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FREE-TIME ACTIVITIES AND SUBSTANCE USE AMONG ADOLESCENTS IN CAPE TOWN, SOUTH AFRICA

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ABSTRACT

The purpose of this dissertation is to describe the execution and implications of two research studies aimed at understanding adolescent free-time experiences and their links to substance use in a sample from one area of South Africa. The first study described the free-time context in this population, using both focus group (N = 114) and survey (N = 946) data. Youth were involved in a broad range of activities, however, socializing, media use, sports, risk behavior (including substance use), dance, musical performance, and going to game shops were most prominent and popular. Free-time was most strongly characterized by intrinsic motivation, which included experiences of competence, relatedness, and positive affect. Activities were also often seen as a way to achieve goals related to health, well-being, and personal achievement. With few exceptions, multiple motivations were identified for the same activities, and specific motivations were reported across multiple activity types. In particular, youth mentioned many of the same motivations for risk behavior as they did for more traditionally pro-social free-time activities. However, there is also some evidence for unique social influences on risk behavior.

The second study examined longitudinal patterns of regular smoking in one cohort of survey participants (N = 2,425). It explored gender and treatment group differences in these patterns, as well as certain free-time experiences that could potentially predict these patterns. There was evidence for four patterns of smoking, with intervention effects on smoking prevention for girls and smoking cessation for boys. Experiences of extrinsic motivation, amotivation, and boredom were related to heightened odds of being a regular smoker.

These studies make a number of unique contributions to what is known about free-time and substance use among South African adolescents. They offer some support for the generalizability of theory, elucidate longitudinal associations between free-time experiences and smoking, and provide a nuanced assessment of one intervention's impact on smoking behavior.

While these findings have specific implications for intervention, they also highlight needs for future research with youth in South Africa and worldwide.

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Chapter 1

Adolescent Substance Use & Free-Time Activities

The work that follows is a doctoral dissertation. The purpose of this document is to describe the execution and implications of two research studies aimed at understanding adolescent free-time experiences and their links to substance use in a sample from one area of South Africa.

In this first chapter, I will provide justification for adolescent substance use as a notable public health problem and, as such, a phenomenon worthy of both research and intervention. Next, I will describe the developmental opportunities (e.g., identity work, skill- and relationship-building) and risks (e.g., exposure to high-risk peers, negative cognitive and emotional experiences) found within free-time activities that make this a promising context for adolescent substance use intervention.

I then move on to discussing the ways in which links between free-time activities and substance use have been studied in the past. I suggest ways in which alternative data collection and analysis strategies might better inform interventions related to free-time and substance use. These include the use of qualitative and person-centered methods, as well as appropriate attention to missing data. I also discuss the need to consider the ways in which culture influences substance use, free-time activities, and the intersection between them.

Finally, I provide background specific to the empirical studies that follow. My population of interest is youth from Mitchell's Plain, South Africa, an under-resourced, mostly colored community established during the apartheid era. Therefore, I discuss what is currently known about substance use and free-time behavior among South African youth. I also discuss the design

and preliminary results of HealthWise South Africa. This classroom-based leisure, life skill, and sexuality education program is currently being tested in a randomized control trial, and it is from this trial that the current sample is drawn.

In the second and third chapters of this dissertation, I will detail two empirical studies of free-time activities and substance use among youth from Mitchell's Plain. These studies incorporate a number of methodological recommendations from the first chapter, and they enhance what is currently known about free time and substance in the population (and culture) of interest. In the fourth and final chapter, I will discuss how my research findings fit within the existing literature on free time, substance use, and adolescence in South Africa. I will also discuss the implications of my findings for intervention, as well as directions for future research. It is my ultimate intention for the research presented here to inform effective efforts to reduce substance use and promote healthy time use among both South African youth and adolescents more broadly.

Why is Substance Use in Adolescence a Problem?

Neurological studies suggest that adolescence is a particularly risky time for substance use and abuse. There is evidence that the brain development that occurs during adolescence, and its associated motivational and behavior changes, are particularly conducive to substance experimentation and addiction (Chambers, Taylor, & Potenza, 2003). Substances can also disrupt the normative cortical development that occurs during adolescence, and the nature of these changes may be such that they promote substance dependence and risk behaviors (Crews, He, & Hodge, 2007).

Epidemiological data on a variety of substances support the notion that substance dependence is prevalent among youth. In 2001, over 70,000 underage youth in the U.S. received treatment for alcohol dependence or abuse, at a societal cost of nearly $2 billion (Miller, Levy, Spicer, & Taylor, 2006). Nicotine dependence affects approximately half of adolescent smokers

(Colby, Tiffany, Shiffman, & Niaura, 2000; DiFranza et al., 2002), and symptoms of dependence often emerge in youth who smoke at low frequencies (DiFranza et al., 2002).

Across substances, there is also evidence that use early in adolescence is likely to persist into late adolescence and adulthood. Youth who initiate alcohol use earlier (8th grade or before) are more likely to be heavy drinkers in 10th grade (Windle, 1991). Across racial groups, earlier onset of alcohol use is also related to more drinking at age 20 (Flory et al., 2006). Teenagers who report an onset of binge drinking are more likely to be diagnosed with drug or alcohol dependence at age 21 (Hill, White, Chung, Hawkins, & Catalano, 2000). As compared to those with other trajectories of use, high chronic users of marijuana in high school have more adult alcohol and marijuana use, and they are most likely to be diagnosed with cannabis-related disorders by young adulthood (Windle & Wiesner, 2004). A U.S. national study of illicit drug use found that the age of first use is inversely related to the likelihood of drug abuse and dependence, such that for each year that onset of use is delayed, abuse and dependence is reduced by 4-5% (Grant & Dawson, 1998). In short, adolescence appears to be a crucial period for development of life-long patterns of substance use and their associated health consequences.

The use of intoxicating substances by adolescents has been linked to a number of acute health consequences beyond those associated with chronic use and substance dependence. In the U.S. in 2005, there were over 7,000 fatal car accidents involving drivers under age 21; in 16% of these accidents, the driver had a blood alcohol content of at least .08 (National Highway Traffic Safety Administration, 2005). Alcohol use has also been implicated in burns, drowning, violent crime, suicide, fetal alcohol syndrome, alcohol poisoning, and psychosis. In the U.S. in 2001, these events resulted in 1433 deaths, nearly 650,000 incidences of injury/illness, and a cost of over $37 billion in medical care, lost work, and quality of life (Miller, Levy, Spicer, & Taylor, 2006). In 2004, unintentional poisoning (mostly from illegal and prescription drug abuse) was responsible for the deaths of 5.3 out of every 100,000 U.S. adolescents and young adults (ages

15-24), a rate that more than doubled from the comparable 1999 figure (Centers for Disease Control and Prevention, 2007).

Adolescent substance use has also been linked with sexual health behavior. However, in many instances, it is unclear the degree to which these associations are causal. For example, there is a body of research indicating that substance use and sexual risk behavior tend to co-occur within the same individuals (e.g., Lowry et al., 1994; National Center on Addiction and Substance Abuse, 1999; Zabin, Hardy, Smith, & Hirsch, 1986). Therefore, it stands to reason that substance use may be putting adolescents at heightened risk for outcomes like pregnancy and sexually transmitted infections. However, data on specific sexual events suggest that the two sets of behaviors do not share a direct causal link (Leigh & Stall, 1993). Rather, there may be an indirect association between substance use and sex that unfolds over time, or it may be that the two set of behaviors share common origins.

The early and persistent use of substances in adolescence has been linked to a broad range of outcomes in adulthood. Adolescents with trajectories of chronic binge drinking have been found to have significantly higher odds of having hypertension and being overweight in young adulthood, as compared to patterns of less alcohol use (Oesterle et al., 2004) Crime involvement and high school drop-out have both been related to trajectories of increasing binge drinking during adolescence (Hill, White, Chung, Hawkins, & Catalano, 2000). High chronic users of marijuana in high school also end up having less education, as compared to other trajectories of marijuana use (Windle & Wiesner, 2004). It is unclear whether these associations are causal or spurious, but they do support the idea that adolescent substance use may have implications for adult functioning.

In summary, adolescents are particularly susceptible to substance use and dependence, as well as their associated consequences for health and well being. Therefore, the prevention of substance use is an important public health goal for youth. One setting that is relevant for both

substance use and prevention is free-time activities.

Defining Free Time and Leisure

There are a number of different terms that have been used to discuss the domain that includes pastimes like sports, playing a musical instrument, doing arts and crafts, and reading. These include "free-time activities," "leisure," and "recreation." These terms have been used both inconsistently and interchangeably across the related literature. In an attempt to arrive at a vocabulary with which to describe the constructs of interest for the current work, a discussion of these terms and their relative benefits and drawbacks follows.

In reviewing the literature on "leisure," Csikszentmilhalyi and Kleiber (1999) found that there were at least three definitions of the term: leisure as free time, leisure as activities, and leisure as experience. In the first definition, free time is considered to be the time outside of the obligations of school, work, household chores, and other activities directly linked to economic or physical survival. The main strength of this definition lies in its relative clarity and objectivity. Delineating time spent in school, work, and personal maintenance (and, by process of elimination, the time that remains) is arguably a simpler and more objective process than what the other leisure definitions require, as discussed below.

That being said, there are some drawbacks to the use of free time as a construct of study. First, free time can encompass a number of either risky or passive behaviors (e.g., smoking, napping) that may fall outside the pool of activities that the public typically considers to be "adolescent pastimes" (Caldwell, 2005). However, the fact that "free time" may violate social convention can also be part of this definition's strength. Explicitly measuring and reporting on free-time activities, regardless of what those activities are, may reduce bias. It can allow for youth to report on the ways that they actually spend their time (and the positive and negative experiences associated with that time use), regardless of whether it fits adult conceptions of valid, acceptable, or beneficial activities.

Potentially more problematic with the term "free time" is the notion that there may little time that is completely devoid of obligation (Csikszentmihalyi & Kleiber, 1999). For example, youth might participate in the school orchestra to earn academic credits or join student government to improve a college application. It is unclear whether this time use can be considered to be distinct from schooling and economic survival. In addition, time outside of school and work can be heavily controlled by parents, coaches, and other activity leaders (e.g., Kloep & Hendry, 2007). Therefore, one must bear in mind that "free time" is not necessarily characterized by freedom or autonomy.

Another definition of "leisure" frames it as "specific, culturally defined recreational activities" (Csikszentmihalyi & Kleiber, 1999, p. 91) . The strength of the definition is its face validity. It allows for a distinction to be made between activities that *seem* different, like skateboarding and religious youth organizations versus drinking, committing vandalism, or daydreaming. The major weakness of this definition, in using it to define a construct of empirical interest, is its unreliability. Within a given population, conceptions of what constitutes recreation could differ across reporters. For example, an adolescent might consider talking on the phone to be recreation while his or her parents might not. Activities can also switch their recreational status depending on context; carpentry, cooking, and raising livestock could all be either recreational or subsistence activities. All of this makes culturally-defined recreation a complicated construct to measure and relate to outcomes of interest.

The final type of leisure definition focuses on the experiences within leisure. Csikszentmihalyi and Kleiber (1999) suggest that there are two different types of experiences that could be considered leisure: (1) positive feelings of freedom and intrinsic motivation and (2) using one's freedom to explore his or her mental, physical, and social potential (i.e., self-

actualization).[1] The key strengths of this definition lie in its consonance with theory and its utility in prediction. As will be discussed below, many explanations for the influence of activities on developmental and risk behavior outcomes have to do with the specific types of positive and negative experiences within these activities. Therefore, at the very least, it makes sense to measure and analyze leisure experiences.

While activity experiences are important to consider, there are several disadvantages in using experience to define activities that are and are not of empirical interest in a given study. First, many leisure experiences lie along a continuum. This raises the issue of subjectively dichotomizing experiences into levels that qualify (or fail to qualify) a given activity as leisure. Also, as with cultural definitions of recreation, experiential definitions of leisure activities are not necessarily reliable. Experiences can vary both between individuals and within the same individual across time. This means that sports, for example, may be a "leisure activity" for some youth but not for others. Alternatively, a youth's sport involvement may be leisure today but not leisure next year. While it is potentially important and interesting to know if and how experiences vary, this variability makes it complicated to specify which types of time use are under empirical examination and which types are not.

As with "free time," using leisure experiences to define activities of interest may result in the study of activities that violate popular conceptions of which activities are considered adolescent past-times. For example, one time-use study found that the amount of time for which individuals reported having the subjective experience of leisure was greater than both reported amounts of free time and reported time spent in recreational activities (Shaw, 1986). This

[1] Csikszentmihalyi and Kleiber tend to treat these two types of experiences as competing definitions, however, the two probably co-occur relatively often. For example, Ryan and Deci (2000) define intrinsic motivation as "the inherent tendency to seek out novelty and challenges, to extend and exercise one's capacities, to explore, and to learn" (p. 70). This definition is very similar to the experience of self-actualization.

necessarily implies that the experiential definition of leisure allows individuals to experience it in obligatory areas of their lives, such as work. Whether or not this is appropriate is a point that is up for debate. Also, Csikszentmihalyi and Kleiber (1999) point out that certain negative behaviors (e.g., drug-use, delinquency) can be associated with the above-mentioned leisure experiences. This raises the question of whether a definition of leisure should allow for the possibility that risk behavior and prosocial behavior could be classified as the same type of activity, as the experience-based definition does.

In sum, there is no one completely satisfactory term that can be used to discuss adolescent pastimes; each has its inherent limitations. For the purposes of the following discussion and subsequent papers, I will use the terms "activities" and "free-time activities" to refer to time-use that takes place outside of school, work, household chores, and personal maintenance activities. These are my preferred terms for several reasons. First, free time is an activity construct commonly used in existing literature. (Although, admittedly, the literature tends to overlook unstructured or risky free-time activities.) Second, this term leaves arguably the least room for ambiguity. It does not require subjective decisions about which activities "count" as culturally-defined recreation or what level of intrinsic motivation meets the criterion for an activity to be considered leisure. This is particularly important in culturally-sensitive work. It allows for a more unified construct that can be compared across cultures[2], and also avoids the pitfall of recreation or leisure activities being mis-specified by a researcher who is not fully familiar with an outside culture of interest.

I acknowledge that certain activities that I label as "free" may, in actuality, be characterized by some level of obligation. However, constructs like autonomy and obligation are rarely measured in studies of specific activities (present studies included), and therefore, not

[2] However, it should be noted that even "free time" is subject to some cultural variation. Factors such as academic policies (e.g., inclusion of leisure in school curricula) and language can complicate cross-cultural comparisons of free-time activities (Caldwell, 2008).

typically used in establishing whether a given pastime is truly a free-time activity. This is a weakness of the general literature and its resolution is beyond the scope of the present study.

It should be noted that the use of the term "free-time activities" to define pastimes of interest for the studies that follow does not preclude an examination of the constructs inherent in the experiential definition of leisure. As mentioned above, individuals have a range of experiences within activities, and these experiences are relevant for outcomes. As such, these experiences are measured, analyzed, and discussed in the work that follows. These will be discussed using the terms "activity experiences" and "free-time experiences" interchangeably.

Free-time activities and adolescent development

Worldwide, between one-quarter and one-half of adolescents' waking hours are spent in schoolwork, household obligations, and paid employment (Larson & Verma, 1999). This leaves a large portion of time available for other types of activities. There are a number of ways in which free-time activities can contribute to positive adolescent development. They can provide opportunities for identity work, skill development, relationship building, movement toward independent/adult status, and positive emotional experiences. However, free-time activities may also promote certain negative experiences that can be harmful for development.

Activities and identity work. One of the most crucial developmental tasks of adolescence is the formation of a personal identity. Erikson (1963) defined identity as the organization of previous skills, relationships, and experiences in a way that helps an individual effectively cope with his or her future physiology, opportunities, and responsibilities. Achieving a cohesive and consistent identity is associated with healthier social and psychological functioning and lower rates of problem behavior (De Haan & MacDermid, 1999; Jones & Hartmann, 1988; Jones, Hartmann, Grochowski, & Glider, 1989; Waterman, 1992).

Baumeister (1986) lists numerous factors that, in previous eras, were relevant for one's self-concept. These included religion, ancestry, marital status, profession, geography, and gender.

However, in the current post-modern era characterized by trends including increased geographic and vocational mobility and less traditional gender roles, these factors are often not stable or salient bases on which to build a self-concept. This has created an opportunity for free-time activities to play a more important role in identity. Activities may be especially important for identity in adolescence, given that youth are often marginalized and limited in the other roles they can occupy in society (Silbereisen & Todt, 1994; Zeldin, 2004).

There are several studies that provide evidence of identity-related experiences in activities. In a qualitative study of structured, voluntary activity involvement, Dworkin, Larson, and Hansen (2003) found that youth were able to describe experiences of gaining self-knowledge and trying new things. They concluded that activities "provide youth with material and experiences for deeper reflection on who they are" (p. 21). In a different study, Coatsworth and colleagues (Coatsworth, Palen, Sharp, & Kohley, 2006) asked youth to describe what they learned about themselves in their self-defining activities. Participants stated that they learned about their competencies, interests, personal characteristics, and values.

Free-time activities may promote not only personal identity development, but also the consolidation of social identity. Kleiber (1999) discusses how adopting the symbols of recreation, including language, dress, customs, and codes of conduct, can promote identification with others. In Eccles's work on activities (e.g., Eccles, Barber, Stone, & Hunt, 2003), she found that extracurricular involvement varied systematically by self-identified social identity. For example, "jocks" were more likely to engage in sports, "brains" were more likely to participate in prosocial activities like volunteerism, and "criminals" were characterized by low levels in all types of extracurricular involvement. In short, activities appear to promote and reinforce identification with specific social groups.

Activities and skill development. Adolescents can have opportunities to learn various skills in their free-time activities. These include goal-setting, time management, problem-solving,

and perseverance in the face of challenges (Dworkin, Larson, & Hansen, 2003; Eccles, Barber, Stone, & Hunt, 2003; Hansen, Larson, & Dworkin, 2003; Larson, 2000). Irby and Tollman (2002) suggest that activities can be a way to learn job skills, as well as learn about career options and pathways to those careers. In addition, youth learn skills for the regulation of their emotions, which includes anger and anxiety control and stress-management (Dworkin & Larson, 2006-2007). Activities also appear to be a fertile ground for learning social skills, including teamwork, leadership, and effective communication (Dworkin, Larson, & Hansen, 2003). Work by Hansen and colleagues (2003) shows that skill development is the area in which organized activities offer the greatest advantage over other types of adolescent time-use, including school and time spent with friends.

Activities and initiative. Initiative is the capacity to act autonomously. Larson (2000) argues that the capacity for autonomous action is crucial to adult success in modern Western society where, rather than having a limited of number of choices in domains such as career and family, one's life course is extremely flexible. Therefore, it appears to be important for individuals to develop initiative prior to entering adulthood.

Larson (2000) asserts that initiative involves intrinsic motivation (being interested and invested in doing an activity for its own sake) and concerted attention in the face of optimal complexity and challenge, both of which are sustained over time. Free-time activities can offer opportunities for both intrinsic motivation and concentration. (Note that extrinsic motivation, amotivation, and boredom can also be associated with free-time activities; see section on negative developmental experiences.)

There is evidence that adolescents experience more intrinsic motivation in their free time than in school, work, or maintenance activities (Kleiber, Larson, & Csikszentmihalyi, 1986; Larson, 2000). There are also examples of intrinsic motivation the literature on personal expressive activities. Waterman (2004) states that personal expressiveness is one element of

intrinsic motivation. Specifically, personally expressive activities are those that are a good fit with one's "true self," or the inherent competences and purpose of the individual. Among college students, Waterman (2004) found that most had at least one personally expressive activity in their lives. Social, altruistic, creative, religious, and athletic activities tended to have the highest levels of personal expressiveness, while passive and obligatory activities (e.g., TV-watching, reading, working, shopping, cooking, eating) tended to not be personally expressive. A study of high school students (Coatsworth, Palen, Sharp, & Ferrer-Wreder, 2006) also found that most youth reported at least one personally expressive activity, although any differences in levels of personal expressiveness by activity type were not statistically significant. This supports the notion that, for most individuals, intrinsic motivation is experienced in at least some of their free-time activities. This intrinsic motivation may, in turn, prime youth to develop and experience initiative.

As far as experiences of concentration in free-time, the evidence is mixed. Larson (2000) showed that concentration was high in youth activities like sports, art, and hobbies but low when spending time with friends. Alternatively, Kloep and Hendry (2007) suggest that many adult-structured youth activities do not offer opportunities for challenges and healthy risks that elicit interest and concentration. This will be discussed further in the sections on activity boredom and structured versus unstructured activities.

Activities and relationship building. Free-time activities may also enhance adolescent development by building their social capital. They can put adolescents in touch with non-familial adults, giving them additional sources of advice, as well as emotional and instrumental support. For example, there is evidence that youth who were involved in sports or in school-support activities (e.g., student government) have greater access to support from teachers and school counselors than other students (Eccles, Barber, Stone, & Hunt, 2003). Adults met during free-time activities may also serve as role models for success and citizenship (Dworkin, Larson, & Hansen, 2003; Hansen, Larson, & Dworkin, 2003).

Group free-time activities also offer the opportunity to interact with peers. These interactions may put adolescents in contact with youth who they normally would not encounter, potentially enhancing respect for diversity. Youth can also learn empathy, loyalty, and intimacy in their group activities (Dworkin, Larson, & Hansen, 2003). Several theorists suggest that this increased intimacy with peers facilitates the process of achieving autonomy from parents, one of the key developmental tasks of adolescence (Iso-Ahola, 1980; Kelly, 1987). Free-time activities are also important for youth as they begin to explore their emerging sexuality. They provide opportunities to build relationships with potential romantic partners and are a context in which one can explore self-definitions of acceptability and attractiveness (Kelly, 1987).

Activities may also offer the opportunity to build a relationship with one's community. Irby and Tollman (2002) discuss how activities can teach civic values by enhancing recognition of one's own impact, as well as engendering responsibility and offering opportunities to learn how to collaborate in pursuit of common goals.

Activities and positive emotional experiences. Finally, aside from all of the developmentally-conducive skills and experiences that free-time activities can offer, they can also be enjoyable. Adolescents often report positive emotional experiences in their activities, and sometimes mention that this can serve as a relief from the stress they feel in other areas of their lives (Dworkin, Larson, & Hansen, 2003; Kleiber, Larson, & Csikszentmihalyi, 1986).

Free-time activities may be likely settings for the experience of flow. Csikszentmihalyi and Kleiber describe flow as a state of consciousness in which there is "the merging of action and awareness" (1999, p. 95). Flow is most likely to occur when an adolescent feels challenge commensurate with his or her skill, a situation that may be more common in free-time activities than in other areas of adolescents' lives (e.g., Kleiber, Larson, & Csikszentmihalyi, 1986). While this state is not purely emotional, many people who have experienced flow report that the experience was positive (Csikszentmihalyi, 1999), and the happiest adolescents tend to be more

often engaged in flow-producing situations (Csikszentmihalyi & Hunter, 2003). In short, free-time activities may contribute directly to adolescents' emotional well-being.

Negative developmental experiences. Despite all of the potential benefits discussed above, it is also possible for free-time activities to have negative effects on adolescent development. However, it is encouraging to note that several studies (Hansen, Larson, & Dworkin, 2003; Shaw, Caldwell, & Kleiber, 1996) have found that these experiences occur at levels no worse than in other domains, such as in school.

As discussed above, youth often derive identity-building experiences from activities. However, there may be some drawbacks if they strongly identify with otherwise healthy activities. First, if one strictly conforms to the identity symbols within a single activity, social identity may completely subsume individual uniqueness. Extreme identification with a single activity may also limit identity development in other areas of free time or more generally (Kleiber, 1999). There is empirical evidence that this is a common occurrence in sports in particular (Larson & Kleiber, 1993). It is also possible that if one is not successful in a valued self-defining activity, self-esteem and self-definition may both suffer (Kleiber, 1999).

Activities can also be a source of negative relationship experiences. This can include teasing or exclusion by peers, favoritism or disrespect by adult leaders, and pressure from parents to join, remain in, perform better in, or quit an activity (Dworkin & Larson, 2006-2007). While there is evidence that activities can provide opportunities for independence and autonomy, some youth also experience control and a lack of choice in their free time activities (Shaw, Caldwell, & Kleiber, 1996), perhaps due to social pressure from friends or demands from parents. Activities may also bring adolescents in contact with peers who engage in risk behaviors or adults who are not healthy role models (Dworkin & Larson, 2006-2007).

Adolescents may also experience negative cognitive and emotional experiences in their activities. Participants in sports and music sometimes report having performance anxiety or

having negative emotions when they feel they have under-performed (Dworkin & Larson, 2006-2007). Many adolescents report feeling time stress in their out-of-school time, particularly in light of obligatory activities, such as homework and household chores (Dworkin & Larson, 2006-2007; Shaw, Caldwell, & Kleiber, 1996). Also, most youth experience at least some boredom in their out of school or leisure time (Shaw, Caldwell, & Kleiber, 1996; Wegner, Flisher, Muller, & Lombard, 2006).

Moderators of activity experiences. It is important to acknowledge that experiences in activities may be moderated by characteristics of the participant. For example, identity-development in sex-typed activities may be greater for those of the minority sex (Shaw, Kleiber, & Caldwell, 1995). There is evidence that girls have more experiences of control and lack of choice in activities than boys (Shaw, Caldwell, & Kleiber, 1996). Gordon and Caltabiaco (1996) found associations between levels of leisure boredom and both age and residence (urban or rural). However, it is unclear whether moderation stems from different types of adolescents selecting into different types of activities or whether personal characteristics are the true cause of variable experience within the same activity.

Activity type and experiences. There is some evidence to suggest that the developmental benefits and drawbacks of free-time involvement may vary by activity type. For example, Hansen and colleagues (2003) found that sports and faith-based activities were typically associated with the highest levels of positive developmental experiences. However, sports were also often associated with relatively high levels of negative developmental experiences (Dworkin & Larson, 2006-2007). As another example, there is evidence that college students have higher levels of identity-related experiences in social, religious, athletic, and altruistic activities and lower levels of these experiences in television-watching, shopping, and reading (Waterman, 2004).

Despite all that we do know about activities and adolescent development, there is one class of free-time activities that has received very little empirical research to date: unstructured

activities. Unstructured activities are not directly defined in the literature. Rather, they are framed as the antithesis of structured activities, which tend to be supervised by adults, restrict time use, and occur on a regular schedule and with same-age peers (Mahoney & Stattin, 2000; Osgood, Anderson, & Shaffer, 2005). Theory can inform certain hypotheses about the developmental outcomes of unstructured involvement. The routine activities theory for individual offending (Osgood et al., 2005) suggests that unstructured activities increase opportunities for deviant behavior. However, theories of self-actualization (Csikszentmihalyi & Kleiber, 1999), self (Haggard & Williams, 1992), and self-determination (Ryan & Deci, 2000) suggest that it is not the type or structure of activities, but rather the experiences within them (many of which were discussed above) that impact development.

Empirical work on structured involvement will often use evidence of benefits to infer that unstructured involvement is detrimental. However, the few direct studies of unstructured activities show that they have value for expressing and affirming identity (Haggard & Williams, 1992), but may also be associated with delinquency (Mahoney & Stattin, 2000). Kloep and Hendry (2007) suggest that an absence of adult control in unstructured activities may allow for experiences of interest, challenge, and skill-building. More research is needed before definitive conclusions can be made about the benefits or drawbacks of unstructured activity participation.

Free-time Activities and the Prevention of Substance Use

As mentioned in the discussion of activity terminology, risky behaviors like substance use are often, in and of themselves, free-time activities. However, there are a host of reasons why involvement in *other* types of free-time activities might influence the likelihood of using or not using substances during free time. A discussion of these linkages follows.

Displacement. One of the simplest reasons why engagement in (pro-social) free-time activities might decrease risk behavior has to do with the idea of competing demands on time. This notion is embodied in the displacement hypothesis, which states that spending time in one

activity necessarily reduces time available for other activities. The displacement hypothesis has been predominantly applied in investigations of how media-use activities, such as watching television, playing video games, and using the Internet (e.g., Lee & Kuo, 2002; Marshall, Biddle, Gorely, Cameron, & Murdey, 2004; Mutz, Roberts, & van Vuuren, 1993), impact involvement in other activities.

While intuitively appealing, the displacement hypothesis rests of several questionable assumptions (Mutz, Roberts, & van Vuuren, 1993). One assumption is that an individual can only engage in a single activity at any given time. While this assumption may be valid for activities that require sustained, focused energy and attention, it may be possible to "multi-task" in a number of more passive activities, such as hanging out with friends. Another assumption of the displacement hypothesis is that one's free time is finite and full, to the point where spending more time in one activity requires a deduction in time from another activity. However, it is possible to expand one's available free time by reducing time in obligatory activities, such as sleeping or meal preparation. Given the potential limitations of the displacement hypothesis, it is not surprising that empirical support for it has been, at best, mixed (e.g., Lee & Kuo, 2002; Marshall, Biddle, Gorely, Cameron, & Murdey, 2004; Mutz, Roberts, & van Vuuren, 1993).

Substitutability. Iso-Ahola's (1980) proposes the concept of substitutability, in which activities with the same psychological meaning can be switched out for each other. For example, "having fun" is one of the reasons that adolescents give for using substances (e.g., Palmqvist, Martikainen, & von Wright, 2003). Given that pro-social free-time activities can be another source of intrinsic motivation, interest, and positive emotional experiences (e.g., Coatsworth, Palen, Sharp, & Ferrer-Wreder, 2006; Dworkin, Larson, & Hansen, 2003; Larson, 2000), participation in them may render substance use less necessary from an adolescent's perspective. This idea is supported by one recent person-centered study of free-time motivation found that youth who were more intrinsically motivated were less likely to use substances, while youth with

low motivation of all types were most likely to use substances (Palen, Caldwell, & Smith, 2007, June).

Another reason youth may use substances is to achieve a more adult-like status or appearance (Moffitt, 1993). Therefore, if a pro-social activity provides opportunities to work toward autonomy and adult status, it may reduce the need to engage in substance use. As mentioned previously, activities sometimes provide these opportunities through increased time spent away from family, greater intimacy with peers, and exploration of future careers (Dworkin, Larson, & Hansen, 2003; Irby & Tolman, 2002).

