School connectedness and Guatemalan youth substance use: Does Gender Matter?

Marcos J. Martinez  
School of Social Work, Florida International University

Elisa Kawam  
School of Social Work, Florida International University

Flavio F. Marsiglia  
Southwest Interdisciplinary Research Center, Arizona State University

Christopher Salas-Wright  
School of Social Work, University of Texas-Austin

Stephanie L. Ayers  
Asociación Civil U Yum Cap

Maria Porta  
School of Social Work, University of Texas-Austin

Abstract  
This study examined if school connectedness was protective for youth and if the effects of school connectedness on alcohol and cigarette/tobacco use varied by gender among a cross-sectional sample of Guatemalan youth (N = 322, Mage = 12.16, 53% male). Using Ordinary Least Squares regression, a significant inverse association was found between school connectedness and past 30-day alcohol use frequency (b = -.11, p < .01), past 30-day alcohol use amount (b = -.12, p < .01), past 30-day cigarette/tobacco use frequency (b = -.06, p < .05), and past 30-day cigarette/tobacco use amount (b = -.05, p < .10). A significant school connectedness by gender interaction effect was also found for all alcohol and cigarette/tobacco use outcomes. Although school connectedness appeared to be protective for youth, females had greater substance use once gender was accounted for. Findings are discussed further in relation to gender, youth prevention efforts and health.

Keywords: substance use, protective factor, global health, school connectedness, gender, adolescents

INTRODUCTION  
The Central American region, which contains a mix of both indigenous Maya and Ladino peoples, has faced significant drug use and violence problems over the past several decades (US Department of State, 2014; OSAC, 2015; Winton, 2005), particularly in Guatemala (Amnesty International, 2013; Bruneau, 2014; Foulger, Page, Hall, & Crookston, 2013; Rothenberg, 2012). Specific to youth, research suggests that the risks for substance use are higher for adolescent males living in urban areas (Foulger et al., 2013). Although risk for drug use among male youth is higher, little knowledge is available on how gender may increase or reduce risk factors for substance use among Guatemalan youth. School connectedness, which refers to the extent youth feel they are a part of their school (Waters, Cross, & Runions, 2009),
is one such factor that has been found to be protective for youth against substance use in other countries. Whether the effects of school connectedness vary by gender as received little attention. Understanding the relationship of gender and school connectedness can provide key insight into the development of evidence-based prevention/interventions that target youth substance use. As a result of this gap in the literature, the current study examines whether school connectedness is protective against alcohol and tobacco use among Guatemalan youth and whether this relationship varies by gender.

**SUBSTANCE USE RISK AMONG GUATEMALAN YOUTH: RED ZONES**

Alcohol and tobacco are the most commonly used substances by Guatemalan youth (Foulger et al., 2013; WHO, 2013). Several risk factors for substance use among youth have been identified and include easy access to drugs and alcohol, community disorganization, poverty, societal inequity, low education, and lack of community empowerment (da Silva et al., 2009; Foulger et al., 2013; Kliewer & Murrelle, 2007; McIlwaine & Moser, 2004; Rothenberg, 2012; Steinberg, Height, Mosher, & Bampton, 2006; Ten Velde, 2012; UNDP, 2013). Furthermore, youth that live in urban areas are at greater risk for substance use, particularly when they reside in areas known as “Red Zones”.

Red Zones are areas that have high levels of extreme poverty, criminality, violence and substance use (Godoy-Paiz, 2012; International Crisis Group, 2011, 2014; Lemonade International, 2015; Om International, 2014; OSAC, 2015; Rothenberg, 2012; Safe Passage, 2015; Thomas, O-Neill, & Offit, 2011; Tidball & Krasny, 2013): in Guatemala City, the site of the current study, areas designated as Red Zones continue to experience high rates of violence and substance use (Thomas et al., 2011), making the city highly unsafe for youth (Kristensem, 2014). Thus, residing in an area such as this that experience widespread economic and social disparity may create an environment for youth significantly heightens the risk for substance use (Godoy-Paiz, 2008, 2012; McAdams, 2013; OSAC, 2015; Rothenberg, 2012). Despite living in this risky environment, the school setting is often seen as one of the most secure places for youth living in the Red Zones as well as a natural venue for prevention and intervention programming.

