Factors Affecting Drug Abuse in Adolescent Females in Rural Communities

Susan L. Renes and Anthony T. Strange

University of Alaska Fairbanks

Abstract

This article explores factors influencing adolescent female substance use in rural communities. Self-reported data gathered from females 12 to 15 years of age in two northwestern communities in the United States showed an association among gender identity, peer and parental relationships, and substance use. Aggressive masculinity had the strongest association with substance use while peer attachment and parent attachment offered some protection. Study findings suggest that early adolescent females exhibiting aggressive behavior are at higher risk for substance use. Along with students who have little parent or peer support, this group represents a target for personal/social development programs that could be implemented by school counselors.

Factors Affecting Drug Abuse in Adolescent Females in Rural Communities

Substance use by adolescent females is increasing rapidly (Blake, Amaro, Schwartz, & Flinchbaugh, 2001; Guthrie & Flinchbaugh, 2001a; Guthrie & Flinchbaugh, 2001b; Lennings, Kenny, Howard, Arcuri, & Mackdacy, 2007; Pizer, 1999; Tarasevich, 2001; Wu, Schlenger, & Galvin, 2007). Prior to 1985, rates of drug use among adolescent females were significantly lower than their male peers, leading some researchers to argue that adolescent females were in less danger of abusing drugs (Substance Abuse and Mental Health Services Administration [SAMHSA], 1997). However, rates of alcohol, tobacco, marijuana, and inhalant use by female adolescents began to approach those of their male peers in the 1980s. Currently, use rates for certain drugs are greater for females than males (Johnston, O'Malley, Bachman, & Schulenberg, 2007), and there has been an increase in the rate of initial use for alcohol and prescription drug use among younger adolescent females (SAMHSA, 2005). This information is thought to have significant value for school counselors who implement personal/social development activities for their students.

Adolescent females in rural environments may be at greater risk than females in urban settings (Howard, Walker, Walker, Cotton, & Compton, 1999; Ruiz, Stevens, McKnight, Godley, & Shane, 2005; Scaramella, & Keyes, 2001). The increased risk may result from several factors. The geographical factors of fewer social opportunities and lack of transportation to available service providers likely contribute to the increased risk (Anderson & Gittler, 2005; Anderson, & Huffine, 2003, Puskar, Tusaie-Mumford, Sereika, & Lamb, 1999; Stewart et al., 1999). The sociocultural factors of valuing autonomy and refraining from discussing personal issues outside the family likely play a

role (Anderson & Huffine). Adolescents in rural communities tend to use more alcohol and tobacco than other substances (Howard et al., 1999; Puskar et al., 1999), but all drug use is reportedly equal to or higher in rural areas than in suburban and urban areas (Atvar & Spencer, 2002; National Center on Addiction and Substance Abuse, 2000; Shears, Edwards, & Stanley, 2006). According to Wu et al. (2007), 16 and 17 year-old females were the most recent users of methamphetamines, particularly in rural environments. Lineberry and Bostwick (2006) confirmed that a high rate of methamphetamine use exists in rural communities. Unfortunately, the majority of past research addressing adolescent substance use has focused on urban and suburban populations (Fahs et al., 1999; Kulis, Marsiglia, & Hecht, 2002; Kulis, Marsiglia, & Hurdle, 2003; Nishimura, Hishinuma, Else, Goebert, & Andrade, 2005; Webb, Bray, Getz, & Adams, 2002; Weiss, Caron, Ball, Tapp, Johnson, & Weisz, 2005). Rural populations receive very little attention.

Influencing Factors

Several studies have linked gender identity to the susceptibility of adolescent females to use drugs (Horwitz & White, 1987; Husefield & Cooper, 1992; Kulis et al., 2002; Kulis et al., 2003; Kulis, Marsiglia, Lingard, Nieri, & Nagoshi, 2008). Gender identity constitutes a personal orientation that exists on a continuum, as opposed to a simple dichotomy. Masculine and feminine characteristics are not mutually exclusive, and both can be present in one individual (Horwitz & White; McCreary, Newcomb, & Sadava, 1999).

Kulis and colleagues (2002) found that dominant or aggressive masculinity was positively associated with substance use for female middle school students. Later, these

investigators (Kulis et al., 2003) measured four dimensions of gender identity, namely aggressive masculinity, assertive masculinity, affective femininity, and submissive femininity and found similar results. Using four dimensions of gender identity allows the measurement of socially desirable and undesirable characteristics within a masculine and feminine framework, with the four identities potentially present in either males or females. Aggressive masculinity represents a negative identity and is defined by ambitious, dominant, rude, lazy, and rebellious behavior. Assertive masculinity represents a positive gender identity and is defined as someone possessing leadership skills, self-reliance, a strong personality, and maturity. Affective femininity shows more nurturing and communicative features of femininity and is defined as being cheerful, sensitive to the needs of others, compassionate, gentle, and cooperative. Submissive femininity captures a sense of dependency and inadequacy, defined as someone who dislikes risks, and is shy, hesitant, resigned, submissive, and conformist.

