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The Relation between Profiles of Leisure Activity Participation and Substance Use among South African Youth

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Abstract

A large body of research indicates that leisure activity participation is associated with substance use for American adolescents, and that leisure may be an important context of substance use prevention. It is important to begin to apply what we have learned with American youth and extend the knowledge base in other countries with significant adolescent risk behavior. The current study examined the association between leisure activity participation and substance use among a predominately Colored sample of 3497 South African 8th graders. Males' activity participation was characterized by five leisure activity profiles (*Uninvolved; Sports and Volunteer; Mixed: Recreation and Hobbies; Mixed: Artistic; Highly Involved*), whereas females' activity participation was characterized by four leisure activity profiles (*Uninvolved; Uninvolved but Social; Mixed; Highly Involved*). Leisure activity profiles were significantly associated with past-month alcohol, tobacco, and marijuana use.

Numerous studies have examined the developmental implications of leisure activity participation among American youth. With the exception of team sports participation (Barber, Eccles, & Stone, 2001; Bartko & Eccles, 2003; Darling, Caldwell, & Smith, 2005; Eccles, Barber, Stone, & Hunt, 2003; Fredricks & Eccles, 2006; Zill, Nord, & Loomis, 1995), youth who participate in adult-organized leisure activities are more likely to engage in prosocial behaviors and less likely to engage in risky behaviors such as substance use than their non-participating peers (Barber et al., 2001; Eccles & Barber, 1999; Eccles et al., 2003; Feldman & Matjasko, 2005; Zill et al., 1995).

Additionally, a smaller body of research suggests that adolescents' profiles of participation across leisure activities are associated with behavioral outcomes. For example, Bartko and Eccles (2003) used cluster analysis in order to discover six profiles of non-school time activities that defined the youth in their sample: *Uninvolved* (i.e., youth who had low participation on all measured activities), *Work* (i.e., youth who spent time in work-related activities), *Volunteer* (i.e., youth who volunteered), *Sports* (i.e., youth who spent time in sports and with friends), *School* (i.e., youth who read, belonged to school-based clubs, and did homework), *High Involved* (i.e., youth who had high involvement in all activities except

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unsupervised activities). Overall, youth with the *School* and *High Involved* profiles had the highest academic achievement and the lowest problem behavior, whereas those with the *Uninvolved* profile had the lowest academic achievement and highest problem behavior.

Although youth certainly select leisure activities based on their pre-existing characteristics, longitudinal studies that have controlled for multiple personal characteristics suggest that the relation between leisure activities and outcomes cannot completely be explained by selection effects (Barber et al., 2001; Darling et al., 2005; Fredricks & Eccles, 2006; Osgood, Anderson, & Shaffer, 2005; Zill et al., 1995). Thus, it is reasonable to assume that leisure activities play an important role in American adolescents' development, including their substance use. Researchers are beginning to use this knowledge in order to develop programs that modify adolescents' leisure experiences in order to promote health and reduce risky behaviors such as substance use among adolescents (Caldwell, Baldwin, Walls, & Smith, 2004a; Caldwell & Smith, 2006; Caldwell et al., 2004b).

Cross-national research has confirmed that leisure is an important developmental context for youth around the world (Larson & Verma, 1999). Few studies, however, have examined the association between leisure activities and risky behaviors such as substance use for non-Western youth. Given the potential of leisure activities to be utilized as a context of prevention, it is important to begin to apply what has been learned with American youth and extend the knowledge base in countries with significant adolescent risk behavior. To this end, the current study examined profiles of South African adolescents' leisure activity participation, as well as the relation between these activity profiles and substance use.

The Prevalence of Substance Use among South African Youth

As in the United States, adolescent substance use and abuse are ongoing problems in South Africa (Parry et al., 2004). Tobacco and alcohol are the most commonly used drugs (Reddy et al., 2003). By the 8th grade, approximately 19% of South African youth are current smokers and 26% are current alcohol users. By the 11th grade, 24% are current smokers and 40% are current alcohol users. Additionally, 26% of 8th graders and 29% of 11th graders report binge drinking (Reddy et al., 2003), which suggests that many South African adolescents who drink alcohol are doing so in a risky manner. These findings are alarming given that early and excessive substance use in adolescence predicts later abuse (Bonomo, Bowes, Coffey, Carlin, & Patton, 2004; Pitkanen, Lyyra, & Pulkkinen, 2005).