**School Context as a Protective Factor**

Given the environmental context, understanding how salient factors operate to protect or put youth at risk for substance use is critical (Steinberg & Taylor, 2010). It is thought that school connectedness in particular may be associated with lower adolescent substance use (Fergus & Zimmerman, 2005). Importantly, the school environment represents one of the most concentrated youth contexts, outside of the family, where social interaction occurs (Prado et al., 2010; Prado, Szapocznik, Maldonado-Molina, Schwartz, & Pantin, 2008) and provides not only social support and education but also aides in the socioemotional development of adolescent behavioral norms (Crosnoe, Erickson, & Dornbusch, 2002).

Positive experiences in school settings may help build resilience, foster positive and healthy development, and reduce the overall chances of youth engaging in risky substance use behavior (Blum, McNeely, & Rinhart, 2002; Rogers, 2013). Schools are key sites that foster important interpersonal relationships with peers and teachers throughout adolescence (Furlong et al., 2003; Roeser, Eccles, & Sameroff, 2000). Within an ecodevelopmental framework, positive experiences in the school context are thought to promote health, resiliency, and drug resistant behaviors in youth (Bacio et al., 2015), especially in unstable societies like Guatemala where many other systemic risk factors for substance use exist (da Silva et al., 2009; Dufur, Parcel, & Troutman, 2013; Pantin et al., 2003b).
Adolescent Ecodevelopment and School Connectedness
Ecodevelopmental theory, a multidimensional framework rooted in an ecological systems perspective, posits that environmental, developmental, and social processes are all interrelated at varying levels of influence: the micro, meso, exo, and macro (Pantin et al., 2003b; Prado et al., 2010; Szapocznik & Coatsworth, 1999). In order to properly understand the etiology of youth substance use behavior, it is crucial to explore all levels in their effect on schools and the students within them. The meso level, which is the primary focus of this study, consists of youths’ relationships and linkages to systems such as the school. Although the micro level is a highly influential system respective to substance use behavior in this age group, strong relationships with meso level systems such as the school can have a positive impact on educational achievement, development, and risk behavior prevention (Martinez, Huang, Estrada, Sutton, & Prado, 2016; Pantin et al., 2003b). Focusing on the meso level via the school provides youth access to a multitude of social-relational experiences crucial to the development of social skills, self-identity, and healthy behaviors that may buffer against substance use risk factors in their immediate surroundings (Pantin et al., 2003b).

The school environment has the potential to provide positive social and developmental opportunities for growth and learning (Bacio et al., 2015; Martinez et al., 2016). Being connected to school and having positive social experiences can aid in the cultivation of academic success, improved physical and mental health, and avoidance of risky behaviors (Prado et al., 2008). Prior research has found that how much a student feels he or she is connected to and valued at school, is associated with lower substance use and improved academic and behavioral outcomes (Bacio et al., 2015; Resnick, Bearman, & Blum, 1997; Stith, Gorman, & Choudhury, 2003; Maddox & Prinz, 2003; Thompson, Iachan, Overpeck, Ross, & Gross, 2006). This sense of value at school is commonly referred to as school connectedness, an umbrella term that refers to the degree to which students feel a part of their school community, how much they enjoy school, the presence of positive relationships between teachers, students, and peers as well as extracurricular involvement outside of the classroom (Goodenow, 1993; Thompson et al., 2006).

School Connectedness and Gender
Previous studies have found an association between school connectedness and lower youth substance use (Martinez et al., 2016; Resnick et al., 1997), positive mental health outcomes (Kidger et al., 2012; Waters et al., 2009), lower probability of violence and crime (Catalano, Haggert, Oesterle, Fleming, & Hawkins, 2004), and lower interpersonal conflict in and out of the school setting (Bond et al., 2007). Some research suggests however that these behavioral and academic outcomes vary depending on gender (Stith et al., 2003; Maddox & Prinz, 2003; Thompson et al. 2006). Some studies for example have found greater school connectedness among females (Bank, 1997; Crosnoe et al., 2002) and some, conversely, with males (Bonny et al., 2002; Thompson et al., 2006; Williams & McGee, 1991).