Socioemotional resources. Some of the highest-risk substance users give coping as one of their reasons for substance use (e.g., Coffman, Patrick, Palen, Rhoades, & Ventura, 2007). It is possible that certain free-time activities foster healthier strategies for coping with negative emotions and experiences and thereby reduce motivations to engage in substance use. In support of this idea is evidence that free-time activities teach problem-solving skills and emotion regulation and put youth in touch with adults who can assist them when needed (Dworkin & Larson, 2006-2007; Dworkin, Larson, & Hansen, 2003; Larson, 2000).

Positive social connections. There are a number of theories that suggest that the exposure and attachment to positive peers and adults will reduce the chances of a youth using substances. Social Learning Theory (Akers, 1977) proposes that substance-specific cognitions are learned from role models, and these cognitions in turn drive substance use. Therefore, if a youth spends time with individuals who disapprove of substance use, they will be less likely to use substances themselves. Unfortunately, there are no empirical studies that directly test whether substance-free role models within adolescents' activities are associated with reduced substance use. However, there is some ethnographic evidence for at least one activity setting in which this may be occurring. The Straight Edge youth subculture is defined, in large part, by its strong drug-free norms (e.g., Helton & Staudenmeier, 2002; Irwin, 1999). Therefore, it is possible that youth who

participate in Straight Edge music and dance activities are less likely to use substances than youth who do not participate.

There are several theories of substance use that focus on the roles of convention and social attachment. Examples include Hirschi's Control Theory (1969), Elliott's Social Control Theory (Elliott, Huizinga, & Menard, 1989), and Hawkins's Social Development Model (Hawkins & Weis, 1985). These theories suggest that when adolescents have weak connections to conventional social institutions (e.g., school, family, work, religion), they will become attached to deviant peers and begin to engage in deviant behaviors themselves. According to social control theories, activities that connect a youth to their school, place of worship, or community should protect against substance use. This hypothesis has received some empirical support, with youth who are involved in religious and community-service activities having lower rates of substance use, as compared to youth who are involved in other types of activities (Eccles, Barber, Stone, & Hunt, 2003).

Family Interaction Theory (Brook, Brook, Gordon, Whiteman, & Cohen, 1990) holds that an emotional attachment to parents who are healthy role models reduces substance use by fostering adolescent adjustment and conventionality and lowering their involvement with substance-using peers. To the degree that adolescents have positive, relationship-fostering interactions with their parents during free time, they may be protected from substance use. There is evidence that adolescents who spend more time with their parents and siblings are less likely to engage in risk behaviors, including substance use (Crouter, Head, McHale, & Tucker, 2004; Duncan, Duncan, & Strycker, 2000). However, family time may have less relevance for outcomes in adolescence than other types of activities. Adolescents spend comparatively little time with their family (e.g., Larson, Richards, Moneta, Holmbeck, & Duckett, 1996), especially as they get older (e.g., Zeijl, te Poel, du Bois-Reymond, Ravesloot, & Meulman, 2000). They also have more

positive free-time experiences outside of the home and family than within them (Larson, Gillman, & Richards, 1997).

Free-time Activities and the Promotion of Substance Use

Exposure to high-risk peers and norms. Several theories underscore the importance of social context for the initiation and continuation of substance use. As mentioned previously, Social Learning Theory (e.g., Akers, 1977) posits that negative role models promote substance use, while social control theories (e.g., Elliott, Huizinga, & Menard, 1989; Hawkins & Weis, 1985; Hirschi, 1969) suggest that the opportunities for attachments to these negative role models arise from weak connections to conventional social institutions. These theories suggest that if peers within activities are substance users, an individual participant is more likely to begin or continue using substances.

There is empirical evidence that the use of substances by single individuals within an activity tends to parallel the perceived use of their friends. In particular, as compared to participants in sports, participants in pro-social activities (e.g., religious activities, volunteerism) have fewer friends who drink or use drugs and also use less substances themselves (Eccles, Barber, Stone, & Hunt, 2003). If one assumes that the majority of adolescents' friends are from their free-time activities, this provides support for the above social theories of substance use. In terms of less structured activities, Mahoney and colleagues (Mahoney, Stattin, & Lord, 2004) found that adolescents who attended a youth recreation center were more likely to engage in anti-social behavior (including substance use) if they had many fellow attendees who were also engaging in anti-social behavior.

Time free from supervision. As mentioned above, adolescents spend increasing amounts of free-time away from their parents (Larson, Richards, Moneta, Holmbeck, & Duckett, 1996; Zeijl, te Poel, du Bois-Reymond, Ravesloot, & Meulman, 2000), and a number of ways in which adolescents spend their time are free from the supervision of non-familial adults as well. There is

evidence that this may have implications for adolescent substance use. For example, youth whose parents give them more opportunities to spend unsupervised time with peers are more likely to have used a variety of substances (e.g., Borawski, Ievers-Landis, Lovegreen, & Trapl, 2003).

Stress, negative emotion, and boredom. Activities can be a source of stress and negative emotion (e.g., Dworkin & Larson, 2006-2007) and substances can be a way to cope with negative emotion (e.g., Coffman, Patrick, Palen, Rhoades, & Ventura, 2007). Therefore, it is possible that certain activities may create a perceived need to use substances. In support of this assertion is empirical evidence that youth who experience anxiety in their free time are more likely to use substances (E. A. Smith & Caldwell, 1989).

While youth may be actively engaged in some of their free-time activities, it is also common for them to experience boredom (Shaw, Caldwell, & Kleiber, 1996). Boredom may stem from the reciprocal influences of over-structuring by adults and a lack of youth skill in planning and executing engaging free-time activities (Kloep & Hendry, 2007). Consistent with the idea of substitutability (Iso-Ahola, 1980), some have suggested that a lack of interest in free-time activities may prompt youth to seek pleasure and arousal through engagement in risky activities such as substance use (e.g., Hunter & Csikszentmihalyi, 2003; Kloep & Hendry, 2007). This notion is supported by empirical evidence that youth who are bored in free time are more likely to use substances (Caldwell & Smith, 1995; E. A. Smith & Caldwell, 1989).

Methodology in the Study of Activities and their Relations with Substance Use

There have been a number of previous studies that test hypothesized associations between free-time activities and substance use, and they employ a range of research designs. A number of these studies have examined associations cross-sectionally (e.g., Bartko & Eccles, 2003; Duncan, Duncan, Strycker, & Chaumeton, 2002; Huebner & Mancini, 2003). Other studies have employed longitudinal designs that either examine free-time involvement as a baseline predictor substance use over time (e.g., Aaron et al., 1995; Abbey, Jacques, Hayman, & Sobeck, 2006; Hoffman,

2006) or examine how both constructs change over time (e.g., Darling, 2005; Eccles, Barber, Stone, & Hunt, 2003; Fauth, Roth, & Brooks-Gunn, 2007).

Studies also vary in the way they operationalize activity involvement. Some studies examine dichotomous participation (yes/no; e.g., Eccles, Barber, Stone, & Hunt, 2003; Moore & Werch, 2005), while others examine frequency or duration of participation (e.g., Bartko & Eccles, 2003; Darling, 2005; Fergus, Zimmerman, & Caldwell, 2005). The time frame of reference for these items can vary, although often the reference is fairly large and/or general (e.g., past year, current school year, "on average").

A number of studies have moved beyond types, frequency, and breadth of participation to examining how substance use relates to specific types of experiences within activities. These experiences include boredom (Caldwell & Smith, 1995), identity exploration (Palen & Coatsworth, 2007), and motivation (Caldwell, Weichold, & Smith, 2006; Palen, Caldwell, & Smith, 2007, June).

Certain studies have focused on the associations between substance use and one specific activity, like competitive sports (Aaron et al., 1995), attending Boys and Girls Clubs (Anderson-Butcher, Newsome, & Ferrari), or playing computer games (Durkin & Barber, 2002). Other studies have examined involvement across multiple activities, either by comparing substance use across youth involved in different types of activities (e.g., Duncan, Duncan, Strycker, & Chaumeton, 2002; Eccles, Barber, Stone, & Hunt, 2003) or by combining scores on individual activities into a composite that is then related to substance use (e.g., Fauth, Roth, & Brooks-Gunn, 2007; Hoffman, 2006).

There are also differences in the ways in which substance use is operationalized in these studies. Use is typically captured with either a dichotomous item or with a frequency item that has binned, categorical response options. The time reference for these items is typically either use in the past 30 days or use in the past year. A single substance may be examined (e.g, Fergus,

Zimmerman, & Caldwell, 2005; Hoffman, 2006). Alternatively, multiple substances may be incorporated, either as separate outcomes (e.g., Darling, 2005; Eccles, Barber, Stone, & Hunt, 2003), as part of an overall substance use composite (e.g., Duncan, Duncan, Strycker, & Chaumeton, 2002; Fauth, Roth, & Brooks-Gunn, 2007; Moore & Werch, 2005), or as part of a more general risk behavior composite (e.g., Bartko & Eccles, 2003; Huebner & Mancini, 2003).

How Can Studies of Free-time Activities and Substance Use be Improved?

Use of qualitative methods. A number of researchers (e.g., Dworkin & Larson, 2006-2007; Dworkin, Larson, & Hansen, 2003; Fredericks et al., 2002; Hutchinson, Baldwin, & Caldwell, 2003) have undertaken qualitative explorations of adolescents' activity experiences. However, no study has yet to purposefully examine how youth perceive associations between free-time experiences and health risk behavior. Qualitative data offer arguably the best means of examining phenomena that occur in complex social contexts, like communities or cultures (Nastasi & Schensul, 2005). When paired with quantitative data, qualitative data allow for "triangulation," or verification of data across sources, thereby enhancing the validity of any complementary quantitative findings (Nastasi & Schensul, 2005). Qualitative data are also a source of vivid descriptions that can increase the impact and appeal of research findings (Johnson & Onwuegbuzie, 2004), which can increase buy-in from key consumers of resultant reports and presentations.

Focus groups offer at least one key advantage over other qualitative methods, such as individual interviews. The social interaction in the groups tends to promote the sharing of information that a researcher did not originally anticipate. This is especially useful in situations where the researcher and participants have fundamentally different perspectives, as is the case with adult researchers and youth participants (Charlesworth & Rodwell, 1997; Seal, Bogart, & Ehrhardt, 1998). In addition, focus groups are one form of qualitative data collection that has demonstrated effectiveness in research on sensitive topics (e.g., Seal, Bogart, & Ehrhardt, 1998),

suggesting that their use would be informative in studies of how substance use relates to free-time involvement.

Use of person-centered analysis. With a few notable exceptions (e.g., Bartko & Eccles, 2003), previous studies of free-time involvement have focused on exploring the relations between variables. However, variable-oriented studies may not be sufficient for understanding experiences within adolescent free-time activities. When examining this type of complex, multifaceted construct, knowing the associations between variables does not necessarily translate into descriptions of individuals. In these situations, a person-oriented approach may be particularly useful. The person-oriented approach focuses on finding patterns of how multiple variables are manifested within individuals. In person-oriented developmental research, these patterns are conceptualized as representing states that individuals can occupy and move between over time (Bergman & Magnusson, 1997).

Studies of experiences within free-time activities lend themselves particularly well to a person-oriented approach. It is possible that youth have multiple types of positive and negative experiences within the same activity. For example, when involved in a school play, a youth might learn teamwork by collaborating on set-building, might be exposed to peers who use substances, might build a positive relationship with the drama teacher, and might experience stress and anxiety over learning his or her lines. While a variable-centered approach would allow us to explore relationships between any one of these experiences and outcomes, a person-centered approach allows us to identify common groupings of experiences and evaluate their total impact on development.

Youth also typically participate in multiple activities during their free time (e.g., Bartko & Eccles, 2003), and it is possible that they have different types of experiences in each. For example, an adolescent might be part of a yearbook staff that is given lots of choice and autonomy while also playing on a sports team in which the coach makes all decisions without

player input. Knowing the experiences within any one of these activities may not reflect the totality of a participant's experiences, and therefore, may not be fully predictive of developmental outcomes.

Appropriately timed measurement. Collins and Graham (2002) advocate scheduling research assessments so that they occur closely to the hypothesized timing of events and processes of interest. To date, this is a consideration that has been largely overlooked in studies of free-time and substance use. However, there are several ways that issues of timing might be better incorporated into future research studies. The Experience Sampling Method, in which participants are signaled at various points in the day to complete assessments, has already been used in a number of studies of adolescent activity involvement (e.g., Larson, 2000; Verma & Larson, 2003). Future extensions of this method could involve adolescents reporting on whether they are using substances and then determining whether this occurs closely in time to other activities in their daily schedules (e.g., doing homework, participating in free-time activities, spending time with friends or family). As a less costly and burdensome alternative to ESM, the typically annual spacing of longitudinal studies of substance use and free-time involvement could be shortened to include assessments at multiple points during the year. In addition, for items measuring these two constructs, the time reference should be the same for both behaviors and it should be fairly proximal to the time of assessment (e.g., past month behavior, past week behavior).

Appropriate treatment of missing data. Previous quantitative studies of the associations between free-time activities and substance use rarely provide an explicit discussion of missing data and the techniques (if any) used to handle them. Complete case analysis is considered acceptable when less than 5% of data are missing (Graham, Cumsille, & Elek-Fisk, 2003). However, in situations when more data are missing, missing data can substantially reduce one's statistical power to detect associations between variables. In addition, to the degree that missingness is related to the constructs of interest, analyses using only complete data may result

in biased parameter estimates. Therefore, it is crucial that missing data are acknowledged and dealt with appropriately.

Multiple imputation and maximum likelihood are two effective ways to incorporate missing data into analysis. Multiple imputation is a data-based procedure that involves creation and analysis of a number of data sets in which values for any missing items are substituted based on a distribution of plausible values (Graham, Cumsille, & Elek-Fisk, 2003). Maximum likelihood (ML) is a model-based missing data procedure, meaning that missing data are handled in the same step in which parameters are estimated. ML can only be used in analyses that rely on a covariance matrix and is typically used in latent variable procedures (e.g., structural equation modeling, latent transition analysis; Graham, Cumsille, & Elek-Fisk, 2003; Schafer & Graham, 2002).

While they may differ in terms of the situation in which each is most practical, multiple imputation and maximum likelihood often yield similar (and acceptable) parameter estimates that are superior to those obtained from old methods of handling missing data, such as pairwise deletion and mean substitution. While complete case analysis is simpler than MI or ML and can provide comparable parameter estimates, in situations with substantial missing data, both MI and ML protect against a loss of statistical power.

In addition to dealing with missing data that have been collected, researchers can take measures that will minimize missing data during its collection. For example, multiple studies have shown that collection of data via Palm Pilot, rather than with paper and pencil, results in significantly fewer missing data over the course of a survey instrument (L. A. Fletcher, Erickson, Toomey, & Wagenaar, 2003; Jaspan et al., 2007; Palen et al., 2008; Palermo, Valenzuela, & Stork, 2004).

Culture

In evaluating the associations between free-time activities and substance use, it is crucial that one considers the impact of culture. The definition of culture tends to vary somewhat across disciplines (Unger et al., 2003). For the purposes of the following discussion, culture is considered to be a group whose members have common history, economy, geography, and social and political structures (Nichols, Malone, Tarlow, & Loewenstein, 2000). These shared experiences result in (or, perhaps, result from) norms, beliefs, and behaviors that are similar among members, and different from those of individuals in different circumstances.

The notion of culture is complicated by the existence of demographic subgroups within cultures (Amodeo & Jones, 1997). For example, expectations for appropriate behavior may differ by gender, cultural sanctions for the same behavior may differ across age groups, and recent immigrants may have a different response to culture than those who are fully assimilated. It is also important to acknowledge that culture is not static; rather, societal norms and sanctions evolve over time (Heath, 2001).

Culture and substance use. One of the key ways that a culture influences substance use is through norms and values for these behaviors; in particular, which behaviors are acceptable or attractive (Nichter, 2003). Within a single culture, the perceived acceptability of use can differ across substances, as in the differences in norms for caffeine and cocaine use in the United States. Coomber and South (2004) suggest that these differences are not based on objective evidence of differing consequences of use but, rather, a culture's moral values.

Heath (2001) discusses how a single substance can also be perceived in very different ways depending on culture: medicine or poison, sacrament or sacreligious, stimulant or sedative, food or not, high status or low. In fact, many substances that are perceived as harmful (and are, therefore, prohibited) in Western cultures have a positive role in other cultural settings (Coomber

& South, 2004). One exception may be inhalants, which Heath (2001) asserts are universally perceived as harmful and unsavory.

Cultural norms and values for micro levels of influence may have an indirect impact on adolescents' substance use. For example, cultures can differ in parenting style and the degree to which parents are able to impact youth behavior, including substance use (Nichter, 2003). Cultures also differ in their expectations for youth time use (e.g., amounts of time in school, supervised by parents, or with friends; Larson & Verma, 1999), which can influence opportunities for engaging in substance use.

A culture's economy can have implications for the substance use of its members (Nichter, 2003; Unger et al., 2003). Substance-related agriculture (e.g., tobacco, barley, hops, cannabis, opium poppies) may be the livelihood of individual citizens, and the production and sales of products derived from these crops may be lucrative for corporate entities. Tax revenue generated by the production and sales of licit substances are then beneficial for local and federal governments. The result is individuals, businesses, and institutions that have a financial interest in both substance-related policy and advertising/promotion. These policies and promotional messages may, in turn, shape cultural norms and values in a way that impacts behavior.

While substance *use* has been going on for at least 6,000 years, the concept of substance abuse/dependency is one that has emerged only in the past two centuries (Heath, 2001) and, therefore, does not have an appreciable role in the history of most cultures. However, modern-day cultural beliefs and values can impact the development and treatment of substance use problems in a number of different ways (Amodeo & Jones, 1997). It is culture that defines problematic versus non-problematic levels of substance use.[3] Culture also attributes explanations

[3] It is this lack of a universal definition, coupled with poor world-wide data on outcomes of substance use problems (e.g., overdose, crimes under influence), that complicates cross-culture comparisons of substance use problems (Heath, 2001).

for any problems, sanctions these problems, and either supports or hinders their resolution through behavior change.

Culture and free-time activities. Play appears to be a universal part of childhood. However, major cultural differences in time-use emerge with adolescence. These differences include the amount of free time available, how that time is used, and with whom it is used. Free-time behaviors also vary within cultures, depending on factors such as gender, age, or historical time (Larson & Verma, 1999).

An adolescent's daily schedule is primarily structured by the economic conditions of the culture of which they are a part (Larson & Verma, 1999). In non-industrial societies, where household amenities (e.g., running water, clothes washer) and income may be minimal and families may be large, household chores and paid labor represent a substantial portion of an adolescent's day. In industrial and post-industrial societies, school tends to replace work in adolescents' daily schedules. However, regardless of whether an adolescent spends time in work, school, or a combination of the two, the amount of time devoted to these obligatory activities impacts the amount of free time left over.

Between cultures with comparable levels of economic development, differences in available free time appear to be driven primarily by values for time-use. Many East Asian cultures, for example, hold Confucianist values that include a strong devotion to education. Consequently, Asian youth spend nearly double the amount of time in a classroom and on schoolwork as do U.S. adolescents (Larson & Verma, 1999). While these educational experiences may be beneficial for youth's long-run economic well-being, they leave less overall free time, and less energy or motivation to participate in activities other than those of a passive nature (e.g., watching television; Larson & Verma, 1999; Silbereisen, 2003).

There is some evidence for intra-cultural associations between economics and activity-related values. In the US, for example, parents with low socioeconomic status tend to see

childhood as a time free from responsibility, while middle-class parents tend to see childhood as a time of preparation for adult roles. These philosophies then influence the different types of time-use that parents encourage in their children (Lareau, 2002).

In terms of the ways in which adolescents spend the free time that is available, the economic conditions of a given culture can also influence the resources available for various free time pursuits. For example, TV watching is a rare past-time for youth in non-industrialized countries, where few families can afford to own a television set. In industrialized nations, where nearly every home has a television, low-income youth watch more than higher income peers (Larson & Verma, 1999). Larson and Verma suggest that this is because many other forms of Western free time use cost substantially more than a television, especially over time.

Beyond simple economics, uses of free time can be shaped by cultural values. Rural India is one example of a region in which traditional cultural values impact adolescent activities in a way that is fairly untouched by Western influence. There, free-time activities have strong community and religious foci. There are also clear gender differences in free-time pursuits, which reflect the roles that men and women are expected to occupy in this society. Girls tend to engage in family- and home-based activities, as well as more religious and artistic pursuits. In contrast, boys tend to engage in more intellectual activities, like reading, as well as competitive sports (Verma & Sharma, 2003). As a whole, free-time activities in this society are structured in a way that teaches and reinforces broader cultural beliefs.

Larson and Seepersad (2003) discuss how two competing sets of cultural values shape free time use for U.S. adolescents: the idea that adolescence is a time of exploration free from adult responsibilities and the Protestant ethic of hard work, structure, and time well-spent. Consequently, American youth spend large quantities of time in both structured activities and unstructured socialization, as compared to youth from other nations. Youth from the U.S. and other Western nations also spend comparatively little time with their families, which may reflect

values of individualism and self-sufficiency (Larson & Verma, 1999; Vazsonyi, Pickering, Belliston, Hessing, & Junger, 2002).

A number of cross-cultural studies of adolescent free-time involvement have focused on documenting differences in time use (e.g., Flammer & Schaffner, 2003; Larson & Verma, 1999; Vazsonyi, Pickering, Belliston, Hessing, & Junger, 2002; Verma & Larson, 2003; Zuzanek, 2005). While some (e.g., Larson & Verma, 1999) have speculated on how these differences in time use impact free-time experiences, fewer studies have directly examined cross-cultural differences in those experiences. A study of leisure motivation and peer pressure among South African, German, and U.S. adolescents (Caldwell, Weichold, & Smith, 2006) revealed that, of the three, South African youth had the highest levels of amotivation and peer pressure and the lowest levels of intrinsic and introjected motivation. U.S. adolescents were higher than the other youth on introjected and extrinsic motivation, and German adolescents were especially low on extrinsic motivation, amotivation, and peer pressure. A study of activity-based identity experiences among youth from the US, Italy, and Chile (Coatsworth et al., 2005) found that youth tended to have similar levels of each type of experience, regardless of country. The small number of cultures and activity-based experiences that have been examined to date underscore both a critical need and a large opportunity for future research.

The South African Context

Substance use. In South Africa, as in other areas of the world, substance use is fairly common, and sometimes problematic, among youth. According to the 2002 South African Youth Risk Behavior Survey (Reddy et al., 2003), one in eight South African high school students begins drinking alcohol before the age of 13, and nearly one-quarter of students in grades 8 through 11 have engaged in binge drinking in the previous month. There is some evidence of alcohol dependence, with a portion of adolescent male binge drinkers report that they use alcohol because they are unable to stop (Ziervogel, Ahmed, Flisher, & Robertson, 1997). In South Africa,

about 40% of teenagers have smoked cigarettes in their lifetime, with more than half of this group made up of current smokers (Global Youth Tobacco Survey Collaborative Group, 2003; Reddy et al., 2003). As in the US, nicotine dependence emerges with low levels of tobacco use and affects about half of adolescent smokers (Panday, Reddy, Ruiter, Bergström, & de Vries, 2007). About 13% of students in grades 8-11 have tried marijuana, with the majority of those having also used it in the past month. South African students have also used a number of other drugs (inhalants, sedatives, cocaine, heroin, club drugs, prescription and over-the-counter medication) at lifetime rates of between 7 and 16% percent (Reddy et al., 2003).

Research on the direct consequences of substance youth among South African youth is less extensive than research with U.S. samples. However, the available research shows that South African adolescents' substance use does have relevance for their health and well-being. For example, about 8% of students have driven after drinking alcohol, and over a third have been passengers of someone who had been drinking (Reddy et al., 2003). Substance use has also been correlated with a number of poor outcomes, including sexual intercourse, school absence, grade retention, not wearing a seatbelt, carrying a knife, and suicide (Flisher, Parry, Evans, Muller, & Lombard, 2003; Flisher, Ziervogel, Chalton, Leger, & Robertson, 1996; Palen, Smith, Flisher, Caldwell, & Mpofu, 2006).

Several South African studies have explored potential reasons for substance use. One qualitative study of male adolescent binge drinkers (Ziervogel, Ahmed, Flisher, & Robertson, 1997) found motivations for alcohol use that overlapped those from U.S. studies, such as achievement of adult status, peer pressure, coping, experimentation, and pleasure. Parents were also seen as playing direct and indirect roles in the promotion of drinking. A study of motivations across a range of substances (Madu & Matla, 2003) found that one of the most common reasons for using substances (especially alcohol) was for entertainment, with some youth also endorsing being tired or stressed as reasons for the use of illicit drugs and cigarettes. A number of these

motivations were also documented in a recent qualitative study of Cape Town youth (Patrick et al., 2008). In addition to mentioning fun, experimentation, coping, and peer pressure as motivations to use substances, participants discussed physical effects (e.g., intoxication, weight loss, enhanced athletic performance), fitting in, and the alleviation of boredom.

Free-time activities. Descriptions of the free-time involvement of South Africans in general, and South African youth specifically, are rare in the empirical literature. The most extensive study of free time use and experiences was conducted by Valerie Møller in 1989 (Møller, 1992). In this study, youth reported an average of 5 hours of spare time (as it was termed for this study) on weekdays and about 7 hours on weekend days. The most frequent and preferred uses of spare time included sports (especially soccer), socializing, watching television or movies, and religious activities. Although drinking alcohol was also a popular past time, very few participants reported that engagement in other risk behaviors (e.g., drug use, crime) was popular.

In Møller's youth activity study, most participants felt their spare time activities were "worthwhile." This is consistent with research with South African adults showing that they are generally satisfied with their spare time activities, and that they are more satisfied in this arena than in areas including housing, education, and employment (Møller, 1998). The most common reason for preferring activities was that they were fun or interesting. However, participants also preferred certain activities because they were novel/educational or because they filled instrumental needs (e.g., fitness, money). In general, the most preferred activities were also the ones in which participants experienced the most freedom.

It should be noted that Møller's youth study was conducted prior to the end of Apartheid. There is some evidence that the free-time landscape has evolved, with South African adults (and low-income adults especially) experiencing a drop in their satisfaction during spare time activities over the 1980's and 1990's (Møller, 1998). In addition, Møller's study was limited to black residents of urban, low-income townships, further calling into question its generalizability across

different groups of South African youth. However, a more recent study suggests that Møller's results may generalize to modern-day youth from different locations and of different population groups.

In their study of adolescents and young adults in the KwaZulu-Natal province of South Africa, Kaufman and colleagues (Kaufman, Clark, Manzini, & May, 2002) found that, depending on population group and gender, between 19 and 28% of participants' time was "free" (i.e., not spent in personal maintenance, paid or unpaid work, studying). Free time fell within three categories: "hanging out" (including doing nothing, spending time at shopping malls or on street corners, and going to bars or parties), home-based activities (including television-watching and talking on the telephone), and organized activities. Organized activities were further subdivided into sports, religious clubs, and community programs. Home-based activities tended to occupy the most time (between 10 and 16% of adolescents' day), followed by hanging out (4 to 12% of day), and organized activities (2 to 6% of day). Sports were the most popular organized activity among boys (45% participating), and religious activities were the most popular organized activity among girls (31% participating).

While there has been some basic descriptive research on activities and free-time experience, few South African studies have attempted to link youth free-time involvement with substance use. One recent investigation of Cape Town youth (Wegner, Flisher, Muller, & Lombard, 2006) found that they experience moderate leisure[4] boredom, with levels being higher for girls and for younger participants. This study showed no significant association between leisure boredom and substance use. However, in several aforementioned studies, a number of youth reported that they use alcohol, cigarettes, and illicit drugs because they were bored and did

[4] Wegner and colleagues explicitly examined "leisure." Therefore, it is unclear the degree to which these findings might generalize to free time more generally.

not have alternative activities available (Madu & Matla, 2003; Patrick et al., 2008; Ziervogel, Ahmed, Flisher, & Robertson, 1997).

HealthWise South Africa

A current research project, HealthWise South Africa, is making contributions to what is known about adolescent substance use, free time, and the intersection between them. The main purpose of this study is to evaluate a culturally-adapted drug prevention curriculum for South African secondary school students. However, the study is also yielding normative data on the free-time activities and health risk behaviors in which adolescents are engaging.

HealthWise has its roots in *TimeWise: Taking Charge of Leisure Time* (Caldwell, Baldwin, Walls, & Smith, 2004), a school-based intervention that aims to increase participants' involvement in positive free-time activities by increasing awareness of various leisure opportunities and their benefits/drawbacks, enhancing self-awareness, and developing leisure-related decision-making skills. Early findings from the U.S. revealed that program participants did become more involved in leisure and develop their leisure-related skills and awareness (Caldwell, Baldwin, Walls, & Smith, 2004). TimeWise participation was also associated with a reduction in the use of some substances (Caldwell, Smith, Ridenour, & Maldonado-Molina, 2005).

The original TimeWise curriculum, plus added components on substance use, sexuality, and general life skills, was adapted to be culturally appropriate (Wegner, Flisher, Caldwell, Vergnani, & Smith, in press) and delivered as *HealthWise: Life Skills for Young Adults* (Caldwell et al., 2004). HealthWise consists of 12 lessons presented to 8th-graders and 6 lessons presented to 9th-graders. Each lesson takes approximately three class periods to deliver. This curriculum, combined with an effort to connect youth with

community resources, aims to increase healthy free time use, reduce substance use, delay onset of sexual activity, and increase condom use among sexually active youth.

In 2004, the full-scale trial of HealthWise began in Mitchell's Plain, a Cape Town township established during the apartheid era. As of 2007, there were at least four (and as many as eight) waves of semi-annual longitudinal data available for each of three school cohorts. Analyses of these data have begun to add to what is known about free-time involvement and its relations with substance use.