Peer relationships have also been linked to adolescent female substance use (Arata, Stafford, & Tims, 2003; D'Amico, Ellickson, Collins, Martino, & Klein, 2005; Henry & Kobus, 2007; Pearson & Mitchell, 2000; Oetting, Deffenbacher, & Donnermeyer, 1998; Oetting & Donnermeyer, 1998). There is evidence that adolescent females, especially younger female adolescents, are particularly susceptible to peer influence, which has been linked in turn to adolescent substance use (Killeya-Jones, & Costanzo, 2007). Schulenberg and colleagues (1999) studied two cohorts of middle school students from southeastern Michigan and found that perceived exposure to peer drinking in the 7th grade contributed to alcohol use between 7th and 8th grade in girls but not in boys. Callas and colleagues (2004) surveyed 7th and 8th grade students in rural

Vermont and found that beliefs and behaviors of peers concerning alcohol use were more important for girls than for boys. Chopak (1993) reported that for rural female adolescents, perceived behavior by peers was the most significant predictor of involvement in alcohol, tobacco, and other drug use.

Adolescents' relationships with their parents, as with gender identity and peer relationships, have been repeatedly linked to adolescent substance use (Fisher et al., 2006; Pires & Jenkins, 2007; Webb et al., 2002). Bogenschneider and colleagues (1998) found that levels of maternal monitoring for adolescent females were inversely related to levels of substance use. Wills and colleagues (2004) found an inverse relationship between parent support and adolescent substance use for both 7th and 9th grade students. In another study, higher family cohesion suppressed initial substance use for female adolescents (Duncan, Tildesley, Duncan, & Hops, 1995).

Purpose of the Study

This study explored the association among gender identity, peer and parental relationships, and substance use in females living in rural environments. The core questions for this study were as follows: (a) What is the relationship between gender identity and current drug use among adolescent females in rural, middle school settings? (b) What is the relationship between peer relationships and current drug among adolescent females in rural, middle school settings? (c) What is the relationship between parental relationships and current drug use among adolescent females in rural, middle school settings? (d) Which factor(s) (i.e. gender identity, peer relationships, and/or parental relationships) best predicts current drug use among adolescent females in rural, middle school settings?

We hypothesized that aggressive masculinity would be positively correlated with (and be the best predictor for) current drug use. Peer relationships were expected to correlate positively and parental relationships to correlate inversely with current drug use by this population. Rural environments were chosen for this study due to the lack of research addressing adolescent substance use in rural areas (Atvar & Spencer, 2002; Epstein, Botvin, & Spoth, 2003; Pilgrim, Abbey, & Kershaw, 2004; Shears et al., 2006).

Methods

Participants

The study population comprised a purposive sample of 98 female middle school students in two rural public middle schools in a northwestern state. Both of these schools were located in rural communities, and both had a poverty level of approximately 40%. A rural environment or population is defined as a population between 2,000 and 20,000 individuals, or a population with less than 2,000 individuals located less than two hours (by car) from an urban area (Aloise-Young, Wayman, & Edwards, 2002). In both schools, almost all participants identified themselves as European American; the residual were Hispanic, American Indian/Alaska Native, Asian American, and African American.

Measures

Gender identity. Kulis and colleagues (2003) developed the instrument that measured gender identity in this study. The question items are designed to reveal positive and negative characteristics of masculinity and femininity. The Kulis instrument consists of 12 questions with five response options that ranged from never to always. The instrument's subscales measure affective femininity, aggressive masculinity,

assertive masculinity, and submissive femininity. The Cronbach alpha coefficients were .81 for affective femininity, .67 for aggressive masculinity, .85 for assertive masculininity, and .69 for submissive femininity. In this study, Cronbach alpha coefficients were .75 for affective femininity, .70 for aggressive masculinity, .69 for assertive masculinity, and .65 for submissive femininity.

Peer and parental relationships. The Inventory of Parent and Peer Attachment – Revised (IPPA-R) was used to measure parent and peer relationships (Gullone & Robinson, 2005). Armsden and Greenberg (1987) developed the Inventory of Parent and Peer Attachment (IPPA) to measure the affective and cognitive aspects of these attachments in middle to late adolescence and early adulthood. Gullone and Robinson revised the IPPA for use with children and younger adolescents, producing the IPPA-R. The items for the parent and the peer scales assess three dimensions of attachment: trust, communication, and alienation. Gullone and Robinson (2005) conducted a psychometric investigation of the IPPA-R for youth between nine and fifteen years of age. Cronbach's alpha coefficients for parent attachment with adolescents were .85 for trust, .79 for communication, and .76 for alienation. Cronbach's alpha coefficients for peer attachment with adolescents were .86 for trust, .86 for communication, and .68 for alienation. In this study, Cronbach alpha coefficients for parent attachments with adolescent females were .91 for trust, .89 for communication, and .87 for alienation. Cronbach's alpha coefficients for peer attachment with adolescent females were .87 for trust, .85 for communication, and .65 for alienation.