The high prevalence of alcohol and tobacco use in South Africa also is of concern given that use of these substances often precedes illicit drug use (Chung & Martin, 2001; Flisher, 2003; Guo et al., 2002; Kandel & Yamaguchi, 1993; Newcomb & Bentler, 1986). Although inhalants and prescription medications are the most common illicit drugs used by South African early adolescents, marijuana use is most prevalent among mid and late adolescents (Reddy et al., 2003). By the 11th grade, 10% of youth report past-month marijuana use. It is important to note that males generally have higher substance use compared to females, and Black youth have much lower rates of substance use than White or Colored (mixed race) youth (Reddy et al., 2003).

As a whole, these findings suggest that substance use is relatively common and problematic among South African adolescents. Given the serious and long-term risks associated with alcohol, tobacco, and marijuana use, innovative methods of prevention are needed. To the extent that leisure activities are associated with substance use and other risk behaviors, leisure may be an important context of prevention (Caldwell et al., 2004a; Caldwell & Smith, 2006; Caldwell et al., 2004b). The following section reviews research on the nature of South African adolescents' leisure experiences, as well as the relation between leisure and substance use.

The Context of Leisure for South African Adolescents

Few studies have examined the nature of South African adolescents' leisure activities and experiences. Much of the current knowledge on this topic stems from Møller's study of the leisure activities of Black youth in the late 1980s (Møller, 1992). Given that this study did not include youth of different ethnicities and was conducted before the end of Apartheid, the generalizability of the findings to contemporary South African youth of diverse backgrounds is unclear. Examining Møller's findings in conjunction with more recent studies of leisure boredom and community leisure opportunities, however, provides a glimpse into the leisure experiences of contemporary South African youth.

As in the United States and other regions of the world (Larson & Verma, 1999), research in South Africa suggests that spending time with friends is a common leisure activity among youth (Møller, 1992; Wegner, Flisher, Muller, & Lombard, 2006). Other popular activities among South African youth include watching TV, listening to music, reading, playing sports, and participating in creative activities (Møller, 1992). South Africa differs from the United States, however, in that many South African youth, particularly those living in impoverished areas, have few opportunities to participate in school- or community-sponsored leisure activities (Kaufman, Clark, Manzini, & May, 2004; Møller, 1992; Wegner et al., 2006). As a result, many leisure activities generally characterized by adult-organization and supervision in the United States (e.g., sports) are often adolescent-organized and unsupervised in South Africa (e.g., pickup games). Further, even when adult-organized leisure activities are technically available, they are often unavailable to the majority of youth (Burnett, 2002; Goslin, 2002).

Although adolescent- and peer-directed leisure activities undoubtedly offer developmental opportunities not available in adult-directed activities (Kloep & Hendry, 2007), research with American suggests that youth who do not participate in adult-organized leisure activities may have fewer opportunities to develop leisure-related skills such as initiative and goal setting that may serve as protective factors against substance use (Larson, 2000). Further, youth not involved in adult-organized and supervised activities may have increased time and opportunities for engagement in risky behaviors (Osgood et al., 2005; Wegner et al., 2006).

Despite the fact that American studies point to a relation between characteristics of leisure activities and substance use, no known studies have examined this relation for South African youth. Kaufman and colleagues (Kaufman et al., 2004), however, did find a relation between sports participation and sexual behaviors. Girls who played sports were more likely to abstain from sex; in contrast, males who played sports were less likely to use condoms. Kaufman et al. note that males and females may receive different societal messages during sports participation which may in turn influence attitudes and health behaviors. Additional research is clearly needed in order to understand the relation between participation in leisure activities and risk behaviors among South African youth.

The Current Study

The current study utilized latent class analysis, a person-centered method, in order to determine South African adolescents' leisure activity profiles and to examine the relation between these profiles and past-month alcohol, tobacco, and marijuana use. Given Kaufman's findings of gender differences in the relation between sports and sexual behaviors, as well as research in a variety of Western and non-Western countries suggesting that gender differences in leisure activity participation are common (Larson & Verma, 1999), gender differences were also explored.

Method

Procedures

The data for this study were collected as part of a randomized trial of a preventive intervention aimed at reducing substance use and risk of human immunodeficiency virus (HIV) among adolescents. The study was approved by the Institutional Review Boards of both the Pennsylvania State University and Stellenbosch University in South Africa. Passive parental consent and active participant assent were obtained prior to survey administration. Self-report surveys were collected via hand-held personal digital assistants (PDAs). Baseline data collected at the beginning of 8th grade were utilized in this study.

Participants

Participants included 3497 8th grade students (mean age = 14.0) from nine schools located in a low-income township created during the Apartheid era near Cape Town, South Africa. There were nearly equal numbers of male and female participants. The majority of participants (86%) identified themselves as Colored (i.e., of Asian, European, or African descent). A smaller percentage identified as Black (9%), White (4%) or Other (1%).