A number of studies using the HealthWise data have examined activities or substance use independent of the other. Many of the activities analyses to date have focused on leisure motivation. These include two studies showing that extrinsic, introjected and identified motivation normatively decrease over the first two years of secondary school. However, students at a HealthWise school with high teacher training have shown a resistance to these developmental trends (Caldwell, Patrick, Smith, Palen, & Wegner, 2007, June; Caldwell et al., in press). HealthWise studies of substance use have included the demonstration of a sequence of use that parallels those found in U.S. samples (Patrick et al., in press) and explorations of associations between substance use and sexual behavior (Palen, Smith, Caldwell, Mathews, & Vergnani, 2007; Palen, Smith, Flisher, Caldwell, & Mpofu, 2006).

There have also been several investigations of the associations between activities and substance use in the HealthWise data. Preliminary cross-sectional results showed that youth who experienced identified (goal-related) motivation in free time had lower odds of recent substance use, while experiencing peer influence in free time was related to heightened odds of substance use (Caldwell, Weichold, & Smith, 2006). Person-centered analyses have yielded evidence of subtypes of leisure motivation that are differentially related to substance use, with this subtype membership also being associated with HealthWise participation in hypothesized ways (Palen,

Caldwell, & Smith, 2007, June). These studies aside, there is still much to be learned about the relations between activities and substances among youth in Mitchell's Plain.

The Current Studies

The aim of the two studies that follow is to use HealthWise data to continue to expand what is known about free-time activities and substance use in the South African context. Study 1 takes a mixed-method approach to understanding the kinds of activities in which youth participate, the relative popularity of these activities, and why adolescents choose to engage in them. Study 2 examines one of the most commonly-used substances among South African youth: tobacco. Specifically, it explores longitudinal patterns of cigarette use over time and determines whether these patterns can be predicted using measures of certain free-time experiences.

Chapter 2

A Mixed-Method Analysis of Free Time Involvement and Motivation Among Youth in Cape Town, South Africa

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Abstract

This study examined the ways in which adolescents from one area in South Africa spend their free time, using both focus group (N = 114) and survey (N = 946) data. It also explored one element of the free-time experience, motivation, which may have implications for both positive development and negative outcomes in adolescence. We found that youth were involved in a broad range of activities, with socializing, media use, sports, risk behavior, musical performance, dance, and going to game shops being most prominent and popular. Free-time was most strongly characterized by intrinsic motivation, which included experiences of competence, relatedness, and positive affect. Activities were also often seen as a way to achieve goals related to health, well-being, and personal achievement. With few exceptions, multiple motivations were identified for the same activities, and specific motivations were reported across multiple activity types. The implications of these results for intervention and future research are discussed.

A Mixed-Method Analysis of Free Time Involvement and Motivation Among Youth in Cape Town, South Africa

Worldwide, between one-quarter and one-half of youth's waking hours are typically discretionary, meaning that they are not occupied by obligatory activities such as school, chores, and maintenance activities (Larson & Verma, 1999). This is a sizable amount of time, suggesting that free time has the potential to be very influential in adolescents' development. There are a number of ways in which free-time activities can contribute to positive development. They can provide opportunities for identity work (Dworkin, Larson, & Hansen, 2003), skill development (Hansen, Larson, & Dworkin, 2003), relationship building (Eccles, Barber, Stone, & Hunt, 2003), and positive emotional experiences (Dworkin, Larson, & Hansen, 2003). However, free-time activities may also promote certain negative experiences that can be harmful for development. These can include negative interactions with peers, parents, and other adults and negative emotional experiences, such as anxiety, disappointment, and stress (Dworkin & Larson, 2006-2007).

The current study examines the ways in which adolescents from one area in South Africa spend their free time, using focus group and survey data. This study also explores one element of the free-time experience, motivation, which may have implications for both positive development and negative outcomes in adolescence. Specifically, this study will list and describe the types of activities in which participants are involved, examine the relative prominence and popularity of these activities, and describe the types and relative frequencies of motivational experiences that adolescents have within and across their activities.

Culture and Free-time Activities

A culture is a group whose members have common history, economy, geography, and social and political structures (Nichols, Malone, Tarlow, & Loewenstein, 2000). These shared experiences result in (or, perhaps, result from) norms, beliefs, and behaviors that are similar

among members, and different from those of individuals in different circumstances. In practice, culture is often operationalized as a simple social address. For example, in studies involving U.S. samples, ethnicity is often equated with culture (e.g., Nichter, 2003). Multi-national studies of human development sometimes equate country of origin with culture (e.g., Caldwell, Weichold, & Smith, 2006; Grouzet et al., 2005). However, culture may depend on additional factors, including those at the individual (e.g., religious affiliation, social class, amount of time that has passed since descendants' emigration) and contextual levels (e.g., overall ethnic composition of one's community, region of the country, residence in an urban vs. rural area).

Therefore, we acknowledge that, in the literature review that follows, "culture" is measured in different ways that may have varying levels of validity. Studies that examine culture using broad ethnic or geographic groups may, in fact, be describing individuals from a number of different cultures. Alternatively, studies of highly specified populations (e.g., specific neighborhoods or towns; restricted ages; a single race, ethnicity or gender) may not be capturing an entire culture but, rather, a subculture within a larger parent culture.

That being said, major cultural differences in time-use emerge with adolescence (Larson & Verma, 1999). The amount of time available for free-time activities is necessarily impacted by obligation to tasks including household chores, paid work, and school. These obligations are shaped by a culture's economic circumstances, as well as their values (Larson & Verma, 1999; Silbereisen, 2003).

Culture can also impact the ways in which any available free time is used. Economic conditions influence the resources available for various pursuits (Larson & Verma, 1999). Uses of free time can also be shaped by cultural values. Free-time activities can be structured in ways that teach and reinforce broader cultural beliefs in areas that include relationships, religion, achievement, and human development (Larson & Seepersad, 2003; Verma & Sharma, 2003).

Free-time Activities in South Africa

Descriptions of the free-time involvement of South Africans in general, and South African youth specifically, are rare in the empirical literature. Moreover, there is so much demographic variation in South Africa that it may be difficult to make general statements that apply across groups. The most extensive study of free time use and experiences was conducted by Valerie Møller in 1989 (Møller, 1992). In this study, youth reported an average of 5 hours of spare time (as it was termed for this study) on weekdays and about 7 hours on weekend days. The most frequent and preferred uses of spare time included sports (especially soccer), socializing, watching television or movies, and religious activities. Although drinking alcohol was also a popular past time, very few participants reported that engagement in other risk behaviors (e.g., drug use, crime) was popular.

In Møller's youth activity study, most participants felt their spare time activities were "worthwhile." This is consistent with research with South African adults showing that they are generally satisfied with their spare time activities, and that they are more satisfied in this arena than in areas including housing, education, and employment (Møller, 1998). The most common reason for preferring activities was that they were fun or interesting. However, participants also preferred certain activities because they were novel/educational or because they filled instrumental needs (e.g., fitness, money). In general, the most preferred activities were also the ones in which participants experienced the most freedom.

It should be noted that Møller's youth study was conducted prior to the end of Apartheid and was limited to black residents of urban, low-income townships. However, a more recent study suggests that these results may generalize to modern-day youth from different locations and of different population groups. In their study of adolescents and young adults in the KwaZulu-Natal province of South Africa, Kaufman and colleagues (Kaufman, Clark, Manzini, & May, 2002) found that, depending on population group and gender, between 19 and 28% of

participants' time was "free" (i.e., not spent in personal maintenance, paid or unpaid work, studying). Free time fell within three categories: "hanging out" (including doing nothing, spending time at shopping malls or on street corners, and going to bars or parties), home-based activities (including television-watching and talking on the telephone), and organized activities. Organized activities were further subdivided into sports, religious clubs, and community programs. Home-based activities tended to occupy the most time (between 10 and 16% of adolescents' day), followed by hanging out (4 to 12% of day), and organized activities (2 to 6% of day). Sports were the most popular organized activity among boys (45% participating), and religious activities were the most popular organized activity among girls (31% participating).

Despite the contributions of Møller (1992) and Kaufman (2002), there are still gaps in knowledge about adolescent time use in South Africa. Both studies defined youth fairly broadly (15-25 years old and 14-22 years old, respectively), confounding findings about school-aged youth with those about individuals who may have adult roles and responsibilities. In addition, neither study examined time use among colored (mixed race) youth. While colored individuals make up only about 9% of the national population, in certain South African provinces (Western Cape, Northern Cape) more than half of the population self-identifies as colored (Statistics South Africa, 2003), making this an important subgroup to investigate.

Free-time Motivation

In their Self-Determination Theory (SDT), Ryan and Deci (2000) posit that humans have three basic psychological needs: autonomy, competence, and relatedness. Provided that these needs are met, individuals will be intrinsically motivated, displaying the "tendency to seek out novelty and challenges, to extend and exercise one's capacities, to explore, and to learn" (p. 70). This motivation then serves as a foundation for positive personal growth. However, if an individual does not fully experience autonomy, competence, or relatedness, he or she will either be amotivated (have no intention to act) or exhibit extrinsic motivation.

As a component of SDT, Ryan and Deci (2000) propose organismic integration theory (OIT), in which intrinsic motivation and the various types of extrinsic motivation are arranged along a continuum based on their associated levels of autonomy. Intrinsic motivation and amotivation are on the extreme ends of this continuum. Arranged between them, from least to most autonomous, are the subtypes of extrinsic motivation: external regulation, introjected regulation, identified regulation, and integrated regulation. External regulation occurs when action is motivated completely by outside forces, typically in the form of a potential reward or punishment. With introjected regulation, behavior is motivated by the potential of avoiding negative emotional states (e.g., guilt, anxiety) or attaining ego rewards (e.g., pride). These emotions often stem from perceptions of how social figures, like peers and family members, will judge one's actions (Baldwin & Caldwell, 2003). Identified regulation occurs when behavior is motivated by a valued goal. Finally, in the case of integrated regulation, a goal-focused motivation is accepted as part of the self and is in line with one's values, however, it lacks the inherent enjoyment of intrinsic motivation. Some have argued that integrated regulation is not exhibited until adulthood due to the high-level cognitive capacities it requires (Vallerand, 1997), therefore, it will not be addressed in the study that follows.

There have been theoretical arguments for the role of motivation in adolescent development. Waterman (2004) discusses the importance of intrinsic motivation for optimal identity development in adolescence and early adulthood. He asserts that if individuals select goals, values, and beliefs that are intrinsically motivated, they will have identities that are a better fit with their personal strengths, thereby allowing them to reach their full potential. Larson (2000) also suggests that intrinsic motivation is one component of initiative, or "the ability to be motivated from within to direct attention and effort toward a challenging goal" (p.170). He argues that initiative is crucial to adult success in certain modern societies where, rather than having a limited number of choices in domains such as career and family, one's life course is extremely

flexible. Therefore, it appears to be important for individuals to maintain intrinsic motivation through adolescence and into adulthood.

There is evidence that adolescents experience more intrinsic motivation in their free time than in school, work, or maintenance activities (Kleiber, Larson, & Csikszentmihalyi, 1986; Larson, 2000). However, there is a general lack of empirical evidence linking intrinsic motivation in free-time activities to positive general outcomes in adolescence and adulthood. One exception is a study showing that youth whose leisure motivations were intellectual (e.g., learning, exploration), social, or competence-oriented (e.g., challenge, competition, achievement) had higher levels of a number of positive personal characteristics, including responsibility, self-esteem, and tolerance (Reddon, Pope, Friel, & Sinha, 1996).[5] Likewise, a study of intrinsically-motivated identity choices within adolescent free-time activities linked these experiences with heightened subjective well-being and internal developmental assets (Coatsworth, Palen, Sharp, & Ferrer-Wreder, 2006).

There are also few studies linking free-time motivation with negative outcomes. In an aforementioned study of free-time motivations, avoidance-related motives (e.g., need for solitude or to unwind) were associated heightened levels of social psychopathologic symptoms, while more intrinsic types were associated with lower levels of psychiatric and depressive symptomology (Reddon, Pope, Friel, & Sinha, 1996). There is also evidence that youth who lack intrinsic motivation during their free time are more likely to experience boredom (Weissinger, Caldwell, & Bandalos, 1992). It is more common for this presence of boredom, rather than lack of intrinsic motivation per se, to be tested in relation to negative outcomes. Among adolescents

[5] While these motivation types do not directly correspond with the intrinsic-extrinsic motivation continuum, there is a degree of conceptual overlap. As defined in Reddon et al. (1996), intellectual motivations appear to be intrinsic, social motivations are both intrinsic and introjected, competence-mastery motivations are intrinsic, and stimulus-avoidance motivations could be considered identified.

and young adults, the experience of boredom[6] has been associated with cigarette smoking (E. A. Smith & Caldwell, 1989), illegal drug use (McIntosh, MacDonald, & McKeganey, 2005), delinquency (Newberry & Duncan, 2001), and binge-eating (Vanderlinden, Grave, Vandereycken, & Noorduin, 2001). Boredom is also associated with lower levels of various facets of well-being, including optimism and self-esteem (Hunter & Csikszentmihalyi, 2003).

Motivation and Activity Type

There are a variety of ways in which youth can spend their free time. It is possible that different forms of time use are prompted by different types of motivation. However, there are few previous studies that compare motivational experiences across types of activities. Two exceptions are studies of "personally expressive activities," which are, by definition, characterized by intrinsic motivation. Waterman (2004) found that, among college students, social, altruistic, creative, religious, and athletic activities tended to have the highest levels of personal expressiveness, while passive and obligatory activities (e.g., TV-watching, reading, working, shopping, cooking, eating) tended to not be personally expressive. In a sample of high school students, Coatsworth and colleagues (Coatsworth, Palen, Sharp, & Ferrer-Wreder, 2006) found these same general trends, although they did not reach statistically significant levels. However, we are unaware of studies that compare multiple types of motivation (e.g., extrinsic, introjected, identified) across activity types.

There is previous work that examines motivation for participation in single types of free-time activities. This literature mainly focuses on sports and physical activities. A qualitative study of male adolescents (Allison et al., 2005) found that the most-discussed reasons for physical activity participation were of a more extrinsic nature. These included socializing, having an attractive appearance, increasing self-confidence and self-esteem, stress relief, and staying away from risk behavior. However, more intrinsic motivations such as enjoyment, challenge, and skill-

[6] Some of these studies were of boredom in free time, while others were of boredom in general. It is unclear the degree to which findings about boredom in general also apply to boredom in free-time context.

development were also discussed. A study of college students (Pedersen, 2002) found that intrinsic motivations for sports participation, such as self-expression and self-improvement, were more frequent than more extrinsic motivations, such as social recognition and opportunities to travel. A study of Greek adults who participated in sports (Tsorbatzoudis, Alexandris, Zahariadis, & Grouios, 2006) found that introjected motivation was the strongest type, followed by intrinsic, identified, and extrinsic motivation and amotivation. The most frequent sports participants had the highest levels of intrinsic, identified, and introjected motivation and the lowest levels of amotivation.

Published research on non-physical activity motivations is scarce, and studies that employ an explicit SDT framework or an adolescent sample are even rarer. Among college theater students, levels of intrinsic motivation in drama were high, levels of introjected and identified motivation were moderate, and levels of external regulation and amotivation were comparatively low (Martin & Cutler, 2002). In a sample of adults, Conway and Rubin (1991) found that entertainment and relaxation were the strongest motivations for watching television. The remaining motivations, from strongest to weakest, were passing time, information seeking, escape, and status. A study of secondary school instrumental music students (Schmidt, 2005) found that a number of different types of participation motivations were endorsed, including challenge, interest, grades, approval from teachers, and avoidance of criticism from teachers. Intrinsic motivation was positively correlated with time spent in practice, as well as with teacher ratings of performance and effort. Success motivations were also positively correlated with practice time and effort, while avoidance of criticism was unrelated to the outcomes of interest. A study of adult AIDS volunteers (Omoto & Snyder, 1995) found that several types of motivation were related to the duration of volunteer service. Learning, relationship-building, challenge and self-discovery were related to longer tenures of service, as were self-enhancing motivations such

as stress-management and avoiding loneliness. Values about helping in general and the gay community specifically were unrelated to duration of service.

Several general conclusions can be drawn from the above studies. Individuals can and do have multiple types of motivation for participating in the same type of activity. Across activities, intrinsic motivations tend to be the most prominent. However, there is also evidence for identified, introjected, and extrinsic motivation, as well as amotivation, in a variety of activity contexts. In studies where motivation is related to other constructs, intrinsic motivation is typically associated with positive outcomes.

That being said, there is still much to be learned about motivation in free time. As mentioned previously, there are few studies that compare motivation across different uses of free time. Also, there has been a general lack of research on motivation that occurs within less active or organized free-time pursuits.

In addition, little is known about free-time motivation among non-US populations. It is possible that the theories of, and previous research on, free-time activities and motivation do not accurately describe individuals who differ in values, economic circumstances, and other dimensions of culture. This is an especially important consideration in the current study, which examines youth from one specific area in South Africa (see Caldwell et al., 2004) who differ from U.S. youth in a number of ways. Most residents in this area self-identify as "colored," a population group that encompasses individuals of mixed African, European, and Asian descent. This blend of ancestry (and presumably culture; see Nsamenang, 2002) is reflected in the variety of linguistic (English, Afrikaans, Xhosa) and religious (Christian, Muslim) traditions represented in the area. The local culture is also shaped by the legacy of apartheid, in the form of low financial and material resources. Differences in these potential markers of culture call into question whether U.S. theory and knowledge about free time and motivation could be effective in informing local programs or policy. The following sections describe what is known about the

generalizability of relevant U.S. theory and research to populations both outside of and within South Africa.

Culture and Free-time Motivation

A number of cross-cultural studies of adolescent free-time involvement have focused on documenting differences in time use (e.g., Flammer & Schaffner, 2003; Larson & Verma, 1999; Vazsonyi, Pickering, Belliston, Hessing, & Junger, 2002; Verma & Larson, 2003; Zuzanek, 2005). While some (e.g., Larson & Verma, 1999) have speculated on how these differences in time use impact free-time experiences, fewer studies have directly examined cross-cultural differences in those experiences, including motivation.

In the general literature on motivation and SDT, there are mixed findings in terms of the impact of culture. Several studies have examined whether the strength or relevance of individual constructs within SDT (i.e., competence, relatedness, autonomy, intrinsic and extrinsic motivation) differ across cultures. In their study of university students from four nations, Chirkov and colleagues (Chirkov, Ryan, Kim, & Kaplan, 2003) found that individuals from cultures with individualistic and horizontal (equality) values tended to have the highest internalization of these values (i.e., autonomy), as compared to individuals from cultures with collectivist and vertical (hierarchical) values. Alternatively, in a study of young adults from 14 nations, the reported importance of participants' future goals allowed these goals to be placed along a continuum which the investigators labeled as intrinsic/extrinsic (Grouzet et al., 2005). The relative position of goals along this continuum was fairly consistent across nations, suggesting cross-cultural relevance of OIT.

Several other studies have tested the cross-cultural applicability of the relations between constructs as posited by SDT. One cross-national study has tested the generalizability of a model in which support for autonomy leads to the satisfaction of needs for autonomy, relatedness, and competence, and this need satisfaction in turn leads to enhanced well-being. Deci and colleagues

(2001) found that, in the context of an adult work environment, this proposed model had an equivalent fit in both the United States and Bulgaria. This suggests that the constructs interact similarly in both groups. In a similar study of U.S. and German university students, Levesque and colleagues (Levesque, Zuehlke, Stanek, & Ryan, 2004) found that, cross-nationally, pressure and feedback were related to both autonomy and perceived competence. While competence was positively associated with well-being for all subsamples, the association between autonomy and well-being was only positive for certain groups. This last finding is contrasted with another study's finding that experiences of autonomy among university students were positively related to well-being regardless of cultural values (Chirkov, Ryan, Kim, & Kaplan, 2003). Finally, some have argued that the strengths of associations between SDT constructs may vary by cultures. For example, Walker and colleagues (Walker, Deng, & Dieser, 2005) suggest that in collectivist (particularly Asian) cultures, relatedness and effort, rather than autonomy and achievement, may be especially important contributors to the experience of intrinsic motivation. In sum, previous research supports the generalizability of many basic tenets of SDT, although there may be certain nuanced differences between cultures. This in turn suggests the validity of using SDT as an initial framework for studying motivation in new cultural contexts.

We are aware of few published cross-national studies of free-time motivation specifically. A study of South African, German, and U.S. adolescents (Caldwell, Weichold, & Smith, 2006) revealed that, of the three, South African youth had the highest levels of amotivation and the lowest levels of intrinsic and introjected motivation. U.S. adolescents were higher than the other youth on introjected and extrinsic motivation, and German adolescents were especially low on extrinsic motivation and amotivation. A study of physical activity motivations of youth from the U.S., Australia and New Zealand (Weinberg et al., 2000) found that U.S. youth had the highest levels of a number of different motivations (competition, fitness, fun, teamwork) for participating in competitive sports. In terms of motivation to participate in other

exercise/fitness activities, U.S. adolescents had higher levels of fitness and energy release motivations than other youth, while Australian youth had comparatively low levels of both intrinsic and extrinsic motivation. These differences suggest that there is value in studying free-time motivation in specific populations of interest, rather than generalizing from other nations or cultures.

Free-time Motivation in South Africa

Several studies have examined general free-time motivation among South African youth. Caldwell and colleagues (Caldwell, Patrick, Smith, Palen, & Wegner, 2007, June) found that identified, introjected, and extrinsic motivation all tended to decrease over the high school years. In addition, boys tended to report lower intrinsic motivation and higher introjected and extrinsic motivation and amotivation, as compared to girls. A person-centered study of free-time motivation found that participants could be classified as high on all types of motivation, low on all types of motivation, or high on more intrinsic forms of motivation (Palen, Caldwell, & Smith, 2007, June). Over time, prevalence of the first two patterns decreased and prevalence of the latter pattern increased. Low motivation was associated with highest odds of substance use, while high intrinsic motivation was associated with the lowest odds of substance use. Despite these results, we know little about what free-time motivation actually looks like in this population, and whether the same specific motivations identified in previous studies (e.g., socializing, self-expression, stress relief) are found among South African youth. In addition, in keeping with the overall state of the literature, we do not know whether and how motivation differs across specific types of activities.

The Current Study

The overall purpose of this study is to understand the free-time activity participation and related motivations of adolescents in a peri-urban area near Cape Town, South Africa. We will

undertake this examination at both activity-specific (e.g., sports) and domain-specific (free time in general) levels.

This mixed-method study employs a concurrent triangulation design (Creswell & Plano Clark, 2007). In this type of design, quantitative and qualitative data are collected within the same time frame. However, each type of data is collected and analyzed separately using methods that are customary for each. Then, interpretation of the two sets of results are compared and contrasted in order to arrive at an overall interpretation of the data. Specifically, in the current study, our aims will be addressed using both focus group and quantitative survey data. Neither type of data is considered of primary importance, but rather, each makes unique contributions to an overall understanding of the free-time context.

There are several advantages to the incorporation of qualitative data in our analysis. Qualitative data offer arguably the best means of examining phenomena that occur in complex social contexts, like communities or cultures (Nastasi & Schensul, 2005). This is particularly important in the current study, in which guiding theories and previous empirical work are based mostly on individuals from outside of the South African context. Qualitative data can also be a source of rich, vivid descriptions (Johnson & Onwuegbuzie, 2004), which our existing survey instrument is unable to fully capture. Focus groups, in particular, offer at least one key advantage over other qualitative methods, such as individual interviews. The social interaction in the groups tends to promote the sharing of information that a researcher did not originally anticipate. This is especially useful in situations where the researcher and participants have fundamentally different perspectives, as is the case with adult researchers and youth participants (Charlesworth & Rodwell, 1997; Seal, Bogart, & Ehrhardt, 1998). In the present study, the use of qualitative methods allowed for participants to list activities and motivations that were unbounded by the investigators' conceptions of these constructs.

The present study has four specific aims. *First, we aim to describe what adolescents do in their free time.* This aim is exploratory and descriptive in nature. This aim has two specific components, each of which is addressed with varying combinations of qualitative and quantitative data. First, we will list the types of activities in which adolescents are involved, as reported in the focus group data. Second, in order to give a more nuanced portrayal of what goes on during free time, we will discuss the relative prominence and popularity[7] of various activity types using both focus group and survey data. We will use focus group data to determine which types of activities are reported most frequently within and across groups. We will use both focus group and survey data to determine which types of activities have higher participation rates, and we will use survey data to determine which activity types occupy larger quantities of time.

Our second aim is to list and describe the types of free-time motivation that emerge in the qualitative data. Again, this aim is exploratory. We will describe the range of specific free-time motivations subsumed under more general motivation types (intrinsic, identified, introjected, extrinsic, amotivation). This will allow us to make more concrete statements about what broad, fairly abstract constructs like "intrinsic motivation" look like in this specific population. We will also note the types of activities in which different motivations tend to be mentioned.

Our third aim is to examine the relative frequency of each general motivation type. We will use both quantitative and qualitative data to examine whether certain types of motivation are especially common or rare across all possible uses of free time. Both theory and previous research position free-time activities as an important context for the experience of intrinsic motivation (Kleiber et al., 1986; Larson, 2000). Therefore, we hypothesize that intrinsic motivation will be the most commonly reported type. Additionally, given that OIT proposes that motivations can be organized on a continuum (Ryan & Deci, 2000), we expect that those types that are closer to

[7] We use the term "prominence" to refer to an activity's salience among research participants. This may be distinct from actual participation in that activity, which we term "popularity."

intrinsic motivation (identified and introjected motivation) will be more common than either extrinsic motivation or amotivation.

Our fourth and final aim is to examine, within the focus group and survey data, whether there are any notable differences in the relative frequencies of free-time motivations (intrinsic, identified, introjected, extrinsic, amotivation) across the various activity types. As mentioned previously, studies that examine single activity types all have evidence for multiple types of motivation, with intrinsic motivation often being most prominent. Therefore, in general, we expect that within a given activity type, all motivation types will be reported and intrinsic motivation will be the most frequently endorsed. In terms of how motivation might differ across activities, theory provides some suggestion as to the activity *experiences* that might be associated with differential levels of intrinsic motivation (e.g., autonomy, opportunities to build and maintain competence and interpersonal relationships; Ryan & Deci, 2001). However, there is little theory or research to guide hypotheses about which *types* of free-time activities (e.g., art, volunteerism) have greater rates or levels of intrinsic motivation, as compared to other types of activities (see Coatsworth et al., 2006 and Waterman, 2004 for exceptions). In addition, we are unaware of any studies comparing types of non-intrinsic motivation (i.e., identified, introjected, extrinsic, amotivation) across activity types. Therefore, we see this research aim as also being exploratory.

Method

Participants

The sample for the present study was drawn from the HealthWise South Africa randomized clinical trial. The intervention participants were from Mitchell's Plain, a low-income township near Cape Town that was established during the apartheid era. There are 25 high schools in the Mitchell's Plain area. In determining which schools to include in this study, six were excluded due to concerns about their ability to functionally participate. Of the remaining

schools, four were randomly selected to receive the HealthWise curriculum. Five schools were selected to serve as control comparisons; however, data from those students were not included in the current study.

Focus group participants (N = 114; 54% female) were 8th and 10th-grade English-speaking students at the four intervention schools involved in the HealthWise trial. Our quantitative sample was selected in order to be chronologically proximal and demographically comparable with our focus group sample. Therefore, we examined data from the 946 8th and 10th-grade students at HealthWise schools who completed an assessment in October 2006. The mean ages of the 8th and 10th-grade students were 14 and 16, respectively. Fifty-three percent of the sample was female. Most participants were colored (87%), with the rest of the students being black (9%), white (3%), Indian or other (1%). In terms of languages spoken at home, 61% of participants reported that they spoke English, 54% reported Afrikaans, and 6% reported Xhosa.

Participant Recruitment & Data Collection – Focus Groups

Focus groups were conducted in August and September, 2006. Potential participants were selected at random from a list of students identified by their teachers as being able to express themselves verbally in English. The following were targeted for recruitment from each of the four schools: 10 8th-grade girls, 10 8th-grade boys, 10 10th-grade girls, and 10 10th-grade boys.

The program's Youth Development Specialists visited selected students in order to explain the study and gauge interest. If students were interested in participating, they read an information letter and completed an assent form. In addition, the students were given an information letter/consent form to carry home to their parent or guardian. Students were responsible for returning the signed parental consent forms to the Youth Development Specialists. For each student who was not interested in participation, an additional student was selected at random and recruited following the above procedure.

Focus group sessions were conducted separately by gender and by grade. Sessions were held in unused classroom spaces in each of the schools. The focus groups typically took place during school hours, with students being pulled out of their scheduled courses. However, one school required sessions to be scheduled after school.

Students from our population of interest have relatively high levels of school absence. Therefore, not all recruited students actually participated in a focus group session. The 15 focus groups consisted of between 4 and 10 participants each. At one school, only two 10th-grade boys arrived for their focus group, so this session was cancelled.

The focus groups lasted approximately 90 minutes each. They were moderated by two members of the U.S. research team (Palen and Patrick). Each session began with a warm-up game and facilitator introductions. Students then answered questions about topics including free-time activities, substance use, sexual behavior, and the HealthWise intervention. Each session concluded with a time for refreshments, and each student was given a t-shirt as a token of appreciation for participation. The complete focus group protocol appears in Appendix A.

Focus groups were audio taped and then transcribed verbatim by a South African transcriptionist. Members of the U.S. and South African research team then checked all transcripts for accuracy.

Focus Group Questions

At the outset of the focus group, the facilitator defined free time as "time that you're not spending in class, doing school work, or doing chores at your home" and free-time activities as those that take place during free time, "things like clubs or events, and they could take place in your school, your home or your community." Participants were then asked to draw pictures of free time activities that went on in their area, either things that they did or things other students did.

Participants were asked to share activities from their drawings. As each activity was mentioned, the facilitator asked a series of follow-up questions about the activity. Participants were asked how many students from their class, out of 10, participated in the activity. They were also how participants felt about the activity, and which elements they specifically liked. The facilitator continued to elicit additional activities until the participants agreed that their list was exhaustive. Later in the session, the facilitator also probed specifically for ways that youth use their free time outside of organized activities or clubs.