Adolescent substance use. An instrument identified by the Center for Substance Abuse Prevention [CSAP] (2001) was used to measure current or 30-day

adolescent substance use in this study. There are 12 questions measuring cigarette, smokeless tobacco, alcohol, marijuana, inhalant, LSD, prescription drug, and cocaine use. Most answers are recorded using seven responses that ranged from no occasions (1) to 40 or more (7). O'Malley, Bachman, and Johnston (1983) used the results from three years of surveys to establish internal consistency or reliability for the questions used in the CMI self-report survey. The reliabilities for the self-report questions for annual use of cigarettes, alcohol, and marijuana were .84 or higher. For the annual use of illicit drugs, other than marijuana, the reliabilities varied from .70 to .87. The reliabilities for the use of cigarettes during the past 30 days were between .86 and .91, for alcohol and marijuana estimates were in the .70s. The 30-day illicit drug use, other than marijuana, was the lowest, ranging from .49 to .72. In this study, similar reliabilities were found. For 30-day use of cigarettes, alcohol, and marijuana, the self-report questions were .885 or higher. For 30-day illicit drug use, other than marijuana, the reliabilities were .758 or higher.

Data Collection

The investigators administered the 30-minute written questionnaires during a scheduled class period. Before the survey was administered, school principals sent letters to the parent(s) or guardian(s) of every female student explaining the nature of the study and requesting their consent to have their student participate in the study. The investigator's Institutional Review Board and the school district School Boards at the two schools approved the data collection procedures. Prior to administering the questionnaire, students were informed that participation in the survey was voluntary and students were guaranteed their responses would remain confidential. Students who

were present the day the survey was administered and who agreed to do so completed the questionnaire; absent students were not contacted further. To ensure anonymity, no names or ID numbers were recorded on the questionnaire, no teachers or administrators were present while the survey was being administered, and the investigator collected all the questionnaires once the survey was completed.

Analysis Strategy

Descriptive statistics were used to describe the variables; means and standards deviations provided a measure of central tendency and a measure of dispersion. Correlational statistics showed the association between gender identity, peer relationships, and parental relationships and substance use behaviors for adolescent females. Ordinary least squares regression or multiple regression was used to determine whether gender identity is a better significant predictor of substance use than peer or parental relationships.

Results

Demographic Profile

For the self-identified ethnic/racial makeup, the majority of the students reported they were of European American descent. Almost a quarter were Hispanic/Spanish/Latino, and most of the residual were American Indian or Alaska Native. The remainder of the study sample was divided among African American, Asian American, Native Hawaiian, and other. Only 3% declined to identify themselves with any of the seven categories of race or ethnicity listed in the survey.

A majority of the participants reported having siblings, and almost half reported belonging to a religious or spiritual group. Over three-quarters of the mothers and a

majority of the fathers were employed. Parents of the participants were very well educated; over a quarter had received a post-bachelor's degree. The remaining half of the parents were college educated. The demographic characteristics of the surveyed students are presented in Table 1.

Table 1

Demographic Profile of the Study Participants (N = 98)

Demographic		Number	(%)
Ethnicity			
	European American	70	71.4
	Hispanic/Spanish/Latino	22	22.4
	American Indian or Alaska Native	16	16.3
	African American	9	9.2
	Asian American	7	7.1
	Native Hawaiian	4	4.1
	Other	1	1.0
Sibling			
	One	26	26.5
	Two to three	35	35.7
	Four or more	30	30.6
Religious Affiliation (yes)		46	46.9
Employed			
Mother		77	78.6
Father		78	79.6
Education			
Mother			
	Some elementary	5	5.1
	Some high school	10	10.2
	High school graduate	26	26.5
	Some college	19	19.4
	Bachelor’s degree	7	7.1
	Master’s degree	12	12.2
	Professional degree	5	5.1
Father			
	Some elementary	9	9.2
	Some high school	11	11.2
	High school graduate	22	22.4
	Some college	22	22.4
	Bachelor’s degree	6	6.1
	Master’s degree	6	6.1
	Professional degree	2	2.0

Gender Identity

Aggressive masculinity was associated with substance use in this population of adolescent females. In other words, when adolescent females perceived themselves as having characteristics associated with aggressive masculinity, greater levels of drugs were used within a 30-day period. In addition, as hypothesized, assertive masculinity was inversely associated with substance use. In other words, adolescent females with the traits of assertive masculinity did not show illegal drug use. In fact, for certain drugs, assertive masculinity seemed to provide some protection from drug use. (See Table 2).

