990]
43. Abma J, Driscoll A, Moore K. Young women’s degree of control over first intercourse: an exploratory analysis. *Fam Plann Perspect.* 1998; 30(1):12–8. [PubMed: 9494810]
44. Eaton DK, Kann L, Kinchen S, et al. Youth risk behavior surveillance – United States, 2005. *J Sch Health.* 2006; 76(7):353–72. [PubMed: 16918870]
45. Whalen, LG.; Graunbaum, J.; Kinchen, S., et al. Middle School Youth Risk Behavior Survey, 2003. U.S. Department of Health and Human Services, Center for Disease Control and Prevention; 2005.
46. Sabogal F, Marin G, Otero-Sabogal R, et al. Hispanic familism and acculturation: What changes and what doesn’t? *Hispanic Journal of Behavioral Sciences.* 1987; 9(4):397–412.
47. Ong AD, Phinney JS, Dennis J. Competence under challenge: Exploring the protective influence of parental support and ethnic identity in Latino college students. *J Adolesc.* 2006; 29(6):961–79. [PubMed: 16750847]
48. Hardway C, Fuligni AJ. Dimensions of family connectedness among adolescents with Mexican, Chinese, and European backgrounds. *Dev Psychol.* 2006; 42(6):1246–58. [PubMed: 17087556]
49. Orellana MF. Responsibilities of children in Latino immigrant homes. *New Dir Youth Dev.* 2003; (100):25–39. [PubMed: 14750267]

50. Kodjo CM, Auinger P, Ryan SA. Prevalence of, and factors associated with, adolescent physical fighting while under the influence of alcohol or drugs. *J Adolesc Health*. 2004; 35(4):346. [PubMed: 15830460]

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Table 1

Subscales Measuring Social Support: Items and Psychometric Properties

Social Support Subscales	Subscale Items	Eigenvalue	Percent of variance	Cronbach Alpha
Perceived support from friends (PSS–Friends)	<ul style="list-style-type: none"> • My school friends worry about me • My friends always support me in every situation • When I have problems, my friends support me 	2.99	21.4	.79
Perceived social support from parent/teacher interactions about school (PSS–School)	<ul style="list-style-type: none"> • I talk with my parents/guardians when I need help with something • I feel my teachers worry about me • My parents/guardians are actively involved in my homework • My parents/guardians talk to my teachers regularly 	1.84	13.2	.53
Perceived support from Family (PSS–Family)	<ul style="list-style-type: none"> • My family shows me support • My family is a support for me 	1.36	9.7	.63
Perceived support from neighbors (PSS–Neighbors)	<ul style="list-style-type: none"> • My neighbors show me support by worrying about me • If I need help and am not able to find my parents/guardians I am able to ask my neighbors to help 	1.13	8.1	.63
Perceived support from other adults (PSS–Other Adults)	<ul style="list-style-type: none"> • I have support of adults other than my parents • Adults are in my life, different than my parents, who care about me. 	1.04	7.4	.54

Perceived Social Support (PSS) and Empowerment Scale Weighted Means, Standard Error (SE) and p-value by Demographic Characteristics of Middle School Students in Matamoros, Mexico 2003 (Sample size n=1,181 corresponding to N=13,159 students in the population*)

Table 2

Descriptive Characteristics	Sample		Independent Variables								
	Weighted %	SE	PSS* - Friend Mean (SE)	PSS - School Mean (SE)	PSS - Family Mean (SE)	PSS - Neighbor Mean (SE)	PSS - Other adult Mean (SE)	Empowerment Mean (SE)			
Total Sample			(n=1,146, N=12,812) 1.81 (.04)	(n=1,120, N=12,514) 1.84 (.04)	(n=1,171, N=13,079) 1.18 (.01)	(n=1,141, N=12,685) 2.36 (.03)	(n=1,128, N=12,615) 1.76 (.03)	(n=1,052, N=11,822) 2.20 (.03)			
Gender			P=.0000	P=.31	P=.06	P=.48	P=.02	P=.59			
Female	51.6	1.1	1.57 (.05)	1.82 (.03)	1.20 (.02)	2.33 (.06)	1.66 (.05)	2.18 (.05)			
Male	48.4	1.1	2.07 (.06)	1.85 (.05)	1.16 (.01)	2.39 (.03)	1.86 (.04)	2.22 (.04)			
Age			(n=1,146, N=12,812) P=.75	(n=1,120, N=12,514) P=.09	(n=1,171, N=13,096) P=.38	(n=1,141, N=12,685) P=.29	(n=1,128, N=12,616) P=.23	(n=1,052, N=11,822) P=.42			
12	23.2	1.5	1.83 (.08)	1.85 (.04)	1.17 (.02)	2.35 (.12)	1.73 (.06)	2.15 (.09)			
13	43.2	2.3	1.80 (.04)	1.79 (.06)	1.17 (.01)	2.33 (.06)	1.73 (.08)	2.21 (.02)			
14	28.9	2.8	1.78 (.05)	1.85 (.02)	1.15 (.03)	2.41 (.06)	1.80 (.07)	2.22 (.04)			
15	4.8	1.4	1.92 (.29)	2.03 (.08)	1.46 (.10)	2.38 (.19)	1.87 (.17)	2.16 (.11)			
Economic Status			(n=1,139, N=12,768) P=.74	(n=1,112, N=12,463) P=.02	(n=1,161, N=13,015) P=.16	(n=1,134, N=12,647) P=.14	(n=1,122, N=12,581) P=.68	(n=1,046, N=11,783) P=.49			
Low status	9.7	1.0	1.82 (.15)	1.76 (.10)	1.23 (.05)	2.29 (.04)	1.77 (.04)	2.13 (.05)			
Medium status	82.9	1.8	1.80 (.03)	1.82 (.03)	1.16 (.01)	2.37 (.03)	1.76 (.03)	2.20 (.03)			
High status	7.4	1.8	1.88 (.07)	2.09 (.08)	1.34 (.03)	2.46 (0.10)	1.70 (.12)	2.20 (.10)			

