HEALTHY LEISURE AND ITS RELATIONSHIP TO SUBSTANCE USE IN SOUTH AFRICAN ADOLESCENTS: A VARIABLE AND PERSON CENTERED APPROACH

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by

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ABSTRACT

The purpose of this dissertation is to develop a more complete understanding of how healthy leisure was associated with substance use in South African adolescents. Although initial comparisons of both US and SA prevalence rates suggest similar levels of substance use, SA adolescents initiate illicit substance use at an earlier age and transition through substances at a faster rate. One means of addressing substance use in adolescence is targeting healthy leisure use; however, little work has been done to understand the role of healthy leisure in adolescent substance use. Using previously collected longitudinal data (HealthWise), two studies, guided by Problem Behavior Theory, analyzed this association. Both studies took an exploratory approach to conceptualizing healthy leisure by conducting a factor analysis producing a healthy leisure factor and a leisure planning efficacy factor.

Study 1 (Chapter 2) used multi-level modeling to analyze the association between state and trait healthy leisure factors and substance use while including treatment and perceived parental over-control as moderators. Results indicate both state and trait healthy leisure were associated with substance use. The leisure planning efficacy factor was not significantly associated with substance use and perceived parental over-control and treatment did not moderate either relationship.

Study 2 (Chapter 3) used growth mixture modeling to identify distinctive developmental patterns of adolescent substance use development and then determine the influence of healthy leisure on subgroups of substance use development. A four-class solution was found to best fit the data, demonstrating three increasing (Early, Middle, and Late Escalators) and one stable (Low/Rare Users) trajectory group. Results found
individuals with high levels of healthy leisure were more likely to be in the Low/Rare Users than in the Early or Middle Escalators class. The leisure planning efficacy factor demonstrated the opposite results where individuals with higher levels were more likely to be in the Early or Middle Escalators than in the Low/Rare Users class.

Overall, results from both studies within this dissertation found subjective perceptions of healthy leisure protective against substance use. This supports the addressing positive use of leisure time within risk behavior prevention programs in South Africa.
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Chapter 1. INTRODUCTION

Adolescent substance use has been associated with a variety of risk outcomes including delinquency, risky sexual behaviors (Flisher, Ziervogel, & Charlton, 1996), leisure boredom (Sharp et al., 2011), academic challenges (Sutherland & Shepherd, 2001) and future substance use/abuse (Grant et al., 2006). These risks are intensified within developing countries such as South Africa (SA) where many of the effects of the Apartheid-era racial hierarchy still serve to disenfranchise Black and Coloured (mixed ancestry) individuals. This developing nation has experienced an increasing adolescent substance use problem (Wegner, Flisher, Muller, & Lombard, 2006), lack of leisure/recreation opportunities (Caldwell, Smith et al., 2004), and high incidence of adolescent discretionary time (Kingdon & Knight, 2004; Wegner & Magner, 2002). Although substance use rates in SA are comparable to those of US adolescents, SA adolescents initiate illicit substance use at an earlier age (Reddy et al., 2010) and transition through substances at a faster rate (Patrick et al., 2009).

One potential means of addressing adolescent risk behavior, specifically substance use, is through leisure time use. The leisure context presents multi-faceted opportunities for both risk and development in adolescence (Zaslow & Takanishi, 1993). Prior research has demonstrated a positive association between risk behaviors (e.g., alcohol use, delinquency) and leisure activities, particularly with unstructured and unsupervised leisure activities such as hanging out (Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2007). On the other hand, leisure has been identified as an important adolescent developmental context where free time activities provide an outlet to engage
in positive social skills, decision making, and identity exploration (Caldwell, 2008; Silbereisen & Todt, 1994).

Unfortunately, Black and Coloured SA adolescents are also disadvantaged when it comes to access to leisure opportunities, facilities, equipment, and positive leisure role models. I was afforded the opportunity to spend time in the Cape Town area of South Africa where Black and Coloured individuals live, work, and attend school. I observed a newly built community center (see Figure 1.1) within a Coloured area surrounded by fences with barbed wire and sitting empty. I anecdotally learned that such community centers often go unused due to lack of structured, organized leisure opportunities for local adolescents.

Interventions targeting health risk behavior have existed for decades but not until recently did they begin to address healthy leisure activities as a means of reducing risk behavior (see Caldwell, Baldwin, Walls, & Smith, 2004). By providing adolescents the tools to develop leisure interests, negotiate leisure constraints, and initiate leisure activities, they may engage in healthy, meaningful leisure pursuits rather than engage in risk behavior. However, healthy leisure has received little attention within either developed or developing contexts and it is not understood how this construct may relate
to adolescent substance use in practical settings. To address these issues and others, I conducted two studies of healthy leisure and substance use within a sample of South African adolescents.

**Structure of Dissertation**

This first chapter begins by reviewing the prevalence rates of substance use in SA adolescents and demonstrating the level of urgency and need to better understand, reduce, and prevent such risk behavior from occurring. This section also illustrates how prevention programs targeting leisure skills have previously demonstrated success in reducing risk behavior. Before discussing the leisure context specific to adolescent development and risk behavior, the terms leisure and healthy leisure, and the challenges in defining them, are reviewed. In order to better understand leisure’s contribution to substance use, the chapter continues by elaborating on the risk and protective attributes of the leisure context, and finally concludes with the aims of my dissertation. Overall, Chapter 1 serves to provide an introduction to the topic and general background information about key concepts within this dissertation.

Chapters 2 and 3 each reflect one study. Chapter 2 examines the association between substance use and state and trait healthy leisure and the moderating effect of perceptions of parental over-control, across up to eight measurement occasions using a multi-level model. Chapter 3 uses the person-centered approach of growth mixture modeling to identify subgroups of substance use trajectories and how these trajectories are associated with healthy leisure. Collectively, these studies serve to better understand the relationship between healthy leisure and substance use in a developing context.
Substance Use in South African Adolescents

In SA, adolescent drug use is widespread. The most recent South African Youth Risk Behavior Survey (Reddy et al., 2010) found 30% of 8th to 11th graders surveyed have smoked cigarettes in their lifetime and 21% were currently smokers. Alcohol use rates were even higher with 50% having ever consumed alcohol, 35% using alcohol within the past month, and 29% binge drinking within the past month. Rates of other substances were lower, with 13% of students having ever used marijuana, 12% having ever used inhalants, and 7% having ever used methamphetamines (i.e., tik). SA adolescents have demonstrated similar patterns of initiation to those of US adolescents where alcohol or tobacco is tried first, followed by marijuana and inhalants; however, SA adolescents transition through substances at a faster rate than US adolescents (Patrick et al., 2009).