Table 2

Pearson Product-Moment Correlations between Gender Identity and Drug Use (N = 98)

Drug	Affective Femininity	Aggressive Masculinity	Assertive Masculinity	Submissive Femininity
Cigarette Use – 30 day	-.135	.031	-.187	.039
Smokeless Tobacco – 30 day	-.234*	.023	-.281**	.016
Cigarette Use – Daily	-.134	.093	-.188	.078
Alcohol Use – 30 day	-.147	.144	-.286**	.139
Alcohol Intoxication – 30 day	-.183	.074	-.255**	.068
Marijuana Use – 30 day	.014	.142	.061	.153
Marijuana Use – Daily	.057	.161	-.022	.131
Inhalant Use – 30 day	-.075	.091	-.244*	.117
LSD Use – 30 day	.038	.198	-.044	.148
Amphetamine Use – 30 day	.052	.171	-.050	.190
Crack Cocaine Use – 30 day	.011	.063	-.111	.128
Powder Cocaine Use – 30 day	.066	.198	-.001	.164

*****= $p < .05$, two-tailed. **= $p < .01$, two-tailed.

Peer and Parental Relationships

The overall scores for peer attachment were higher than for parent attachment and we found a consistently inverse relationship between peer attachment and

substance use in the population studied. In other words, when adolescent females perceived themselves as attached to peers, they were less likely to use drugs. Unlike their counterparts in urban areas, attachment to peers in a rural environment was not positively associated with drug use. Table 3 shows the inter-correlation among peer attachment and substance use.

As predicted, parental relationships were inversely correlated with current use of substances. In other words, when adolescent females perceived themselves as attached to parents, they were less likely to use drugs. Table 3 shows the inter-correlation among parental attachment and illegal substance use.

Table 3

Pearson Product-Moment Correlations between Peer and Parental Relationships and Drug Use (N = 98)

Drug	Peer Relationship	Parent Relationship
Cigarette Use – 30 day	-.331**	-.123
Smokeless Tobacco – 30 day	-.344**	-.112
Cigarette Use – Daily	-.364**	-.114
Alcohol Use – 30 day	-.360**	-.313*
Alcohol Intoxication – 30 day	-.354**	-.200
Marijuana Use – 30 day	-.360**	-.150
Marijuana Use – Daily	-.371**	-.128
Inhalant Use – 30 day	-.300**	-.196
LSD Use – 30 day	-.379**	-.140
Amphetamine Use – 30 day	-.355**	-.126
Crack Cocaine Use – 30 day	-.266**	-.082
Powder Cocaine Use – 30 day	-.376**	-.136

*****= $p < .05$, two-tailed. **= $p < .01$, two-tailed.

Strongest Association

Ordinary least squares regression was used to determine the relative strength of the variables associated with substance use. Multiple regression analyses were conducted to determine which independent variables would be associated with substance use behaviors when adjusting for other independent variables and background control variables (e.g., ethnicity). Multiple regression analyses may reveal relationships between independent variables and dependent variables that were not apparent in bivariate analyses, or relationships observed in bivariate analyses may be diminished in multiple regression analyses. Multiple regression is also useful for determining the relative strength of association between independent variables and the dependent variables (i.e., which independent variables are most strongly associated with substance use behaviors). Ordinary least squares regression was used to ascertain the best predictor(s) of illegal substance use.

As expected, aggressive masculinity manifested the strongest relationship. Consistently, aggressive masculinity appeared as a significant predictor and was robust across several types of substances. Peer relationships only showed a statistically significant inverse relationship with daily cigarette use ($b = -.267$, $SE = .023$, $p = .049$) and 30-day use of amphetamines ($b = -.276$, $SE = .007$, $p = .047$). Parent relationships only predicted a statistically significant inverse relationship with 30-day use of alcohol ($b = -.273$, $SE = .178$, $p = .05$). Table 4 shows the regression analysis for aggressive masculinity.

Table 4

Standardized Coefficients for the Regression of Drug Use and Aggressive Masculinity

Drug	B	SE B	*B*	r^2
Cigarette Use – 30 day	.020	.092	.019	.769
Smokeless Tobacco – 30 day	.137	.068	.321*	.287
Cigarette Use – Daily	.334	.211	.175	.658
Alcohol Use – 30 day	.359	.178	.273*	.500
Alcohol Intoxication – 30 day	.211	.151	.209	.404
Marijuana Use – 30 day	.116	.080	.155	.681
Marijuana Use – Daily	.175	.088	.253	.546
Inhalant Use – 30 day	.241	.082	.454**	.335
LSD Use – 30 day	.254	.089	.358**	.562
Amphetamine Use – 30 day	.119	.066	.202	.644
Crack Cocaine Use	—	—	—	—
Powder Cocaine Use	—	—	—	—

*= p <. 05, **= p < .01 Note: Statistics could not be computed for crack cocaine or powder cocaine use.