PSS=Perceived Social Support

% = weighted proportions expressed in terms of percentages

Mean = weighted means

SE = standard error of weighted means or proportions expressed in terms of percentages

* any discrepancy in the n reported and the total n represents missing observations

Bolded numbers = significant at type I error level = .05

Table 3

Prevalence of Behavioral Outcomes By Demographic Characteristics of Middle School Students in Matamoros, Mexico 2003. (Sample size n=1,181 corresponding to N=13,159 students in the population^{*})

Descriptive Characteristics	Outcome Variables			
	Fighting ^a % (SE)	Alcohol Use ^b % (SE)	Tobacco Use ^c % (SE)	Sexual Activity ^d % (SE)
Total Sample	(n=1,179, N=13,152) 36.2 (3.1)	(n=1,172, N=13,086) 32.4 (2.5)	(n=1,177, N=13,152) 34.6 (2.2)	(n=1,176, N=13,141) 7.7 (.5)
Gender	P=. 006	P=.	P=.	P=.
Female	28.3 (3.9)	30.6 (1.9)	33.2 (2.1)	5.0 (1.2)
Male	44.7 (3.3)	34.3 (3.6)	35.9 (2.4)	10.7 (1.6)
Age	P=.	P=.	P=. 001	P=. 03
12	36.1 (1.8)	24.7 (2.9)	22.0 (2.4)	4.6 (1.3)
13	31.7 (3.0)	32.2 (4.0)	35.2 (1.3)	7.5 (.9)
14	43.2 (4.8)	39.3 (3.1)	42.7 (5.2)	9.4 (1.7)
15	34.7 (4.1)	29.6 (5.9)	39.3 (4.5)	14.8 (1.7)
Economic status	(n=1,169, N=13,089) P=. 01	(n=1,162, N=13,022) P=.	(n=1,167, N=13,067) P=. 07	(n=1,167, N=13,081) P=.
Low status	38.3 (9.2)	30.8 (7.3)	29.4 (6.5)	6.7 (3.4)
Medium status	34.6 (3.0)	33.0 (2.4)	34.3 (2.5)	7.9 (.9)
High status	52.2 (5.1)	29.2 (2.0)	44.5 (3.6)	7.1 (3.3)

^a participated in fight one or more times in past 12 months

^b drank alcohol one or more times in lifetime

^c smoke cigarette one or more times in lifetime

^d had sexual relations one or more times in lifetime

% = weighted proportions expressed in terms of percentages

SE = standard error of weighted proportions expressed in terms of percentages

^{*} any discrepancy in the n reported and the total n represents missing observations

Bolded numbers = significant at type I error level =.05

Table 4

Adjusted Odd Ratios For Behavioral Risk Factors By Perceived Social Support (PSS) Subscales and Empowerment Scale among Female Middle School Students In Matamoros, Mexico, 2003

	Fighting (n=625; N=6785)	Alcohol Use (n=622; N=6,765)	Tobacco Use (n=618; N=6,735)	Sexual Activity (n=626; N=6792)
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Age (continuous variable)	1.26 (.96, 1.66)	1.49 (1.17, 1.91)	1.64 (1.29, 2.08)	1.50 (.81, 2.77)
Economic Status (continuous variable)	1.27 (.79, 2.03) *		.86 (.70, 1.05) *	
Empowerment				
PSS – Friends				
PSS – School	3.51 (1.05, 11.69)	3.52 (2.27, 5.48)	4.32 (2.43, 7.68)	
PSS – Family	2.17 (.82, 5.76)	1.03 (.35, 3.04)	1.18 (.31, 4.46)	1.01 (.06, 17.07)
PSS – Neighbors				
PSS – Other Adults		.36 (.17, .77)		
Interaction terms	N/A	NA	NA	N/A

Bolded numbers = significant at type I error level=.05

* economic status left in the model determined by significant univariate finding

Table 5

Adjusted Odd Ratios For Behavioral Risk Factors By Perceived Social Support (PSS) and Empowerment among Male Middle School Students In Matamoros, Mexico, 2003

	Fighting (n=554, N=6,365)	Alcohol Use (n=550; N=6,321)	Tobacco Use (n=549; N=6,332)	Sexual Activity (n=550; 6,350)
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Age (continuous variable)	.95 (.74, 1.23)	1.08 (.81, 1.43)	1.28 (.94, 1.73)	1.38 (.92, 2.08)
Economic Status (continuous variable)			1.78 (.96, 3.31)	
Empowerment		1.39 (1.04, 1.87)	1.78 (1.29, 2.45)	
PSS – Friends	.61 (.35, 1.06)			
PSS – School				2.08 (1.29, 3.35)
PSS – Neighbors		1.73 (1.09, 2.74)		
PSS – Other Adults	.52 (.26, 1.05)			
Interaction terms	PSS Friend * PSS Other Adult 3.56 (1.11, 11.46)^a	N/A		

Bolded numbers = significant at type I error level=.05

^aAOR is the effect of disagreement with both friend support and other adult support on boys fighting as compared with agreement with one or both friend support and other adult support.