Flisher, Parry, Evans, Muller, and Lombard (2003) surveyed 2,930 students in grades 8 through 11 in Cape Town, SA to identify prevalence and correlates of substance use. They found past month substance use rates of 27% for tobacco, 31% for alcohol, and 7% for marijuana with increasing rates of use between grade 8 and grade 11 (except for Black females). A significant association was found between past month substance use and days absent from school, repeating a grade, and length of time living in the city, even after controlling for grade and school. These findings are especially of interest as the current studies also focused on the Cape Town, SA area.

There is a recognized need for developing skills in adolescent substance users related to constructively using free time and engaging in appropriate social interactions (Jainchill, 2000). Using a leisure-focused intervention has shown promise in reducing
substance use in SA adolescents. HealthWise South Africa, a school-based prevention program designed to increase positive use and experiences of free time and reduce substance use and risky sexual behavior, is one such program that has demonstrated positive results (see Caldwell, Smith et al., 2004).

Students within the HealthWise (HW) intervention group had lower rates of past month alcohol and tobacco use, and were less likely to binge drink within the past 30 days as compared to the control group (Smith et al., 2008). Related to leisure, HW students reported higher rates of leisure-related intrinsic motivation and lower rates of amotivation, which has been previously associated with substance use (Caldwell et al., 2008). Unfortunately, HW (and its American counterpart, TimeWise; see Caldwell, Baldwin et al., 2004) is one of the few empirically validated prevention programs worldwide that targets substance use and leisure/free time together, taking into account the importance of leisure skills and motivations within the risk behavior context.

Defining Leisure

One difficulty with studying leisure is a lack of consensus on how to define and measure it (Mannell & Kleiber, 1997). Some separate leisure into either objective or subjective terms (Godbey, 2008; Iso-Ahola, 1980; Neulinger, 1974; Sharp et al., 2011). Objective conceptualizations of leisure include viewing leisure as amount of free time away from one’s obligations (e.g., work, school) or engaging in specific activities (e.g., basketball, reading). Alternatively, leisure can be characterized as state or mind, state of being, or a meaningful experience, providing for a more subjective conceptualization. Both objective and subjective definitions of leisure, and previous methods of measuring each, will be reviewed within this section, providing a foundation of knowledge for later
discussions identifying associations between leisure characteristics and adolescent outcomes.

**Objective Conceptualizations**

Defining leisure as free time usually refers to time away from the obligations of work and/or school. However, this definition becomes less clear when free time is used to engage in activities such as household chores or caring for children. In some studies related to adolescent time use, free time is defined by activity type such as extracurricular or community activities; a definition that also presents challenges of its own. For example, much of the work on leisure time has come from a developmental perspective and focused on structured versus unstructured free time activities generally finding structured activities to be protective and unstructured activities to be associated with risk behavior (topic addressed in more detail later within the chapter). However, consistent conceptualizations of structured and unstructured activities are lacking and each researcher may categorize activities differently. Simply grouping activities that are adult led and have formal rules into a ‘structured’ group does not indicate the quality of the activity. In fact, some unstructured activities may have the potential for as much benefit as structured activities and vice versa.

Defining leisure as either free time or activity poses challenges for collecting time use data as well as measurement. Capturing accurate accounts of free time use is challenging and previous research is often limited to extracurricular and community activities (e.g., Eccles, Barber, Stone, & Hunt, 2003). Although approximately half of adolescent’ time is spent in leisure, and more outside of the school year, (Feldman & Matjasko, 2007; Larson, 2000; Larson & Verma, 1999), one study found that only 20%
of 10th graders sampled participated in structured activities (e.g., youth groups, organized recreation programs) and instead filled discretionary time watching TV and talking or hanging out with friends (Zill, Nord, & Loomis, 1995). This suggests that by focusing solely on extracurricular and community activities, other types of free time activities including hobbies or social activities and large groups of adolescents have been excluded; a major problem given that adolescents spend a large portion of their free time in social contexts (Kleiber, Caldwell, & Shaw, 1993; Larson, 2000; Zill et al, 1995).

Recent free time statistics for SA adolescents aren’t available; however, time diary data from 1989 found that 30% of South African adolescents’ days are spent in leisure (Møller, 1992). Palen, Caldwell, Smith, Gleeson, and Patrick (2011) conducted a mixed-methods study regarding the types and frequency of activities engaged in by SA adolescents during their free time. Qualitative data collected from 15 focus groups (114 students total) found the most frequently mentioned activities across focus groups were sports and physical activities (n=15 focus groups), risk behavior (n=14 focus groups), playing a musical instrument or singing (n=11 focus groups), pool or game shop (i.e., area where individuals either play or watch others play billiards; n=9 focus groups), and watching TV or movies (n=8 focus groups). The most frequently participated in activities from quantitative survey data (N=946 students) were watching TV or movies (89%), hanging out with friends (70%), sports and physical activities (53%) and playing a musical instrument or singing (43%).

**Subjective Conceptualizations**

An alternative to viewing leisure objectively is viewing it as a subjective experience defined as a state or mind, way of being, or a satisfying experience (de Grazia,
Neulinger’s (1981) leisure paradigm views leisure as a state of mind defined by two principles: perceived freedom and activity motivation. Within this paradigm, perceived freedom, or autonomy, refers to the perception that an individual is choosing how to spend their free time and motivation refers to either intrinsic (doing the activity for the inherent satisfaction of doing it) or extrinsic motivation (receiving some reward for engaging in the activity). Neulinger believed leisure existed on a continuum from ‘pure leisure’, characterized by perceived freedom and intrinsic motivation, to ‘leisure-job’ consisting of perceived freedom and extrinsic motivation.

Although this subjective view is a better representation, capturing individual’s personal meaning of leisure (as opposed to how time is structured) also has limitations. Adolescents may report engaging in unhealthy or problem behaviors during their leisure time and by leaving the definition open to “subjective experience,” this may include both positive, and negative uses of free time. While objective conceptualizations lend themselves easily to quantitative depictions of leisure, subjective conceptualizations can be much more difficult to define (Neulinger, 1981).