Discussion

Aggressive masculinity was found as the best predictor of current drug use among adolescent females 12 to 15 years of age in the rural communities examined in this study, extending prior studies conducted in urban environments, and is the most significant outcome of this study. A previous study looking at a sample of 8th grade students in a southwest urban population found aggressive masculinity linked to drug outcomes, including lifetime and 30-day use of cigarettes, alcohol, and marijuana, regardless of gender or ethnicity (Kulis et al., 2003). It appears risk factors associated with aggressive masculinity thought to be exclusive to adolescent males are now risk factors for females. The change in the level of drug use by adolescent females might be attributed, in part, to the erosion of traditional gender identities. Certain behaviors that

were traditionally taboo might now be options for this population, including drug use (Kulis et al., 2003).

Several of this study's findings resemble national findings where adolescent females identified alcohol as the drug used most. Twenty-eight percent of adolescent females in this study reported drinking alcohol in the past 30 days; in a national survey twenty-seven percent of adolescent females, age 12 to 17, reported drinking alcohol in the past 30 days (SAMSHA, 2005). Reported 30-day use of marijuana was 5% in this study, and 6% in the SAMSHA study (for males and females, 12 to 17 years of age). Reported 30-day use of cigarettes was 6.1% of the adolescent females in this study compared to 10.8% for females aged 12 – 17 (SAMSHA).

The percentage of inhalant use reported by this study's participants in the last 30 days was considerably higher than the reported levels of inhalant use nationally. Just a little more than 12% of the adolescents surveyed for this study reported use of inhalants while only 5.1% of the eighth grade females in the Johnston study (2005) and 1.4% of the eighth grade males and females in the SAMSHA study (2005) reported inhalant use during the same time period. However, Mosher, Rotolo, Phillips, Krupski, and Stark (2004) did find a 9% rate of inhalant use for all adolescents 12 to 17 years of age in Washington State and Muilenberg and Johnson (2007) reported that 20.4% of the students attending a middle school in rural Mississippi reported using inhalants. Mullenberg and Johnson speculated that rural use might be high because inhalants are relatively inexpensive and easily accessible.

Peer Relationships

The inverse relationships between peers and all 12 indicators of drug use were statistically significant, which was not expected. In the past, strong peer attachments were positively associated with substance use in urban areas. The difference in the results of this study of peer relationships and drug use compared to previous studies could be the difference in parental support or parental monitoring that occurred along with the peer relationships (Tragesser, Beauvais, Swaim, Edwards, & Oetting, 2007). Pearson et al. (2006) suggested that social networks with the same characteristics might function to support drug use in one context but not in another. Peer attachment might serve as a buffer against externalizing behaviors for adolescents with little parental monitoring or parental involvement. Supporting peer relationships among adolescent females in a rural environment could increase the effect of this protection.

Parental Relationships

The relationships between parent relationships and adolescent female substance use in a rural environment were positive, as was anticipated, but the strength of the relationships was not as strong as was expected.

Limitations of the Research Study

Some limitations of this study are important to point out. First, the Cronbach alpha coefficients for two of the gender identity subscales in this study were slightly below .70. Future research studies should consider adding related questions to each of the subscales to increase internal consistency. Second, the data were cross-sectional, which did not allow for an examination of patterns of change. This is important when considering that relationships can change rapidly in adolescence (Blanton, Gibbons,

Gerrard, Conger, & Smith 1997; Kandel, 1996) and substance use often escalates or diminishes as adolescents mature (Dekovic, Buist, & Reitz, 2004). In addition, the adolescent females provided all the data. No information was gathered from parents, teachers, or others who interact with the study participants. Several studies established the validity of self-reported data (for example, Tarter, 2002); however, student responses might include response bias. Multiple contacts were needed to protect participants completing the survey. Data were collected only from adolescent females with signed parental consent forms returned to the schools. Students with parental consent forms also had to agree to complete the survey. Each contact offered the potential to refuse to participate and the multiple contacts may have eliminated some students. In addition, only students who were in school on the day the survey was conducted were able to complete the survey. Responses from the students who were not able to participate might have altered the study's outcomes. The adolescent females completing the survey could represent a low risk sample of youth for substance use. This sampling procedure limits the external validity of this study.

Implications for School Counselors

The findings of this study have several implications for school counselors who are designing and implementing personal/social development activities. Understanding gender identity and its relationship to the use of drugs among young females might be used as a preventative tool for curtailing adolescent drug use. Middle school girls, who exhibit aggressive behavior, are likely to benefit from an intervention implemented in a middle school setting. Intervening early with this group, the school counselor can establish a personal/social development activity that will teach alternative ways of

responding to peers and adults in social situations without resorting to aggressive behavior.