Measures

Activity Participation—Activity participation was assessed with the question "During the past four weeks have you spent time insert activity after school or over weekends?" (0 = no, 1 = yes). Participation in eight categories of activities was assessed: hanging out with friends, watching TV or movies, doing sports or other physical activities (PA), playing a musical instrument or singing, taking part in a drama or dance group, doing hobbies or creative activities, going to parks or community/sports centers, and volunteering.

Past-month Substance Use—Participants were asked "During the past four weeks did you (a) use alcohol (including wine and beer), (b) smoke cigarettes, and (c) use dagga [marijuana]?" (0=no, 1=yes).

Analytic Strategy

Profiles of leisure activity participation across the eight activities were determined using latent class analysis (SAS PROC LCA). PROC LCA estimates two sets of parameters (Lanza, Collins, Lemmon, & Schafer, 2007). The first set of parameters represents the percentage of participants in a given profile. The second set of parameters represent the probability of endorsing an item (e.g., participating in a given leisure activity) given membership in a particular profile. These probabilities range from 0 to 1, where probabilities close to 0 and 1 indicate a strong relation between the item and the profile. For example, and item-response probability of 1 for the item "hanging out with friends" among youth in a particular profile indicates that youth in that profile have a high probability of spending time with friends.

After establishing the latent class model, substance use covariates were estimated using multinomial logistic regression within PROC LCA. Each covariate was entered separately.

Results

Descriptive Statistics

Descriptive statistics concerning past-month leisure activity participation and substance use are presented in Table 1. Among males, watching TV/movies, hanging out with friends, doing sports/PA, and doing hobbies/creative activities were the most popular leisure

activities. Among females, watching TV/movies, hanging out with friends, doing hobbies/creative activities and music/singing were most popular. Participating in drama/dance was the least popular leisure activity among both males and females.

In terms of substance use, approximately 21% of males and females reported past-month cigarette use. The prevalence of alcohol and marijuana use were lower, with 12% of females and 15% of males reporting past-month alcohol use and 3% of females and 9% of males reporting past-month marijuana use.

Model Specification

To test for measurement invariance across gender, a model in which measurement parameters were constrained to be equal for males and females was compared to a model in which measurement parameters were allowed to differ. The χ^2 difference test was statistically significant, indicating that model fit was better when the measurement parameters were allowed to vary. Therefore, models were examined separately for males and females.

Given the dearth of information on South African adolescents' leisure experiences, it was not possible to develop a priori hypotheses regarding the number and structure of the profiles of leisure activities. Therefore, models with two to six profiles were tested. Model fit was assessed with the likelihood ratio statistic (G^2). Models are said to have acceptable fit when the degrees of freedom are close to or less than the G^2 (Lanza, Flaherty, & Collins, 2003). The Akaike information criterion (AIC) and the Bayesian information criterion (BIC), which are penalized log likelihood tests, were also used to compare models with different numbers of profiles (Lanza et al., 2007). Model comparisons are presented in Table 2. For males, a five-class solution best fit the data (G^2 (211) = 202.50), whereas for females a four-class solution provided the best fit (G^2 (220) = 252.58).

Profiles and Covariates for Males

Results suggest that males belong to one of five profiles: *Uninvolved; Sports and Volunteer; Mixed: Recreation and Hobbies; Mixed: Artistic*; and *Highly Involved* (see Table 3). Members of four of the five profiles participated in multiple leisure activities. The exception was the *Uninvolved* class (21% of the sample), which was characterized by exclusively watching TV/movies.

Members of the other four profiles were similar in that they all watched TV/movies and participated in sports/physical activities. Additionally, members of the *Sports and Volunteer* profile (12%) also volunteered, members of the *Mixed: Recreation and Hobbies* (46%) profile also hung out with friends, went to parks/community centers, and did hobbies/creative activities, and members of the *Mixed: Artistic* (6%) profile also hung out with friends and participated in drama/dance and music/singing. Finally, members of the *Highly Involved* profile (15%) participated in all of the measured leisure activities.

Results of the multinomial logistic regression models are presented in Table 4. With few exceptions, males who reported past-month alcohol use, past-month cigarette use, or past-month marijuana use had lower odds of belonging to the *Uninvolved* profile compared to the other profiles.

Profiles and Covariates for Females

Results (see Table 5) suggest that females belong to one of four profiles: *Uninvolved; Uninvolved but Social; Mixed*; and *Highly Involved*. Members of three of the four profiles

participated in multiple leisure activities. The exception was the *Uninvolved* profile (25% of the sample), which was characterized by exclusively watching TV/movies.