Although this research has been primarily conducted with U.S. samples, these findings suggest the possibility of gendered effects with respect to the school context. A potential explanation for finding gendered effects may be a result of the proscription of gender role norms and expectations by the larger societal culture. Specific to Central America, the differentiation of gender roles in Guatemalan society and subsequent behavioral and social expectations for male and female youth may have a substantive influence on youth perceptions towards appropriate educational attainment, occupational status, and long term goal formation (Stith et al., 2003). The educational trajectories for male and female youth in Guatemala may provide
indication for these proscribed gender role norms within the educational context. For example, although girls and boys experience comparable enrollment in primary school (1st - 6th grade), a large percentage of female students tend to leave school far before their male peers (McAdams, 2013; Stith et al., 2003; UNESCO, 2012).

Such differences in educational attainment may be a result of the different societal values placed on education based on gender. Normative values and expectations specific to education, which derive from cultural and familial stereotypes, may have an influence on the attitudes that male and female youth have towards educational achievement (Stith et al., 2003). For example females may receive messages that their role is domestic: bearing and caring for children, maintaining a household, and engaging in other community level familial activities. Conversely, the messages that males receive are likely to concern business transactions, educational achievement, and leadership in the community. Males may be given a sense of power and dominance over females and taught to be conversant and opinionated while females may be socialized to stay quiet and, instead of speaking up, to defer to the men who hold the decision making power (Lindsey, 2011; Martinez, Marsiglia, Ayers, & Nuno-Gutierrez, B.L., 2015).

Given the different social, behavioral, and educational norms among girls and boys in the Guatemalan context, (Lindsey, 2011), exploring the protective effects of school connectedness on substance use and whether gender moderates this relationship is worthwhile.

**Current Study**

Despite the presence of risk factors in everyday life for Guatemalan youth, school connectedness may promote academic success as well as help young people in avoiding risky behavior such as substance use. Thus, the principal aim of this study is to determine if school connectedness was a protective factor for youth against alcohol and cigarette/tobacco use outcomes and if the effects of school connectedness vary depending on gender. It is hypothesized that higher school connectedness will be protective for both males and females against alcohol and cigarette/tobacco use. Second, considering the context of Guatemalan culture, it is hypothesized that the protective effects of school connectedness will be stronger for boys on alcohol and tobacco use outcomes compared to girls.

**METHODS**

**Data**

This cross sectional study utilized the pre-surveys of adolescents (Mage 12.16; 53% male) from Guatemala City, Guatemala (N = 322), participating in in Mantente REAL, which is the Spanish language version of keepin’ it REAL. keepin’ it REAL is a model substance use prevention program that teaches youth drug resistance strategies (Marsiglia & Hecht, 2005). This study was a collaboration between researchers from a non-profit organization based in Guatemala City and a southwestern university in the United States (U.S.). The focus of the Guatemala City non-profit organization is on implementing prevention programming, and with the help of the U.S. partner, they selected keepin’ it REAL as the curricula to deliver to Guatemala City students. Twelve schools located in Guatemala’s metropolitan area participated in this study and were chosen based on their location in the red zone areas in Guatemala City. The target population for this study was preadolescent youth, which is considered a high-risk group for substance use. The average class size ranged from 14 to 40 students.
Survey Administration

Human subjects protections for secondary data analysis was approved by institutional review boards from both collaborators in this study. As part of the non-profit organizations protocol, the parents of students in all participating schools were notified that their children would be taking part in the keepin’ it REAL research study prior to data collection. Since each participating school approved the program as part of their regular curriculum no individual parent permission or separate youth assent were required. Before curriculum implementation occurred, a one-hour classroom based survey was administered to participating students and collected information on basic demographic, substance use, education, and family characteristics. Students were instructed to write down the first letter of their name (e.g. J for Juan), the day of the month they were born, the month they were born, and the first letter of their mother’s first name (e.g. M for Maria) in order to create a unique identifier that allowed tracking and matching of students’ pre and posttest surveys.

Measures

Past 30-day alcohol use frequency and past 30-day alcohol use amount were measured using two one item measures. The first item asked, “In the past 30 days, how many times did you drink an alcoholic beverage?”, with responses ranging from (1) = ‘none’ to (5) = ‘more than 30.’ The second item asked, “In the past 30 days, how many alcoholic drinks did you drink?”, with responses ranging from (1) = ‘none’ to (5) = ‘more than 30.’