Qualitative Data Analysis

Three of the authors (Palen, Gleeson, and Patrick) coded the focus group transcripts for information relevant to the current study. An initial coding scheme was developed based on theory and the authors' impressions from having conducted the groups. Specifically, three types of information were coded in the responses to the focus group questions listed above. First, each activity that was mentioned (either in response to the initial activity question or the follow-up question about unstructured activities) was assigned an activity type. Eight of the activity types corresponded to those from the quantitative survey (see section on Survey Measures). Additional codes were developed for activities that did not fit neatly within one of the existing categories.

Any of the activities discussed in the first part of the focus group had follow-up information. Participants gave a number, one through 10, of how many students (out of 10) participated in a given activity. Typically, multiple numbers were mentioned. If the majority of numbers mentioned were 3 or less, the activity was coded as having low perceived participation levels. Between 4 and 6 participants were considered to represent perceived moderate involvement, and seven or more participants was coded as perceived high involvement.

Participants also discussed what they liked about each of the activities they drew at the outset of the focus group. We interpreted these explanations as motivations to initiate and maintain involvement in the activities. An examination of the focus group transcripts confirmed

this interpretation; the given reasons were consistent with the types of motivation encompassed by SDT. Consequently, reasons for liking activities were coded as representing intrinsic motivation, identified motivation, introjected motivation, extrinsic motivation, or amotivation, with more specific sub-codes for each.

In order to achieve reliability (see Creswell & Plano Clark, 2007), each of the coders applied the scheme to each transcript independently. Then, the three met to discuss the transcripts, and any discrepancies were resolved by group consensus. The coding scheme was modified as needed to accommodate unanticipated information. This is consistent with the constant comparative method for establishing validity in qualitative research (Silverman, 2005).

Transcripts and their corresponding codes were entered into *Atlas.ti* software. Following data entry, quotation lists for each code were reviewed by the coders to verify that the codes were applied consistently and correctly across all transcripts. The final coding list (including example quotes) was then reviewed by the second author (Caldwell) who did not participate in the coding process but was highly familiar with both the population and constructs of interest. This type of external audit is an accepted procedure for establishing the validity of qualitative results (Creswell & Miller, 2000). The final list of the codes used for this study appears in Appendix B.

Each activity that focus group participants mentioned was entered in an overview grid alongside a group identifier (see Knodel, 1993). For each activity, codes for its type and perceived participation level were also entered. This allowed for the simple generation of lists of specific activities falling under a broader activity code. By reading this grid into SPSS, it also allowed for counts of how many time activities of a given type were mentioned within and across groups, as well as counts of each type of perceived participation level (high, medium, low) within activities of a given type.

For the qualitative motivation analyses, *Atlas.ti* was used to generate counts of the number of times each type and subtype of motivation was mentioned, both in general and within

the context of a particular kind of activity. This information was entered in a second overview grid (activity type x motivation code), which could then be visually inspected for patterns in the reporting of overall free-time motivation and motivations by activity type.

Participant Recruitment & Data Collection – Survey Assessment

Beginning in 2004 and for three consecutive years, all 8th-graders from the four participating schools were invited to participate in the quantitative assessment. Passive parental consent was obtained, as was youth assent. Participants completed identical assessments on personal digital assistants (PDAs) near the beginning and end of each school year. The assessments used in this study are from October 2006 (second 8th-grade assessment for Cohort 3, second 10th-grade assessment for Cohort 1).

Survey Measures

Participants were asked about their involvement in eight activities: hanging out with friends, sports or other physical activities, playing a musical instrument or singing, drama or dance groups, hobbies or creative activities (e.g., artwork, drawing, woodwork, needlework, beadwork, collecting things), going to a park or community/sports center, watching TV or movies, and volunteer work. Participants responded as to whether they spent time doing each of these activities in the past 4 weeks. For the items about friends, sports, music, drama/dance and hobbies, there was the added qualifier of this participation taking place after school or over the weekends.

For each activity for which a participant reported participation, additional follow-up questions were presented. One of these questions asked about typical frequency of participation in the activity, with the semi-continuous response options of "0 = less than 1 hour per week," "1 = 1-5 hours per week," "2 = 6-10 hours per week," and "3 = more than 10 hours per week." The participants were also prompted to select one of the following four reasons why they usually participate in the activity: "I want to," "I do it for a purpose," "I feel like I have to," and "There is

nothing else to do." According to SDT, these response options correspond to intrinsic motivation, identified motivation, introjected motivation, and amotivation, respectively.

General levels of free time motivation were assessed using a modified version of the Free Time Motivation Scale for Adolescents (Baldwin & Caldwell, 2003). This instrument measures four different types of motivation (intrinsic, identified, introjected, extrinsic), as well as amotivation. Response options for all items were on a five-point Likert scale (0 = "strongly disagree," 4 = "strongly agree"). Scale scores were created by taking the mean of items representing a given free time construct. Descriptive information for these scales appears in Table 2-1.

Quantitative Data Analysis

Activity participation rate. Differences in participation by activity type was assessed using an 8 (activity type) x 2 (participation; yes/no) Chi-square. If the omnibus test achieved significance, each of 28 pairwise Chi-squares were calculated. In order to reduce the chance of Type I error given our numerous comparisons, the significance level for these follow up tests was adjusted using a Bonferroni correction, resulting in a *p*-value of .0018.

Time spent in activities. Differences in mean levels of time spent in each activity were assessed using a one-way ANOVA. If necessary, a significant result was followed-up with a Tukey's HSD post-hoc test.

Overall free-time motivation. Differences in mean levels of each type of free-time motivation were assessed using a one-way ANOVA. If necessary, a significant result was followed-up with a Tukey's HSD post-hoc test.

Motivation by activity type. Differences in motivation by activity type were assessed using an 8 (activity type) x 4 (motivation) Chi-square. If the omnibus test achieved significance, each of 28 pairwise (by activity type) Chi-squares was calculated. As with activity participation, a Bonferroni correction ($p < .0018$) was used.

Results

Aim 1: Description of the Free-Time Context

Table 2-2 presents data from the focus groups, including the types of activities mentioned, the number of groups mentioning each activity type, and the participation levels that youth ascribed to activities within that type. Table 2-3 presents results from survey data on participation rates and frequency of participation for each of the eight activity types measured with that instrument.

In each of the focus groups, participants listed between 9 and 23 free time activities in which youth their age participate (mean number of reported activities = 15). Participants spontaneously mentioned all eight types of activities that were measured in the quantitative survey. They also mentioned several types of activities that were similar to, yet distinct from, the original eight activities. In addition, participants mentioned a number of unique, previously unmeasured free-time activities.

Sports and physical activities. Sports and other physical activities were among the most prominent free-time activities for youth in our focus group sample. They were the only type of activity to be discussed in all 15 focus groups, with an average of three or four specific sports mentioned per group. Participants reported involvement in a broad range of sports and physical activities. Team sports tended to come up most often, and they included baseball, basketball, cricket, hockey (both ice and field), netball (similar to basketball, typically played by girls), rugby, soccer, and volleyball. Soccer was the most frequently mentioned physical activity, being brought up in all 15 groups. Netball and swimming were each mentioned in seven groups, and rugby and cricket were also mentioned on multiple occasions.

Individual sports and physical activities included athletics (similar to track and field), cycling, going to the gym or using weights, golf, ice skating, karate, swimming, tennis and table tennis. These types of activities tended to be discussed in only one or two groups. Spectating was

an activity not assessed in the survey instrument; however, participants in six focus groups mentioned that youth spend time watching sports like cricket, rugby, and soccer at either the school or professional level. Participants from five groups also reported involvement in a number of "extreme" activities, some of which could be considered sports or physical activities. These included skateboarding and car racing.

In general, levels of reported sport participation from the focus groups tended to parallel the number of times that sport was mentioned. Soccer usually had high reported participation level, perceived participation levels for other frequently-mentioned sports were typically moderate, and sports reported in only one or two groups were typically described as having either moderate or low participation. Several aforementioned variations on sports activities were associated with moderate popularity. Members of one focus group said that playing and watching soccer had high participation rates, while participants in another group stated that only a few of their peers watched car races. Extreme sports and activities were associated perceptions of low-to-moderate participation.

In the quantitative data, sports were still fairly popular, although not to the degree that they were according to the qualitative data. About half of youth reported involvement in sports, which is significantly more participants than the arts, volunteerism, or going to parks and recreation centers, but it is significantly less participation than watching TV/ movies or hanging out with friends. The relative amount of time spent in sports as reported in the survey also parallels participation rates. Sports participants reported an average of between 1 and 5 hours a week of involvement. This is somewhat less time that what participants spend with TV/movies or friends, however, it is significantly more time that youth spend with hobbies/creative activities or at parks and recreation centers.

Performing arts. The quantitative survey assesses several performing arts activities (playing a musical instrument, singing, participating in drama and dance groups), all of which

were reported in the focus groups. Participants often discussed general versions of these activities, but more specific activities mentioned included ballroom dance classes and Smack, an interscholastic dancing and singing competition. Participants also reported involvement in less formal versions of these performing arts activities. Some participants reported informal dancing or going to dance clubs. Participants from seven groups also discussed listening to music, which was sometimes done in the context of dancing, spending time with friends, or cellular telephone use.

The data on prominence and popularity of performing arts activities were mixed. Instrumental and vocal music was mentioned in 11 focus groups, placing it among the most frequently-mentioned activities. However, according to both quantitative and qualitative data, participation rates and frequency of participation for musical performance are moderate. Informal dance was mentioned in eight groups, with high perceived participation. Informal dance was more popular that organized drama or dance groups, which were only mentioned in four groups and were associated with low-to-moderate participation. This is consistent with survey data showing that participation in these performing arts groups was the least common of the eight activity types measured in the survey.

Media use. Quantitative assessment of media use was limited to watching television and movies. Indeed, participants from eight of the focus groups reported on television (including soap operas and MTV) or movie-watching as a free-time activity, making it the most frequently mentioned media use activity. However, they also reported use of media that were not widely available either during previous studies (Kaufman, Clark, Manzini, & May, 2002; Møller, 1992) or at the time the HealthWise survey was designed. Participants in six groups discussed MXit, an inexpensive mobile-phone-based test-messaging program. Participants in six groups also mentioned playing electronic games, either on computers or systems like PlayStation. Media use, regardless of type, was almost always described as having high levels of participation.

Media use, in the form of watching television and movies, was the most popular free-time activity according to the quantitative survey data, with 89% of youth reporting participation in the preceding month. Along with hanging out with friends, movies and television took up the most time, with youth spending an average of between 1 and 10 hours watching per week.

Hanging out with friends. Spending time with friends was mentioned as a free-time activity in seven focus groups. There were a variety of verbs that participants used to label this type of activity, including "chilling," "hanging out," "playing," "visiting," "walking around," "spending time," and "sitting." Participants in four groups also mentioned a type of social activity that was not explicitly measured in the survey assessment: spending time with romantic partners.

Hanging out with friends was a fairly popular free-time activity. In the survey, this activity was associated with a 70% participation rate and the highest reported frequency of involvement (between 1 and 10 hours per week) as compared to other activities. Hanging out with friends and romantic partners were both associated with high perceived participation levels in the focus groups as well.

Parks, recreation centers, volunteerism and hobbies. The remaining activities that were assessed in the survey instrument tended to be the least prominent among focus group participants. Four sets of focus group participants mentioned going to parks and to the YMCA. Participants in two groups each mentioned volunteerism, in the forms of cleaning up in their community and working in a peer education program. Participants in one of the groups mentioned painting as a hobby or creative activity; however, none of the other examples given in the corresponding survey item (drawing, woodwork, needlework, beadwork, collecting things) were mentioned. Each of the above activities was associated with low perceived participation in the focus groups. This finding somewhat contradicts the survey data on these activities. Over one-third of survey participants said that they participated in each of these activities. However, these activities were also among those with the lowest time spent in participation.

Risk behaviors. Focus group participants mentioned a number of unique activities that had not been previously measured in the HealthWise study. Chief among these were risk behaviors, the second most frequently reported type of free-time activity in the focus groups. Risk behaviors were mentioned in all but one group, with participants reporting an average of about three specific risk behaviors per group. Substance use (including cigarettes, alcohol, marijuana, and other drugs) was, by far, the most frequently mentioned risk behavior, mentioned in 14 groups and representing 71% of the risk behaviors reported. Substance use levels were either reported as high or moderate. Crime, gang involvement, and fighting were mentioned in four groups, and sex was mentioned in two groups. These last two sets of behaviors were often only mentioned briefly, so participation levels were only reported in two groups (high for fighting, moderate for sex).

In the survey assessment, risk behaviors were not measured with the same types of items with which pro-social free-time activities were measured. However, follow-up analyses of risk behavior involvement showed that 27% of participants had reported using alcohol in the month preceding the survey, 32% had reported using cigarettes, 15% had reported using other drugs (marijuana, inhalants, and/or methamphetamine), and 8% had reported engagement in vaginal intercourse. As compared to data on past-month pro-social activity participation, these data position substance use and sexual intercourse among the least popular activities.

Other activities. In terms of other previously-unmeasured activities, participants in nine groups reported going to "game shops," community establishments where they either play pool themselves or watched others play. This activity was associated with moderate-to-high levels of participation. Shopping, which also included going to the mall and window shopping, was mentioned in six groups. Students in four groups reported involvement in games, such as chess, dominoes, hide and seek, and tag. Other free-time activities included sleeping/napping (mentioned in seven groups), reading (six groups), and participating in Christian Fellowship (one

group). When focus group participants reported participation levels for these activities, they tended to be low-to-moderate.

Finally, a few activities were mentioned with either insufficient frequency or detail (often in response to the unstructured activity follow-up question) to merit the assignment of categories for analysis. These included: eating, going to parties, spending time with family, standing or sitting on street corners, going to theme parks, and playing with dolls.

Aim 2: Types of Free-Time Motivation as Reported in Focus Groups

A list of motivations reported in the focus groups, along with exemplars and associated frequencies, appears in Table 2-4. Consistent with previous theory and research, intrinsic, identified, introjected and extrinsic motivation, as well as amotivation, were all mentioned by focus group participants.

Intrinsic motivation. Intrinsic motivations tended to fall in five different categories: affective experience of intrinsic motivation, relatedness, competence, autonomy, and challenge. Affective experiences of intrinsic motivation included liking (either the activity in general or specific aspects of the activity), enjoyment, and excitement. Affective motivations were mentioned in relation to all activity types, with the exception of time spent with romantic partners. The following example comes from a discussion with 8th-grade boys about soccer:

> INTERVIEWEE: People like it.
> INTERVIEWER: Okay, people like it. What do they like about it? What makes soccer something to like?
> INTERVIEWEE: It's a…it's a nice sport.

Often, the discussion of liking or enjoyment led into a discussion of other types of motivation. In the example below, a group of 10th-grade boys moves from discussing affective experiences in pool to discussing challenge:

> INTERVIEWER: Okay, what else? Something they like or don't like?
> INTERVIEWEE: It is fun to shoot.
> INTERVIEWER: Why is it fun?

INTERVIEWEE: I don't know, it's fun. You concentrate, especially you have to think a lot in that game also. You can't just shoot; you have to think about the next shot.
INTERVIEWER: Okay.
INTERVIEWEE: It isn't always the same because the balls don't lay the same every time.

Indeed, challenge was another type of intrinsic motivation that participants discussed. This included not only the feeling of having one's abilities challenged, but also experiences like competition and persistence. Challenge was discussed in the context of a number of activities, including sports, extreme activities, the performing arts, and games (including video games and playing pool).

Relatedness emerged as another theme related to intrinsic motivation. In general, this involved situations in which youth do an activity as a way of building and maintaining social connections. Within relatedness, we also found evidence for two very specific types of motivation. One of these motivations was meeting new people. This motivation was expressed in relation to numerous activities. However, it was the most frequently reported motivation for involvement with MXit, as exemplified with a group of 10th-grade girls:

INTERVIEWER: Okay, what sorts of conversations are fun?
INTERVIEWEE: You getting to know people.
INTERVIEWER: Getting to know people.
INTERVIEWEE: Meeting new people.
INTERVIEWER: Meeting new people, okay.
INTERVIEWEE: Maybe finding a boyfriend.
INTERVIEWER: Oh.
INTERVIEWEE: Many people find husbands on MXit.

Another specific relatedness motivation that emerged was related to company or companionship. Participants sometimes expressed doing an activity as a way to socialize with or become closer to people who were already in their lives. This was, again, a frequently-reported motivation for using MXit, as well as being a motivation for a number of other activities. It was also the most frequently reported motivation for hanging out with friends and the only reported motivation for spending time with romantic partners:

INTERVIEWER: What do people like about spending time with a boyfriend, a girlfriend?
INTERVIEWEE: They get to socializing with each other.
INTERVIEWER: Okay, socializing, what's fun about that?
INTERVIEWEE: Get to know each other more better. [8th-grade boys]

Another theme within intrinsic motivation was either demonstrating or building competence. Some youth indicated that they do a certain activity in order to learn new skills or information. This was a frequent motivation for watching television, as well as the most frequently mentioned motivation for reading:

INTERVIEWEE: You learn a lot of stuff from reading.
INTERVIEWER: You learn a lot of stuff, what kind of stuff?
INTERVIEWEE: Being what the book is about, and it expand your vocabulary. [8th-grade girls]

Learning was a motivation within other activities as well. Participants discussed acquiring a number of new practical, interpersonal, and self-management skills. These skills included dancing, doing tricks (in activities like ice skating and skateboarding), self-discipline, and teamwork.

As part of competence, participants reported having achievement motivations. That is, activities afforded the opportunity to achieve benchmarks of competence, like scoring points or winning a game. We considered this to be distinct from the experience of extrinsic motivation because it did not involve external rewards for competence, but rather the recognition of competence in a way inherent to the nature or rules of an activity. The following example comes from a group of 10th-grade girls:

INTERVIEWER: Alright, okay, well what do people like about playing netball, and what do they not like about playing netball?
INTERVIEWEE: The winning part.
INTERVIEWER: The winning part. They like that or don't like that?
INTERVIEWEE: They like it.
INTERVIEWER: Okay, what do you like about winning? What's good about that experience of winning, what happens that's good?
INTERVIEWEE: You feel good.

Although infrequently mentioned, another aspect of competence was when participants reported doing an activity to build or enhance self-confidence or self-esteem. One of two instances comes from an 8th-grade boy who was involved in karate: "Some of the people think Karate is boring, it's like nerdy stuff and things. But Karate, it motivates you, it helps you a lot, it even teach you discipline, self-esteem, and it builds up your confidence."

A final, less frequently mentioned aspect of intrinsic motivation was autonomy. These specific motivations related to freedom or independence within an activity. Sometimes, activities also afforded participants the opportunity to express identity, personal qualities, or opinions. We felt that this self-expression was a subtheme under autonomy, given that it reflects recognition of one's own values and desires. This awareness is, in turn, requisite to acting in a way that is consistent with those values (i.e., autonomous action). The following quotation, from a group of 10th-grade boys, expresses several facets of autonomy within dancing, including how levels of autonomy might vary across styles of dance:

> INTERVIEWER: So, what…what specifically about it is fun? How is that fun different from…
> INTERVIEWEE: You can express yourself also.
> INTERVIEWER: Okay, expressing yourself.
> INTERVIEWEE: You can dance like you want; there is not a right way to dance.
> INTERVIEWER: Okay, okay, so it's a chance to be like an individual, there's no right or wrong.
> INTERVIEWEE: It depends also what kind of dancing you do.
> INTERVIEWER: Okay.
> INTERVIEWEE: You see, you get group dancing, like ballroom and stuff like that, and you have to dance right.
> INTERVIEWER: Okay, okay, so there are some dances with more rules, okay.

Identified motivation. As with intrinsic motivation, participants expressed a number of specific motivations under the more general category of identified motivation. Specifically, participants reported that engaging in activities could further six types of goals: health/fitness, escape, career, travel, keeping busy, and avoiding risk behavior.

Health and fitness-related motivations, including maintaining a healthy weight and appearance, were the most commonly-reported identified motivation. Health motivations were

primarily reported in sports and physical activities. In one instance, getting thin was discussed as a motivation for methamphetamine use. Health was also the most frequently reported motivation for engaging in sleep during free time, with participants stating that it helped people look healthy and feel well-rested.

Another commonly-reported set of identified motivations related to escape. Participants often reported doing an activity because it allowed them to escape stress, anxiety, or negative emotion, to cope with negative situations, or to relax. Escape motivations were evident in a number of different activities. They were frequently mentioned in relation to substance use, as well as in the context of sports:

> INTERVIEWER: How do you guys feel about netball? Do you like it? Do you not like it?
> INTERVIEWEE: I like it because it's fun.
> INTERVIEWER: It's fun, okay. What's fun about it?
> INTERVIEWEE: Running.
> INTERVIEWER: What is it, I'm sorry?
> INTERVIEWEE: Running.
> INTERVIEWER: Running. Do you like running? What about running do you like? What do you like, the way it feels?
> INTERVIEWEE: When you run you get out and you have stress in your house or something and you just can run and you don't feel.
> INTERVIEWEE: You feel, like, you feel alone on the road and so.
> INTERVIEWER: Okay, so it's a chance to feel alone.
> INTERVIEWEE: Relief.
> INTERVIEWER: It's a relief. Relief from what?
> INTERVIEWEE: From stress.
> INTERVIEWER: Okay, what kind of stress?
> INTERVIEWEE: Like, I'll make an example now.
> INTERVIEWER: That's okay, examples are good.
> INTERVIEWEE: Your parents and you have a fight and then you just start running … and you get out of the house.
> INTERVIEWER: Okay, so netball is a good way to get out of the house and get a relief from stress, would you guys say that is true?
> INTERVIEWEE: Yes, Miss. [8th-grade girls]

Participants sometimes discussed how their free-time activities could further career goals. This typically involved becoming a professional in the sport or art form (singing, musical instrument, painting) with which they were currently involved. Participants in one group of 10th-

grade boys also discussed how some students volunteered as peer counselors because "they want to be like [U.S. television talk show hosts] Doctor Phil and Ricki Lake."

Opportunities for travel were another identified motivation that was discussed in the context of performance activities (sports and music). One 8th-grade boy discussed the traveling done by an elite female swimmer at his school:

> There, there is competition in swimming because if you win, you go out to far places like the girl in our class. She won in backstroke, she won one race and she got a trip to, um, Jo'burg or Durban, somewhere there. And so she came third in Durban because of practicing here by this Lentegeur, um, swimming pool here.

Participants also discussed how their free-time activities could serve as diversions. A number of activities, including sports, pool, games, and reading were seen as ways to either avoid boredom or stay occupied:

> INTERVIEWER: Any other reasons why people like to swim? Anything about the experience of swimming that they like?
> INTERVIEWEE: Some just for the fun.
> INTERVIEWER: For the fun. What specifically about swimming is fun?
> INTERVIEWEE: That you wanna get out or something.
> INTERVIEWER: That you wanna get out of something. So, like what kind of things?
> INTERVIEWEE: If something is boring in your house and you go to a club or something then you join it or something. [8th-grade boys]

Activities were also sometimes seen as an alternative to engaging in risk behaviors, like fighting, gangsterism, substance use, and loitering. This was typically in the context of sports and physical activities, but a group of 8th-grade boys also discussed risk behaviors as they related to video games:

> INTERVIEWEE: What is in the road play with your friends and so and keeps you away from all the wrong stuff and keep inside doing that game and complete that stage or so.
> INTERVIEWER: Okay, so is everybody saying the fact that it's more challenging than playing in the street and that it keeps you off the street?
> INTERVIEWEE: Yes, M'am. I also play every day because all…all of the boys my age smoke dagga and drugs.

Introjected motivation. Participants discussed a number of introjected motivations for activity participation. The most frequent among these was the achievement of social status. This included getting attention, looking cool, impressing others, and being popular. This motivation was mentioned across a number of different activity types. One 10th-grade girl discussed social status as it related to dancing: "I think most people, like, love dancing. For instance, we at a party and the latest dance or the most recent dance, if you dance the latest dance, almost everyone is going to look at you, the attention." In relation to sports, participants sometimes discussed aspirations to become a legend, like Michael Jordan or David Beckham. Social status was also a frequent motivation for engaging in risk behavior:

> INTERVIEWER: How do people feel about smoking?
> INTERVIEWEE: They enjoy it.
> INTERVIEWER: Why do they enjoy it?
> INTERVIEWEE: Because they think if they can stand with a cigarette they…they big.
> INTERVIEWEE: Yeah, they, its like, they wanna be cool.
> INTERVIEWER: They wanna be cool with whom?
> INTERVIEWEE: They just wanna show everybody that they can do it.
> INTERVIEWER: That they can do it, that they're able.
> INTERVIEWEE: Or try to impress their friends. [10th-grade boys]

In a related vein, some participants mentioned being motivated by social conformity. This motive was only discussed in relation to risk behaviors. Two groups discussed smoking to be in the "in" or "cool" crowd. Another group discussed how teen pregnancy was fashionable.

In the context of sports and musical performance, participants sometimes discussed social recognition in the form of attention from fans, spectators, and audiences. In discussing motivation for playing soccer, one 8th-grade girl said: "If a boy score then everybody in the audience go wild if he scored." An 8th-grade boy discussed the possibility of being seen by fans locally and nationwide:

> Um, the people…the reason why people hum they like rugby is there's…there's like more fun. And there is lot of people and there's like…if you start now here by a local team like here in Mitchell's Plain, you will come far because there is mostly trials for rugby and you can see on the TV and like here by Newlands stadium there's always a rugby match on a Saturday…

Direct pressure from peers was only mentioned as a motivation participation in risk behaviors. A group of 10th-grade girls discussed social pressures to be sexually active:

> INTERVIEWEE(1): …you score with the girl because nowadays if you tell someone you a virgin, they will laugh you out
> INTERVIEWEE (2): You a loser.

Girls in the same group also discussed having sex in order to please one's partner, while a group of 10th boys discussed fighting so as not to be labeled a "moffie" (gay).

There was one type of introjected motivation that we did not anticipate, given previous literature. Across a number of different types of competition-centered activities (sports, extreme activities, music, dance, pool, fighting) participants discussed using activities as a way to subordinate other participants. This included defeating or showing superiority to others. Boys in one 8th-grade group discussed subordination in the context of a risk behavior:

> INTERVIEWER: Do people like anything about fighting? Why do people do it?
> INTERVIEWEE: It's to show that they the strongest
> INTERVIEWER: Show that they the strongest.
> INTERVIEWEE: They wanna impress girls.
> INTERVIEWER: Impress girls, okay.
> INTERVIEWEE: Just to show them who's boss.
> INTERVIEWER: Show who who's boss?
> INTERVIEWEE: Show your opponent who's boss.

Extrinsic motivation. Participants occasionally mentioned experiences of extrinsic motivation in their free-time activities. In the context of sports and extreme activities, participants discussed the possibility of receiving trophies, medals, and sponsorship. Prizes and money were also discussed in relation to dancing, being in a band, and playing pool. Unanticipated extrinsic motivations including using sports injuries to get out of school and receiving free food while volunteering.

Amotivation. Participants rarely mentioned amotivation. When it was mentioned, it was in the form of "just doing" an activity or doing an activity because there was "nothing better to do." Amotivation was not specific to any one activity type, being mentioned one time each in the

context of singing, risk behavior, video games, and sleeping. Interestingly, amotivation did not come up in the context of activities for which it was most common in the quantitative assessment: hanging out with friends, watching television and movies, or going to parks and recreation centers (see Aim 4).

Other motivations. There was one type of reason for participation that was not easily classified according to SDT. As part of the discussion on each activity, the facilitator asked participants if girls or boys were more likely to participate. If participants stated that youth of one gender were more likely to participate in a given activity, the facilitator asked them why. In the subsequent discussion, gender typically emerged as a motivation. In some cases, participants ascribed certain strengths, abilities, or preferences to one gender, which in turn made their participation more likely:

> INTERVIEWER: Okay, why are boys skateboarding more than girls?
> INTERVIEWEE: I think they into more extreme sports.
> INTERVIEWER: They're into more extreme sports.
> INTERVIEWEE: They not scared to fall and get hurt. [10th-grade boys]

In other cases, participation by one gender seemed to be promoted by broader cultural conceptions about the gendering of the activity itself:

> INTERVIEWER: Okay, why are girls more likely to play netball?
> INTERVIEWEE: Because it's a girly sport.
> INTERVIEWER: It's a girly sport. What makes it a girly sport? How do you know it's a girly sport?
> INTERVIEWEE: Because you have to run, jump and…
> INTERVIEWEE: You wear skirts
> INTERVIEWER: You wear skirts, okay. So what makes that not a boys' sport? What makes that a girls' sport?
> INTERVIEWEE: Because it's something different to basketball, and basketball is a…it's a…mostly a boys' sport.
> INTERVIEWER: Okay, so it's different from boys' sports. [8th-grade girls]

A more complete discussion of gender, activity participation, and motivation appears in Gleeson and colleagues (2008).

Aim 3: Frequencies of General Free Time Motivations

Means for each type of free time motivation reported in the survey data appear in Table 2-1. Overall, the means were significantly different: $F(4, 4663) = 357$, $p < .001$. Post hoc tests revealed that levels of intrinsic motivation were highest, levels of introjected motivation, extrinsic motivation, and amotivation were lowest, and levels of identified motivation fell in between.

An examination of the focus group data was generally consistent with those from the survey data. Intrinsic motivation was the most commonly reported motivation type across activities, with 100 mentions. Identified motivation was the second most common type, with 62 mentions. The frequencies for the remaining motivational types were 33 mentions of introjected motivation, 10 mentions of extrinsic motivation, and 4 mentions of amotivation.

Aim 4: Motivation by Activity Type

Table 2-5 shows the number of times focus group participants mentioned each general motivation type in relation to each activity type. There are a few findings of note. Intrinsic motivation was the most (or among the most) commonly endorsed motivation type for nearly every activity type. The only exceptions were listening to music and sleeping, for which there were several more mentions of identified motivation. There were several activity types that were especially high in intrinsic motivation (two-thirds or more of total motivations discussed): spending time with romantic partners, spectating, hanging out with friends, drama/dance groups, watching TV/movies, and playing pool. Risk behavior was the only frequently-mentioned activity type for which introjected motivation was as common as intrinsic motivation.