Middle school girls who lack parental support represent a group school counselors can target. Encouraging parents to play an active role in their child's life and finding appropriate mentors are effective strategies. School counselors can encourage parents to oversee the selection of friends chosen by their child and inform parents how this role provides a type of indirect protection from drug use by reducing the number of drug using friends that children contact regularly, which then limits drug use involvement (Bahr, Hoffman, & Yang, 2005; Simons-Martin, 2007; Walden, McGue, Iacono, Burt, & Elkins et al., 2004). Continuing to focus on the significance of parental and mentoring relationships is important, as commercially driven youth cultures such as myspace.com, facebook.com, xanga.com, and friendster.com could remove adolescents further from parental influence. To avoid this, parents need not only to be aware of the activities of their adolescent children but oversee them as well.

Helping all students develop social skills to improve peer relationships is a strategy that school counselors could implement in a middle school setting. The results of this study indicate that social isolates are a group to be concerned about in rural environments and represent an appropriate group for a selected intervention. Ennett et al. (2006) also found that adolescents who do have close friendships are the least vulnerable to substance use.

School counselors in any setting would do well to take into account what the physical and social environment has to offer that would be of interest to their students. Pearson et al. (2006) suggested encouraging participation in prosocial activities with

groups at risk for drug abuse that take into account the social environment and the patterns of drug use in that environment. Certainly rural environments offer unique opportunities for prosocial activities that could be of interest to students.

Conclusion

In summary, the findings of this study show the importance of addressing adolescent female substance abuse prevention, as drug use in this population is on the rise. Past research has indicated that girls in rural environments are particularly susceptible. School counselors who understand that girls who exhibit aggressive behavior or who appear to have little parent or peer support are at risk for substance use could be instrumental in implementing activities that effectively target this vulnerable population.

The purpose of this study was to look at potential influences of drug use by adolescent females in rural environments. However, potential influences of drug use by adolescent males in a rural environment are also important. There may be an interaction between gender identity and socialization factors (e.g., attachment to parents and peers) for both females and males that leads to risky behaviors. Low attachment to parents and peers might increase the likelihood an adolescent will begin thinking and behaving in a manner consistent with aggressive masculinity as a way to feel protected. The isolation brought on by the aggressive behavior might support drug use as a viable coping strategy in rural environments. With the lack of research conducted in rural environments, the substance abuse prevention needs of all adolescents require further exploration.

References

Aloise-Young, P. A., Wayman, J. C., & Edwards, R. W. (2002). Prevalence of cigarette smoking among rural adolescents in the United States. *Substance Use & Misuse, 37,* 613-630.

Arata, C., Stafford, J., & Tims, M. (2003). High school drinking and its consequences. *Adolescence*, *38*, 567-579.

Armsden, G. C., & Greenberg, M. T. (1987). The inventory of parent and peer attachment: Individual differences and their relationship to psychological well-being in adolescence. *Journal of Youth and Adolescence, 16,* 427-454.

Atvar, S., & Spencer, G. A. (2002). Health risk behaviors among adolescents attending rural, suburban, and urban schools: A comparative study. *Family Community Health, 25*(2), 53-64.

Bahr, S. J., Hoffmann, J. P., & Yang, X. (2005). Parental and peer influences on the risk of adolescent drug use. *Journal of Primary Prevention, 26,* 529-551.

Blake, S. M., Amaro, H., Schwartz, P. M., & Flinchbaugh, L. (2001). A review of substance abuse prevention interventions for young adolescent girls. *Journal of Early Adolescence, 21*, 294-324.

Blanton, H., Gibbons, F. X., Gerrard, M., Conger, K. J., & Smith, G. E. (1997). Role of family and peers in the development of prototypes associated with substance use. *Journal of Family Psychology, 11,* 271-288.

Bogenschneider, K., Wu, M., Rafaelli, M., & Tsay, J. C. (1998). Parent influences on adolescent peer orientation and substance use: The interface of parenting practices and values. *Child Development, 69,* 1692-1688.

Callas, P. W., Flynn, B. S., & Worden, J. K. (2004). Potentially modifiable psychosocial factors associated with alcohol use during early adolescence. *Addictive Behaviors, 29,* 1503-1515.

Center for Substance Abuse Prevention. (2001). *Core measures initiative.* Retrieved from http://www.activeguidellc.com/cmi/index.htm

Chopak, J. S. (1993). The relationship between perceived risk and parental and peer influences on selected health risk behaviors of rural adolescents. Retrieved from Dissertations and Theses Full Text database.

D'Amico, E., Ellickson, P., Collins, R., Martino, S., & Klein, D. (2005). Processes linking adolescent problems to substance-use problems in late young adulthood. *Journal of Studies on Alcohol*, *66*, 766-775.

