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Longitudinal Patterns of Active Leisure among South African Youth: Gender Differences and Associations with Health Risk Behaviours

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Abstract

This study identified adolescents' patterns of active leisure participation over two years and five waves of data and how those patterns were related to substance use and sexual activity.

Participants included 3581 primarily Colored (mixed race) South African adolescents. Latent class analysis was utilized to determine patterns of active leisure patterns and multinomial logistic regression was used to examine the relationships between the patterns and substance use and sexual activity. Four patterns were identified: *Non-Participants*; *Early Participants*; *Late Participants*; and *Consistent Participants*. Most males were *Consistent Participants*, whereas most females were *Non-participants*. Female *Consistent Participants* had the lowest odds of tobacco use, marijuana use, and sexual activity by the tenth grade relative to the other patterns, whereas *Early Participants* had the highest odds. In contrast, male *Consistent Participants* were at moderate risk of engaging in health risk behaviors relative to the other patterns. These findings suggest the need for a cautious approach to developing active leisure-based interventions, taking into account the contextual factors that may influence participation and health risk behaviors.

Keywords

adolescence; physical activity; sexual activity; South Africa; sport; substance use

Engaging in active pursuits is a common and preferred type of leisure activity among South African youth, although the available research suggests that participation is more common for males than females and for White and Black youth compared to Colored (i.e., mixed race of African, Asian, or European descent) youth (Palen et al., 2010; Whitley, Hayden, & Gould, 2013). Some of these gender and racial differences are attributable to policies set in place during Apartheid such as reserving most resources for urban White males (Nauright, 1997). Although efforts have been made post-Apartheid to provide greater access to facilities and opportunities for active leisure for females and Black, Colored, and Indian youth, the most recent research available suggests that many youth do not have access to the resources necessary to fully engage in organized active leisure pursuits such as formal sports teams (Bhana, 2008; Palen et al., 2010; Wegner, Flisher, Muller, & Lombard, 2006; Whitley, Hayden, & Gould, 2013). As a result, a lot of youth active leisure occurs in the context of unsupervised informal gatherings which may provide opportunities for youth to engage in health risk behaviors.

Research findings concerning the relationships between active leisure and health risk behaviors among South African youth have been mixed and vary based on gender. For example, one study of primarily Black South African youth found that members of community sports clubs had a lower HIV prevalence compared to those who were not members, and that women sports club members were more likely to use condoms than non-members (Campbell, Williams, & Gilgen, 2002). Another study with similar sample demographics found that high community-level participation in sports was associated with lower prevalence of sexual activity for females, but higher prevalence of sexual activity and lower condom use for males relative to non-participants of the same gender (Kaufman, Clark, Manzini, & May, 2004).

Given the popularity of active leisure among South African youth, the limited research about South African adolescents' active leisure participation over time, and the mixed results across the available studies, it is clear that additional research is needed to clarify the nature of the relationship between active leisure participation and health risk behaviors among South African youth. The current study examined active leisure among a primarily Colored sample of South African high school students. First, patterns of youth with different patterns of active leisure participation from the eighth through tenth grades were identified, and gender differences in the patterns were examined. Second, the relationship between pattern membership and sexual activity, alcohol use, cigarette use, and marijuana use by the tenth grade was determined. Thus, we were able to examine whether a change in active leisure participation between the eighth and tenth grades was associated with risk behavior.

Methods

Participants

Participants included 3581 students from five high schools located in an under-resourced township near Cape Town, South Africa. Self-report surveys were collected every six months via hand-held personal digital assistants (beginning and end of eighth, ninth, and tenth grade). At baseline, the mean age of participants was 14 years (50% male). Participants identified themselves as Colored (88%), Black (6%), White (5%) or Other (1%).

Measures

Active Leisure—Active leisure was assessed with the question “During the past four weeks have you spent time doing sports or other physical activities after school and over weekends?” (0 = no, 1 = yes).