To address this issue, many leisure researchers prefer to combine subjective and objective views of leisure, seeing as a free time activity that is intrinsically motivated, or to go even further, one that is also developmentally beneficial (Csikszentmihalyi & Kleiber, 1991; Iso-Ahola, 1980; Neulinger, 1974). Caldwell’s Leisure Activities-Context-Experience (LACE; 2011) model provides a framework for understanding adolescent leisure by viewing leisure as more than just an activity or use of free time, but also as a dynamic relationship between it, the context, and the subjective experience of leisure.
Quantifying Leisure

These varying definitions are also reflected in how leisure has been measured. Previous research has conceptualized leisure in regards to behavior (e.g., number of days engaged in aerobic activity; Caldwell, Kivel, Smith, & Hayes, 1998), motivation (e.g., “Why do you do what you do in your free time?”; Sharp, Caldwell, Graham, Ridenour, 2006), type of activity one is engaged in (e.g., activity checklist; Eccles et al, 2003), and more subjective measures (e.g., “I feel good about myself in my free time”; Sharp, et al., 2011). Sharp and colleagues (2006) commented that leisure researchers prefer to view leisure in subjective terms as “intrinsically motivated, self-determined, and provide enjoyment and escape from daily tensions,” while developmental researchers tend to view leisure as activity engagement (p. 360).

Leisure in the Current Studies

The current studies followed Caldwell’s (2011) LACE model and viewed leisure as the interaction of the individual with the activity in which he or she is participating, perceptions and experiences of participation, and the context of the participation. As Chapter 2 will illustrate, leisure may be reflected in both trait and state measures. Using leisure boredom as an example, individuals may tend to be boredom prone in general, reflected in an increased likelihood of experiencing boredom regardless of setting (e.g., work and leisure). Boredom proneness would then be considered a trait measure representing a personality characteristic. Alternatively, individuals may only experience boredom in under-stimulating situations such as engaging in an activity when the level of individual’s skill exceeds the challenge presented (Csikszentmihalyi, 1990). This latter type of boredom is more context-dependent and would be considered state boredom,
suggesting the experience of boredom is short-term and will change based on the stimulus presented. This state-trait distinction in regards to healthy leisure is addressed in further depth later within this chapter. Using the LACE model as a framework serves to unpack the multi-dimensional nature of leisure experience by combining both subjective and objective conceptualizations.

**Leisure as a Context of Risk and Development**

Caldwell’s LACE model (2011) attempts to provide a broader, ecological conceptualization of leisure taking into account intrapersonal, interpersonal, and environmental factors that may facilitate or diminish adolescent leisure experience. Such factors are important to understand as they “combine to create conditions that either serve to protect the youth from negative or risky behaviors or promote positive and healthy development” (Caldwell & Faulk, 2013, p. 50). Although not an exhaustive list by any means, what follows will illustrate examples of protective and developmentally beneficial elements of the leisure context (e.g., intrinsic motivation, activity type) and the potential for risk associated with the leisure context (e.g., peers) to further an understanding of the importance of leisure.

There are a number of salient contexts in which adolescent development takes place including school, work and family. Leisure has been termed the “fourth developmental context” (Silbereisen & Todt, 1994; van Vliet, 1983) due to its potential for growth and facilitation of optimally satisfying experiences. Caldwell and Smith (2006) suggest that

of all the contexts in an adolescent’s life, leisure has great potential for personally meaningful activity, enjoyment, autonomy, self-determination, becoming
connected to community, developing competence, forming durable relationships with adults, voicing opinions, being listened to, feeling a sense of belonging and mattering, and having control over one’s actions. (p. 400)

Although leisure provides the opportunity for development and growth, it also provides the opportunity for exploration and potential for engagement in risk behavior (Caldwell & Darling, 1999). Risk behavior is a broad term encompassing health behaviors that are associated with negative outcomes; however this dissertation focuses solely on substance use, reflected in the empirical examples provided.

**Leisure Motivation**

In the previous quote, Caldwell and Smith argued that leisure provides developmental opportunities that may not exist to the same extent within the school, work, or home environment. For example, although the school environment presents adolescents with both challenge and complexity, experiences of intrinsic motivation are lacking (Larson, 2000) which, over time, leads to students exerting less effort and consequently achieving lower grades (Eccles, Lord, & Midgley, 1991). The school environment is intended to be a structured setting where adolescents often act as passive participants who are told where and when to meet and what topic to study by an authoritative figure. Consequently, it’s not surprising that experiences of intrinsic motivation and autonomy are decreased.

On the other hand, the context of leisure facilitates the experience of intrinsic motivation providing “an opportunity for agency and self-determined behavior, exploration of interests, identity development, skill development, and pursuit of meaningful and personally expressive experiences over time” (Caldwell, Patrick, Smith,
Leisure provides a context where adolescents can be a producer of their own environment through involvement, initiative, and enjoyment; circumstances that facilitate positive, healthy development (Hunter & Csikszentmihalyi, 2003, Larson & Kleiber, 1993). In theory, leisure is the only context where adolescents can freely choose what to do, when to do it, and whom to do it with. These are all choices which enhance, rather than restrict, intrinsic motivation; an experience that Ryan and Deci suggest is necessary for “optimal functioning” (2000, p. 68).

While intrinsic motivation is associated with positive development, adolescents who experience amotivation (lack of intention to act) also tend to experience degraded leisure experiences, becoming vulnerable to the influence of and engaging in substance use with peers (Caldwell, Baldwin et al, 2004; Caldwell & Smith, 2006).

Activity Type or Format

The benefits of structured and unstructured activities have been well documented. Structured activities such as extracurricular activities have been associated with a variety of developmental outcomes (e.g., academic achievement, initiative, and competence), while research related to unstructured activities such as unsupervised time with peers has demonstrated associations with risk outcomes (e.g., binge drinking and illicit substance use; Caldwell, 2008; Caldwell & Smith, 2006; Osgood, Wilson, Bachman, O’Malley, & Johnston, 1996). Participation in structured activity facilitates growth of a variety of developmental assets including acquiring and practicing life skills, developing a social network, and identifying with a valued and recognized group. Participating in structured activities also is related to benefits such as educational attainment, higher levels of self-esteem, and increased feelings of agency (Caldwell, 2008; Larson, 2000; Larson &
Verma, 1999). For example, engagement in extracurricular and service activities (e.g., volunteer, church) during high school was found to serve as a protective factor and was associated with lower levels of alcohol and drug use (Eccles et al., 2003). Benefits have also been demonstrated long term with longitudinal studies showing a positive association between youth activities and later community participation as an adult, illustrative of active participation in one’s environment (e.g., volunteerism, political organizations, arts, sports; Larson, 2000).

Some types of unstructured and unsupervised activities such as hanging out or talking on the phone may contribute to a variety of risk behaviors including substance use (Osgood & Anderson, 2004). The negative outcomes associated with unstructured and unsupervised activities often occur within a social setting. Research has found that unsupervised and unstructured time spent with peers may be associated with multiple risk factors including binge drinking, tobacco use, and illicit substance use (Barnes, Welte, Hoffman, & Dintcheff, 2005; Barnes et al., 2007; Osgood et al., 1996). Additionally, substance use by risky peers has been associated with adolescent substance use, even in the presence of both internal and external protective factors, demonstrating the unhealthy potential for social settings (Syvertsen, Cleveland, Gayles, Tibbits, & Faulk, 2010).