Past 30-day tobacco/cigarette use frequency and past 30-day cigarette/tobacco use amount were also measured using two one item measures. The first item asked ‘In the past 30 days, how many times did you smoke tobacco or cigarettes?’ Responses ranged from (1) = ‘none’ to (5) = ‘more than 30 times.’ The second item assessed amount and asked, “In the past 30 days, how many cigarettes have you smoked?”, with responses ranging from (1) = ‘none’ to (5) = ‘more than 5 boxes.’

School connectedness was measured using a single item measure that asked, “Do you feel part of this school?” Responses included: (1) = ‘not at all’; (2) = ‘a little bit’; (3) = ‘a fair amount’; and (4) = ‘a lot.’

A school connectedness by gender interaction was created in order to test the moderation hypothesis. Gender was coded as (0) male and (1) female. First, the school connectedness variable along with the other predictor variables, were centered in order to provide more interpretable regression coefficients and to reduce multicollinearity (Aiken & West, 1991). Second, the product of the centered school connectedness and gender variables was calculated, creating the interaction.

Several control variables were included in the analysis including student grades, age, financial strain, and quality of parent-child relationship. Average school grades were coded as (1) ‘D’s & F’s’ to (4) ‘A’s.’ Financial strain was measured using two items that asked participants if there was enough money at home to buy food and pay house utilities (e.g., electricity, water). Responses ranged from (1) = ‘never’ (4) = ‘always.’ Quality of the parent child relationship assessed communication between parent and child and was measured using a previously validated 9-item scale (α = .88).
IBM SPSS Statistics for Windows, Version 21, was used to test the hypothesized relationships (IBM, 2012). First, descriptive statistics were obtained in order to assess both the distribution and characteristics of the sample. Independent samples t-tests were then utilized to determine potential differences in substance use and education outcomes between male and female youth. Second, ordinary least squares regression (OLS) was used to test (a) the relationship between school connectedness and past 30-day alcohol and cigarette/tobacco use and (b) the interaction between school connectedness and gender on past 30-day alcohol and cigarette/tobacco use.

RESULTS

Descriptive statistics for this study are presented in Table I below. The mean age of the sample was 12.16 years (SD = .50) and was comprised of more males (53%) than females (47%). A majority of youth felt connected to their school (M = 3.17, SD = .86), with males reporting slightly higher school connectedness (M = 3.21, SD = .88) compared to females (M = 3.13, SD = .84). Student grades averaged around the C range (M = 2.90, SD = .86). Youth reported a high quality relationship with parents (M = 4.16, SD = .86). A majority of the sample reported their family as having enough money to buy food (M = 3.62, SD = .67) and pay for house utilities (M = 3.74, SD = .61). Overall youth reports of past 30-day alcohol use frequency (M = 1.15, SD = .48) and amount (M = 1.13, SD = .48) were low compared to older adolescent youth. Past 30-day tobacco/cigarette use frequency (M = 1.05, SD = .32) and amount (M = 1.06, SD = .37) were also low. Given the age of youth in the sample, these rates of use were expected. Nevertheless, this particular age period investigated in this study has been identified as a critical time to examine risk and protective factors associated with substance use as well as actual substance use (Pantin et al., 2003b; Prado et al., 2008).

<table>
<thead>
<tr>
<th>Variables</th>
<th>M(SD)</th>
<th>Min</th>
<th>Max</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Substance Use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Past 30-day Alcohol Use (Freq)</td>
<td>1.15(.48)</td>
<td>1</td>
<td>5</td>
<td>295</td>
</tr>
<tr>
<td>Past 30-day Cigarette/tobacco use (Freq)</td>
<td>1.05(.32)</td>
<td>1</td>
<td>5</td>
<td>293</td>
</tr>
<tr>
<td>Past 30-day Alcohol use (Amnt)</td>
<td>1.13(.48)</td>
<td>1</td>
<td>5</td>
<td>299</td>
</tr>
<tr>
<td>Past 30-day Cigarette/tobacco use (Amnt)</td>
<td>1.06(.37)</td>
<td>1</td>
<td>5</td>
<td>297</td>
</tr>
<tr>
<td><strong>School Context</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School connectedness</td>
<td>3.17(.86)</td>
<td>1</td>
<td>4</td>
<td>311</td>
</tr>
<tr>
<td>Grades</td>
<td>2.90(.86)</td>
<td>1</td>
<td>4</td>
<td>318</td>
</tr>
<tr>
<td><strong>Controls</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.47(.50)</td>
<td>0</td>
<td>1</td>
<td>322</td>
</tr>
<tr>
<td>Age</td>
<td>12.16(.96)</td>
<td>10</td>
<td>17</td>
<td>317</td>
</tr>
<tr>
<td>Quality of parent child relationship</td>
<td>4.16(.86)</td>
<td>1</td>
<td>5</td>
<td>309</td>
</tr>
<tr>
<td>Financial strain: Buy food</td>
<td>3.62(.67)</td>
<td>1</td>
<td>4</td>
<td>321</td>
</tr>
<tr>
<td>Financial strain: Pay house utilities</td>
<td>3.74(.61)</td>
<td>1</td>
<td>4</td>
<td>320</td>
</tr>
</tbody>
</table>