As with the focus group data, intrinsic motivation was the most commonly endorsed type of motivation across all activity types in the survey data (see Table 2-6). However, the omnibus Chi-squared was significant, indicating overall differences in motivation across activity type ($\chi^2(21) = 381$, $p < .001$). Post-hoc Chi-squareds were used to explore the differences between each of 28 pairs of activity types. For example, we compared volunteerism and sports to

determine whether they differed in the percentage of youth reporting intrinsic, identified, and introjected, and amotivated reasons for participation. (This comparison was not significant, indicating similar motivation frequencies in these two types of activities; see Table 5.) The pairwise tests revealed that the patterns of motivation for hanging out with friends and watching TV/movies were distinct from those for the other activity types. Both of these activities had comparatively high frequencies for intrinsic motivation. They also had the highest frequencies of reported amotivation out of any of the activity types, while the frequencies of both identified and introjected motivation were the lowest out of all activity types. Spending time at parks and recreation centers had a motivation pattern that was similar to hanging out with friends and watching TV/movies, although the frequencies of identified motivation, introjected motivation, and amotivation were not as extreme. The remaining activity types tended to have similar profiles of motivation: comparatively high frequencies of identified and introjected motivation coupled with comparatively low frequencies of amotivation. This pattern was especially pronounced for volunteer work and sports.

Discussion

The overall purpose of this study was to come to a better understanding of the free-time context for a group of South African youth. The first specific aim was to describe what adolescents in our population of interest do in their free time. In the focus groups, participants mentioned all of the types of activities that were measured in our quantitative survey instrument: hanging out with friends, sports, performing arts, creative activities, parks and recreation centers, watching TV and movies, and volunteer work. However, a number of additional activity types were mentioned, including risk behavior, media use, sleeping, shopping, playing games, reading, and religious activities.

Several of these broad activity types subsumed a number of more specific activities. The best example of this is sports and physical activities, which encompassed 19 distinct pastimes.

Participants also discussed spectating and adventure/extreme activities, which could be interpreted as relating to sports or physical activities. Media use included MXit, listening to music, and playing video and computer games. Risk behavior included substance use, fighting, crime and sexual behavior. There were several other activity types, like hobbies/creative activities and volunteer work, which had potential for including a number of diverse pastimes. However, these activity types were infrequently mentioned and, as such, were associated with only a few specific activities. For example, painting was the only creative activity mentioned in the focus groups.

We sought to further describe the free time context by determining which activities were most popular or prominent in the participants' lives. Consistent with previous research (Kaufman, Clark, Manzini, & May, 2002; Møller, 1992), socializing and media use were fairly popular according to both quantitative and qualitative data. Data on the popularity of sports/physical activities and substance use were mixed. In the focus groups, sports were the most frequently mentioned activity type, and they were often associated with high or moderate participation rates. However, only about half of survey participants reported involvement in sports and physical activities. It is possible that sports are a highly salient activity in this population, regardless of actual participation rates. This is supported by the mention of spectating sports as a free-time activity, and well as discussions of social recognition as a motivation for sports participation. The discrepancies in the survey and focus group data may also be a product of the differences in the questions posed in each instrument. The focus group facilitator asked participants about activity involvement in general, however, the survey elicited responses about involvement in the four weeks preceding the assessment. A number of focus group participants discussed the seasonal nature of sports. Therefore, it is possible that a student might participate regularly in a sport without having done so in the past month.

Similarly, risk behavior in general and substance use specifically were frequently-reported activities in the focus groups. This contradicts quantitative evidence showing that substance use and sexual behavior have low past-month participation, as compared to the pro-social activities that were mentioned. One potential explanation for this finding is that youth may have inflated perceptions of how many peers are engaging in risk behavior. This is consistent with a forthcoming research report of substance use norms in this population (Palen et al., 2008, May).

Contrary to previous research (Kaufman, Clark, Manzini, & May, 2002; Møller, 1992), religious activities were not a popular activity among focus group participants. It is possible that this finding is a valid reflection of the prominence of religious activities (or lack thereof) in this population's lives. Alternatively, this finding may be an artifact of how the activity question was posed. The focus group facilitator asked about activities that take place in "free time," outside of school and chores. However, data from both focus groups and interviews with school educators indicate that a number of student religious organizations meet during school hours, which may have led to them not being reported in the focus groups. Also, it is possible that participants view attendance at non-school religious activities to be obligatory rather than freely-determined, although we are unaware of any empirical studies that examine this possibility. In short, religious involvement may be a use of time that was unable to be captured using the methods here.

Several activities that were unmeasured in our survey were popular or prominent among focus group participants. These included informal dance and going to game shops. Among the least popular activities were hobbies/creative activities, volunteer work, going to parks or recreation centers, sleeping, reading, shopping, and playing games. It is unclear, from the data included in the present study, whether this lack of involvement stems from a lack of opportunity or a lack of interest. However, this issue is explored in greater depth in a study of constraints to

activity participation among youth in this sample (Palen, Patrick, Gleeson, Caldwell, & Smith, 2008).

Our second aim was to undertake an exploratory analysis of qualitative activity motivation data. Intrinsic motivation was reported in relation to all discussed activity types, and it included affective experience of intrinsic motivation, relatedness, competence, autonomy, and challenge. However, there were several types of intrinsic motivation that we were surprised to not find. Given some evidence of collectivist values among Africans (Eaton & Louw, 2000), we expected that relating to one's broader culture would be a motivation for participation in certain free-time activities. This was not the case. One potential explanation is that culture is not a motivator for free time use among youth in our population. However, we would argue that it is also possible that, given its pervasive influence on thought and behavior, culture is a legitimate motivator of which adolescents are not conscious. Also, cultural norms, values and traditions no doubt play a role in the presence and strength of other types of motivations evidenced in this study.

Theorists from the United States (e.g., Havighurst, 1972) position the achievement of independence from parents as a crucial developmental task of adolescence. Therefore, we expected that this might be expressed as a motivation for participation in certain free-time activities. While freedom and independence were discussed more generally, separation from parents was not. There is some suggestion in the literature that while the achievement of autonomy might be a universal task of adolescence, it can be achieved in different ways across cultures. Specifically, an individual might become autonomous while still maintaining physical and emotional proximity to others, including parents (Chirkov, Ryan, Kim, & Kaplan, 2003; Greenfield, Keller, Fuligni, & Maynard, 2003) Unfortunately, there is a scarcity of South African research on changes in family relationships in adolescence and how these might relate to developmental outcomes. Therefore, we are unable to determine whether or not it is problematic

for activities to not provide opportunities for achieving independence from parents among our population. This represents an opportunity for future research.

Identified motivations included the goals of health/fitness, escape, career, travel, keeping busy, and avoiding risk behavior. These motivations were discussed in relation to almost all types of activities. They are also consistent with the identified motivations reported in previous research (e.g., Allison et al., 2005; Conway & Rubin, 1991; Omoto & Snyder, 1995; Pedersen, 2002; Reddon, Pope, Friel, & Sinha, 1996). We are encouraged by the fact that a number of these goals relate to positive developmental experiences, like dealing with stress, experiencing new places, and becoming economically self-sufficient. However, we also caution that goals are context-dependent and may not be unilaterally positive for adolescents. It may be that certain goals can promote involvement in risky free-time activities, as when participants discussed substance use as a way of coping with problems and as a way to lose weight. Alternately, certain goals and activities may hinder successful development when they interact. For example, activity-based career goals typically focused on professions in which few individuals succeed, such as professional athlete, professional musician, and television talk show host. To the degree that youth focus on unlikely careers and foreclose exploration of more realistic options, they may not be fully prepared when it is time to enter the working world.

Introjected motivations were often discussed in relation to performance activities (sports, performing arts) or risk behavior. These motivations took a number of different and expected forms, including achieving social status and experiencing pressure from peers. Participants also discussed using activities as a means of subordinating others; to our knowledge, this specific motivation has not been previously documented.

One introjected motivation that was not mentioned was pressure from parents. It is possible that the questions asked in the focus groups (i.e., “What do you like about participating in soccer?”) were not conducive to eliciting discussion about parental pressure for activity

participation. Alternatively, as with African American families in the U.S. (Lareau, 2002), parents in South Africa may have values that limit the degree to which they structure children's activity participation. Unfortunately, there is currently a lack of research on how parents influence adolescent free time use in South Africa; this is an area that should be the focus of future studies.

On the infrequent occasions when extrinsic motivation was mentioned, it often took forms that have been previously documented, including trophies, medals, prizes, and money. Participants also discussed less typical extrinsic motivations, including free food and getting out of school. Amotivation was rarely reported in the focus groups.

Our third aim was to examine relative levels of different types of motivation in free time in general. On the whole, these findings were consistent with our hypotheses and consistent across both the survey and focus group data. Intrinsic motivation was the most frequently-reported motivation type in the focus groups, as well as the type with the highest level of agreement in the survey data.

Identified motivation had the next-highest scores in both types of data. In the focus groups, frequency of reported motivations continued to be stepped: introjected motivation, followed by extrinsic motivation, and then amotivation being least frequent motivation type. However, in the survey data, levels of these final three motivation types were statistically equivalent. This discrepancy may suggest that there is a difference between the presence of a motivation (as assessed in the focus groups) and strength of a motivation (as assessed in the survey), although this would require formal empirical testing.

Our fourth aim was to examine differences in motivation patterns across various activity types. As expected, intrinsic motivation was the most frequently endorsed motivation type for all but two activity types (listening to music and sleeping in the focus groups) across both forms of data. This included sports, an activity type for which previous studies have yielded mixed results on the primacy of intrinsic motivation (Allison et al., 2005; Pedersen, 2002; Tsorbatzoudis,

Alexandris, Zahariadis, & Grouios, 2006). This finding is encouraging, suggesting that adolescents can experience intrinsic motivation in a number of different activity contexts.

Certain activities in the focus groups were associated with an especially high proportion of reported intrinsic motivation, including spending time with friends and romantic partners, spectating, drama and dance groups, pool, and watching TV and movies. However, there appears to be no common theme that unites these activity types and distinguishes them from the types that are not as heavily intrinsically motivated (e.g., structured vs. self-directed, social vs. solitary, artistic vs. not, competitive vs. not). In addition, survey data may be a more precise basis for comparative statements about motivation frequencies, and in these data the proportion of reported intrinsic motivation was fairly similar (37-48%) across activity types. Therefore, we believe our findings about intrinsic motivation tell an overall story of similarities rather than differences.

As mentioned previously, risk behavior was characterized by many of the same motivations as more pro-social activities. However, risk behavior was also characterized by a comparatively high number of mentions of introjected motivation. It was also the only activity type for which peer pressure and conformity were discussed. These results are consistent with previous theory and research on social influences on substance use and other risk behaviors (e.g., Ajzen, 1991; Akers, 1977; Palen et al., 2008, May; Patrick et al., 2008). Risk behavior has a number of barriers that may be uniquely prominent in this activity type, like risks of legal consequences, punishment from parents, and health consequences. Perhaps social pressures are important in moving youth past these particular barriers to participation. However, one previous study showed that peer conformity is greater for pro-social activities than delinquent activities (Berndt, 1979), which contradicts our results. More research directly comparing introjected motivation across pro-social activities and risk behavior will be required to determine whether risk behavior truly has a unique pattern of motivation.

Hanging out with friends and watching TV/movies were unique in being associated with high levels of amotivation in the survey data. It is possible that these activities are less likely to foster conditions or opportunities (e.g., feedback and challenge) that are conducive to the maintenance of more intrinsic forms of motivation (Ryan & Deci, 2000). Alternatively, both of these activities may serve as "default activities," or ways to use time when participants are not otherwise engaged. This notion is supported, for television at least, by evidence of "passing time" as a motivation for watching (Conway & Rubin, 1991).

However, in the survey data, amotivation was not reported in the context of friends or television/movies. One possible explanation is that the survey's activity motivation items necessarily offered a limited range of responses: "I want to," "I do it for a purpose," "I feel like I have to," and "There is nothing else to do." Having nothing else to do might have been a reasonable "default option" for youth whose specific motivation was not listed as a possible response. In contrast, the focus group format was conducive to eliciting a broad range of motivations, both because of its open-ended nature and because the facilitator probed for follow-up to responses like "I don't know" or "just because" that could be construed as amotivation. This may have served to reduce reported amotivation within this assessment format.

In general, the other activity types overlapped in their associated patterns of motivation. There are at least two potential explanations for this finding. One is that adolescents have similar motivations for initiating participation in activities in general, and the selection of specific activities is driven by factors other than those motivations. So, for example, many adolescents may want to experience enjoyment in their activities, but the selection into painting versus skateboarding versus smoking may be driven by something like ability or opportunity. Alternatively, if one takes the position that participation can change existing motivation (a position supported in the literature; see Mullan & Markland, 1997; Pearce & Larson, 2006), then it may be the case that experiences within many activities are similar enough to foster similar

patterns of motivation. This similarity across activity experiences may be universal. That is, many activities may offer opportunities for enjoyment, competence, or autonomy to all participants. Another explanation for similarity in experiences may have to do with individual selection into activities that offer a good fit with personal characteristics. For example, one student may develop competence motivations in soccer because she is naturally athletic, while another student might develop competence motivations in painting because she is naturally artistic. If these students had chosen to participate in non-athletic or non-artistic activities, they might not have developed competence motivations. Testing each of these explanations for similarities in motivation across activity type will be best accomplished through intensive longitudinal studies, an issue which will be discussed below as a direction for future research.

In sum, the current study served to describe the free-time context for one group of South African youth. Youth are involved with a broad range of activities, however, socializing, media use, sports, risk behavior, dance, and going to game shops are most prominent. Free-time is most strongly characterized by intrinsic motivation, which includes experiences of competence, relatedness, and positive affect. Activities are also often seen as a way to achieve goals related to health, well-being, and personal achievement. In general, multiple motivations were identified for the same activities, and specific motivations were reported across multiple activity types.

Limitations and Directions for Future Research

The participants in this study are youth from two school grades in four schools in one under-resourced area of Cape Town, South Africa. It is possible that the results presented here do not generalize to youth in other areas of South Africa or the world, or to children or adults who are outside of the age range studied. In addition, youth in this study were participating in a program designed to impact their leisure attitudes and behaviors. It is possible that this program had an impact on reported prevalence of participation or motivation, or on the association between free-time variables. That being said, researchers who are interested in describing free

time and motivation in different populations could, at the very least, use this study to inform research questions, hypotheses, and measurement for use in future empirical work.

Also, the focus group study only included participants who were proficient in spoken English, despite the fact that some students in Mitchell's Plain also speak Afrikaans or Xhosa. We felt that the benefits of including non-English speakers were outweighed by the time and expense that would have been required to train Afrikaans- and Xhosa-speaking focus group facilitators and to translate written transcripts into English. Also, a multi-lingual research design would have introduced facilitator effects that would be necessarily confounded with language effects. However, we do acknowledge that the use of only English-proficient students potentially limits the generalizability of our findings.

Another limitation of the current study is that the data are cross-sectional. As discussed previously, it is unclear whether existing motivation leads to the selection of particular activities, whether participation in a given activity fosters particular kinds of motivations, or some combination of the two. For example, does a youth start participating in soccer because he or she wants to experience competence and achievement, or do these motivations emerge as a result of playing soccer? Questions of timing in motivation and activity participation would be best addressed through intensive longitudinal study that incorporates multiple and frequent assessments of these constructs. In addition, experiments targeted at modifying only participation or only motivation would go beyond questions of timing by directly testing causal links between the two constructs.

As mentioned in the Introduction, there is a need for more research linking motivational experiences to both positive and negative outcomes, especially longitudinally. This information is essential in determining whether and which types of free-time motivation are viable mediators for programs designed to prevent problems or promote well-being among youth. The qualitative portion of this study lays the groundwork for further investigation by providing a list of specific

motivations that are valid across activities within this population. Future studies might measure the presence or strength of each of these motivations and relate them to health and behavioral outcomes of interest.

Finally, motivations for participation are only one factor influencing activity participation. In the current study, the focus group facilitator asked participants about both their likes and dislikes within activities. In many cases, participants volunteered their dislikes prior to their likes. These dislikes often reflected barriers to participation. Therefore, in a future paper (Palen, Patrick, Gleeson, Caldwell, & Smith, 2008), we will discuss the barriers and limitations that, like motivations, serve to shape the free-time landscape in South Africa.

Table 2-1: Descriptive information for free-time motivation scales

Scale	Number of items	Sample item	Mean (*SD*)	α
Intrinsic motivation	2	I do what I do in my free time because I want to.	2.86 (.94)[a]	.69
Identified motivation	6	I do what I do in my free time because I develop skills that I can use later in life.	2.60 (.80)[b]	.80
Introjected motivation	3	I do what I do in my free time because I want people to like me.	1.61 (0.97)[c]	.73
Extrinsic motivation	3	I do what I do in my free time because my parents expect me to.	1.65 (1.07)[c]	.81
Amotivation	3	I don't know why I do my free time activities, nothing much interests me.	1.69 (1.03)[c]	.81

Note. Means are significantly different, $F(4, 4663) = 357$, $p < .001$. Means with differing superscripts are significantly different from each other at $p < .05$.

Table 2-2: Focus group activity mentions by type, with associated participation rates

Activity type	Number of groups in which motivation was mentioned	Total mentions of type across groups	Perceived participation level (%)		
			High	Med	Low
Sports and physical activities*	15	55	41	39	20
Soccer†	15	15	75	25	0
Netball	7	7	25	50	25
Swimming	7	7	57	43	0
Rugby	5	5	0	50	50
Cricket	3	3	0	100	0
Risk behavior	14	38	42	58	0
Substance use	14	27	40	60	0
Playing musical instrument or singing*	11	12	11	67	22
Pool/game shop	9	10	43	57	0
Other activities	8	14	100	0	0

Watching TV or movies*	8	10	100	0	0
Clubbing/informal dancing	8	9	100	0	0
Hanging out with friends*	7	9	100	0	0
Listening to music	7	7	100	0	0
Sleeping	7	7	33	33	33
Spectating (sports, pool, car races)	6	9	50	0	50
Video games/computers	6	8	80	0	20
Shopping/going to mall	6	7	100	0	0
MXit	6	6	100	0	0
Reading	6	6	0	40	60
Adventure/extreme	5	5	0	67	33
Drama or dance group*	4	6	0	33	66
Spending time with romantic partners	4	6	100	0	0
Games	4	4	50	0	50
Going to a park or community/sports center*	4	4	0	0	100
Volunteer work*	2	2	0	0	100
Hobbies or creative activities*	1	1	0	0	100

Religious/spiritual	1	1	-	-	-

Note. * Activity types that were also measured in survey assessment. † Only the five most frequently mentioned sports are tabled. All other sports were only mentioned in one or two groups.

Table 2-3: Participation in free-time activities as reported in quantitative assessment

Activity	% participating in preceding 4 weeks $N = 946$[i]	Frequency of participation among participants (mean; SD)[ii]
Watching TV or movies	89[a]	1.42 (1.03)[x]
Hanging out with friends	70[b]	1.45 (1.02)[x]
Sports and physical activities	53[c]	1.00 (.87)[y]
Playing musical instrument or singing	43[d]	.94 (1.00)[y,z]
Hobbies or creative activities	42[d]	.80 (.87)[z]
Volunteer work	41[d]	.81 (0.94)[y,z]
Going to a park or community/sports center	37[d]	.77 (.86)[z]
Drama or dance group	24[e]	.98 (.87)[y,z]

Note. [i]Participation rates are significantly different, $\chi^2(7) = 1125$, $p < .001$. Participation rates with differing superscripts are significantly different from each other at $p < .0017$. Between 0 and 3 participants were missing responses for each of these items. [ii]Variable is scaled as follows: 0 = "less than 1 hour per week," 1 = "1-5 hours per week," 2 = "6-10 hours per week," 3 = "more than 10 hours per week." Means of participation frequency are significantly different, $F(7, 3743) = 45.3$, $p < .001$. Participation frequencies with differing superscripts are significantly different from each other at $p < .05$.

Table 2-4: Motivation in free-time activities as reported in focus groups

Motivation type	Exemplar(s)	Number of mentions across groups
Intrinsic motivation		100[a]
Affective experience of intrinsic motivation	"They like the excitement of playing cricket."	75
	"I just like driving cars."	
Relatedness (general)	"Just play soccer to see the other people."	6
Meeting new people	"You meet new friends also when you play soccer."	13
Company/ companionship	"Maybe you could get together with your friends."	15
	"Everyone, like, enjoy each other's company."	
Competence (general)	"Or sometimes it's just a talent you have and you not trying to prove anything."	8
Learn new skills/knowledge	"You could learn new thing…like new dance moves."	25
	"Also you learn about teamwork."	
Achievement	"People like, like score your goals."	11
	"Some people like to win the games."	

Confidence	"It builds your confidence."	2
	"It makes you feel also important."	
Autonomy (general)	"It's just like feeling free. They can do like whatever they want to."	3
Self-expression	"You can actually express yourself, you give your opinion."	5
Challenge	"Like they challenge each other who is the best in the game."	19
	"It also motivates you to come back, go practice and come back and do the thing."	
Indentified motivation		62[a]
Health/fitness	"Me, the thing that I like about soccer, it...increases your...health."	18
	"It will keep you fit."	
Escaping	"It clears your mind of everything."	17
	"I heard rumors that it actually like releases you from stress and pressure."	
Related to future profession	"You can make a career of it."	10
	"Singing can take you far…like you can do it maybe as a profession or something."	
Travel opportunities	"If you win they, you win a trip to go swim with other children like in Durbin and Johannesburg."	4

Keep busy/avoid boredom	"If something is boring in your house and you go to a club or something then you join it."	8
Aids in avoidance of risk behavior	"It keeps you away from all the bad habits like drugs, smoking and because that's big risk to you."	5
Introjected motivation		33[a]
Achieving social status	"You could become a star." "They like to show off."	20
Conformity	"It's the in thing…everybody's doing it." "They smoke just to be like fitting in with their friends."	3
Fans	"And the thing you like of cricket is when if you bat...you have fans that's looking at you and people shouting at you."	5
Peer pressure	"Nowadays if you tell someone you a virgin, they will laugh at you."	3
Subordinate others	"Just to show them who's boss." "They like beating men."	8
Extrinsic motivation	"And sometimes if you win something you get something out of soccer like a trophy or something that you win."	10
Amotivation	"They don't have anything better to do."	4

	"They just do it sometimes."	
Inherent to gender	"[Boys are] not scared because [they are] stronger than girls."	34
	"It's because [girls are] more mature."	

Note. [a]Sum of mentions across all subcategories for this motivation type.

Table 2-5: Motivation by activity type as reported in focus groups

Activity type	Number of mentions by motivation type				
	Intrinsic	Identified	Introjected	Extrinsic	Amotivation
Sports and physical activities	36	28	13	5	0
Risk behavior	7	6	7	0	1
Playing musical instrument or singing	8	4	3	1	1
Pool/game shop	6	1	1	1	0
Watching TV or movies	5	1	1	0	0
Clubbing/informal dancing	3	3	2	1	0
Hanging out with friends	4	1	0	0	0
Listening to music	1	2	1	0	0
Sleeping	1	3	0	0	1
Spectating	2	0	0	0	0
Video games/computers	5	2	0	0	1
Shopping/going to mall	2	2	1	0	0
MXit	3	1	1	0	0
Reading	5	4	0	0	0

Adventure/extreme	3	0	2	1	0
Drama or dance group	3	0	1	0	0
Spending time with romantic partners	2	0	0	0	0
Games	1	1	0	0	0
Going to a park or community/sports center	1	1	0	0	0
Volunteer work	1	1	0	1	0
Hobbies or creative activities	1	1	0	0	0

Note. No motivations for religious activities were discussed.

Table 2-6: Motivation in free-time activities as reported in survey assessment

Activity	*N*	% of activity participants reporting motivation			
		I want to	I do it for a purpose	I feel like I have to	There is nothing else to do
Hanging out with friends[a]	659	48	8	10	35
Watching TV or movies[a]	840	43	8	11	39
Going to a park or community/sports center[b]	345	43	18	14	25
Hobbies or creative activities[b,c]	392	44	19	18	19
Playing musical instrument or singing[b,d]	405	43	25	15	17
Drama or dance group[b,d]	226	41	28	15	16
Volunteer work[c,d]	383	38	26	22	14
Sports and physical activities[d]	502	37	28	22	13

Note. Frequencies are significantly different, $\chi^2(21) = 381$, $p < .001$. Activities with differing superscripts are significantly different from each other at $p < .0017$.

Chapter 3

Longitudinal Patterns of Cigarette Use Among Youth in Cape Town, South Africa

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Abstract

This study sought to describe longitudinal patterns of regular cigarette use among a sample of 2,425 youth from a low-income township in Cape Town, South Africa. It also examined whether smoking pattern was related to gender, participation in a comprehensive prevention program, and several indicators of engagement in free-time activities. There was support for the presence of four patterns of regular cigarette use: non-smokers, initiators, consistent smokers, and quitters. As compared to control group students, female intervention participants were more likely to be non-smokers and male invention participations were more likely to be quitters. Experiences of extrinsic motivation, amotivation, and boredom were related to heightened odds of being a regular smoker, and being a quitter in particular. Implications for intervention and directions for future research are discussed.

Longitudinal Patterns of Cigarette Use
Among Youth in Cape Town, South Africa

Smoking is more common in South Africa than in most other countries in Southern Africa (Flisher et al., 2001; Global Youth Tobacco Survey Collaborative Group, 2002, , 2003; Steyn, Bradshaw, Norman, Laubscher, & Saloojee, 2002; Townsend, Flisher, Gilreath, & King, 2006). National mortality data have linked cigarette use with heightened risk for a number of diseases of the respiratory, circulatory, and digestive systems, including lung cancer, tuberculosis, and ischaemic heart disease (Sitas et al., 2004). In 2003, these diseases were the documented causes of approximately 40% of South African deaths (Statistics South Africa, 2005).

Among U.S. adults, smoking has been shown to be highly addictive and cessation difficult (e.g., S. S. Smith & Fiore, 1999). While nicotine dependence is somewhat less prevalent among youth, it is still a condition that affects approximately half of adolescent smokers in the United States, South Africa, and elsewhere (Colby, Tiffany, Shiffman, & Niaura, 2000; DiFranza et al., 2002; Panday, Reddy, Ruiter, Bergström, & de Vries, 2007). Particularly troubling is that symptoms of dependence often emerge in youth who smoke at low frequencies (DiFranza et al., 2002; Panday, Reddy, Ruiter, Bergström, & de Vries, 2007). Because the addictive nature of nicotine makes cessation challenging, a more feasible goal is to prevent tobacco use before its onset. However, the timing of prevention efforts requires knowledge of when smoking is typically initiated. In addition, not all youth smoke, so it may be more cost-effective to deliver intervention targeted at only those youth who are at the highest risk for smoking initiation. If one wants to use this type of strategy, it requires knowledge of the characteristics and needs of youth who are at risk for smoking.

While longitudinal patterns of cigarette use have been well-studied with U.S. samples, little is known about smoking over time in South African populations. It is plausible that South Africans in general, as well as members of specific demographic, ethnic and geographic

subgroups within South Africa, have different values, beliefs and behaviors as compared to individuals in the U.S. and elsewhere. Nichter (2003) suggests that there are many ways in which these cultural elements can influence smoking. At the societal level, culture can influence smoking via the role of tobacco in the economy, the political influence of tobacco companies, and cultural views of what is attractive or stylish. More proximal aspects of cultural influence include differences in parenting style and influence, and differences in peer norms and rules for acceptable behavior. These cultural factors might influence the onset and prevalence of substance use, as well as the associations between substance use and various potential risk and protective factors. Therefore, if one hopes to implement effective tobacco-prevention programs in South Africa, it is crucial to base them on epidemiological data from that nation (or cultural subgroups of interest within that nation) specifically.

The purpose of the study that follows is three-fold. First, we will describe longitudinal patterns of regular smoking among a group of South African adolescents. This will include an examination of potential gender differences in the prevalence or composition of smoking patterns. Second, we will determine whether an existing prevention program has an impact on the prevalence or composition of smoking patterns. Finally, we will examine one particular type of risk/protective factor for smoking: free-time experiences. Specifically, we will examine whether intrinsic motivation, extrinsic motivation, amotivation, and boredom during free time are individually or cumulatively predictive of smoking patterns. We will also examine whether these associations vary across gender or treatment status.

Smoking among South African Adolescents

Most research on adolescent smoking in the South African context has been cross-sectional. In South Africa, about 40% of teenagers have smoked cigarettes in their lifetime, with more than half of this group made up of current smokers (Global Youth Tobacco Survey Collaborative Group, 2003; Reddy et al., 2003). These figures differ somewhat by gender.

Several large-scale studies showed that boys were more likely to have initiated cigarette use, to have initiated it prior to age 10, and to be current smokers (Global Youth Tobacco Survey Collaborative Group, 2003; Reddy et al., 2003). Alternatively, data from the Cape Town area showed that boys and girls had similar incidence of smoking (Flisher et al., 2001). The authors of the latter study suggest possible area-specific explanations, including minimal disparity in disposable income by gender and a decrease in the influence of gender roles on substance use (Flisher et al., 2001).

Beyond gender, there are other demographic characteristics that are related to smoking prevalence. A review of South African youth tobacco use (Townsend, Flisher, Gilreath, & King, 2006) found evidence of racial, age, and residence differences in smoking. Colored youth (derived from Asian, European, and African ancestry), older youth, and urban youth were the most likely to smoke.

Smoking can have a direct impact on health and well-being, but previous research with this population also suggests that cigarette use may be related to adolescent outcomes through its association with the initiation of marijuana and inhalant use (Patrick et al., in press). In addition, cigarette smoking has been associated with numerous risky non-substance-related outcomes for South African youth including school absence, grade retention, sexual activity, carrying weapons to school, and suicide attempts (Flisher, Parry, Evans, Muller, & Lombard, 2003; Flisher, Ziervogel, Chalton, Leger, & Robertson, 1996; Taylor, Dlamini, Kagoro, Jinabhai, & de Vries, 2003).