**Protective Attributes of Leisure**

There are many aspects of leisure participation and experience that may be considered as protective from a Problem Behavior Theory (PBT; Jessor & Jessor, 1977) perspective. Many of the positive developmental aspects of the leisure context map onto substance use protective factors (e.g., self-control, academic competence, social support) specified by the National Institute on Drug Abuse (2003). Protective factors can be
internal (e.g., life satisfaction, physical activity) or external (e.g., community recreation opportunities, influence of parents and friends) and serve as a buffer to reduce or delay onset of substance use (Syvertsen et al., 2010). Leisure has been viewed as a protective factor due to attributes of self-determined and autonomous pursuits, deriving personal benefit from intrinsically motivating activity, and feelings of competence and self-efficacy (Caldwell, 2005). Research supports this view finding positive leisure experiences to be associated with less of a desire to seek out substance use (Sharp et al., 2011).

**External Influences of Leisure**

External factors can influence the quality of the leisure experience. During adolescence, there are two powerful external influences on leisure: the parent(s)/guardian(s) and peers. Although peer relationships (previously discussed) have been found to be extremely influential, this section focuses only on the role of the parent, which is analyzed within Chapter 2. Adolescence is a period of change where parents and adolescents have to balance the desire for increased autonomy with the protective role of the parent. Characteristics of the parent including parenting style (e.g., authoritative), degree of parental monitoring, and how much control the parent exerts can serve as a protective factor or a risk factor for adolescent substance use (Borawski, Ievers-Landis, Lovegreen, & Trapl, 2003). For example, over-protection, or over-control, by adults and societal institutions (e.g., laws, curfews, or structured sports programs) may be detrimental to adolescents who lack the freedom to develop skills used to initiate and engage in meaningful leisure pursuits (Kloep & Hendry, 2007). Chapter 2 further details
the role of parental over-control and its potential contribution to leisure and substance use.

**Theoretical Foundation**

Within the current studies, Problem Behavior Theory (PBT; Jessor & Jessor, 1977) is used to describe the anticipated relationship between healthy leisure and substance use. PBT is a social psychological framework developed to explain risk behavior (e.g., substance use, risky sexual behaviors) through three inter-related systems: personality (e.g., goal motivation, personal values, expectations, control), perceived environment (e.g., social context, peer and family approval), and behavior system (e.g., conventional vs. problem behavior structures). This theory suggests health risk behaviors co-occur as a result of an adolescent’s tendency for unconventionality (Jessor & Jessor, 1977) and is a cyclical process where engagement in one risk behavior is associated with an increased tendency to engage in additional risk behaviors.

Within the past few decades, PBT has been extended to health behaviors. In this extension, problem or risk behaviors are viewed as health-compromising behaviors and protective factors as health-enhancing behaviors (Jessor, 2008). Donovan, Jessor, and Costa (1991) posited that health-enhancing behaviors are socially normative and supported by society, institutions, parents, and peers, and adolescents would therefore be encouraged to adopt such behaviors. Donovan, Jessor, and Costa (1993) further investigated specific health-enhancing behaviors and how they contributed to health-related lifestyles in adolescents. Six latent measures of health-enhancing behaviors (i.e., safety, sleep, diet, exercise, low sedentary behavior, and dental care) were explained by one common factor, suggesting behaviors are “not a set of completely isolated,
independent behaviors; rather, there is at least a modest degree of organization…” (p. 357). Following the same perspective as Donovan and colleagues where engagement in health-enhancing behaviors suggests a health-focused lifestyle, we view healthy leisure as an additional factor indicative of a health-focused lifestyle and a health-enhancing orientation.

Empirical results provide support for this extension to health behaviors, finding greater psychosocial conventionality to be associated with engagement in health-enhancing behaviors and lower engagement in health-compromising behaviors. More specifically, greater involvement in risk behavior (e.g., substance use, delinquency) is associated with lower levels of engagement in healthy behaviors or a healthy lifestyle (e.g., value on health, health self-description; Donovan, Jessor, & Costa, 1991). Costa, Jessor, Fortenberry, and Donovan (1996) identified similar results when analyzing contraceptive use in adolescents. Findings indicated greater contraceptive use (indicative of a healthy lifestyle) was associated with less engagement in substance use and delinquency and greater engagement in health behaviors and attitudes such as exercise and attention to a healthy diet. A more recent study examining fruit and vegetable intake found higher levels of intake associated with lower levels of substance use and higher levels of seatbelt use, sunscreen, and engagement in self-screening procedures (e.g., breast and testicular) in college-aged men and women (Adams & Colner, 2008).

Leisure-specific research has demonstrated a negative association between health risk behavior and health-enhancing behaviors. A recent meta-analysis focusing on smoking and leisure found most articles identified a negative relationship between smoking cigarettes and physical activity as well as sport participation in youth.
(Kaczynski, Mannell, & Manske, 2008). Sharp and colleagues (2011) also identified a negative association between healthy leisure and substance use, but within a SA adolescent sample. Collectively, these studies support PBT’s extension to health behaviors and demonstrate its applicability to understanding the association between healthy leisure and risk behavior.

**Healthy Leisure**

Understanding what healthy leisure is and means to people is challenging because both terms, health and leisure, are complex and difficult to define individually, let alone as a construct. The World Health Organization (WHO) defines health as a “state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (1992, p.1). This definition suggests health is more than avoiding disease, death, or injury; it’s about optimal functioning at both the individual and societal level (Brundtland, 2002). Much like the concept of leisure, the definition of health is broad, providing flexibility for individuals to define it in such a way that maximizes their own well-being. This is illustrated by the various measures used to capture health, which range from broad subjective measures (e.g., well-being, quality of life) to precise biological measures (e.g., blood pressure, cortisol).

Given the lack of a specific definition and measure of health and the multiple definitions and measures of leisure, it is challenging to identify how best to conceptualize healthy leisure, a fairly new concept within both leisure and developmental research. Few scholars have attempted to define, measure, or study the concept of healthy leisure and thus it remains not well understood. Mannell and Kleiber (1997) found individuals exhibit a great interest in living healthier lifestyles, however only a few articles have
focused specifically at the association between healthy leisure and health risk behavior, demonstrating need for further investigation into this association. Some articles include offhand references to healthy leisure, but only two previous articles have conducted studies analyzing healthy leisure and substance use.