Lifetime Sexual Activity—Participants were asked “Have you ever had sex? This means intimate contact with someone during which the penis enters the vagina (female private parts).” Participants who responded that they had sex at any of the five time points were coded as 1 (i.e., had sex by Time 5). Participants who provided data on at least 1 of the last 3 time points and responded that they had not had sex were coded as 0 (i.e., had not had sex by Time 5). This coding strategy was chosen to account for the fact that attrition was significant by Time 5 and it was not possible to use reliable methods of missing data estimation with the chosen analytic method (discussed in more detail below).

Substance Use—Lifetime use of alcohol, cigarettes, and marijuana were assessed with the questions “How many drinks of alcohol (including beer and wine) have you had in your entire life?,” “How many cigarettes have you smoked in your entire life?” and “How many times have you used dagga [marijuana] in your entire life?,” respectively. The coding scheme was similar to that of sexual activity. For each substance, participants who reported use at any of the five time points were coded as 1 (i.e., used the substance by Time 5). Participants who provided data on at least 1 of the last 3 time points and responded that they had not had used the substance were coded as 0 (i.e., had not used the substance by Time 5).

Analytic Strategy

The active leisure patterns were determined using latent class analysis (SAS PROC LCA), which estimates the prevalence of each pattern and the probability of endorsing a particular response (e.g., participating in active leisure at a given time point) given membership in a particular pattern (item-response probabilities). The item-response probabilities range from 0 to 1, where probabilities close to 1 indicate a strong relationship between the item and the pattern (Lanza, Flaherty, & Collins, 2003). Generally, item-response probabilities greater than .50 are used to define a given pattern.

Missing Data—Attrition reached 44% by Time 5. PROC LCA utilizes maximum likelihood with the EM algorithm in order to estimate missing responses on items used to determine the patterns (e.g., active leisure participation at the beginning of eighth grade), but deletes cases with data missing on the predictors of the patterns. In order to avoid the substantial loss of data that would have occurred had we used only Time 5 health risk behavior data, we developed the coding scheme described above in order to examine substance use and sexual activity *by* Time 5.

Results

Baseline Model Selection and Tests for Gender Differences

A baseline model that included males and females was selected by comparing the likelihood ratio statistic (G^2), Akaike’s information criterion (AIC), and the Bayesian information

criterion (BIC), as well as interpretability, for models with two to five patterns (see Table 1). Model identification was tested by examining the G^2 distribution of 100 random start values to ensure that the G^2 for a given model was the lowest and most prevalent of the 100 random start values (Lanza, et al., 2003). The model with the lowest AIC (i.e., the 4-pattern solution) and the lowest BIC (i.e., the 3-pattern solution) were compared in terms of model fit. The 4-pattern solution was chosen as it provided the best fit to the data ($G^2(8) = 7.86$) and was interpretable and identified.

To test for measurement invariance across gender, a model in which item-response probabilities were constrained to be equal for males and females was compared to a model in which item-response probabilities were allowed to differ. The χ^2 difference test was not statistically significant ($\chi^2(20) = 22.59$), indicating that there were not significant gender differences in the item-response probabilities. Therefore, the item-response probabilities were constrained to be equal across genders. The prevalence of each pattern, however, was allowed to vary across gender.

Active Leisure Patterns

Results of the 4-pattern solution are presented in Table 2. The *Non-Participants* pattern was characterized by a low probability of participation in active leisure at all five time points. *Early Participants* was characterized by a moderate probability of participation from the Time 1 to Time 3, but a low probability of participation by Time 4. *Late Participants* was characterized by a low probability of participation from the Time 1 to Time 3, but a high probability of participation at Times 4 and 5. *Consistent Participants* was characterized by a high probability of participation at all five time points.

Although there were not gender differences in the item-response probabilities, there were gender differences in prevalence. Most males were *Consistent Participants* (62%) or *Early Participants* (25%). In contrast, only 19% of females were *Consistent Participants*. Most were *Non-participants* (38%) and *Early Participants* (34%). *Late Participants* was the least common pattern for both males (7%) and females (8%).