Independent Samples T-Tests

Independent samples t-tests were conducted to determine if significant differences existed between males and females in alcohol and cigarette/tobacco use and educational outcomes. No significant differences were found between males and females in alcohol use frequency, t(293)= 1.794, p > .05; alcohol use amount, t(297)= 1.79 , p > .05; school connectedness,
t(309)=.82, p > .05; or in grades t(316)= -.04, p > .05. There were significant differences between males and females in tobacco use frequency, t(291)= 2.04, p < .05, and tobacco use amount, t(295)= 2.18, p > .05.

**Past 30-day Alcohol Use Frequency**

Results for the OLS regression models testing the relationship between school connectedness and past 30-day alcohol use frequency are reported in Table II. There was a significant and inverse association between school connectedness and past 30-day alcohol use frequency (b = -.11, p < .01). There was also a significant gender by school connectedness interaction effect on past 30-day alcohol use frequency (b = .15, p < .01; See Figure I below and Table II).

![Figure I: Interaction on Past 30-day Alcohol Use Frequency](image)

There was a significant and inverse relationship between school connectedness and past 30-day alcohol use amount, (β = -.12, p < .01). As well, a significant gender by school connectedness interaction with past 30-day alcohol use amount was found, (b = .20, p < .01; See Figure II below and Table III).

![Figure II: Interaction on Past 30-day Alcohol Use Amount](image)
There was a significant association between school connectedness and past 30-day cigarette/tobacco use frequency ($\beta = -0.06, p < .05$). Additionally, there was a significant gender by school connectedness interaction with past 30-day cigarette/tobacco use frequency ($b = 0.09, p < .05$; See Figure III below and Table II).

**Figure III: Interaction on Past 30-day Cigarette/Tobacco Use Frequency**

![Diagram showing interaction between school connectedness and past 30-day cigarette/tobacco use frequency for males and females.](image)

Past 30-day Tobacco Use Amount

Results for the OLS regression models estimating the relationship between school connectedness and past 30-day cigarette/tobacco use amount are reported in Table III. A significant and inverse relationship between school connectedness and past 30-day cigarette/tobacco use amount was found, ($\beta = -0.05, p < .10$). Additionally, there was a significant gender by school connectedness interaction with past 30-day cigarette/tobacco use amount, ($\beta = 0.08, p < .10$; See Table III).

**Table 2. OLS Regression Results for Past 30-day Alcohol Use Frequency and Past 30-day Cigarette/Tobacco Use Frequency**

<table>
<thead>
<tr>
<th></th>
<th>Past 30-day Alcohol Use (N = 263)</th>
<th>Past 30-day Cigarette/Tobacco Use (N = 263)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
</tr>
<tr>
<td>Gender (0=Males; 1=Females)</td>
<td>-0.07</td>
<td>.05</td>
</tr>
<tr>
<td>School Connectedness</td>
<td>-0.11**</td>
<td>.04</td>
</tr>
<tr>
<td>Gender*School Connectedness</td>
<td>.15**</td>
<td>.06</td>
</tr>
<tr>
<td>Grades</td>
<td>-0.01</td>
<td>.03</td>
</tr>
<tr>
<td>Age</td>
<td>.01</td>
<td>.03</td>
</tr>
<tr>
<td>Quality of parent child relationship</td>
<td>-0.04</td>
<td>.03</td>
</tr>
<tr>
<td>Financial strain: Buy food</td>
<td>-0.03</td>
<td>.04</td>
</tr>
<tr>
<td>Financial Strain: Pay house utilities</td>
<td>.02</td>
<td>.04</td>
</tr>
<tr>
<td>R²</td>
<td>.05</td>
<td>.07</td>
</tr>
</tbody>
</table>