Sharp and colleagues (2011) conceptualized healthy leisure as the extent to which leisure is experienced as good and healthy and examined its relationship with substance use and whether changes in healthy leisure predicted changes in substance use over time. They found higher levels of healthy leisure at baseline were associated with lower levels of alcohol and marijuana use and increasing levels of healthy leisure over time were associated with a decreased likelihood of using alcohol, tobacco, and marijuana.

In the second article, Caldwell and colleagues (1998) explored healthy leisure behaviors (measured as time spent in physical activity and one subjective measure) of lesbian, gay, and bisexual adolescents. Results indicated that non-gay adolescents were more likely to report engaging in healthy leisure behaviors when compared to their lesbian, gay, and bisexual counterparts. Adolescents who consistently engaged in positive health behaviors were more likely to continue such participation into adulthood, suggesting that healthy leisure habits developed during adolescence would continue into adulthood (Le Menestrel & Perkins, 2007).

Despite the lack of a concrete definition of healthy leisure, a few individuals have suggested what may make a leisure activity healthy. Although not empirically tested, Godbey (2010) identified characteristics of healthy leisure, which included being an active participant in one’s environment, being creative, engaging in meaningful activities, being optimistic, using one’s senses to understand and appreciate surroundings, humor,
and social relations or networks. Additionally, Wilhite, Keller, Hodges, and Caldwell (2004) interviewed individuals with multiple sclerosis and found common themes to a healthy leisure lifestyle included appreciation, relaxation, relationship building, altruism, legacy building, enjoyment, and anticipation.

**Healthy Leisure in the Current Studies**

Continuing with Caldwell’s LACE model as a framework, healthy leisure was broadly viewed as any characteristic, skill, or behavior facilitating a protective context of leisure. Since healthy leisure is so poorly defined, the current studies took an exploratory approach and used factor analysis to identify latent constructs indicative of healthy leisure. Godbey (2010) noted that healthy leisure varies from person to person, making it challenging to provide a general definition of the topic. As previously described, the same phenomenon occurs with leisure; although there may be typical characteristics of leisure, it is also a subjective experience. Given our exploratory approach to conceptualizing healthy leisure, the current studies attempted to address these varied meanings by using a person-centered analytic approach to account for between- and within-person differences.

In Chapter 2, individual changes in healthy leisure were captured by separating the variable into person-specific, or trait, and occasion-specific, or state, components as these two types of healthy leisure may be differentially associated with substance use. For example, SA does not require physical education within the school curriculum. Consequently, females may be excluded from physical activity while males are encouraged to participate in extra-curricular activities. The South African Minister of Sport is dedicated to building additional sport centers within high schools and including
physical education, or sports periods, during school. However, the stated purpose is to recruit young talent to “right inequalities in opportunities and development in sport”; initiatives that historically have targeted predominantly male sports like rugby and soccer (Edwards, 2011). Such regulatory constraints for physically active sport participation may contribute to low levels of trait healthy leisure, especially in females. In contrast, factors such as peer approval may be a contributor to state healthy leisure. Palen and colleagues (2010) collected qualitative data on the leisure constraints of SA adolescents. Peers were identified as an interpersonal constraint with one 10th grade girl stating:

Say for instance you wanna dance and you can’t and there’s, like, other children or friends would say, “No, sit down, you can’t dance, don’t try it.” And then it makes you feel bad because they not even saying it, “Okay, we gonna help you dance, get rhythm.” They just say, “Sit. You can’t.” (p. 443)

This girl’s peers were critical of her dancing, however they may be supportive of other activities she engages in where they perceive she possesses greater skill or where the activity is more socially acceptable.

In Chapter 3, latent trajectories of substance use were identified, accounting for the heterogeneity in adolescent substance use development, and the influence of healthy leisure on each group’s trajectory. Healthy leisure’s influence was modeled using an individual’s average across all available measurement occasions, most similar to trait healthy leisure described previously.

**Dissertation Aims**

This dissertation aims to develop a more complete understanding of how healthy leisure in adolescence is associated with substance use development. It addresses the lack
of literature related to adolescent leisure in developing countries by using longitudinal data to identify the impact of healthy leisure on health risk behavior, specifically substance use, of adolescents in the developing nation of South Africa. Research addressing leisure behaviors in SA is limited, but existing literature has found associations between leisure experiences (e.g., boredom, motivation, parental control) and health risk behavior (Caldwell et al., 2010; Wegner et al., 2006).

My involvement with the HealthWise South Africa project afforded me the opportunity to utilize previously collected data to examine the association between healthy leisure and substance use over up to eight measurement occasions. This dataset included multiple items (collected at each wave) specifically addressing healthy leisure and substance use.

**Study #1**

The first study analyzed the association between substance use and state and trait healthy leisure and the moderating effect of perceived parental over-control while controlling for gender. Treatment was also added as a predictor in the model to determine if and how treatment influenced the association between substance use and healthy leisure. Previously collected data were analyzed using multi-level modeling where healthy leisure was separated into trait (i.e., developmental course of healthy leisure over time) and state variables (i.e., fluctuations around the developmental course of healthy leisure on each measurement occasion). This approach used longitudinal data and accounted for the nesting of occasions within individuals by measuring the level of association between healthy leisure and substance use on each measurement occasion. This study addressed the need for research related to leisure behaviors and experiences to
understand within- and between-person factors and influences (moderators) of these factors.

**Study #2**

The second study took a person-centered approach to analyzing the relationship between healthy leisure and substance use. Person-centered approaches attempt to account for the heterogeneity within the sample and provide an advantage over variable-centered approaches (which assume sample homogeneity) to inform prevention science efforts. By identifying subgroups that benefit differentially from the treatment provided, intervention strategies can be tailored to maximize benefits. Within this study, latent subgroups of substance use trajectories were identified with growth mixture modeling using previously collected data. Next, healthy leisure was included as a covariate to determine the impact of healthy leisure on each subgroup. This study provided feedback related to the benefits of healthy leisure at varying levels of substance use.