Members of the other four profiles were similar in that they all watched TV/movies, but they differed on their participation in the remaining seven leisure activities. Whereas the *Uninvolved but Social* profile (30%) hung out with friends, members of the *Mixed* profile (31%) volunteered and did sports/PA, hobbies/creative activities, and music/singing. Members of the *Highly Involved* profile (14%) participated in all of the measured leisure activities.

Results of the multinomial logistic regression models are presented in Table 4. Females who reported past-month alcohol use, cigarette use, or marijuana use had higher odds of belonging to the *Uninvolved but Social* and *Highly Involved* profiles compared to the *Uninvolved* profile. Females who reported past-month alcohol use had lower odds of belonging to the *Mixed* profile compared to the *Uninvolved* profile, but females who reported past-month cigarette use had higher odds of belonging to the *Mixed* profile compared to the Uninvolved profile.

Discussion

The present study expanded on past research by examining leisure activity participation among a sample of South African youth. Latent class analysis was utilized in order to determine leisure activity profiles, as a well as examine the relation between these profiles and past-month substance use.

Although there were significant gender differences in many of the leisure activity profiles, it is important to note that both males and females had profiles characterized by watching TV/movies (*Uninvolved*) and participating in all of the measured leisure activities (*Highly Involved*). In the majority of cases, male and female substance users were less likely to belong to the *Uninvolved* profile compared to the other profiles.

As a whole, these findings suggest that either (a) engaging in leisure activities predisposed the youth in this sample to substance use or (b) there is something unique about youth who choose to engage in multiple leisure activities. Although the cross-sectional nature of this study does not allow one to draw definitive conclusions on this matter, it is important to understand the possible contextual and individual characteristics that may contribute to adolescents' substance use in order to develop additional research questions that may inform the design of leisure-based programs and policies aimed at preventing substance use among South African youth.

Contextual Characteristics of Leisure Activities and Substance Use

When considering the ways in which leisure activity participation may have predisposed youth to substance use, it is important to consider the context of leisure activities. As noted, in impoverished areas such as the one examined the current study, there may be few opportunities to participate in adult-organized leisure activities. Thus, it is probable that many of the leisure activities examined in the current study were youth- rather than adult-organized. Youth-initiated leisure activities may lack the adult supervision and guidance necessary to ensure that youth do not become involved in risky behaviors such as substance use. In contrast, youth who exclusively watch TV/movies, presumably at home, may receive the greatest adult supervision.

It is also important to note the relation between spending time with friends and risky behaviors such as substance use. Several studies with American youth suggest that spending

time with friends, especially in the absence of other leisure activities, is associated with the highest rates of substance use and delinquency (Osgood et al., 2005; Zill et al., 1995). In this study, the *Uninvolved* profile, which was characterized by not socializing or engaging in social leisure activities, was nearly always associated with the lowest relative odds of substance use for both males and females. Therefore, spending time with friends, or participating in activities that allow unsupervised time with friends, may be associated with higher substance use.

Individual Characteristics and Substance Use

An alternate explanation for these findings may be that adolescents' choose activities based on their pre-existing characteristics, beliefs, and expectations, and in turn these characteristics also influence substance use decisions (Fredricks & Eccles, 2006). For example, youth who are at-risk of problem behavior as a result of personal, familial, or community factors may be more likely to choose peers and leisure activities that provide support and/or opportunities for problem behaviors, and may be more likely to engage in substance use. Although it was not possible to test this hypothesis in the current study, longitudinal research on South African adolescents' leisure activity participation that controls for known risk factors for substance use is needed in order to account for this possibility.

It is important to reiterate that even though it is probable that youth select leisure activities based on their personal characteristics, it is also probable that there are developmental consequences of participation (Fredricks & Eccles, 2006). Findings from longitudinal studies with American youth support this assertion (Barber et al., 2001; Darling et al., 2005; Fredricks & Eccles, 2006; Osgood et al., 2005; Zill et al., 1995).

Limitations

Several limitations should be taken into consideration when interpreting the results of this study. First, the data for this study were collected in one impoverished region of South Africa and primarily included Colored adolescents. Thus, the findings may not generalize to South African youth of different races, with different economic circumstances, or in different regions.

Further, all data come from self-reports. Although this likely had minimal impact on questions concerning leisure activity participation, youth may have under- or over-reported substance use based on perceived social expectations.

Additionally, some leisure activities were combined (e.g., sports and physical activities), and thus the precision of measurement was reduced. Further, the measured activities did not include all possible leisure activities, and thus important profiles of participation may have been overlooked. Finally, it was not possible to determine causal relationships given the crosssectional nature of the study.