Dekovic, M., Buist, K. L., & Reitz, E. (2004). Stability and changes in problem behavior during adolescence: Latent growth analysis. *Journal of Youth and Adolescence, 33,* 1-12.

Duncan, T. E., Tildesley, E., Duncan, S. C., & Hops, H. (1995). The consistency of family and peer influence on the development of substance use in adolescence. *Addiction, 90,* 1647-1660.

Ennett, S., Bauman, K., Hussong, A., Faris, R., Foshee, V., Cai, L., et al. (2006). The peer context of adolescent substance use: Findings from social network analysis. *Journal of Research on Adolescence, 16*(2), 159-186.

Epstein, J. A., Botvin, G. J., & Spoth, R. (2003). Predicting smoking among rural adolescents: Social and cognitive processes. *Nicotine and Tobacco Research, 5,* 485-491.

Fahs, P. S., Smith, B. E., Atav, A. S., Britten, M. X., Collins, M. S., Morgan, L. C., et al. (1999). Integrative research review of risk behaviors among adolescents in rural, suburban, and urban areas. *Journal of Adolescent Health, 24,* 230-243.

Fisher, S. L., Bucholz, K. K., Reich, W., Fox, L., Kuperman, S., Kramer, J., et al. (2006). Teenagers are right–parents do not now much: An analysis of adolescent-parent agreement on reports of adolescent substance use, abuse, and dependence. *Alcoholism: Clinical and Experimental Research, 30,* 1699-1710.

Gullone, E., & Robinson, K. (2005). The inventory of parent and peer attachment–revised for children: A psychometric investigation. *Clinical Psychology and Psychotherapy, 12,* 67-79.

Guthrie, B. J., & Flinchbaugh, L. J. (2001a). Gender-specific substance prevention programming: Going beyond just focusing on girls. *Journal of Early Adolescence, 21*, 354-372.

Guthrie, B. J., & Flinchbaugh, L. J. (2001b). Introduction. *Journal of Early Adolescence, 21*, 253-255.

Henry, D. B., & Kobus, K. (2007). Early adolescent social networks and substance use. *Journal of Early Adolescence, 27,* 346-362.

Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2007). *The national survey results on drug use from the monitoring the future study, 1975-2006.* Rockville, MD: National Institute on Drug Abuse.

Kandel, D. (1996). The parental and peer context of adolescent deviance: An algebra of interpersonal influences. *Journal of Drug Issues, 26,* 289-315.

Killeya-Jones, L., & Costanzo, P. (2007). Peer standing and substance use in early-adolescent grade-level networks: A short-term longitudinal study. *Prevention Science, 8*, 11-23.

Kulis, S., Marsiglia, F. F., & Hecht, M. L. (2002). Gender labels and gender identity as predictors of drug use among ethnically diverse middle school students. *Youth and Society, 33,* 442-475.

Kulis, S., Marsiglia, F. F., & Hurdle, D. (2003). Gender identity, ethnicity, acculturation, and drug use: Exploring differences among adolescents in the southwest. *Journal of Community Psychology, 31,* 167-188.

Kulis, S., Marsiglia, F. F., Lingard, E., Nieri, T, & Nagoshi, J. (2008). Gender identity and substance use among students in two high schools in Monterrey, Mexico. *Drug and Alcohol Dependence, 95,* 258-268.

Lennings, C., Kenny, D., Howard, J., Arcuri, A., & Mackdacy, L. (2007). The relationship between substance abuse and delinquency in female adolescent in Australia. *Psychiatry, Psychology and Law, 14*, 100-110.

Lineberry, T. W., & Bostwick, J. M. (2006). Methamphetamine abuse: A perfect storm of complications. *Mayo Clinic Proceedings, 81,* 77-84.

McCreary, D., Newcomb, M., & Sadava, S. (1999). The male role, alcohol use, and alcohol problems: A structural modeling examination in adult women and men. *Journal of Counseling Psychology*, *46*, 109-124.

Mosher, C., Rotolo, T., Phillips, D., Krupski, A., & Stark, K. (2004). Minority adolescents and substance use risk/protective factors: A focus on inhalant use. *Adolescence, 39*, 489-502.

Muilenberg, J. L., & Johnson, W. D. (2006). Inhalant use and risky behavior correlates in a sample of rural middle school students. *Substance Use, 27*(4)*,* 21-25.

Nishimura, S. T., Hishinuma, E. S., Else, I. R., Goebert, D. A., Andrade, N. N. (2005). Ethnicity and adolescent substance use. *Cultural Diversity and Ethnic Minority Psychology, 11,* 239-258.

Oetting, E. R., Deffenbacher, J. L., & Donnermeyer, J. F. (1998). Primary socialization theory: The role played by personal traits in the etiology of drug use and deviance. *Substance Use and Misuse, 33*, 1337-1366.