*p < .05  **p < .01  ***p < .001
Table 3. OLS Regression Results for Past 30-day Alcohol Use Amount and Past 30-day Cigarette/Tobacco Use Amount

<table>
<thead>
<tr>
<th></th>
<th>Past 30-day Alcohol Use (N = 268)</th>
<th>Past 30-day Cigarette/Tobacco Use (N = 266)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
</tr>
<tr>
<td>Gender (0=Males; 1= Females)</td>
<td>-0.08</td>
<td>0.05</td>
</tr>
<tr>
<td>School Connectedness</td>
<td>-0.12**</td>
<td>0.04</td>
</tr>
<tr>
<td>Gender*School Connectedness</td>
<td>0.20**</td>
<td>0.06</td>
</tr>
<tr>
<td>Grades</td>
<td>-0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Age</td>
<td>0.00</td>
<td>0.03</td>
</tr>
<tr>
<td>Quality of parent child relationship</td>
<td>-0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Financial strain: Buy food</td>
<td>0.00</td>
<td>0.04</td>
</tr>
<tr>
<td>Financial strain: Pay house utilities</td>
<td>0.01</td>
<td>0.04</td>
</tr>
<tr>
<td>R²</td>
<td>0.07</td>
<td></td>
</tr>
</tbody>
</table>

†p < .10  *p < .05  **p < .01  ***p < .001

DISCUSSION

Previous research suggests that school connectedness may be protective against substance use and lead to both academic achievement and positive development among youth (Kidger et al., 2012; Resnick et al., 1997; Thompson et al., 2006; Waters et al., 2009). Previous findings conflict, however, regarding the protective nature of school connectedness for boys and girls. This study fills a gap in the literature by examining whether the effects of school connectedness on substance use varied by gender. Results suggest that the effect of school connectedness on substance use was protective for boys but risky for girls. In such, findings from the current study provide nuanced insight into the relationship between youths’ school context, the moderating role of gender, and the subsequent effects on substance use.

School connectedness was protective for youth on both alcohol and cigarette/tobacco use outcomes. However, when degree of school connectedness was held constant across gender, males reported lower substance use than females. For female youth, school connectedness appeared to be a risk factor for substance use: as perceptions of school connectedness increased, females had higher substance use rates. These findings were unexpected and contrast with previous research that has found stronger protective effects for females than males (Catalano et al., 2004; Kidger et al., 2012; Resnick et al., 1997; Waters et al., 2009). A possible explanation for these findings may have to do with the Guatemalan cultural context, specifically the value on and opportunities for education among male and female youth.

For instance, differential expectations and normative values regarding education are transmitted to youth at an early age through cultural and familial stereotypes. Boys are encouraged to be successful educationally while girls are socialized to the domestic sector and are taught to defer to men (McAdams, 2013; Stith et al., 2003). As a result, it may not be surprising that school connectedness was only protective for male youth. Normative education and gender role expectations may make the school environment more difficult to navigate for girls who do succeed; they may experience pushback from educators as well as their male peers as they progress through school. Teachers may also be less likely to support girls and may even serve as a barrier in advancing through courses and grades. As well, girls who do continue their education beyond primary school may possibly face pressure from male peers...
to engage in antisocial behavior, such as substance use, which may create an inherent risk associated with school connectedness.

The findings from this study may have direct implications for teachers, administrators, and school counselors in their approach to working with youth in the school environment. Creating an environment where youth are respected and valued in their learning processes while understanding the complex and divergent needs of males and females in a high risk area may increase the connection that adolescents have to their school in addition to their overall social support with their peers both in and out of the classroom (Kidger et al., 2012). Specifically, the ways that schools address and engage male and female Guatemalan adolescents may require a shift in the wider school culture. Such a shift may accompany increased efforts by teachers, staff, and families in order to ensure that youth feel safe, secure, and supported in their learning and development (Roeser et al., 2000).