These two studies served to address the lack of research specific to healthy leisure and limitations of available literature related to leisure experience and risk behavior. Study #1 looked at the covariation or coupling of healthy leisure and substance use at each measurement occasion at multiple levels (i.e., within- and between-person). Rather than looking at this association at each measurement occasion, study #2 looked across measurement occasions to identify latent groups of substance use trajectories to better understanding developmental patterns of substance use in the sample, and associated these trajectory groups with healthy leisure to determine the differential influence on groups with varying levels of risk. Collectively, these studies serve to inform prevention science by beginning to differentiate between state vs. trait healthy leisure and how these
different constructs relate to substance use (study #1), and identifying a typology of adolescents that may benefit most from a targeted leisure-focused intervention (study #2).
References


Chapter 2. THE DYNAMIC ASSOCIATION BETWEEN HEALTHY LEISURE AND SUBSTANCE USE IN SOUTH AFRICAN ADOLESCENTS: A STATE AND TRAIT PERSPECTIVE

Introduction

In South Africa, adolescent drug use is widespread. The most recent SA Youth Risk Behavior Survey (Reddy et al., 2010) found 30% of 8th to 11th graders surveyed have smoked cigarettes in their lifetime and 21% were currently smokers. Alcohol use rates were even higher with 50% having ever consumed alcohol, 35% using alcohol within the past month, and 29% binge drinking within the past month. Rates of other substances were lower, with 13% of students having ever used marijuana, 12% having ever used inhalants, and 7% having ever used methamphetamines (i.e., tik). Flisher, Parry, Evans, Muller, and Lombard (2003) surveyed 2,930 students in grades 8 through 11 in Cape Town, SA to identify prevalence and correlates of substance use. They found past month substance use rates to be 27% for tobacco, 31% for alcohol, and 7% for marijuana with increasing rates of use between grade 8 and grade 11 (except for Black females). A significant association was found between past month substance use and days absent from school, repeating a grade, and length of time living in the city, even after controlling for grade and school. These findings are especially of interest as the current study sample also focused on the Cape Town, SA geographical area. Related to initiation of substances, SA adolescents have demonstrated similar patterns of initiation to those of US adolescents where alcohol or tobacco is tried first, followed by marijuana and
inhalants; however, SA adolescents transition through substances at a faster rate than US adolescents (Patrick et al., 2009).

One means to addressing adolescent risk behavior is by targeting skills, behaviors, and experiences in free-time, or leisure. There is a recognized need for developing skills in adolescent substance users related to constructively using free time and engaging in appropriate social interactions (Jainchill, 2000). Unfortunately, studies have historically “over-looked leisure-related factors as correlates and causes of substance use” in adolescents and consequently leisure’s contribution to adolescent health behavior remains an area in need of research (Freire & Caldwell, 2013; Iso-Ahola & Crowley, 1991, p. 261). Although the association between leisure and health risk behavior (e.g., substance use, risky sexual behavior, and delinquency) has received increasing attention within past few decades, some facets of leisure, specifically healthy leisure, continue to be largely ignored. Investigating the relationship between healthy leisure and substance use, and moderating characteristics, will help to better understand and be explicit about what characterizes good and/or healthy leisure and how such healthy leisure may buffer against risk behaviors (Godbey, Crawford, & Shen, 2010).

South Africa is a developing nation with an increasing adolescent substance use problem (Wegner, Flisher, Muller, & Lombard, 2006), lack of leisure/recreation opportunities and resources (Caldwell et al., 2004), and high incidence of adolescent discretionary time (Kingdon & Knight, 2004; Wegner & Magner, 2002). Little research has focused on the leisure behaviors and experiences of these adolescents, how such experiences may be associated with risk behavior, and potential moderators of these relationships. Previously collected qualitative data suggests one such moderator may be
perceived parental over-control. Palen and colleagues (2010) found parents to be the most common interpersonal constraint to leisure mentioned within focus groups of SA adolescents. When parents were perceived as too controlling, adolescents reported they responded by disobeying parental rules.

The current study, guided by Problem Behavior Theory, used multi-level modeling and made use of up to eight repeated measurement occasions to understand how both a stable healthy leisure lifestyle (trait) and context-specific healthy leisure state contributed to adolescent substance use and whether a parental factor (i.e., perceived parental over-control) moderated these relationships.

**Conceptual and Theoretical Framework**

Figure 2.1 illustrates a broad conceptual framework for the current study. Guided by Problem Behavior Theory (Jessor & Jessor, 1977), we expected healthy leisure, separated into state and trait measures, to be negatively associated with substance use, and for perceived parental over-control to moderate these relationships. Each of these components is discussed in further detail.

**Problem Behavior Theory**

Problem Behavior Theory (PBT; Jessor & Jessor, 1977) is a social psychological framework developed to explain risk behavior (e.g., substance use, risky sexual behaviors) through three inter-related systems: personality (e.g., goal motivation, personal values, expectations, control), perceived environment (e.g., social context, peer and family approval), and behavior system (e.g., conventional vs. problem behavior structures). This theory suggests health risk behaviors co-occur as a result of an adolescent’s tendency for unconventionality (Jessor & Jessor, 1977) and is a cyclical
process where engagement in one risk behavior is associated with an increased tendency to engage in additional risk behaviors.

Within the past few decades, PBT has been extended to health behaviors where problem or risk behaviors are viewed as health-compromising behaviors and protective factors as health-enhancing behaviors (Jessor, 2008). Donovan, Jesser, and Costa (1991) posited that health-enhancing behaviors are socially normative and supported by society, institutions, parents, and peers, and adolescents would therefore be encouraged to adopt such behaviors; a view supported by qualitative data from SA reporting that adolescents perceived disapproval of substance use from parents, teachers, and peers (Morojele, Brook, & Kachieng’a, 2006). Donovan, Jesser, and Costa (1993) further investigated specific health-enhancing behaviors and how they contributed to health-related lifestyles in adolescents. Six latent measures of health-enhancing behaviors (i.e., safety, sleep, diet, exercise, low sedentary behavior, and dental care) were explained by one common factor, suggesting behaviors are “not a set of completely isolated, independent behaviors; rather, there is at least a modest degree of organization…” (p. 357). Following the same perspective as Donovan and colleagues where engagement in health-enhancing behaviors suggests a health-focused lifestyle, we viewed healthy leisure as an additional factor indicative of a health-focused lifestyle and a health-enhancing orientation.

Empirical results provide support for this extension to health behaviors, finding greater psychosocial conventionality to be associated with engagement in health-enhancing behaviors and lower engagement in health-compromising behaviors. More specifically, greater involvement in risk behavior (e.g., substance use, delinquency) is associated with lower levels of engagement in healthy behaviors or a healthy lifestyle
Costa, Jessor, Fortenberry, and Donovan (1996) identified similar results when analyzing contraceptive use in adolescents. Findings indicated greater contraceptive use (indicative of a healthy lifestyle) was associated with less engagement in substance use and delinquency and greater engagement in health behaviors and attitudes such as exercise and attention to a healthy diet. A more recent study examining fruit and vegetable intake found higher levels of intake associated with lower levels of substance use and higher levels of seatbelt use, sunscreen, and engagement in self-screening procedures (e.g., breast and testicular) in college-aged men and women (Adams & Colner, 2008).