Longitudinal Patterns of Smoking in Adolescence

Whereas cross-sectional data may provide information on prevalence of smoking and characteristics of smokers at one particular point in time, they are less helpful for elucidating timing of initiation and how this relates to risk factors and outcomes. The bulk of longitudinal research on smoking in adolescence and young adulthood has been conducted with samples from

the United States. These studies have typically yielded between three and six distinct patterns of use over time (Abroms, Simons-Morton, Haynie, & Chen, 2005; Chassin, Presson, Pitts, & Sherman, 2000; Colder et al., 2001; Fergus, Zimmerman, & Caldwell, 2005; Juon, Ensminger, & Sydnor, 2002; Maggi, Hertzman, & Vaillancourt, 2007; Orlando, Tucker, Ellickson, & Klein, 2004; Soldz & Cui, 2002; White, Pandina, & Chen, 2002). These trajectories are fairly similar across studies, despite the fact that the variables with which they are constructed often differ. The simplest smoking variable used in defining trajectories is a dichotomous indicator of lifetime use (e.g., Maggi, Hertzman, & Vaillancourt, 2007). Other studies examine frequency of use (Maggi, Hertzman, & Vaillancourt, 2007), amount of use during a designated time period (Colder et al., 2001; Fergus, Zimmerman, & Caldwell, 2005; Soldz & Cui, 2002), or some combination of the two (Chassin, Presson, Pitts, & Sherman, 2000; Orlando, Tucker, Ellickson, & Klein, 2004; White, Pandina, & Chen, 2002).

The most common longitudinal smoking pattern appears to be abstinence, with as many as 75% of participants reporting being non-smokers or light smokers across time. Previous research has also consistently identified a group who initiates or accelerates their smoking in mid-adolescence and tends to smoke over subsequent assessments; these youth have represented up to half of participants across various studies. Most studies have identified a group of adolescents who initiate smoking early (either prior to the beginning of a study or shortly thereafter) and remain smokers, representing up to a quarter of youth. Finally, most studies have evidence of a small group of youth who either smoke erratically over the course of the study or begin as smokers and later quit.

There is some evidence that longitudinal patterns of smoking differ by demographic characteristics. At least two studies have found that girls began smoking earlier and smoked at higher rates compared to boys (Abroms, Simons-Morton, Haynie, & Chen, 2005; White, Pandina, & Chen, 2002). However, other studies have found that trajectory membership is similar for boys

and girls (Fergus, Zimmerman, & Caldwell, 2005; Juon, Ensminger, & Sydnor, 2002; Orlando, Tucker, Ellickson, & Klein, 2004). One study found that consistent smokers and quitters tended to be older that non-smokers or those who accelerated in their smoking behavior (Fergus, Zimmerman, & Caldwell, 2005). There is mixed evidence for the association between cigarette use and socioeconomic status, with some studies finding no association (Fergus, Zimmerman, & Caldwell, 2005; Juon, Ensminger, & Sydnor, 2002; White, Pandina, & Chen, 2002) but at least one study finding that youth whose parents had more education were more likely to be non-smokers or have a late-onset smoking trajectory than to have patterns of early use (Orlando, Tucker, Ellickson, & Klein, 2004).

We have conducted one study of longitudinal smoking patterns, among South African girls only (Palen, Smith, Caldwell, & Flisher, 2008). There was evidence for three longitudinal patterns over the course of 8th, 9th, and 10th grades: non-smokers (65% of participants), consistent smokers (17%), and those who initiated smoking in the 9th grade (18%). Girls who had experienced school failure or absence, spent more time with friends, had social norms of more smoking, and had used alcohol or marijuana at baseline were most likely to be consistent smokers and least likely to be non-smokers. It remains to be seen whether these findings also hold in boys from this population.

Smoking and Intervention: HealthWise South Africa

Typically, evaluations of substance use interventions examine changes in group-level prevalence of use. However, taking a person-centered approach to evaluating program effects can allow us to make more nuanced statements about how and for whom an intervention has effects. In terms of longitudinal smoking patters, does a program change participants' likelihood of exhibiting various patterns? Are they more likely to be abstainers? More likely to be quitters? Both? Or, does a program change the types of

patterns that are exhibited? For example, do program participants have a pattern of onset that is delayed as compared to controls? We are proposing to ask these types of evaluative research questions as part of an ongoing intervention with a group of South African youth.

Until recently, there was a lack of research on programs designed to prevent substance use among South African adolescents. In an attempt to address this problem, a U.S. program was adapted for use with South African youth. *TimeWise: Taking Charge of Leisure Time* (Caldwell, Baldwin, Walls, & Smith, 2004) is a school-based intervention that aims to increase participants' involvement in positive free-time activities by increasing awareness of various leisure opportunities and their benefits/drawbacks, enhancing self-awareness, and developing leisure-related decision-making skills. Early findings revealed that program participants did become more involved in leisure and develop their leisure-related skills and awareness (Caldwell, Baldwin, Walls, & Smith, 2004). TimeWise participation was also associated with a reduction in the use of some substances (Caldwell, Smith, Ridenour, & Maldonado-Molina, 2005).

The original TimeWise curriculum, plus added components on substance use, sexuality, and general life skills, was adapted to be culturally appropriate (Wegner, Flisher, Caldwell, Vergnani, & Smith, in press) and delivered as *HealthWise: Life Skills for Young Adults* (Caldwell et al., 2004). HealthWise consists of 12 lessons presented to 8th-graders and 6 lessons presented to 9th-graders. Each lesson takes approximately three class periods to deliver. This curriculum, combined with an effort to connect youth with community resources, aims to increase healthy free time use, reduce substance use, delay onset of sexual activity, and increase condom use among sexually active youth. While the

curriculum does not directly address smoking behavior, we anticipated that the positive health messages conveyed in the curriculum would seek to reduce and prevent cigarette use.

There are several previous studies that have examined the impact of HealthWise on smoking behavior. A two-year evaluation of intervention effects on substance use (E. A. Smith et al., 2007) found that rates of lifetime, past month, and past month regular cigarette use increased over time in the full sample and in all subgroups under investigation (HealthWise, control, boys, girls, baseline non-smokers). However, HealthWise students increased less than did control group students. In our previously-mentioned study of regular smoking in girls (Palen, Smith, Caldwell, & Flisher, 2008), HealthWise participants were most likely to be non-smokers and least likely to initiate smoking. However, we have yet to apply this person-centered evaluation strategy to boys.

Smoking and Free-Time Activities

There are a number of reasons why adolescents' free-time activities might serve as risk or protective factors for smoking. The Displacement Hypothesis (Mutz, Roberts, & van Vuuren, 1993) suggests that participation in pro-social activities may leave less time for engagement in health risk behaviors, including smoking. Experiences within activities may also meet needs, like having fun, coping with negative emotions, and achieving adult status, that render substance use less necessary (e.g., Aguilar & Munson, 1992; Iso-Ahola, 1980). Consistent with theories of social control (e.g., Elliott, Huizinga, & Menard, 1989; Hirschi, 1969), activities may strengthen protective social bonds with parents, other adults, and pro-social peers. Alternatively, it is possible that free-time activities can promote smoking through connections with high-risk peers (e.g., Mahoney, Stattin, & Lord, 2004). Activities might also promote certain negative emotions

and states, such as anxiety or boredom, that create a perceived need to use substances (e.g., Dworkin & Larson, 2006-2007; Hunter & Csikszentmihalyi, 2003; Kloep & Hendry, 2007).

Longitudinal investigations of free-time activities and smoking have been limited to examining participation (either yes/no or frequency) in specific types of activities. Fergus and colleagues (2005) found that involvement in several types of free time activities at baseline (9^{th} grade) was unrelated to subsequent smoking trajectory. However, youth who were more involved in sports at the end of the study (12^{th} grade) were more likely to have been non- or light smokers and less likely to have been quitters. Those who were more involved in non-sport extracurriculars in the 12^{th} grade were most likely to have been non-smokers and least likely to have been consistent smokers across high school. Soldz and Cui (2002) found that there was no longitudinal association between amount of time spent watching television and pattern of smoking behavior. One study found that church attendance was related to smoking trajectory (Juon, Ensminger, & Sydnor, 2002), with non-smokers being the most likely to attend services weekly; other studies have failed to find an association (Fergus, Zimmerman, & Caldwell, 2005; Soldz & Cui, 2002). In our previous study with South African girls (Palen, Smith, Caldwell, & Flisher, 2008), longitudinal smoking patterns were unrelated to participation in a number of free-time activities at baseline (sports, performing arts, hobbies, volunteering).

Knowing that an adolescent participates in a certain type of activity, such as sports or a church youth group, tells us little about his or her actual experiences. Within a given activity type, there may be considerable variation in the specific activities (and related experiences) available. For example, involvement in a team sport might provide different social experiences than participation in an individual sport. Even within the same specific activity, individuals might have different experiences. Therefore, rather than examining broad activity types, it may be more useful to examine specific experiences within the activity. One important activity-based experience to consider is intrinsic motivation.

Initiative is the capacity to act autonomously. Larson (2000) argues that the capacity for autonomous action is crucial to adult success in modern Western society where, rather than having a limited number of choices in domains such as career and family, one's life course is extremely flexible. Therefore, it appears to be important for individuals to develop initiative prior to entering adulthood.

Larson (2000) asserts that one component of initiative is intrinsic motivation, or being interested and invested in doing an activity for its own sake. There is evidence that free-time activities are an especially important context for the development and maintenance of intrinsic motivation in adolescence (Kleiber, Larson, & Csikszentmihalyi, 1986; Larson, 2000). Standing in contrast to intrinsic motivation are extrinsic motivation, amotivation, and boredom. Extrinsic motivation exists when behavior is motivated completely by outside forces, typically in the form of a potential reward or punishment. Amotivation is "the state of lacking the intention to act" (Ryan & Deci, 2000, p. 72), leading to either inaction or acting without purpose. Finally, there is evidence that youth who lack intrinsic motivation during their free time are more likely to experience boredom (Weissinger, Caldwell, & Bandalos, 1992).

There has been scant research linking free-time motivation to adolescent outcomes. There is some empirical evidence from the U.S. that links intrinsic motivation in free-time to positive outcomes, including responsibility, self-esteem, and subjective well-being (Coatsworth, Palen, Sharp, & Ferrer-Wreder, 2006; Reddon, Pope, Friel, & Sinha, 1996). Research on potential outcomes of boredom is somewhat broader, and there have been demonstrated positive associations between boredom and the use of substances, including cigarettes (McIntosh, MacDonald, & McKeganey, 2005; E. A. Smith & Caldwell, 1989).

As mentioned above, conceptions about the role of initiative in successful development are primarily based on Western thought. It is unclear whether hypothesized and empirically demonstrated associations between related free-time experiences and substance use should hold

in nations like South Africa. The results of existing research have been mixed. Caldwell and colleagues (2006) found that intrinsic motivation, extrinsic motivation, and amotivation in free-time were all unrelated to alcohol use cross-sectionally. However, using the same sample, Palen and colleagues (Palen, Caldwell, & Smith, 2007, June) found links between *patterns* of free-time motivation and substance use. Youth with high intrinsic motivation and low extrinsic motivation and amotivation were least likely to use a variety of substances (including cigarettes), while youth with comparatively low levels of intrinsic motivation and moderate levels of extrinsic motivation and amotivation were most likely to use substances.

As for boredom, one recent investigation of Cape Town youth (Wegner, Flisher, Muller, & Lombard, 2006) found no significant association between leisure boredom and substance use, however, other studies have found an association. In a qualitative study of male adolescent binge drinkers, participants reported drinking alcohol because they were bored and did not have alternative activities available (Ziervogel, Ahmed, Flisher, & Robertson, 1997). Another study found that about one-third of youth reported using illicit drugs or smoking cigarettes because they were bored (Madu & Matla, 2003). A qualitative study of the population currently under investigation also found associations between boredom and substance use (Patrick et al., 2008).

The above studies suggest that intrinsic motivation, as well as related constructs, in free time may have implications for the use of cigarettes and other substances. However, there is a lack of longitudinal research that pairs these two domains. Answering longitudinal questions about free-time experiences and smoking may clarify the processes linking the two constructs, as well as provide a more nuanced picture of youth who are most at risk for smoking-related health outcomes. This knowledge may, in turn, provide more concrete recommendations for those interested in using free-time experiences as a mode of smoking prevention.

In addition, little is known about the cumulative effects of free-time experiences on substance use. Developmental scientists (e.g., Rutter, 1979) have found evidence for the

cumulative effects of stressors on mental health outcomes. That is, the more risk factors an individual has, the more likely he or she will be to develop poor outcomes. Therefore, we would expect that an individual who is bored, extrinsically motivated, amotivated, and not intrinsically motivated in his or her free time would be more likely to use substances than an individual with only a subset of these experiences. There is less evidence in the literature for the cumulative benefits of protective factors (see Griffin, Scheier, Botvin, & Diaz, 2000), however, one might hypothesize that an individual who is intrinsically motivated and not bored, extrinsically motivated or amotivated might be especially *unlikely* to use substances. This possibility has yet to be examined empirically.

The Current Study

The current study aimed to describe longitudinal patterns of regular cigarette use among South African boys and girls. First, we examined how many and which patterns of smoking were evident in the data. We anticipated finding the three patterns of smoking (non-smoker, consistent smoker, initiator) found in our previous six-wave study of girls from the sample (Palen, Smith, Caldwell, & Flisher, 2008). However, it was possible that additional patterns would emerge with the inclusion of boys and an additional wave of data. For the patterns that did emerge, we examined whether they were similar for boys and girls and tested for gender differences in the prevalence of each pattern. Previous research with U.S. samples led us to hypothesize that girls and boys would either be similar (Fergus, Zimmerman, & Caldwell, 2005; Juon, Ensminger, & Sydnor, 2002; Orlando, Tucker, Ellickson, & Klein, 2004) or that girls would be more likely to display early-onset patterns of smoking (Abroms, Simons-Morton, Haynie, & Chen, 2005; White, Pandina, & Chen, 2002).

Next, we evaluated whether there were treatment group differences in the composition and prevalence of various smoking patterns. Given previous studies (Palen, Smith, Caldwell, &

Flisher, 2008; E. A. Smith et al., 2007), we anticipated that HealthWise participants would be more likely to display patterns characterized by non-smoking at one or more assessments.

We then related smoking patterns to specific free time experiences. In particular, we focused on experiences related to initiative: intrinsic motivation, extrinsic motivation, amotivation, and boredom. This moved beyond previous research by relating longitudinal smoking to free-time experiences, rather than to involvement in specific types of activities. We hypothesized that youth who were intrinsically motivated would be most likely to exhibit a non-smoking profile and least likely to exhibit a consistent smoking profile. We believed those who experienced extrinsic motivation, amotivation, and boredom would be most likely to be consistent smokers and least likely to be non-smokers. We also examined whether there were gender or treatment group differences in the associations between smoking and these free-time experiences, although this aim was exploratory and we did not hypothesize group differences.

Finally, we examined whether having a risky or non-risky *constellation* of free-time experiences has an association with smoking that went above and beyond the association with individual free-time experiences. We anticipated that engaged, low-risk youth (intrinsically motivated, not extrinsically motivated, amotivated, or bored) would be especially likely to be non-smokers.

Method

Sample

Participants were from Mitchell's Plain, a low-income township near Cape Town that was established during the apartheid era. Data were drawn from the randomized control trial of HealthWise South Africa. Four high schools implemented the HealthWise program, and five other high schools served as controls. Descriptive statistics for baseline characteristics appear in Table 3-1.

Procedure

Beginning in 8th grade, participants completed biannual assessments of their substance use, free-time involvement, and other behaviors. Questionnaires were administered via personal digital assistants (PDAs) during school hours. Over the course of three academic years, 2,425 high school students completed up to seven assessments. However, school absence and drop-out is fairly high among the target population, so the mean number of completed assessments for each participant was four.

Measures

Regular cigarette use. At each assessment, participants were asked how many cigarettes they had smoked in their lifetime. Participants who indicated that they had used more than one cigarette were presented with a follow-up question asking whether they had smoked cigarettes in the four weeks preceding the current assessment. Participants who responded in the affirmative answered an item about the number of cigarettes that they had smoked in the preceding four weeks, with response options consisting of 1 or less, 2-9, or 10 or more cigarettes. For the purposes of the present study, participants who had used 10 or more cigarettes in the past month were coded as regular cigarette users at that assessment. Participants who had never used cigarettes or had used less than 10 cigarettes in the past month were coded as not being regular cigarette users at the assessment.

Motivation and boredom in free-time activities. Intrinsic motivation, extrinsic motivation, and amotivation were assessed using the Free Time Motivation Scale for Adolescents (Baldwin & Caldwell, 2003). Boredom was assessed using a scale developed for the TimeWise research trial (Caldwell, Baldwin, Walls, & Smith, 2004). Response options for all items were on a five-point Likert scale (0 = “strongly disagree,” 4 = “strongly agree”). Scale scores were created by taking the mean of items representing a given free time construct. Preliminary analyses indicated that

participants generally do not change substantially in these qualitative aspects of free time.[8] This is consistent with our previous findings regarding the stability of intrinsic motivation and amotivation (Caldwell, Patrick, Smith, Palen, & Wegner, 2007, June). Therefore, for each free-time experience, we chose to average participants' scores across all available time points. Descriptive information about each free-time experience scale appears in Table 3-2.

We also constructed an overall indicator of the qualitative aspect of participants' free-time engagement. The purpose of doing this was to categorize a participant as either engaged or relatively unengaged. Therefore, for each of the four free-time variables described above, participants were coded as either having or not having that type of motivation (or boredom). Participants who scored above the "neither agree nor disagree" level of a given scale (score of more than 2) were coded as having that motivation or being bored; those who scored below this point were coded as not having the motivation or not being bored. Participants who experienced intrinsic motivation and did not experience extrinsic motivation, amotivation, or boredom were coded as "engaged." All other participants were considered "less (or un-) engaged."[9]

Analytic strategy

[8] Means of these constructs were plotted over time, and a visual inspection showed that any trends were roughly linear. Therefore, growth curve models were constructed in which linear time was used to predict motivation or boredom score. The changes in intrinsic motivation and amotivation scores (i.e., slopes) were not statistically significant (parameter estimates of .004 and -.007, respectively). The boredom slope was statistically significant (-.01, $p < .05$), however, we would argue that a change of this magnitude is of little practical significance. The extrinsic motivation slope was also statistically significant (-.09, $p < .001$), yielding a scale score change of .63 over the course of seven assessments. We acknowledge that a change of this magnitude has the potential to be practically meaningful. However, we still chose to operationalize extrinsic motivation as a person-mean in order to (1) be consistent in operationalization across all free-time covariates and (2) include participants regardless of the number of assessments completed, thereby minimizing missing data on the covariate. We acknowledge that future studies might operationalize extrinsic motivation differently, potentially in ways that allow for tests of whether changes in this construct are related to changes in substance use.

[9] We originally planned to test the effects of a third level of engagement, "unengaged," in which participants were extrinsically motivated, amotivated, bored, and not intrinsically motivated. However, this represented only 1% of participants. Therefore, we limited our multivariate classification to only "highly engaged" and "less engaged."

Baseline model. Latent class analysis was used to determine the number and types of longitudinal smoking patterns in the total sample. Input data were the dichotomous indicators of regular cigarette use at each of seven time points.

Latent class analysis (Lanza, Flaherty, & Collins, 2002) uses manifest variables to classify individuals according to underlying, unobservable constructs. Latent class models are composed of two sets of parameters. Measurement parameters show the probability of a given response to a particular item, conditional on latent class. Any deviations from a probability of 0 or 1 reflect measurement error from sources that include model misspecification and missing data. In the current study, the measurement parameters reflected the probability that a participant will indicate that he or she smokes regularly at a particular time point, given his or her broader longitudinal pattern of smoking. Group membership parameters reflect the probability of a participant being classified in each of the latent classes. In the current study, these parameters reflected the proportion of youth who exhibit each longitudinal pattern of smoking.

Overall model fit was assessed using the G^2 statistic.[10] Lower G^2 values represent a better fit than higher values, and a G^2 close to a model's degrees of freedom indicates acceptable model fit. Comparative fit between two models with the same number of classes is assessed using χ^2 difference tests (Collins, Fidler, Wugalter, & Long, 1993; Lanza et al., 2002). Comparisons between models with differing numbers of classes were made using the Akaike information criterion (AIC) and Bayesian information criteria (BIC), two statistics that reflect fit with a penalty for the number of estimated parameters (Lanza, Flaherty, & Collins, 2002).

We began by fitting a two class (i.e., two longitudinal patterns of smoking) model, and then continued to estimate models with one additional class until one or more of the following conditions were met: (1) classes with redundant interpretations emerged, (2) multiple sets of

[10] Under certain conditions, G^2 approximates a χ^2 distribution. However, given that latent class modeling often involves large contingency tables, some of the cells of these tables can be sparsely populated. In this situation, the G^2 and χ^2 distributions can be different.

starting values yielded multiple solutions, none of which was dominant, or (3) both the BIC and AIC began increasing. This resulted in a pool of potential solutions (with different numbers of smoking profiles), from which one solution was selected based on its interpretability and fit.

SAS PROC LCA (Lanza, Lemmon, Schafer, & Collins, 2007) was used to fit all models in the current study. Given that PROC LCA uses the EM algorithm to arrive at maximum likelihood (ML) parameter estimates, missing data on the smoking indicators can be accounted for in the models (Lanza, Lemmon, Schafer, & Collins, 2007). However, there is evidence that ML and EM can yield multiple solutions (e.g., Boomsma, 1985; Rubin & Thayer, 1982). Therefore, each model was estimated using 100 different sets of random starting values.

Assessing gender differences. Given our aim of testing gender effects on smoking, we re-estimated our baseline model using gender as a grouping variable.[11] In one version of the model, measurement parameters (in this instance, probability of smoking at a given wave for youth with a given smoking pattern) were constrained to be equal for boys and girls. In another version of the model, measurement parameters were freely-estimated. If the G^2 for the freely-estimated model was not significantly lower than the G^2 for the constrained model, this would indicate measurement invariance. In other words, this would indicate that the same patterns of smoking are evident for both boys and girls and, therefore, both genders can be combined in subsequent hypothesis-testing models. If, instead, the G^2 for the freely-estimated model was significantly lower than the G^2 for the constrained model, this would mean that boys and girls are different in the types of longitudinal smoking patterns that they display and must be analyzed separately in subsequent hypothesis testing.

If measurement invariance holds, gender differences in the prevalence of each smoking pattern can be directly evaluated by estimating an additional model in which the probability of

[11] Only participants who reported gender and reported it consistently across all available assessments were included in the multiple-groups gender analyses; forty-two participants were excluded.

exhibiting a given smoking pattern is constrained to be equal across gender. If the G^2 for this model is not significantly higher than the G^2 for the unconstrained model, this indicates that boys and girls are similar in their prevalence of different longitudinal smoking patterns. Alternatively, a significant difference in the G^2 would indicate a significant difference in the prevalence of one or more patterns across gender.

Assessing treatment group differences and interactions. We tested for HealthWise effects on smoking behavior by re-estimating our baseline model using treatment condition as a grouping variable.[12] We tested for both measurement invariance and differences in prevalence of smoking behavior patterns in the same manner as described above for gender. Similar tests for treatment-by-gender interactions were then conducted using a series of four-group models (HealthWise boys and girls, control group boys and girls).

Effects of free-time motivation and boredom. Next, we examined the univariate effects of intrinsic motivation, extrinsic motivation, amotivation, and boredom on the different smoking patterns by including them as covariates in a latent class model of all participants. This yielded odds ratios that expressed, for all participants, the change in odds of exhibiting a given pattern of smoking for each unit increase in the free-time experience scale of interest. We also tested any significant covariates in models that grouped participants by gender and by treatment status, to determine whether the nature of associations between free-time engagement and smoking varied. This determination was made through an informal comparison of the direction and magnitude of resultant odds ratios. Given that the current version of PROC LCA (version 1.1.5) does not compute standard errors for covariates, it is not possible to conduct formal statistical tests of group differences in the effects of covariates using this software (Lanza, Lemmon, Schafer, & Collins, 2007).

[12] Only participants who reported treatment group in at least one of the first four assessments (i.e., time during which the intervention was being delivered) and reported it consistently across those assessments were included in the multiple-groups treatment analyses; sixty-four participants were excluded.

We also sought to determine whether having an especially non-risky profile of free-time experiences was related to smoking patterns, above and beyond the relations between smoking and any one free-time experience. To achieve this, we estimated a final model that included multiple covariates. Intrinsic motivation, extrinsic motivation, amotivation, and boredom were all included, as was the categorical indicator of overall free-time engagement. If this final indicator is significant when included as a covariate in the multivariate model, this would indicate that overall profiles of engagement have unique additional associations with smoking behavior.

Results

Baseline Model

We estimated models with two through five classes. Both the two- and the three-class models replicated across the 100 sets of starting values, with the three-class solution offering a better model fit according to all indices (see Table 3-3). The three-class solution consisted of participants who never smoked regularly, participants who smoked regularly at all assessments, and participants who began smoking regularly at the end of 9th grade.

Beginning with the four-class model, the 100 sets of start values yielded multiple solutions. The four-class model had 3 different solutions: G^2 = 119 (69% of starts), G^2 = 133 (37% of starts), and G^2 = 143 (4% of starts). All three solutions yielded a lower AIC (181, 195, and 205, respectively) and higher BIC (360, 374, and 384, respectively) than the three-class model. All of the solutions yielded the three classes (non-smokers, consistent smokers, initiators) found in the three class solution. Depending on the starting values, the fourth class was either a group who started as somewhat regular smokers but stopped smoking over time, a group who started smoking regularly at the end of 10th grade, or a group who started smoking regularly at the end of 8th grade.

The 5-class model yielded five different solutions: G^2 = 79.35 (55% of starts), G^2 = 79.43 (27% of starts), G^2 = 89 (10% of starts), G^2 = 98 (5% of starts), and G^2 = 119 (3% of starts). The

two best-fit and most frequent solutions were nearly identical in fit and in interpretation. They each yielded the three classes of smokers from the three-class solution. They also yielded the additional classes found in the two best-fit four-class solutions: youth who stopped smoking regularly and youth who began regular smoking in the 10th grade. Given that the best-fitting five-class models yielded essentially redundant solutions, we selected the best-fitting four-class model for subsequent analysis. Again, this model consisted of non-smokers (60% of sample), consistent regular smokers (16%), those who initiated regular smoking in 9th grade (21%), and those who quit their regular smoking between the 9th and 10th grades (4%; see Table 3-4).

Assessing Gender Differences

Our next step was to determine whether the baseline model parameters differed by gender (see Tables 3-5 and 3-6). We first conducted analyses that tested whether the smoking measurement parameters differed. A model in which measurement parameters were allowed to vary across gender ($G^2(193) = 161$) did not fit significantly better than a model in which the measurement parameters were constrained to be equal ($G^2(221) = 196$, $G^2diff(28) = 35$, *ns*). This indicated that the same types of smoking profiles were evident in both boys and girls. Next, we estimated a model in which the probabilities of having a given profile of smoking behavior were constrained to be equal across gender. This model ($G^2(224) = 198$) offered a comparable fit to the model in which membership probabilities were freely estimated ($G^2diff(3) = 2$, *ns*). This indicated that boys and girls have comparable rates of being non-smokers, consistent smokers, quitters, and initiators.

Assessing Treatment Group Differences

Our next step was to evaluate potential treatment group differences in smoking behavior (see Tables 3-5 and 3-6). A model in which measurement parameters were allowed to vary across treatment condition ($G^2(193) = 182$) did not fit significantly better than a model in which the measurement parameters were constrained to be equal ($G^2(221) = 217$, $G^2diff(28) = 35$, *ns*). This

indicated that the same patterns of longitudinal smoking behavior were evident among both HealthWise and control group participants; the intervention did not "create" new smoking patterns. We then estimated a model in which the probabilities of having a given profile of smoking behavior were constrained to be equal across treatment condition. This model ($G^2(224) = 229$) fit significantly worse than the model in which membership probabilities were freely estimated ($G^2diff(3) = 12$, $p < .01$). This indicated that there were overall treatment group differences in the frequencies of patterns of smoking behavior. Specifically, as compared to control group students, HealthWise participants were more likely to be non-smokers and quitters and less likely to be initiators (Table 3-6).

Assessing Gender-by-Treatment Interactions

Our next step was to test for possible treatment-by-gender interactions. This involved comparisons between a series of four-group models (control boys and girls, HealthWise boys and girls), which are detailed in Table 3-7. As with the separate models for gender and treatment condition, measurement was invariant across the four groups; the same four smoking profiles were present in each (Model A vs. Model B). We then examined differences in the likelihood of exhibiting a given profile by treatment/gender group. As previously demonstrated, the four treatment/gender groups were different overall (Model C vs. Model B), and in particular, there were treatment group differences in profile membership (Model D vs. Model B). HealthWise boys and girls were significantly different from each other in their probabilities of profile membership (Model E vs. Model B), indicating a treatment by gender interaction. Control boys and control girls were similar in their probabilities of profile membership (Model F vs. Model B). Several additional comparisons were made to determine whether HealthWise boys (Model G vs. Model F) or HealthWise girls (Model H vs. Model F) were similar to the control group in their probabilities of profile membership. (This would indicate that HealthWise only impacted smoking behavior for students of one gender.) However, both of these models fit significantly

worse than previous models, indicating that HealthWise students of both genders had smoking behavior that was different from control group students. Therefore, our chosen model was one in which, for the probabilities of exhibiting a given smoking pattern, HealthWise boys and girls were different from each other and different from control group students. The profile membership parameters for this model appear in Table 3-6.

An inspection of the profile membership parameters (i.e., probabilities of exhibiting each smoking pattern) reveals the nature of the treatment-by-gender effect on smoking. As compared to control students and HealthWise boys, HealthWise girls have an especially high probability of being non-smokers. In contrast, HealthWise boys have an especially high probability of being quitters. We performed a formal statistical test of this observation using two sets of model comparisons. First, we estimated a model in which the probabilities of being a consisting smoker and an initiator were constrained to be equal across gender within the HealthWise group. This model did not fit significantly worse than a model in which all membership parameters were freely-estimated (Model I vs. Model B), indicating that essentially the same proportions of HealthWise girls and boys were consistent smokers and initiators. We then estimated a model in which HealthWise boys and girls were constrained to have equal probabilities of being non-smokers and quitters. This model had a significantly worse fit than the freely-estimated model (Model J vs. Model B), lending formal support to our initial observation about the treatment-by-gender interaction: HealthWise has its overall positive effects on smoking by promoting smoking cessation among boys and preventing the initiation of smoking among girls.