To increase student support, schools may need to spend more time learning about their students and their specific matrix of risks and strengths in and out of the classroom. Once schools understand that males and females likely do not experience the school environment the same way, teachers may need to address risks, increase communication, and capitalize on strengths in a gender sensitive manner. This sort of approach will likely require increased communication between teachers and staff, administration and teachers, as well as between the school and the youth’s parents. Additionally it is suggested that the students themselves should be involved in and empowered by this process; by incorporating parents and students together into the school culture, it is thought that a student’s self-awareness, agency, and educational success will increase accordingly. Furthermore, as student agency and parent participation both increase, families may feel as though they are supported and protected via inclusion into the larger school community. This may lead to even more benefits that transcend the school into the home environment.

Aside from the focus on gender responsive school protocol, the findings from this study must be understood within the broader ecological context. Guatemala, and even more the Red Zones sampled here, are places that experience poverty, violence, and lack of access to basic resources (International Crisis Group, 2011, 2014; Lemonade International, 2015; Om International, 2014; Safe Passage, 2015; Thomas et al., 2011). That social context on top of the cultural knowledge that females complete less education, instead opting to have children, frames school in a manner akin to luxury. If schools are to enroll students and retain students while mitigating the risks for substance use and other negative behaviors, acknowledging cultural norms and barriers associated with a student’s exposure to violence, trauma, and poverty is critical. In this manner, students may feel as though they are understood and valued.

The school setting has the opportunity to become a place of support and community by supporting students across several developmental domains. Strategies that actively engage male and female students through culturally and gender sensitive content and communication may increase male and female perceptions of school connectedness. As such, primarily targeting the micro yet also explicitly addressing the mezzo and macro systems is important given the broader ecological context. In this respect, working to understand and incorporate all parts of the ecodevelopmental framework into prevention and intervention programming may be the most developmentally sensitive and effective approach to working with marginalized school based youth at risk for substance use (Martinez et al., 2016; Pantin et al., 2003b; Prado et al., 2008; Szapocznik & Coatsworth, 1999).
Specific strategies that may be employed include training materials for teachers that focus on gender and specific to their needs within the local school region; working with school administrators to support shifts in school culture; and informing future prevention and intervention programming that addresses the development of healthy behaviors for at risk youth through academic, community, online, and social media channels. Detailed teacher training that highlights the experiences of adolescent youth may aid in the process of creating school environments (e.g., socially, educational materials, delivered curricula) that support and encourage the development of school connectedness in positive ways for both boys and girls. By supporting teachers in this specific learning and by reifying a school culture of inclusion and gender responsiveness, prevention programming may be more informed and robust specific to substance use (Kliewer & Murrelle, 2007). Since more longitudinal and in depth studies with regard to substance use and gender are needed, it may be beneficial for those studies to include teachers directly in their study designs and program implementation in order to understand the complex set of factors that protect or place youth at risk for substance use (Pantin et al., 2003b; Waters et al., 2009). Representing initial strategies in a niche sample, the findings and suggestions stated above offer a beginning by which to develop programming and future studies to target adolescent substance use in Guatemalan youth.

Limitations
While findings from this study add to the current body of literature and have important implications for substance use prevention/interventions for youth that are sensitive to both gender and school context, there are limitations that need consideration. The main limitations of this study include the cross-sectional design as well as the use of a single item to measure school connectedness. Cross-sectional studies do not allow researchers to make inferences about the temporal, cause and effect nature of the relationships explored and do not allow for the enhanced exploration of cultural meaning behind complex subjects. This is specifically salient with respect to the single item measure of school connectedness, which does not capture the complete nature of student perceptions of safety, support, belonging, and engagement at school (Mcneely et al., 2004). Also, the red zone location of the schools examined in this study may suggest high levels of neighborhood and personal violence than previously thought. As such, individual level factors in addition to school and neighborhood effects should be included in future studies seeking to build on this work in measuring school connectedness, gender, and substance use behavior in youth.

Conclusions
School connectedness appears to be an important protective factor for adolescent youth. This study found that the effect of school connectedness on substance use outcomes varied by gender, which may suggest the need for programming that accounts for gender as an important contextual factor. Through the use of ecodevelopmental theory, this study provides insight for future efforts aimed at programmatic development of substance use prevention/interventions that increase school connectedness and aid in enhancing the wellbeing of adolescent youth in high-risk areas.

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