Leisure-specific research has demonstrated a negative association between health risk behavior and health-enhancing behaviors, including leisure activities. A recent meta-analysis focusing on smoking and leisure found most articles identified a negative relationship between smoking cigarettes and physical activity as well as sport participation in youth (Kaczynski, Mannell, & Manske, 2008). Sharp and colleagues (2011) also identified a negative association between healthy leisure and substance use, but within a SA adolescent sample. Collectively, these studies support extending PBT to include health.

**Current study context.** The current study utilizes data collected from high school students in the Mitchell’s Plain area of Cape Town, South Africa. This is an area created under the Apartheid regime where individuals and families who were designated as Coloured (i.e., mixed ancestry) by the Population Registration Act of 1950 were required to live. Although Apartheid no longer exists, Mitchell’s Plain remains predominately inhabited by Coloured individuals, reflected in characteristics of the current sample.
Participants in the current study were overwhelmingly Coloured (91%) and demonstrated similar levels of socio-economic status (SES) measured by running water in the home (93%), electricity in the home (97%), and type of home structure (79% resided in a brick house). In addition to consistent levels of SES within the sample, all participants were exposed to a similar environmental context where substance use and gangsterism were present within the area and the setting lacked recreational opportunities and/or equipment. Due to this, no additional contextual factors were controlled for within the sample as these variables lacked sufficient variability for analyses.

Healthy Leisure and Substance Use

Although many articles make offhand references to healthy leisure, few articles to date have explicitly defined and measured the concept. Mannell and Kleiber (1997) found individuals were exhibiting a great interest in living healthier lifestyles, however only a few articles have looked specifically at the association between healthy leisure and health risk behavior, demonstrating need for further investigation into this association. Only two previous articles have reported on studies analyzing healthy leisure and substance use.

The first article used cross-sectional data from 2,756 high school students in the United States to compare three groups of adolescents who self-identified as either homosexual, heterosexual, or questioning their sexual identity. The construct of healthy leisure was measured with two items including a measure of frequency of strenuous aerobic activity and a second subjective measure where respondents rated their agreement with the statement “I try to do things in my free time that are healthy for me” (Caldwell, Kivel, Smith, & Hayes, 1998, p. 346). Results indicated that adolescents who self-identified as homosexual or questioning their sexual identity were less likely to engage in
healthy free time activities and more likely to engage in binge drinking as compared to their heterosexual peers. Although this study did not analyze the association between healthy leisure and substance use, it was the earliest study found to explicitly measure healthy leisure.

In the second article, Sharp and colleagues (2011) used longitudinal data to look at whether leisure experiences, including healthy leisure, predicted change in past month substance use (i.e., tobacco, alcohol, marijuana) in South African adolescents. Within the sample (N=1,118), levels of healthy leisure remained fairly stable across seven measurement occasions (range 2.56-2.65 on 0-4 scale). Results from a generalized linear model for binary outcomes indicated that at a between-persons level, a one unit increase in baseline healthy leisure was associated with a decreased likelihood of using alcohol and marijuana in the past month by 22% and 40% respectively (no significant association was found for marijuana). At a within-person level, a one unit increase in healthy leisure was associated with a decrease in the likelihood of using all three substances in the past month (alcohol, 17%; tobacco, 24%, marijuana, 35%).

Since healthy leisure is so poorly defined, the current study took an exploratory approach, guided by the Leisure Activities-Context-Experience (LACE; Caldwell, 2011) model, and used factor analysis to identify latent constructs indicative of adolescent healthy leisure. The LACE model attempts to provide a broader, ecological conceptualization of leisure taking into account intrapersonal, interpersonal, and environmental factors related to the specific activity, broader context, and personal experience that may facilitate or diminish adolescent leisure. Such factors are important to understand as they “combine to create conditions that either serve to protect the youth
from negative or risky behaviors or promote positive and healthy development” (Caldwell & Faulk, 2013, p. 50). The LACE model was used to identify leisure measures that may serve to encourage healthy leisure behaviors and consequently positive development. This factor analytical process will be described further in the measures section.

**Separating State and Trait Healthy Leisure**

**Substantive considerations.** Making distinctions between state and trait constructs has existed for decades within personality research (Steyer, Schmitt, & Eid, 1999) where a trait is considered to be an individual characteristic that remains relatively stable across contexts while a state is an individual’s situation-specific or context-dependent response (see Figure 2.1 for illustration). State and trait constructs are then used to represent between-person (trait) and within-person differences (state). Although uncommon within personality literature, it is possible for constructs to exhibit local heterogeneity, or varying associations with other constructs at the state and trait level (Borsboom, Mellenbergh, & van Heerden, 2003; Hamaker, Nesselroade, & Molenaar, 2007).

The LACE model described above takes into account internal and external factors that influence leisure experience and acknowledges these contextual elements such as sense of belonging, adult led/supervised activity, positive peer and parental role model, degree of challenge, and individual skill level (Caldwell & Faulk, 2013). These are all elements that are heavily context-dependent and may change from day to day or activity to activity. For example, Palen and colleagues (2010) conducted qualitative interviews with SA adolescents regarding the leisure constraints they experience. One interpersonal
constraint mentioned was criticism from their peers about their skills in an activity. One 10th grade girl stated:

Say for instance you wanna dance and you can’t and there’s, like, other children or friends would say, “No, sit down, you can’t dance, don’t try it.” And then it makes you feel bad because they not even saying it, “Okay, we gonna help you dance, get rhythm.” They just say, “Sit. You can’t.” (p. 443)

This girl’s peers were critical of her dancing; however they may be supportive of other activities she engages in where they perceive she possesses greater skill.

Because of the potential for differential relationships at the state and trait level and the context-dependent nature of leisure experience, it was important for the current study to examine the association between substance use and both state and trait healthy leisure to tease out any discrepant effects. In addition to the substantive issues mentioned, methodological issues will be discussed.

**Methodological considerations.** One limitation of empirical PBT work is that conventionality and unconventionality (or health compromising and health enhancing) orientations may not lie on opposing ends of a uni-dimensional spectrum. A study of problem and positive behaviors in American Indian adolescents identified a significant correlation between latent problem and positive behavior factors; however this correlation was small and accounted for only 4% of the total variance. The authors summarized that adolescents in the sample “were neither ‘good’ kids nor ‘bad’ kids; as a group, they represented a complex mixture of problem and positive behaviors” (Mitchell & Beals, 1997, p. 277).
One explanation for such small correlations may be that many of these comparisons between health-compromising and health-enhancing behaviors are occurring at the between-person level and ignoring within-person variability. When between-person comparisons are used solely, not only is within-person variability being ignored, but incorrect conclusions may also be reached. Such aggregate between-person results have the potential to miss or mask conflicting results at the within-person level, resulting in a lack of generalizability (Molenaar, 2004). Schwartz and Stone (1998) provide an example of this issue using physical activity and blood pressure. At the between-person level, higher levels of exercise are associated with lower average levels of blood pressure; however, at the within-person level, on occasions when individuals engage in physical activity, they also have an increase in blood pressure. By looking at only the between-person averages, the contrasting within-person associations would have been missed. In addition, confounding or moderating effects may differentially influence between- and within-person factors.