Tests for Effects of Free-Time Motivation and Boredom on Smoking

In order to assess overall associations between free-time motivation/boredom and smoking behavior, each covariate was first tested within a model that included all study participants. Univariate analyses (Table 3-8) revealed that scores on extrinsic motivation,

amotivation, and boredom[13] all had significant independent associations with smoking behavior. (Intrinsic motivation score was unrelated to smoking behavior.) The direction and magnitude of these associations were similar across covariates. Youth who scored lowest on free-time extrinsic motivation, amotivation, and boredom were most likely to be non-smokers. As scores on each of these three scales increased, so did a student's odds of being classified into one of the other three profiles of smoking. Youth with high scores on free-time extrinsic motivation, amotivation, or boredom were slightly more likely to be classified as initiators, even more likely to be classified as consistent smokers, and especially likely to be classified as quitters.

We included each of the significant covariates from above in two additional sets of models that grouped by gender and by treatment status. The odds ratios for each of the groups appear in Table 3-8. These results show that the interpretation of free-time effects is the same for each subgroup: odds ratios are all positive, with lower odds for being an initiator and higher odds of being a quitter. However, in almost all instances, the odds ratios for boys and control group students were equal to or higher than those for girls and HealthWise participants. As mentioned previously, we were unable to determine whether these differences were statistically significant. However, these results may indicate that free-time motivation and boredom are more closely related to smoking behavior among boys. It also suggests that the relationship between free time and smoking may be weaker for HealthWise participants.

Finally, we tested a model in which all four previously examined covariates (intrinsic motivation, extrinsic motivation, amotivation, boredom) and a free-time engagement composite were included as simultaneous covariates. The results of this analysis appear in Table 3-9.[14] The

[13] The univariate test for boredom may violate the marginal homogeneity assumption. Latent class models that include covariates make the assumption of marginal homogeneity; that is, that the measurement model (i.e., smoking probabilities) is the same at every level of the covariate. If the measurements model changes when a covariate is added, there is evidence to suggest that this assumption is violated. There is currently no accepted strategy for dealing with this type of violation. Therefore, when there is a violation of marginal homogeneity, results for covariate(s) should be interpreted with caution.

[14] The multivariate test may violate the marginal homogeneity assumption.

engagement composite did not achieve statistical significance, indicating that it did not have an association with smoking patterns above and beyond the individual associations with the scales from which it was derived.

Given the non-significance of the multivariate analysis, we followed-up with several additional analyses. First, we confirmed that the free-time engagement composite did have a significant univariate association with smoking pattern, in the direction and with group differences that are consistent with those from the other significant covariates (see Table 3-8).[15] Next, we re-estimated the multivariate model using more extreme cut-offs for the engagement composite;[16] neither revised version of the composite achieved statistical significance. Also, since intrinsic motivation was not a significant univariate predictor of smoking, we estimated an additional model that included free-time extrinsic motivation, amotivation, boredom, and "disengagement" (indicator of whether participant was above neutral point on extrinsic motivation, amotivation, boredom; 14% of sample) as covariates. Again, the (dis)engagement composite did not achieve statistical significance.

Discussion

In this study, we found evidence for four longitudinal patterns of regular smoking: non-smokers, initiators, consistent smokers, and quitters. These are the same types of patterns that have been evidenced across longitudinal smoking studies in the United States. These patterns also appeared with frequencies comparable to U.S. studies, with non-smokers being most common and quitters being least common. These results suggest that we may be justified in applying other previous research findings about smoking in this new context.

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[15] The univariate test for the engagement composite may violate the marginal homogeneity assumption.
[16] Engagement2 = intrinsic motivation > = 2.5 and extrinsic motivation, amotivation, and boredom < 1.5 (17% of sample); Engagement3 = intrinsic motivation > = 3 and extrinsic motivation, amotivation, and boredom < = 1 (7% of sample)

In some ways, these cross-national similarities are surprising, given theory and related empirical evidence regarding cultural and racial-ethnic differences in smoking behavior (e.g., Mermelstein & The Tobacco Control Network Writing Group, 1999; Nichter, 2003). One possible explanation is that there may be fewer cross-cultural differences in regular smoking, as opposed to rates of "ever" smoking (i.e., potentially lighter cigarette use). If one assumes that nicotine dependence is more common among regular smokers than among ever smokers, then cross-national similarities in this behavior may be due to biological contributors to dependence that vary little across social and geographic groups. However, we are unaware of any studies that directly compare nicotine dependence across racial/ethnic groups or nations. In addition, the current study does not assess nicotine dependence, so we cannot be sure of the degree if its influence among regular smokers.

All three of the smoking patterns evidenced in our earlier study of the girls in the sample (Palen, Smith, Caldwell, & Flisher, 2008) were present here. However, quitters emerged as a new, fourth pattern of longitudinal smoking behavior. Given that this class represents only about 4% of the total sample, it is possible that this fourth pattern exists among girls but that the girls-only sample did not offer sufficient power for its detection. This notion is corroborated by our finding that measurement was invariant across gender. In other words, the same types of smoking patterns (including quitting) were evident for both boys and girls.

Consistent with some previous U.S. research (Fergus, Zimmerman, & Caldwell, 2005; Juon, Ensminger, & Sydnor, 2002; Orlando, Tucker, Ellickson, & Klein, 2004), girls and boys were similar in their prevalence of each smoking pattern. This is also consistent with cross-sectional data from Cape Town in which boys and girls had similar incidence of smoking (Flisher et al., 2001). Flisher and colleagues suggested sociocultural explanations for this finding; however, we did not have data on constructs such as gender values and disposable income that would be necessary to test this assertion in our own data.

Consistent with previous research (Palen, Smith, Caldwell, & Flisher, 2008; E. A. Smith et al., 2007), there were treatment group differences in smoking behavior. These studies suggested that HealthWise had beneficial effects on smoking because it limited the initiation of regular cigarette use among baseline non-smokers. This finding was replicated here, in both the full HealthWise sample and the subsample of HealthWise girls. However, HealthWise boys did not differ from control group participants in their probability of remaining non-smokers. Rather, HealthWise boys had an especially high probability of being classified as quitters. (HealthWise girls were similar to control group students in their probability of being classified as quitters.)

One possible explanation for the above finding may be that HealthWise boys were a higher-risk group at baseline. This notion is supported by evidence of this being the group with the highest probability of being classified with a pattern that involved smoking at baseline (quitters and consistent smokers combined). Therefore, there is a larger pool of HealthWise boys who are eligible to quit, as compared to the other gender/treatment groups. Also, it is possible that, in the face of intervention, boys find it easier to quit smoking than do girls. This is supported by several studies showing that nicotine dependence is stronger for adolescent girls than boys (DiFranza et al., 2002; Panday, Reddy, Ruiter, Bergström, & de Vries, 2007). However, as mentioned previously, we cannot determine the degree to which regular smoking reflected nicotine dependence, so this hypothesis will need to be addressed in future intervention studies that better operationalized dependence.

In addition, the fact that HealthWise boys were no lower than control students in their prevalence of smoking initiation should not necessarily be interpreted as a lack of program effect on the prevention of smoking onset. Again, given their smoking prevalence, HealthWise boys may be a higher risk group at baseline. As such, we might expect them to maintain a heightened risk of smoking over time. In other words, in the absence of intervention, we might hypothesize that HealthWise boys would have shown greater odds of being initiators and consistent smokers,

as compared to youth from the other treatment/gender groups. However, this did not occur; HealthWise boys had a probability of being non-smokers that was comparable to that of the control group. This may mean that HealthWise operated by suppressing rates of smoking initiation, thereby making this "high-risk" group more similar to their "low-risk" peers. Additional statements about HealthWise's effects on boys' smoking could be made by repeating the current study with samples of boys who have more similar levels of smoking behavior at baseline. It may be possible to do this with the second and third cohorts from the HealthWise study, for which data are currently being collected.

The nature and frequencies of the various smoking patterns within the control group have several additional implications for future intervention efforts. First, the number of youth classified as quitters was very small. This underscores the notion that, in the absence of outside intervention, smoking cessation is rare. This, in turn, suggests the need for smoking cessation programs that are specifically designed to reach adolescent smokers. Second, those who initiated smoking during the time period under observation tended to start either prior to the 8th grade or during the 9th grade. Therefore, programs targeted at the prevention of adolescent smoking onset should be initiated prior to high school. Finally, the majority of control group students were not regular smokers at any assessment. This suggests that an intervention targeted at only the half of adolescents who are most at risk for smoking initiation may be more efficient than a universal prevention program. However, this would require the identification of smoking predictors that could realistically be used to define and recruit target populations.[17]

This study was successful in uncovering several significant predictors of smoking behavior. As hypothesized, students who scored higher on free-time extrinsic motivation,

[17] Admittedly, doing this within a classroom setting would be difficult. However, it may be possible to deliver intervention in settings characterized by a large proportion of youth who are at high risk for smoking (e.g., juvenile justice facilities), if one is able to identify such settings. Alternatively, one might implement an adaptive intervention, in which the delivery of a program is universal but high-risk youth receive a higher intervention dose (Collins, Murphy, & Bierman, 2004).

amotivation, or boredom were also more likely to be classified as having one of the smoking patterns (initiators, consistent smokers, quitters) than the non-smoking pattern. However, the probabilities of having each of the smoking patterns were somewhat different in relative strength than originally hypothesized. Consistent with expectations, free-time extrinsic motivation, amotivation, and boredom scores were related to higher odds of being a consistent smokers and initiator. However, contrary to expectations, high scores on any of these scales were associated with the highest odds of being classified as a quitter.

This finding could be a methodological artifact. The quitters were a small group, and the inclusion of certain covariates (boredom, overall free-time engagement) changed the measurement model such that the quitter class more closely resembled the non-smoking class. In addition, we did not directly compare the odds ratios for quitters with those for initiators and consistent smokers. Therefore, we cannot be certain that the least engaged youth truly have heightened odds of quitting smoking; future research will be needed to make more conclusive statements about the associations between free-time engagement and trajectories of substance use.

It is important to note that while the associations between free-time engagement and smoking were stronger for boys, they were nearly identical in interpretation across gender (i.e., associations between boredom/extrinsic motivation/amotivation and smoking are all positive, with the strongest being associations with quitting). This suggests some degree of universality in the nature of associations between these constructs and smoking. The gender similarities imply that the same free-time-focused substance use interventions might be effective for both boys and girls. For example, if we could reduce boredom in free time, we have reason to expect that smoking would change in similar ways for both boys and girls.

The associations between free-time engagement and smoking were somewhat stronger among the control group than among HealthWise participants. This suggests that HealthWise may be operating, in part, by weakening the association between free-time experiences and

smoking (e.g., HealthWise students remain bored but no longer smoke as a result). However, given that the associations retain the same interpretation across treatment groups, there are most likely additional explanations for HealthWise's effects. HealthWise may be operating through changing levels of free-time engagement, or there may be non-free-time-related mediators at work. There is some existing support for each of these possibilities (e.g., Caldwell, Patrick, Smith, Palen, & Wegner, 2007, June; Palen, Caldwell, & Smith, 2007, June; Palen et al., 2008, May).

One's free time intrinsic motivation score was not a significant predictor of longitudinal smoking patterns. This finding is consistent with a previous cross-sectional analysis of this sample showing that intrinsic motivation was unrelated to alcohol use (Caldwell, Weichold, & Smith, 2006); however, it is contrary to our hypothesis and surprising in light of the relations between smoking and the other engagement-related constructs in this study. One possible explanation may be related to practical variability in intrinsic motivation. Theory regarding the links between intrinsic motivation and substance use suggests that it is the absence of intrinsic motivation that is detrimental for youth. However, within these data, there are few students who truly lack intrinsic motivation. On average, participants "agreed" with statements about their intrinsic motivation, and less than 10% of participants fell on the "disagree" side of the scale's neutral point. This finding is not surprising, given evidence that free time is a prime context for intrinsic motivation (Kleiber, Larson, & Csikszentmihalyi, 1986; Larson, 2000). However, it suggests that, within this population, intrinsic motivation in free time may not be a useful independent marker for identifying youth who are at risk for substance use.

It is also possible that intrinsic motivation is related to smoking only among a certain subset of youth. For example, Palen et al. (Palen, Caldwell, & Smith, 2007, June) found that youth with comparable levels of free-time intrinsic motivation were at heightened risk for substance use if they also had high levels of introjected motivation, extrinsic motivation, and

amotivation. This point should be further explored with additional longitudinal person-centered studies.

Another unexpected finding was that a free-time engagement composite did not offer additional predictive power, above and beyond the effects of individual free-time constructs on smoking pattern. This finding was robust, being demonstrated in the original planned analysis as well as a number of different follow-up analyses. It is possible that multiple experiences related to free-time engagement do not confer cumulative protection. Extrinsic motivation, amotivation, and boredom are each relevant for outcomes, yet the interaction between them may not have added relevance for smoking behavior. Alternatively, this finding may be driven by a statistical artifact. The engagement composite was highly correlated with the other free-time covariates (ranging from .38 for intrinsic motivation to -.62 for extrinsic motivation; all statistically significant at $p <$ .001). Therefore, it is possible that with the other free-time covariates included, there was little variance in smoking pattern remaining to be explained by the engagement composite.

Limitations and Future Directions

The data used in the present study cover a three year span, from approximately ages 14 to 17. This represents only a portion of individual smoking histories. Among South African adolescents, a small minority begin smoking before age 10 (Reddy et al., 2003), and national data on adult smokers show that the average reported age of smoking initiation is about 20 (Steyn, Bradshaw, Norman, Laubscher, & Saloojee, 2002). Therefore, to capture the complete range of smoking trajectories, it will be important to collect longitudinal data on samples that begin in late childhood and continue through early adulthood and beyond. In addition, it will useful to examine differences in the long-term health outcomes of various smoking trajectories.

Participants in the current study were mostly colored adolescents, from one under-resourced, peri-urban area outside of Cape Town. Previous evidence shows that these demographic groups have comparatively high rates of smoking behavior (Reddy et al., 2003;

Townsend, Flisher, Gilreath, & King, 2006). Therefore, it is possible that the patterns of smoking demonstrated here (and their prevalences and associations with covariates) may be different among other groups of South African and African adolescents.

There are also limitations in our operationalization of smoking behavior. We selected "10 or more cigarettes in the past month" as our smoking criterion because it was the highest available frequency in our data, and we felt this frequency was a more valid representation of health risk than were lower quantities. However, regular smoking as we have defined it here most likely characterizes multiple patterns of behavior, from the adolescent who smokes two cigarettes per weekend to the adolescent who smokes a pack or more of cigarettes per day. These youth are most likely at different levels of risk for smoking-related health outcomes and most likely would have different responses to intervention. Future tobacco-related studies should use instruments that better capture these meaningful gradations in behavior.

It should also be noted that cigarette smoking is not the only tobacco-use behavior that puts the health of South African adolescents at risk; about 15% of this population reports having used "other" tobacco products (Global Youth Tobacco Survey Collaborative Group, 2003).Therefore, analyses to inform tobacco-related public health efforts are not complete without considering the onset and continuation of other forms of tobacco use.

These limitations aside, the current study is the first to describe longitudinal smoking trajectories among both South African boys and girls, as well as to determine whether free-time engagement can predict these trajectories. We have offered some insight as to the effects of one prevention program on cigarette use, including possible explanations for these effects. However, future research is needed to clarify the inter-relations between intervention, free time, and smoking within the South African context.

Table 3-1: Descriptive statistics at baseline (N = 2,204)

Variable	*N*	Frequency (%)
HealthWise participation	2,190	41
Female	2,194	51
Age	2,179	mean = 14 years
		(SD = .86, range = 12-17)
Race	2,121	-
Colored	-	86
Black	-	9
White	-	4
Indian	-	< 1
Other	-	< 1
Religion	2,191	-
Catholic	-	23
Christian - other	-	45
Muslim	-	28
Other	-	4
Live with mother	2,196	88
Live with father	2,192	68
Socioeconomic status	-	-
Have electricity at home	2,198	97
Have tap water at home	2,198	94
Have motor car at home	2,193	55

Table 3-2: Descriptive information for free-time experience scales

Scale	Number of items	Sample item	Grand mean (*SD*)	α at baseline
Intrinsic motivation	2	I do what I do in my free time because I want to.	2.83 (.73)	.58
Extrinsic motivation	3	I do what I do in my free time because my parents expect me to.	1.82 (.86)	.76
Amotivation	3	I don't know why I do my free time activities, nothing much interests me.	1.71 (.79)	.72
Boredom	3	For me, free time just drags on and on.	1.61 (.74)	.57

Table 3-3: Measures of model fit, full sample

Model	Loglikelihood	G^2	*df*	AIC	BIC
2 class	-4251.15	555.33	112	585.33	672.23
3 class	-4060.97	174.96	104	220.96	354.22
4 class	-4032.85	118.74	96	180.74	360.34
5 class	-4013.16	79.35	88	157.35	383.30

Note. The best-fitting/most frequent 4- and 5-class solutions are tabled here.

Table 3-4: Class membership probabilities and probabilities of regular cigarette use, baseline model

	Class Label			
	Non-smoker	Initiator	Consistent	Quitter
Class membership probabilities	.60	.21	.16	.04
Probabilities of regular cigarette use				
Beginning of 8th grade	.01	.05	**.60**	**.63**
End of 8th grade	.02	.06	**.86**	**.81**
Beginning of 9th grade	.01	.19	**.93**	**.56**
End of 9th grade	.02	**.51**	**.97**	**.61**
Beginning of 10th grade	.01	**.73**	**.93**	.32
End of 10th grade	.02	**.82**	**.98**	.15
Beginning of 11th grade	.06	**.84**	**.80**	.00

Note: Smoking probabilities greater than .5 are in bold.

Table 3-5: Measures of model fit, multiple groups analyses with four classes

Model	Loglikelihood	G^2	*df*	AIC	BIC
Measurement variance across gender, prevalence freely-estimated	-3972.50	160.98	193	284.98	643.10
Measurement invariance across gender, prevalence freely-estimated	-3989.82	195.63	221	263.63	460.01
Measurement invariance across gender, prevalence constrained across gender	**-3991.15**	**198.29**	**224**	**260.29**	**439.35**
Measurement variance across treatment group, prevalence freely-estimated	-3992.90	182.41	193	306.41	663.96
Measurement invariance across treatment group, prevalence freely-estimated	**-4010.24**	**217.08**	**221**	**285.08**	**481.16**
Measurement invariance across treatment group, prevalence constrained across treatment group	-4016.00	228.60	224	290.60	469.37

Note. Preferred models are bolded.

Table 3-6: Class membership probabilities from multiple groups analyses

	Class Label			
	Non-smoker	Initiator	Consistent	Quitter
Gender comparisons				
Boys and girls	.59	.21	.16	.04
Treatment group comparisons				
Control group	.57	.24	.16	.03
HealthWise	.62	.16	.16	.05
Gender-by-treatment interaction				
Control boys and girls	.56	.24	.17	.04
HealthWise boys	.55	.18	.14	.13
HealthWise girls	.65	.15	.17	.03

Table 3-7: Measures of model fit, gender-by-treatment interaction analyses

Model	Measurement parameters	Group membership parameters	G^2	*df*	Model comparison	$\Delta G^2(df)$
A	Variant across groups	All freely-estimated	253.64	387	-	-
B	Invariant across groups	All freely-estimated	337.16	471	B - A	83.52(84)
C	Invariant across groups	HW boys = HW girls = Control boys = control girls	367.22	480	C - B	30.06(9)***
D	Invariant across groups	HW boys = HW girls; Control boys = control girls	357.15	477	D - B	19.99(6)**
E	Invariant across groups	HW boys = HW girls	351.45	474	E - B	14.29(3)**
F	**Invariant across groups**	**Control boys = control girls**	**342.26**	**474**	**F - B**	**5.10(3)**
G	Invariant across groups	Control boys = control girls = HW boys	354.35	477	G - F	12.09(3)**
H	Invariant across groups	Control boys = control girls = HW girls	354.32	477	H - F	12.06(3)**
I	Invariant across groups	HW boys consistent & start = HW girls consistent & start	338.31	473	I - B	1.15(2)
J	Invariant across groups	HW boys quit & non = HW girls quit & non	351.43	473	J - B	14.27(2)***

Note. $^{**}p < .01$, $^{***}p < .001$. The preferred model is bolded.

Table 3-8: Results of univariate tests of free-time covariates

		Unconditional odds ratios[a]		
	p	Initiator	Consistent	Quitter
Intrinsic motivation	.159	1.0	1.0	0.6
Extrinsic motivation	< .001	1.1	1.5	3.5
Boys		1.4	1.5	4.6
Girls		0.9	1.4	2.6
HealthWise		1.2	1.6	2.8
Control		1.1	1.5	4.9
Amotivation	< .001	1.2	1.9	3.3
Boys		1.2	1.7	5.4
Girls		1.3	1.8	1.9
HealthWise		1.3	1.6	2.5
Control		1.3	2.1	4.4
Boredom[b]	< .001	1.3	1.7	3.5
Boys		1.4	1.7	4.6
Girls		1.3	1.6	1.8
HealthWise		1.3	1.4	2.7
Control		1.3	1.9	4.8
Engagement composite[b]	< .001	0.8	0.4	0.2
Boys		0.6	0.5	0.1
Girls		1.0	0.4	0.3
HealthWise		0.7	0.4	0.2

Control	0.8	0.5	0.1

Notes. [a]Non-smokers are the reference group. [b]The univariate tests for boredom and engagement may violate the marginal homogeneity assumption.

Table 3-9: Results of multivariate test of free-time covariates

		Conditional odds ratios		
	p	Initiator	Consistent	Quitter
Intrinsic motivation	.032	1.1	1.1	0.5
Extrinsic motivation	.029	0.9	1.1	1.9
Amotivation	< .001	1.2	1.6	1.2
Boredom	.138	1.2	1.1	1.7
Engagement	.661	0.9	0.8	0.9

Notes. Non-smokers are the reference group. This test may violate the marginal homogeneity assumption.

Chapter 4

Contributions, Implications and Future Directions

Contributions of this Research

The two preceding studies make several unique contributions to what is known about free-time and substance use among South African adolescents. They offer some support for the generalizability of Self-Determination Theory, elucidate longitudinal associations between free-time engagement and smoking, and provide a nuanced assessment of HealthWise's impact on smoking behavior.

Evidence for and against the generalizability of Self-Determination Theory. Both of the preceding studies used Self-Determination Theory (SDT) as a guiding framework. Previous research had suggested that many of the general tenets of SDT are relevant in non-US (particularly, European and Asian) contexts (e.g., Chirkov et al., 2003; Deci et al., 2001; Grouzet et al., 2005; Levesque et al., 2004). However, research on SDT in the African context has been limited. The two studies presented here suggest that SDT has some utility and applicability with, at the very least, our sample of South African youth. Almost every type of free-time motivation mentioned in the focus groups had been documented in previous research and could be easily classified along the motivational continuum proposed by Organismic Integration Theory. Also, constructs encompassed by SDT (extrinsic motivation, amotivation, boredom) had their hypothesized general association with substance use/non-use in the longitudinal smoking study.

That being said, some results from the smoking study violated our SDT-informed expectations. The individuals who were most disengaged in free-time had heightened odds of actually *stopping* smoking over time, a finding discussed in the next section on longitudinal free-time experience and substance use. Also, intrinsic motivation in free time was unrelated to

smoking patterns. This could stem from a lack of variability in free-time intrinsic motivation, or it could be that the associations between substance use and intrinsic motivation vary across individuals or situations. Again, this could reflect something unique about the free-time experience for South African youth. Alternatively, this could indicate a need for more nuanced thinking about how the motivational types encompassed by SDT relate to outcomes, incorporating the idea that individuals experience multiple motivations within and across different behaviors and this *combination* has implications for health and well-being.

Free-time engagement and substance use longitudinally. The cigarette study was, to our knowledge, the first to examine the associations between *longitudinal patterns* of smoking and free-time *engagement*. (Previous studies have examined either longitudinal smoking and activity *participation* or *cross-sectional* smoking and free-time engagement.) In general, the findings from this study were consistent with hypotheses: smoking was positively related to extrinsic motivation, amotivation, and boredom in free time. In the context of previous studies (that provided little evidence for associations between participation in specific activities and longitudinal smoking patterns; Fergus et al., 2005; Palen, Smith, Caldwell, & Flisher, 2008; Soldz & Cui, 2002), the current study supports the assertion that it may be factors like free-time boredom and motivation rather than participation in a specific type of activity that is relevant for adolescent outcomes. This is consistent with the results of the current qualitative study, which showed that different activity types can be characterized by similar patterns of motivation (and, thereby, might have the similar overall associations with outcomes).

We were surprised to find that, compared to youth who were more engaged in their free-time activities, youth who were less engaged may have had heightened odds of quitting smoking. It is possible that this specific finding is a methodological artifact. The number of quitters was small, and their measurement parameters changed with the inclusion of certain covariates. In addition, I did not make direct comparisons between the odds ratios for quitters and for the other

types of smokers (initiators, consistent smokers). However, if valid, these results may suggest that the association between free-time engagement and substance use is complex and varies across individuals. In light of the uncertainty in the present study, the association between free-time engagement and trajectories of substance use should continue to be examined in future work.

Person-centered evaluation of intervention effects. Evaluation research is typically variable-centered. That is, program effects are operationalized as sample-level changes in outcomes of interest. This strategy fails to acknowledge that there are often different types of individuals within a given intervention study. They bring different characteristics and baseline behavior, and they may change in different (and meaningful) ways over time. Prior to the current cigarette study, there was evidence that HealthWise had overall effects on recent smoking behavior (E. A. Smith et al., 2007). However, the exact nature of this effect was not clear. Did HealthWise prevent smoking onset completely or just delay it? Did HealthWise only change the behavior of baseline non-smokers, or did it also promote cessation among baseline smokers? This study provided support for two types of effects: HealthWise prevented smoking onset among girls and promoted cessation among boys.

These findings are encouraging for several reasons. First, the prevention of smoking onset, as demonstrated among the HealthWise girls, no doubt has greater public health impact that simply delaying smoking onset for a year. Additionally, HealthWise was designed and positioned as a primary prevention program. Consequently, I did not expect to see program effects on smoking cessation. The fact that there *were* positive effects on cessation among boys suggests that some of the messages delivered in substance use prevention programs may be relevant and effective for youth who are already using.

Implications for Intervention

Although only one of the two preceding studies tested intervention effects, each provided information about using free-time activities as a context for intervention. They support the

strategy of using free-time as a context for risk behavior intervention and suggest that this type of intervention need not focus on single types of free-time activities. They also underscore the need for primary prevention in smoking and offer suggestions for the design and execution of evaluative studies.

Free-time as a context for intervention. Leisure-focused interventions like TimeWise (Caldwell, Baldwin et al., 2004) and HealthWise (Caldwell, Smith et al., 2004) rely on the assumption that free time can be used for healthy, developmentally-conducive activities or for risky activities that potentially limit development. These programs attempt to shift time-use away from risky (or neutral) activities and into healthier pursuits.

The results from the mixed-method study support the validity of free-time context for risk behavior prevention. As previously mentioned, adolescents report that risk behaviors like substance use, sexual behavior, and delinquency are just as prominent in their free-time repertoire as are activities that are presumed to be more prosocial, like sports, media use, and spending time with friends. Also, reported motivations for risk behavior often overlapped with motivations for other types of free-time use. This overlap in context and motivation suggests that risk behavior may be somewhat interchangeable with other (and hopefully healthier) ways of using free-time. However, the degree to which such substitutions *actually* occur is unclear; this is a direction for future research as discussed subsequently.

The validity of leisure education as substance use prevention is further supported by the links, demonstrated here, between smoking and free-time engagement. This study was unable to determine whether the links are causal, nor the degree to which free-time engagement is modifiable. These conditions would need to be met in order to conclude that free-time engagement is an appropriate and effective program mediator. However, the fact that HealthWise, a leisure-focused intervention, was able to impact smoking behavior leads us to believe that some sort of free-time-related construct is at work, even if it's not engagement per se. For example,

HealthWise might prompt youth to reduce involvement in activities with pro-smoking social norms and increase involvement in activities in which healthy behavior is valued. Unfortunately, the current HealthWise trial does not have data regarding substance use *within* free-time activities, so this is a hypothesis that can only be explored in future research trials.

Activity types and motivation. Evidence from the mixed method study showed that motivations are generally not unique to single types of free-time activities. Participants in the same type of activity report multiple motivations, and the same motivation is reported across a number of activities. (Notable exceptions were peer pressure and conformity, reported only in relation to risk behavior. Also, companionship was the only motivation specified for spending time with romantic partners.) In addition, many activity types were similar in the relative frequencies of reported motivation, with intrinsic motivation being most common and amotivation being least common. In short, adolescents are meeting needs (e.g., relatedness and competence) and striving for goals in a number of specific ways. It appears that, for interventions aimed at promoting more intrinsic forms of motivation in free-time activities, there may not be a need to stress involvement in one specific type of activity, like sports, volunteerism, or the arts. For stakeholders interested in fostering intrinsic motivation in a general sense, it may be important to stress the search for whatever activities would be intrinsically motivating for that particular individual. For those interested in helping adolescents meet specific needs (e.g., meeting new people, challenge, coping), one might then focus on the subset of activities for which these motivations were reported.

Admittedly, the above point may be somewhat controversial. A number of studies have demonstrated differential associations between participation in specific types of activities and distal outcomes (e.g., Cooper, Valentine, Nye, & Lindsay, 1999; Eccles & Barber, 1999; Fergus et al., 2005; A. C. Fletcher, Nickerson, & Wright, 2003; Fredericks & Eccles, 2006; Marsh & Kleitman, 2002). One could assume that these differences in outcomes stem from differences in

experiences within activity types. If this is the case, it could suggest that our study was unable to detect true significant differences in experiences across activities. Perhaps the same motivations are *present* across many activities, but their *magnitudes* vary in ways that lead to differential outcomes. Or, there may be unmeasured activity experiences that do vary across activities and are more relevant for distal youth outcomes than is motivation. Examples of these experiences could include adult supervision/guidance and participants' norms for healthy and risky behavior (Mahoney, Larson, Eccles, & Lord, 2005). Alternatively, it is possible that our results only reflect the Mitchell's Plain free-time experience. Perhaps there is something unique about the cultural or socioeconomic conditions in this area (e.g., lack of resources/support for most activities) that renders activity experiences and outcomes more homogeneous across activity types than they are in other populations.