Oetting, E.R., & Donnermeyer, J.F. (1998). Primary socialization theory: Etiology of drug use and deviance. *Substance Use and Misuse, 33*, 995-1026.

O'Malley, P. M., Bachman, J. G., & Johnston, L. D. (1983). Reliability and consistency in self-reports of drug use. *The International Journal of Addictions, 18*, 805-824.

Pearson, M., & Mitchell, L. (2000). Smoke rings: Social network analysis of friendship groups, smoking, and drug-taking. *Drugs: Education, Prevention, and Policy, 7,* 21-27.

Pearson, M., Sweeting, H., West, P., Young, R., Gordon, J., & Turner, K. (2006). Adolescent substance use in different social and peer contexts: A social network analysis. *Drugs: Education, Prevention & Policy*, *13*, 519-536.

Pilgrim, C., Abbey, A., & Trace, K. (2004). The direct and indirect effects of mothers' and adolescents' family cohesion on young adolescents' attitudes toward substance use. *Journal of Primary Prevention, 24,* 263-283.

Pires, P., & Jenkins, J. (2007). A growth curve analysis of the joint influences of parenting affect, child characteristics and deviant peers on adolescent illicit drug use. *Journal of Youth & Adolescence, 36*(2), 169-183.

Pizer, B. (1999). Getting loaded: Adolescent girls' stories of substance abuse and treatment. Retrieved from Dissertations and Theses Full Text database.

Schulenberg, J., Maggs, J. L., Dielman, T. E., Leech, S. L., Kloska, D. D., Shope, J. T., et al. (1999). On peer influence to get drunk: A panel study of young adolescents. *Merrill-Palmer Quarterly, 42,* 108-142.

Shears, J., Edwards, R. W., & Stanley, L. R. (2006). School bonding and substance use in rural communities. *Social Work Research, 30,* 6-18.

Substance Abuse and Mental Health Services Administration. (1997). *Substance use among women in the United States* (DHHS Publication No. SMA 97-3162). Office of Applied Studies, U.S. Department of Health and Human Services. Rockville, MD.

Substance Abuse and Mental Health Services Administration. (2005). *Results from the 2004 national survey on drug use and health: National findings* (Office of Applied Studies, NSDUH Series H-28, DHHS Publication No. SMA 05-4062). Rockville, MD.

Tarasevich, S. L. (2001). A study of the relationship between student assistance program process and outcomes at the local school level with emphasis on parent and student satisfaction. Retrieved from Dissertations and Theses Full Text database.

Tarter, R. E. (2002). Etiology of adolescent substance abuse: A developmental perspective. *The American Journal on Addiction, 11,* 171-191.

Tragesser, S. L., Beauvais, F., Swaim, R. C., Edwards, R. W., & Oetting, E. R. (2007). Parental monitoring, peer drug involvement, and marijuana use across three ethnicities. *Journal of Cross-cultural Psychology*, *38*, 670-694.

Walden, B., McGue, M., Iacono, W. G., Burt, S. A., & Elkins, I. (2004). Identifying shared environmental contributions to early substance use: The respective roles of peers and parents. *Journal of Abnormal Psychology, 113,* 440-450.

Webb, J. A., Bray, J. H., Getz, J. G., & Adams, G. (2002). Gender, perceived parental monitoring, and behavioral adjustment: Influences on adolescent alcohol use. *American Journal of Orthopsychiatry, 72,* 392-400.

Weiss, B., Caron, A., Ball, S., Tapp, J., Johnson, M., & Weisz, J. R. (2005). Iatrogenic effects of group treatment for antisocial youth. *Journal of Consulting and Clinical Psychology, 73,* 1036-1044.

Wills, T. A., Resko, J. A., Ainette, M. G., & Mendoza, D. (2004). Role of parent and peer support in adolescent substance use: A test of mediated effects. *Psychology of Addictive Behaviors, 18,* 122-134.

Wu, L., Schlenger, W. E., & Galvin, D. M. (2007). Concurrent use of methamphetamine, MDMA, LSD, ketamine, GHB, and flunitrazepam among American youths. *Drug and Alcohol Dependence, 84,* 102-113.

Author Note

Susan L. Renes, Ph.D. is an Assistant Professor in the Counseling Department of the School of Education, University of Alaska Fairbanks. Anthony T. Strange, Ed.D. serves as Chair of the Graduate Studies Program in the School of Education, University of Alaska Fairbanks. Communication regarding this article should be addressed to: Susan L. Renes, Ph.D., Assistant Professor, School of Education, P.O. Box 756480, Fairbanks, Alaska 99775-6480. Phone: 907-750-3235. Fax: 907-474-5451, e-mail: slrenes@alaska.edu