Relationships with Health Risk Behaviors

Relationships between the patterns and substance use and sexual activity by the tenth grade are presented in Table 3. *Non-Participants* was chosen as the reference group for these analyses in order to enable comparisons of the health risk behaviors of youth who participated in active leisure with varying consistency to those who did not participate. The four patterns were not significantly different in regard to alcohol use. There were significant differences, however, in terms of cigarette use, marijuana use, and sexual activity. Results are presented separately for males and females.

Males

Males who reported cigarette use by the tenth grade had higher odds of belonging to patterns characterized by active leisure participation (i.e., *Early Participants*, *Late Participants*, and *Consistent Participants*) relative to *Non-Participants*. Males who reported marijuana use by the tenth grade had higher odds of belonging to *Early Participants* and *Consistent*

Participants patterns but lower odds of belonging to the *Late Participants* pattern relative to *Non-Participants*. Males who reported sexual activity had lower odds of belonging to the three patterns characterized by active leisure participation relative to *Non-Participants*.

Females

Females who reported cigarette and/or marijuana use had lower odds of belonging to the *Late Participants* and *Consistent Participants* patterns relative to *Non-Participants*, but higher odds of belonging to the *Early Participants* pattern. Females who reported sexual activity had lower odds of belonging to *Consistent Participants* relative to *Non-Participants*, but higher odds of belonging to the *Early Participants* and *Late Participants* subgroups.

Discussion

This study examined patterns South African adolescents' active leisure participation from the eighth to tenth grades, gender differences in the patterns, and the relationships between the patterns and substance use and sexual activity.

Although the patterns were the same for males and females, there were notable gender differences in the prevalence of the patterns. Most males were *Consistent Participants*, whereas most females were *Non-participants* or *Early Participants*. These findings may reflect different active leisure preferences and norms, as well as different opportunities for active leisure available to males and females. In the past, netball was the only sport to which the majority of Colored and Black females in South Africa had access (Hargreaves, 1997; Pelak, 2005), whereas even in under-resourced communities males had greater options. More recently, Palen et al. (2010) found that focus group participants regularly referred to some activities, including active leisure and sports, as boys' activities because girls lacked the skills and/or preferences for those activities. Additionally, girls routinely mentioned fear as a constraint to participation in sports, as well as dislike to have to follow certain rules (specifically with regard to netball), and dislike of physical exertion, getting dirty, and losing when they participated in sports.

Other explanations may be that parents allow males greater access to active leisure opportunities than females (Whitley, Hayden, & Gould, 2013). Females also often have more housework and other chores related to keeping a household going than do males, which may limit opportunities for active leisure participation. Additionally, in under-resourced and/or crime-ridden areas, parents may be more hesitant to allow their female than male adolescents out of the house to participate in active leisure pursuits (Wegner, et al., 2006).

Establishing Active Leisure Participation

It was more common for adolescents who participated in active leisure in the eighth grade to continue to participate over time than to discontinue participation. Additionally, very few adolescents were *Late Participants*. In congruence with research conducted in the developed world (Telama, et al., 2005), these findings suggest that preferences for active leisure participation may be established early and are difficult to change. Thus, in order to have significant public health impacts, health promotion programs within physical activity and

sports should start before adolescence, or make considerable efforts to recruit adolescents who otherwise would not participate.

Patterns of Active Leisure Participation and Health Risk Behaviors

As the findings regarding active leisure participation and health risk behaviors point to gender differences, they are discussed separately for males and females. The patterns of active leisure participation were not significantly associated with alcohol use by the tenth grade for males or females.

Female *Consistent Participants* appear to be at lowest risk of cigarette use, marijuana use, and sexual activity by the tenth grade, whereas female *Early Participants* appear to be at the greatest risk of cigarette use and marijuana use by the tenth grade. These findings mirror those of past South African research which have found sports to be associated with reduced risky sexual activity among females (Campbell, et al., 2002), as well as American research that suggests that dropping out of sport is associated with poor outcomes (McHale, Crouter, & Tucker, 2001). Taken together, these findings suggest that physical activity and/or sports may naturally be protective contexts for South African females if there is continued participation.