Each of the above scenarios is a valid potential explanation for our study not demonstrating activity-type differences suggested elsewhere in the literature. However, I would also argue that previously-demonstrated differences in outcomes by activity type are not especially robust. The associations between single activity types and specific outcomes can vary within and across studies. For example, the association between sports and substance use has been demonstrated to be positive, null, and negative, depending on factors like sample, construct operationalization, and timing of measurement (e.g., Eccles & Barber, 1999; Fredericks & Eccles, 2006). Also, specific activities are often combined into broader "super types" (e.g., "clubs," "prosocial activities," "unstructured activities," "school-sponsored activities"), and these groupings often vary across studies. This makes it difficult to determine the degree to which findings about activity type replicate and generalize. For example, a specific activity like volunteering might be grouped with church attendance in one study (Eccles & Barber, 1999), "civil rights" activities in another (Fredericks & Eccles, 2006), scouting in another (A. C. Fletcher et al., 2003), and reading, computer use, karate lessons and art classes in still another (Marsh &

Kleitman, 2002). Therefore, there seems to be little support for arguments that participants in one type of activity always turn out "better" than other youth. In addition, given that youth are typically not randomly assigned to participation in specific activities, differences in outcomes could be driven by selection effects. In other words, participants might have similar experiences across activities but still have different outcomes because of the pre-existing characteristics or conditions that led them to participate in a specific kind of activity.

Even if the literature reflected any systematic and meaningful differences in *outcomes* by activity type, there is less evidence in support of systematic variation in *engagement* or *experiences* across specific activity types. As discussed in Chapter 1, I am unaware of previous research directly examining whether free-time motivation varies across activity types. This is not a situation that is unique to motivation; many studies that suggest evidence of the psychological benefits of a single type of free-time activity do not directly compare these benefits with those derived from other activity types (e.g., Durkin & Barber, 2002; Marsh & Kleitman, 2003; Wankel & Berger, 1990; Yates & Youniss, 1996). Therefore, while there may be evidence for the benefits of general activity participation versus non-participation, there is less basis for statements, for example, that participation in volunteerism confers benefits that are not conferred by sports or art or spending time with friends.

One exception to the single-activity research design is a study by Hansen and colleagues (Hansen et al., 2003), which compared the levels of 18 positive developmental experiences across five types of activities. In this study, the relative scores of each activity varied across the positive experiences; in other words, no single activity type always provided the "best" experiences. Also, for the majority of positive experiences, the mean score was above the scale mid-point for all activities. If one interprets the scale mid-point as distinguishing between the presence and absence of an experience, this indicates that single activities provide multiple positive developmental experiences and the same experience is present in multiple types of activities. This

is a conclusion that is very similar to the one reached about engagement in the preceding mixed method study, lending to support to the validity of our findings.

Similar results were found in a study by Larson and colleagues (Larson, Hansen, & Moneta, 2006). For four activity types (sports, arts, community, service), no one activity always provided better-than-average levels of developmental experiences. For example, sports were associated with above-average levels of initiative and below-average levels of positive relationships.[18] In addition, positive developmental experiences were typically associated with multiple activities. For example, above-average levels of initiative were reported in sports, arts, and faith-based activities. Above-average levels of experiences related to social capital were reported for community, service, and faith-based activities. Again, this suggests that no one activity is superior to others in all experiences, although it does not preclude the possibility that only a subset of activities may provide single, specific experiences.

Need for and timing of smoking prevention. In the cigarette study, the control group provided information about normative progressions in smoking in the age group under study. Three findings were particularly important: regular smoking was fairly common (40% of participants), the onset of regular smoking tended to occur prior to or in the 9th grade, and smoking cessation was relatively rare. This underscores the need for primary prevention efforts, particularly those that reach youth before entry into high school (8th grade in this population).

Development of future quantitative evaluative instruments. The existing HealthWise survey asks about participation in eight types of free-time activities, and it asks about free-time motivation in a fairly general sense. Data from the qualitative study suggests additional, relevant activities that will be important to measure in future surveys of this population. This could

[18] However, it should be noted that faith-based activities were associated with above-average levels of all six positive experiences, while academic activities (i.e., student government, academic clubs) were always associated with below-average levels. This suggests that these activities may be unique in the experiences they provide. Unfortunately, these types of activities were not measured in our survey and were rarely reported by focus group participants; therefore, we do not know whether differences in motivations for these activities exist in our population of interest.

include measuring substance use using items formatted like those that capture other potential uses of free time. In addition, the qualitative data suggest and prioritize specific free-time motivations that could be important to measure in future studies. The inclusion of these additional measures may allow for enhanced precision in statements related to the prevalence of activity participation and motivation. In addition, having quantitative data on these constructs will allow future researchers to relate them to a number of outcomes of interest, including well-being and risk behavior.

Directions for Future Research

While the preceding studies did make contributions to our existing knowledge about South African adolescents, it also brought to light a number of areas that merit attention in future studies. Some of these areas are very general, like understanding developmental tasks and parenting behavior within this cultural context. However, there is also much left to be learned about free-time activities, related experiences, and their intersection with substance use.

Normative developmental tasks in adolescence. What should free-time activities be helping adolescents to accomplish? Why might adolescent substance use get in the way of healthy development? Are there developmental needs that substance use actually helps an adolescent to meet? None of these questions can be fully answered without knowing the developmental tasks that must be negotiated in order to be a fully-functioning member of adult society. While there is theory and research on developmental tasks within the US (e.g., Havighurst, 1972), it is possible that these tasks and the methods used to achieve them vary in the African context generally (Nsamenang, 2002) and among our population of interest specifically. This type of culturally-sensitive developmental research would no doubt have implications for how we think about free-time activities, but also adolescent behavior more broadly.

Follow-up through adulthood. Behavior in adolescence can have immediate, acute effects on health and well-being. However, adolescent behavior also has repercussions for adult behavior

and outcomes. Knowing how adolescent behavior relates to adult outcomes is essential in prioritizing intervention goals. Which conditions or behaviors are highly related to healthy functioning in adulthood? (These may be candidates for developmental tasks in a given culture.) Is substance use in adolescence always predictive of adult use (and related health conditions), or are only a subset of adolescent users truly "at risk"? To answer these questions, it is crucial that researchers conduct long-term studies that follow adolescents as they move into and through adulthood.

Parent and family relationships in adolescence. Contrary to expectations, parents and family were not discussed in relation to motivations for free-time activity participation. This raised the question of whether parents are truly uninvolved in their children's free-time experiences or whether our research design was simply unable to capture this involvement. Forthcoming research (Palen, Patrick et al., 2008) suggests that parents at least play a role in *limiting* free-time participation. However, there are a variety of important questions that remain unanswered. What role do parents see free-time activities as playing in their children's lives? As a result, which activities do they feel are appropriate or inappropriate uses of free time? In what ways, if any, do parents instrumentally and emotionally support their children's free-time involvement? The resulting information could be used to create a more ecologically-focused approach to intervention that targets adolescent free-time involvement.

Longitudinal studies linking participation, motivation and substance use. While the preceding studies described certain associations between free-time participation, motivation, and substance use, they were unsatisfactory for answering questions related to the *processes* by which these constructs are linked. Does motivation serve as the impetus for joining a new activity? Does continued participation change motivation in systematic ways? Do shifts in motivation predict shifts between different free-time activities, including shifts into or out of substance use?

Fortunately, exploration of these questions *is* possible using the HealthWise data. What remains to be seen is whether the existing semi-annual assessments are spaced closely enough to determine the ordering of various behavioral changes. If the shifts in motivation and participation often occur within the same 6-month period, our current data will frame these changes as being simultaneous. More frequent assessments (e.g., monthly, weekly, daily) would be required to capture the order of more rapid processes. While ordering is not sufficient to determine causation, it does eliminate certain possibilities; those remaining can be tested using experimental designs that manipulate participation or motivation.

Exploring conflicting findings. I was surprised that focus group participants rarely mentioned religious activities as part of their free-time repertoire. This contradicts previous research (Kaufman et al., 2002; Møller, 1992). One could undertake a small qualitative study to determine adolescent perceptions of religious activities: whether they are considered to be obligatory or part of free time (or both), the degree to which this is a popular use of time, and the developmental experiences (either positive or negative) that participants may derive from their involvement. This would help to explain contradictions between this study and previous work, and in so doing, provide an even more complete picture of the free-time context in this population.

Further study of previously undocumented free-time activities. As previously mentioned, adolescents in the focus groups named several activities that have been previously undocumented in empirical research, including MXit and gameshops. Still, little is known about what goes on within these specific contexts. Who are the primary users of MXit technology and the primary patrons of gameshops? (In other words, with whom are adolescents interacting? Just each other, or adults as well?) Where and when are MXit and gameshops being used? What sorts of conversations are youth having on MXit? Who owns and profits from MXit and gameshops? What role do these individuals see their service playing in the lives of adolescents, and would

they be receptive to changing in ways that make these settings maximally beneficial for adolescent development?

Having this information might allow us to capitalize on these activities as innovative tools and settings for intervention. For example, MXit could be used to deliver intervention-related messages to youth in general or to HealthWise participants specifically. In terms of one-way communication, this might involve sending adolescents advertisements for upcoming free-time opportunities or sending daily free-time-related tips that are consistent with HealthWise principles. One could also conceive of using MXit for two-way communication strategies, like an interactive "free-time counselor" from whom adolescents could get real-time information and advice on topics like finding local activities or ways for negotiating a current constraint to activity participation. Future interventions (or modifications to existing interventions like HealthWise) might also position MXit as a tool for organizing group free-time activities with friends and with new activity partners.

In terms of gameshops, they are an unstructured activity facility that focus group participants actually reported using (as opposed to their rare discussions of using parks or recreation centers). Stakeholders might use information about what attracts youth to gameshops as a way to develop new activity facilities (or modify existing ones) in a way that will boost utilization and participation. Alternatively, existing gameshop facilities might be expanded to include activities other than playing or watching pool, such as musical performance or playing other games.

Examination of other risk behavior outcomes. The preceding inferential study examined patterns of cigarette use and their relations with gender, intervention, and free-time experiences. Conducting similar analyses using other risk behavior outcomes could contribute in similar ways, such as offering a more fine-grained evaluation of program effects. It would also allow us to

determine the degree to which findings demonstrated for cigarettes generalize across risk behaviors.

While not as common as cigarette use, smokeless tobacco use is still occurring among South African adolescents (Global Youth Tobacco Survey Collaborative Group, 2003). However, it is rarely investigated in evaluation research, suggesting an opportunity for future studies. National rates of lifetime alcohol use are even higher than cigarette use (Reddy et al., 2003), positioning this as another important risk behavior to investigate. Also, there is increasing concern in South Africa about rates of methamphetamine use. In 2002, methamphetamine was the primary or secondary drug of abuse for less than 1% of drug patients; by early 2007, this figure had risen to 40% (Plüddemann, Myers, & Parry, 2008), making this substance a salient public health challenge.

It will also be important to investigate risk behaviors other than substance use. Given the potential role of sexual behavior in South Africa's high prevalence of HIV (23% of individuals aged 25 to 29; Shisana et al., 2005), a greater understanding of sexual risk behavior (e.g., condom non-use, multi-partnering) over time might have substantial public health impact. Focus group participants also mentioned crime and gang involvement as a major threat to health and well-being in their communities (Palen, Patrick et al., 2008).

Meaningful measurement of risk behavior. A limitation of the preceding cigarette study was that smoking was necessarily operationalized in a fairly ambiguous way. It was unclear which type of smoking behavior (weekend smoking? dependence?) was actually captured by having smoked 10 or more cigarettes in the past month.

Regardless of which risk behaviors an investigator chooses to measure, behavior should be measured in ways that are clinically meaningful. Is cigarette use only problematic if one has become nicotine dependent? Is sexual intercourse only problematic if it occurs in the absence of contraception? Is delinquent behavior only problematic if it has resulted in an arrest? Previous

and future research should be used to distinguish between “acceptable” and “harmful” levels of outcomes, and measurement instruments should be designed in ways that can distinguish between risk levels. These measurement instruments do not necessarily need to be limited to self-reports and might also include biological assessment, reports by those other than the individuals under investigation (e.g., teachers, parents), and institutional (e.g., school, juvenile justice) records.

Conclusions

The over-arching contribution of the preceding work is to underscore the complexity of free-time activities, substance use, and the associations between them. Possible uses of free-time are extensive and not limited to structured and legal activities. Also, the associations between activity type and motivation are not simple. In the preceding mixed method study, specific motivations were rarely unique to an activity type and participants in the same type of activity typically experienced a variety of motivations.

Similarly, the associations between free-time engagement and substance use are most likely complex. While, intrinsic motivation and extrinsic motivation are conceptual opposites, they were not inverse in their associations with smoking. Also, greater free-time engagement was not always related to greater probability of smoking across time.

Issues surrounding the evaluation of preventative intervention are also more complex than is often acknowledged. I have shown that the same intervention did not operate in the same ways across individuals, and the same outcome of interest (lower smoking at follow-up) was the result of different processes (not initiating or quitting). In addition, dichotomizing simple behavioral variables (e.g., smoking: yes/no) may not always result in a meaningful experimental outcome. Researchers should turn to existing and future epidemiological studies in order to define outcomes that are truly relevant to public health.

Finally, free-time activities and substance use are behaviors that occur within the larger, complex context in which adolescents are situated. Adolescents are grappling with developmental

needs and tasks in their transition to adulthood, and they are influenced by parents who can inhibit or promote positive development. Among South African youth in particular, little is known about the nature of these influences. Youth also exist in a historical era characterized by globalization and rapidly evolving technology that influence values and opportunities. Acknowledgement of all of these issues will be essential in the design of future studies aimed at promoting healthy adolescent development.

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Appendix A

Student Focus Group Protocol

Introduction

Hi! Thank you for coming to meet with us today. We have brought along snacks; feel free to have something to eat as we talk.

We're researchers from Penn State University in the United States. We're here in Mitchell's Plain trying to learn a little bit more about learners in this area. Specifically, we're interested in learning about the sorts of things that you do with your time outside of school. We also want to hear about the things that people your age do to either protect their health or put it at risk.

Before we get started, we need you to fill out a form for us. This form explains what we will be doing today, and also asks for your permission for us to video and audio tape this meeting. Please read the form, and then if everything it says is okay with you, please sign and date it. Before you leave today, you will receive an extra copy of this form for you to keep.

If you have decided that you do not want to participate today, that is okay too. Just let us know and you will be able to leave.

(Distribute & then collect learner assent forms.)

We appreciate you agreeing to come meet with us today. We hope that you enjoy having this opportunity to express your thoughts and opinions.

We think that most of these questions should be interesting and fun. However, if we do ask a question that makes you feel embarrassed or uncomfortable, know that you do not have to answer it.

Also, please know that we will keep your responses confidential, or private. Although we will share the things that are said here today, only we will know who said them. To help with this, we're going to use only your first name in this meeting. When we write down what was said here, we will identify you by a meaningless number. When we present our research results to others, we will talk about you in general terms, like "8th-grade girl at a school that uses the HealthWise program." Again, all of this should help to keep your responses private.

So, if you could, please write your first name on the name tags we've set out, big enough so that your name can be seen by all of us and by the video camera. (Allow time for task.)

Now, we've mentioned that we're going to do our part to keep your responses private. We'd also like to ask for your help in this. Please do not share what the other learners said with people

outside of this group. That way, everyone can feel more comfortable about sharing their real thoughts and feelings. It *is* okay to talk about the kinds of questions we asked or what your own responses were. Also, please try to speak one at a time and please be respectful of the things that everyone has to say.

Does this sound okay? Does anyone have any last questions for us before we begin?

(Answer questions.)
If you have any other questions as we go on, please feel free to ask them.

WARM UP ACTIVITY

Presence/Absence of Opportunity

Okay, we'd like to start out today by talking about free time activities. By free time, we mean time that you're not spending in class, doing school work, or doing chores at your home. These activities can be things like clubs or events, and they could take place in your school, your home, or your community.

Each of you has a piece of paper at your place. We'd like you to draw a picture of one free time activity, or maybe a few free time activities, that go on in this area. They can be things that you do right now, or maybe things that other learners do.

(Allow time for task.)

1) So, now we'd like to hear about what each of you drew. Can you tell us about the sorts of activities available for learners your age to do during their free time?

(Make list of activities on blackboard or large sheet of paper. After each activity is suggested, ask:)

> 1a) We'd like to know about how many learners actually choose to participate in this activity. So, let's say that we were to ask 10 learners in your class whether or not they did this activity. How many of the ten would say they participated?
>
> 1b) Are boys or are girls more likely to participate? Or, do they participate equally? Why?
>
> 1c) How do learners feel about this activity? Do they like it? Why or why not?

2) Sometimes obstacles get in the way of participating in activities. Can you tell me about some of the things that get in the way of doing the activities you've just listed? (make list)

> 2a) What are some ways that you overcome or could overcome these obstacles?
>
> 2b) (If not already mentioned) Is your neighborhood a safe place for participating in activities?

3) So, we've made a list of things that are available for you to do. Looking at this list, do you think there are enough different kinds of things to do? Is there enough variety?

> 3a) What other kinds of activities would you like to have? (Make list on blackboard or paper.)
>
> 3b) Are all youth able to do these listed activities? Are any types of youth excluded from participation?

Linking Leisure to Outcomes

Okay, so you've mentioned that not all learners participate in existing organized activities, and that there are some things you'd like to have that aren't currently available. So, we'd like to ask a little bit more about what happens in this time outside of activities.

4) What sorts of things do learners your age do in your free time when you're not doing an organized activity or club? (NOTE: This could include healthy unstructured activities.)

> 4a) (If not already addressed) Do you think that having more options for leisure activities would help learners avoid risk behavior? By risk behavior, I mean things like using alcohol, cigarettes, or other drugs, or having sex. Why or why not?

Linking HealthWise to Leisure (only asked to learners in treatment group schools)

6) Do you remember participating in the HealthWise program at your school? (Show copy of HealthWise learner workbook.) You may have done exercises in a workbook that looked like this?

Okay, you each have an index card in front of you. I'm going to ask you to make two lists for us. On one side of the card, please make a list of the things you remember learning in HealthWise. Try to come up with between 3 and 5 things. On the other side of the card, please list anything you learned from HealthWise that you have been able to use in your daily life, things that were especially helpful. (Allow time for this.)

Okay, we've posted pieces of paper on the wall. We'd like to ask for each of you to pick one thing from each of your two lists and write it on those pieces of paper. (Allow time for task.)

> 6a) What do you think the purpose of the HealthWise program is?
>
> 6b) Do you think the ways you use your free time changed after being in HealthWise? In what ways?
>
> 6c) What did you like most about HealthWise?
>
> 6c) Is there anything you didn't like about HealthWise? Anything you would change if you could?

Motivations For/Against Risk Behavior

Okay, so earlier we talked a little about behaviors that can be risky for health. We'd like to talk a little more about that if we could.

7) Some people your age use substances like alcohol, cigarettes, dagga, and tik tik. We've worked to come up with a list of reasons why we think learners may do this. (Show list.) What do you think about each of these reasons? Do they make sense? Are all of them true, or are there some that don't really matter? Why or why not?

7a) Are there any reasons you would add to this list?

7b) (If not already addressed) Do you think some learners use substances because they're bored, or because they don't have better things to do?

8) Okay, while some people your age do use substances, there are also many who choose not to use alcohol or drugs. What are some reasons why learners choose to avoid alcohol and drugs? (Make list.)

9) Okay, let's move on and talk about another behavior that can be risky for someone's health. We'd like to talk about having sex. Now, we do understand that sometimes kids are forced to have sex when they don't want to. However, there are also some people your age who choose to have sex. We'd like to talk specifically about kids who choose to have sex. We've worked to come up with a list of reasons why we think learners may do this. (Show list.) What do you think about each of these reasons? Do they make sense? Are all of them true, or are there some that don't really matter? Why or why not?

9a) Are there any reasons you would add to this list?

9b) (If not already addressed) Do you think some learners have sex because they're bored, or because they don't have better things to do?

10) And again, there are many kids your age who are not having sex. What are some reasons why kids don't have sex? (Make list.)

Wrap-Up

We have asked a lot of questions today about things you do in your free time. Is there anything else that you would like to share with us? It could be something we asked about or something else you think we should know about how you spend your free time. (Take a few responses if volunteered.)

Well, thank you for all of the great information you've given us today. This information will be useful as we try to improve resources and programs that are available in your school and community. [Treatment schools only: and it will also help us to improve the HealthWise program].

Great! Again, thank you so much for your help today! Please remember to keep other learners' comments private, and they will do the same for you. Also, please be sure to take a copy of your consent form with you as you leave.

Appendix B

Student Focus Group Codes

Code #	Code Label	Description/Notes	Exemplars
ACT1	Hanging out with friends	This code is used when participants mention spending time with friends but not while engaged in another activity.	This includes: hanging out with friends, spending time with friends, chilling with friends, playing with friends, visiting friends, and walking around with friends.
ACT2	Sports/physical	This code relates to any activities that are physical in nature. It also includes any sports, both team sports and individual sports. It does not include extreme activities.	This Includes: team sports, individual sports, skateboarding, martial arts, using weights.
ACT3	Singing/musical instrument	The code includes any activities that relate to singing and playing a musical instrument.	This includes: playing a musical instrument (individually or in a band), singing (individually or in a group), and karaoke.
ACT4	Drama/dance group	This code is used when participants identify participation in more organized forms of drama and dance. It does not include going to a club to dance.	This includes: drama class, and dance class.
ACT5	Hobbies/creative	This code is used for any activities that are creative or can be considered a hobby, such as collecting items.	This includes: drawing, painting, and sculpture.
ACT6	Park/recreation center	This activity code refers to time spent in parks or at recreation centers.	This includes: going to the park, and playing in the park.
ACT7	TV/movies	This code is used for any references to watching TV or movies, both at home and in a cinema.	This includes: watching TV, watching movies, watching movies at the cinema.

ACT8	Volunteerism	This code entails participation in any volunteer, non-paid activities.	This includes: picking up trash in one's community, peer counseling.
ACT9	Risk behavior	Activities in this code include behaviors that are risky to the particpants or others around them.	This includes: drinking, drinking alcohol, drugs, fighting, sex, fooling around with older boys, smoking, stealing, and vandalism.
ACT10	Other activities	This is a code for activities that do not fit neatly in another category.	This includes: modeling, eating (for fun), partying, laying on the beach.
ACT10a	MXit	MXit is a text system that participants access with their cell phones. This code is used for all references to this activity.	This includes: sending messages to friends with MXit, using MXit, playing with a cell phone.
ACT10b	Listening to music	This code relates to listening to music.	This includes: listening to music, listening to music on their phone.
ACT10c	Shopping/going to the mall	This code is for going shopping for fun but does not include shopping as a chore. It also includes spending time at shops.	This includes: going shopping, window shopping, going to the mall.
ACT10d	Video games/computers	Time spent playing video games on a computer or console are placed under this code.	This includes: playing the PlayStation, PC games, playing on the computer, video games.
ACT10e	Sleeping	Sleeping during free time (above and beyond sleep required for maintenance purposes) is included in this code.	This includes: sleeping, beauty sleep, and taking a nap.
ACT10f	Adventure/extreme	This codes lists any activities that are considered to be extreme or adventurous. These activities tend to connote danger or potential risk to participants.	This includes: pipe cart driving, racing at the mall, street car racing. This does not include: biking, and outdoor activities such as camping.
ACT10g	Religious/spiritual	This includes any activities that contain a religious component.	This includes: Christian Fellowship, church activities.

ACT10h	Clubbing/informal dancing	This code is used for any kinds of informal dancing or going clubbing. Formal dancing is not included in this category.	This includes: break dancing, clubbing, dancing with music.
ACT10i	Reading	This includes any kind of reading that is undertaken for personal enjoyment. It does not include reading related to school work.	This includes: reading.
ACT10j	Games	This code entails playing games that are not video or computer games. These may be physically active games with others or more passive games.	This includes: board games, games with friends, and playing in the road.
ACT10k	Spending time with romantic partners	Time spent with romantic partners are included under this code. This does not include time spent with friends. If the participants' comment is ambiguous the activity is placed under the "spending time with friends" code. This also involves activities that can only be undertaken with romantic partners but does not include sex.	This includes: kissing, looking for boyfriends/girlfriends, spending time with a girlfriend or boyfriend.
ACT10l	Pool/gameshop	Playing pool and spending time at the gameshop are included within this code. This does not include playing video games at home or playing any other types of games outside of the gameshop.	This includes: playing pool, going to the gameshop, and playing at the gameshop.
S	Spectating	This is an addendum to activity codes when participants describe spectating (rather than actually participating in) the activity.	This often includes watching sports or pool.

1	**Intrinsic motivation**	Participants do an activity because of its inherent rewards.	"There's one thing that I like…if you ice skate, when you done your feet is totally sore."
1a	Relatedness	Participants do an activity as a way of building and maintaining social connections. This can include romantic relationships.	"Just play soccer to see the other people."
1ai	Meeting new people	Participants do an activity as a way to meet new people. This can include romantic relationships.	"You meet new friends also when you play soccer."
1aii	Culture/tradition	Participants do an activity because it is tradition or part of their culture.	"Here is South Africa also as a part of some cultures."
1aiii	Company/ companionship	Participants do an activity as a way to socialize with or become closer to the people in their lives. This includes both the same and opposite sex. "Fitting in" goes both here and under 3f.	"Maybe you could get together with your friends." "Everyone like enjoy each other's company."
1b	Competence	Participants do an activity in order to build or demonstrate competence.	"Or sometimes it's just a talent you have and you not trying to prove anything." "They like doing tricks."
1bi	Learn new skills/knowledge	Participants do an activity because they learn new skills or information. This includes interpersonal skills.	"You could learn new thing…like new dance moves." "Also you learn about teamwork."
1bii	Confidence	Participants do an activity because it builds or enhances self-confidence or self-esteem.	"It builds your confidence." "It makes you feel also important."
1biii	Achievement	Participants do an activity because it offers opportunities for achievement. This code can include the experiences of scoring points or winning.	"People like, like score your goals." "Some people like to win the games."

1c	Autonomy	Participants experience freedom or independence in an activity. Includes independence from parents.	"It's just like feeling free. They can do like whatever they want to."
1ci	Self-expression	Participants have the opportunity to express identity, personal qualities, or opinions.	"You can actually express yourself, you give your opinion."
1d	Affective experience of intrinsic motivation	Participants do an activity because they like it, because they experience enjoyment or excitement. Includes experiences of physical pleasure, like a high. Includes liking specific aspects of the activity.	"They like the excitement of playing cricket." "I just like driving cars."
1e	Challenge	Participants are challenged in an activity. Includes competition and persistence.	"Like they challenge each other who is the best in the game." "It also motivates you to come back, go practice and come back and do the thing."
2	**Indentified motivation**	Participants do an activity as a means of attaining goals that are not inherent to the activity.	"They can save lives." "They like hanging out with friends because it keep them away from the home."
2a	Related to future profession	Participants do an activity because it could become a career or because it builds job-related skills.	"You can make a career of it." "Singing can take you far…like you can do it maybe as a profession or something."
2b	Travel opportunities	Participants do an activity because it gives them opportunities to travel that they would not otherwise have.	"If you win they, you win a trip to go swim with other children like in Durbin and Johannesburg."

2c	Aids in avoidance of risk behavior	Particpants do an activity as a way of avoiding undesirable behaviors, which include traditional risk behaviors (e.g., sex, drugs) as well as other behaviors that participants perceive as having negative consequences (e.g., shopping).	"It keeps you away from all the bad habits like drugs, smoking and because that's big risk to you."
2d	Health/fitness	Participants do an activity because it will improve their strength or fitness. Includes weight loss and feeling refreshed after sleeping.	"Me, the thing that I like about soccer, it...increases your...health." "It will keep you fit."
2e	Escaping	Participants do an activity because it allow them to escaping stress, anxiety, or negative emotion, to cope, or to relax.	"It clears your mind of everything." "I heard rumours that it actually like releases you from stress and pressure."
2f	Keep busy/avoid boredom	Participants state that an activity allows them to stay busy or avoid boredom.	"If something is boring in your house and you go to a club or something then you join it."
3	**Introjected motivation**	Participants are involved with an activity in order to obtain approval or avoid rejection.	"They like rugby because they want to hurt the people." "They do stuff to please other people."
3a	Achieving social status	Participants do an activity to achieve recognition or social status. Includes achieving fame.	"You could become a star." "They like to show off."
3b	Positive peer pressure	Participants' peers cause them to participte in healthy, pro-social activities.	"Influence things like that…but you could get good and bad…like doing your homework, finishing your coffee, maybe getting into a dance activity or singing activity, extramural activity."
3c	Negative peer pressure	Participants' peers cause them to participate in risky activities.	"Nowadays if you tell someone you a virgin, they will laugh at you."

3d	Parents	Participants do an activity because of their parents.	NO QUOTES.
3e	Fans	Participants do an activity because of the recognition of spectators and fans.	"And the thing you like of cricket is when if you bat...you have fans that's looking at you and people shouting at you."
3f	Conformity	Participants do an activity in order to be like their peers. "Fitting in" goes here and with 1aiii	"It's the in thing…everybody's doing it." "They smoke just to be like fitting in with their friends."
3g	Subordinate others	Participants enjoy subordinating or defeating other participants.	"Just to show them who's boss." "They like beating men."
4	**Extrinsic motivation**	Participants are motivated by a reward that is not inherently in the activity (e.g., trophies)	"And sometimes if you win something you get something out of soccer like a trophy or something that you win."
5	**Amotivation**	Participants express a lack of motivation for participation.	"They don't have anything better to do." "They just do it sometimes."
5g	Inherent to gender	Activity participation is based on inherent qualities of one's gender (personality characteristics, "girls' sport")	"[Boys are] not scared because [they are] stronger than girls." "It's because [girls are] more mature."

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