Despite these limitations, the present study suggests that there is a relation between leisure activity participation and substance use for South African youth. Further research is needed in order to fully understand the nature of South African adolescents' leisure experiences, as well to understand the direction of influence in the leisure activity – substance use relationship. This information can be used to inform the development of leisure-based programs and interventions aimed at preventing substance use and other risky behaviors among South African youth.

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Table 1

Prevalence of Leisure Activity Participation and Substance Use by Gender

	Males (N = 1750)		Females (N = 1747)	
	No	**Yes**	**No**	**Yes**
Leisure Activities				
Hanging out with Friends	37.87	62.13	42.26	57.54
Watching TV/Movies	12.58	87.42	12.60	87.40
Sports/Physical Activities	28.47	71.53	54.07	45.93
Parks/Recreation Centers	49.60	50.40	63.88	36.12
Hobbies/Creative				
Activities	41.31	58.69	49.11	50.89
Music/Singing	57.15	42.85	49.74	50.26
Drama/Dance	75.14	24.86	74.57	25.43
Volunteering	50.37	49.63	53.64	46.36
Past-Month Substance Use				
Alcohol	85.35	14.65	88.49	11.51
Cigarettes	78.57	21.43	79.28	20.72
Marijuana	91.48	8.52	97.02	2.98

Table 2

Measures of Model Fit

Males					Females				
# of Profiles	**Likelihood Ratio G^2**	**df**	**AIC**	**BIC**	**# of Profiles**	**Likelihood Ratio G^2**	**df**	**AIC**	**BIC**
2	388.49	238	422.49	515.50	2	366.78	238	400.78	493.71
3	300.89	229	352.89	495.15	3	300.11	229	352.11	494.24
4	245.70	220	315.70	507.20	4	252.58	220	322.58	513.92
5	202.50	211	290.50	531.24	5	244.58	211	332.58	573.12
6	189.81	202	295.81	585.79	6	210.69	202	316.69	606.43

Table 3

Item-Response Probabilities and Profile Membership Prevalence for Males

	Profile				
	Uninvolved	**Sports and Volunteer**	**Mixed: Recreation and Hobbies**	**Mixed: Artistic**	**Highly Involved**
Prevalence	0.21	0.12	0.46	0.06	0.15
Item Response Probabilities					
Hanging out with Friends	0.40	0.13	**0.78**	**0.76**	**0.79**
Watching TV/Movies	**0.85**	**0.67**	**0.96**	**0.56**	**0.94**
Sports/Physical Activities	0.26	**0.74**	**0.83**	**0.81**	**0.94**
Parks/Recreation Centers	0.17	0.44	**0.56**	0.28	**0.94**
Hobbies/Creative Activities	0.31	0.49	**0.65**	0.54	**0.87**
Music/Singing	0.21	0.24	0.39	**0.86**	**0.83**
Drama/Dance	0.06	0.23	0.11	**0.87**	**0.69**
Volunteering	0.23	**0.72**	0.45	0.42	**0.86**

Note: Probabilities greater than .55 are in bold.

Table 4

Unconditional Odds Ratios for Profile Membership by Past-Month Substance Use

	Males					Females			
	Profile					Profile			
	Sports and Volunteer	Mixed: Recreation and Hobbies	Mixed: Artistic	Highly Involved	*p* value	Uninvolved but Social	Mixed	Highly Involved	*p* value
Alcohol Use	1.03	1.67	3.84	4.55	< .001	1.94	0.51	3.15	< .001
Cigarette Use	0.76	2.81	5.41	3.07	< .001	2.44	2.01	2.19	< .001
Marijuana Use	1.03	1.44	15.37	5.27	< .001	2.24	1.06	5.86	< .01

Note: Uninvolved is the Reference Group

Table 5

Item-Response Probabilities and Profile Membership Prevalence for Females

	Profile			
	Uninvolved	**Uninvolved but Social**	**Mixed**	**Highly Involved**
Prevalence	0.25	0.30	0.31	0.14
Item Response Probabilities				
Hanging out with Friends	0.25	**0.85**	0.43	**0.90**
Watching TV/Movies	**0.82**	**0.99**	**0.77**	**0.95**
Sports/Physical Activities	0.16	0.33	**0.66**	**0.83**
Parks/Recreation Centers	0.09	0.32	0.41	**0.83**
Hobbies/Creative Activities	0.27	0.47	**0.56**	**0.92**
Music/Singing	0.24	0.45	**0.61**	**0.87**
Drama/Dance	0.07	0.09	0.40	**0.62**
Volunteering	0.30	0.28	**0.66**	**0.72**

Note: Probabilities greater than .55 are in bold.