As a whole, the findings for males concerning active leisure and health risk behaviors were not as consistent across health risk behaviors as they were for females. For example, *Early Participants* and *Late Participants* had the highest odds of cigarette use by the tenth grade, *Early Participants* had the highest odds of marijuana use by the tenth grade, and *Non-Participants* and *Early Participants* had the highest odds of sexual activity by the tenth grade. What is clear from these findings, however, is that *Early Participants* appear to be a particularly high risk group across health risk behaviors.

Limitations

Several limitations should be taken into consideration when interpreting the results of this study. The findings may not generalize to South African adolescents of different races, with different economic circumstances, or in different regions because the data for this study were collected in one under-resourced region of South Africa and primarily included Colored adolescents. Additionally, although surveys were administered by research staff and confidentiality was emphasized, all data were collected via self-report, so adolescents may have distorted their true substance use and/or sexual activity based on perceived social expectations or fear of punishment. Further, physical activity and sports were measured as a single item due to time restrictions and the large size of the survey. Measuring physical activity and sports separately would have shed light on the differences or similarities of the two contexts, as well as potential differential associations with health behaviors.

Implications

Despite these limitations, the present study highlights significant relationships between active leisure and South African adolescents' health risk behaviors. Active leisure is widely promoted as an avenue to encourage healthy youth development by organizations such as UNICEF (2003), but the findings from this study suggest that active leisure participation

may be more beneficial for female than male youth. Although the nature of this study did not allow us to determine whether aspects of the active leisure environment led to health risk behaviors, or if males who are more inclined to participate in risky behaviors also participate more consistently in active leisure, the results do suggest that male-focused active leisure-based interventions should be implemented with caution. Specifically, coaches should make efforts to understand attitudes toward, and engagement in, risky behaviors in order to tailor intervention messages appropriately, and should be prepared to intervene to ensure unhealthy norms are not reinforced by youth participants. Additionally, providing adult supervision of males' informal active leisure pursuits could serve to discourage discussion of, and participation in, health risk behaviors.

Better understanding of the barriers to, and facilitators of, active leisure participation among South African females should be a high research priority, as the results can be used to inform the promotion of female participation in active leisure. The known barriers to females' active leisure participation, however, also suggest that investments in other types of more accessible health-promoting leisure activities should be made available to female youth.

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Table 1

Model Selection

# of Profiles	G ²	df	AIC	BIC
2	109.98	20	131.98	200.00
3	39.93	14	73.93	179.04
4	7.86	8	53.86	196.07
5	2.82	2	60.82	240.13

Note. The selected model is in bold.

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Table 2

Prevalence and Item-Response Probabilities of the Patterns

	Non- Participants	Early Participants	Late Participants	Consistent Participants
<i>Prevalence: Males</i>	0.05	0.25	0.07	0.62
<i>Prevalence: Females</i>	0.38	0.34	0.08	0.19
<i>Sports/PA Participation</i>				
Time 1: Beg. of 8th	0.19	0.63	0.37	0.81
Time 2: End of 8th	0.13	0.62	0.08	0.89
Time 3: Beg. of 9th	0.11	0.60	0.36	0.93
Time 4: End of 9th	0.12	0.36	0.76	0.93
Time 5: Beg. of 10th	0.14	0.43	0.73	0.92

Note. Values greater than .50 are in bold.

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Table 3
 Unconditional Odds Ratios for Pattern Membership by Time 5 Substance Use and Sexual Activity

	Profile								p value
	Non-Participants		Early Participants		Late Participants		Consistent Participants		
	Males	Females	Males	Females	Males	Females	Males	Females	
Alcohol Use	1.00	1.00	3.04	1.40	3.28	0.73	2.04	0.86	0.16
Cigarette Use	1.00	1.00	2.29	1.87	2.41	0.83	1.09	0.61	0.00
Marijuana Use	1.00	1.00	3.31	1.48	0.74	0.70	1.35	0.53	0.00
Sexual Activity	1.00	1.00	0.77	1.59	0.07	1.04	0.36	0.91	0.01

Note: Non-participants is the reference group.