Utilizing methodology from ecological momentary assessment (EMA) work, the current study separates healthy leisure into between- and within-person predictors of substance use. Previous studies using PBT often make use of cross-sectional data, only allowing for between-person comparisons. Similar to EMA studies which “…usually focus on how changes from one assessment to another in predictors relate to changes in outcome measures” (Schwartz & Stone, 1998, p. 7), the current study will make use of up to eight repeated measurement occasions to identify predictors of both trait and state healthy leisure. By making use of both state and trait healthy leisure, we can identify the differential effects of average levels of healthy leisure (trait) and occasion-specific
deviations around that average (state) on substance use and moderators of these associations, specifically parental over-control. One important distinction to make within the current study and typical EMA studies is that the current study was limited to biannual measurement occasions while EMA studies are often comprised of intensive longitudinal data. Consequently, when state healthy leisure is referenced, it represents a longer time period.

**Perceived Parental Over-Control**

The role of the parent in adolescent substance use has received increased attention over the last few decades, with parental monitoring factors such as control, emerging as important predictors of adolescent substance use. Dishion and McMahon (1998) have defined parental monitoring as “a set of correlated parenting behaviors involving attention to and tracking of the child’s whereabouts, activities, and adaptations” (p. 61). These authors also discuss the difficulties in defining parental monitoring when different fields and disciplines create definitions and measures suited to their area(s) of interest. Previous measures of parental monitoring include concepts such as parental knowledge, child perception of parental knowledge, child disclosure, parental solicitation, parental control, and parental support (Keijsers, Branje, VanderValk, & Meeus, 2010; Kerr & Stattin, 2000). The current study analyzed perceptions of parental over-control as a moderator of the association between healthy leisure and substance use.

As with many other factors of parental monitoring, parental control has not been consistently defined and measured (Barnes & Farrell, 1992). One definition of parental control refers to it as “parental behaviors toward the child which are intended to direct the child’s behavior in a manner acceptable to the parent” (p. 764). Previous studies have
measured parental control through coercive (e.g., slapping, hitting, grounding) constructs, inductive (e.g., verbal warnings) constructs, and perceived psychological control (from both parents and child; Carlton-Ford, Miller, Nealeigh, & Sanchez, 1997). Although no agreed-upon conceptualization exists, prior measures indicate that capturing the adolescent’s perceptions of parental over-control may represent a more valid depiction of the construct of interest. For example, if the adolescent does not perceive parental actions and attitudes as controlling, there may be no adverse consequences.

Kloep and Hendry (2007) argued that over-protection, or over-control, of adults and societal institutions (e.g., laws, curfews, or structured sports programs) may be detrimental to adolescents who lack the freedom to develop skills used to initiate and engage in meaningful leisure pursuits. Instead, these pursuits may be meticulously planned, organized, and implemented by often well-intentioned adults (e.g., helicopter parenting). This may lead to a negative cyclical process whereby adults expect adolescents to constructively use their leisure time and when they fail to (because they haven’t had the opportunity to develop appropriate skills) adults exert even more influence and control over leisure time use. Authors sum up this issue saying “It might be (developmentally) risky not to take risks from time to time!” (p. 6).

From a developmental perspective, personal control has been associated with enhanced well-being and health in adults and Kerr and Stattin suggest the same may hold true for adolescents (2000). Previous research findings support these views and suggest parental over-control interferes with acquisition of developmental tasks and abilities such as problem solving skills and successful negotiation of stressful experiences (Fox & Calkins, 2003; Krohne & Hock, 1991). Parents who are perceived of as too controlling by
adolescents may influence leisure experiences through reductions in autonomy, initiative, and self-determined activities (Sharp, Caldwell, Graham, & Ridenour, 2006). Such experiences of autonomy are central to self-determined behavior (Ryan & Deci, 2000), which has been associated with positive development in adolescence (Caldwell & Witt, 2011; Watts & Cremeens, 2010).

**Perceived parental over-control and healthy leisure.** Kloep and Hendry’s view, and supporting empirical examples, are all indicative of the potential for perceived parental over-control to moderate the relationship between trait healthy leisure and substance use. As mentioned previously, if adolescents lack the opportunity to develop and refine skills and abilities critical to engaging in developmentally beneficial and meaningful leisure activities, levels of trait healthy leisure may tend to be low. In turn, adolescents may look to risky peers to aid them in structuring activities.

Palen and colleagues (2010) collected qualitative data from SA adolescents regarding experiences of leisure constraints. Respondents mentioned parents, and specifically overprotective parents, as the most frequent interpersonal constraints they experienced and indicated parents were most often trying to keep them safe and were concerned about danger within the neighborhood and from local peers. Results from the national SA Youth Risk Behavior survey conducted in 2008 support these qualitative comments and found 10% of the sample reported not engaging in physical activity in the past week did so due to safety concerns and feeling frightened (Reddy et al., 2010). At the state level, the influence of perceived parental over-control may be context specific and dependent upon the specific type of activity (e.g., school dance team vs. hanging out at a friend’s house), safety of the surrounding community the activity is taking place in
(e.g., known gang activity in the area), and social characteristics of the activity (e.g.,
structured activity with peers vs. hanging out with older adolescents).

**HealthWise South Africa**

Using a leisure-focused intervention has shown promise in reducing substance use
in SA adolescents. HealthWise (HW) South Africa, a school-based prevention program
designed to reduce substance use and risky sexual behavior by targeting positive use and
experiences of free time, is one such program that has demonstrated positive results
(more detailed information within Methods section; Caldwell et al., 2004). Students
within the HW intervention group had lower rates of past month alcohol and tobacco use,
and were less likely to binge drink within the past 30 days as compared to the control
group (Smith et al., 2008). Related to leisure, HW students reported higher rates of
leisure-related intrinsic motivation and lower rates of amotivation, which has been
previously associated with substance use (Caldwell et al., 2008).

Individuals exposed to HW received lessons targeting skills necessary for
engaging in healthy leisure pursuits and consequently, we anticipated that the relationship
between healthy leisure and substance use would be dependent upon whether they
received treatment or not. This was tested by an interaction term (treatment by healthy
leisure).

The current study broadly analyzed the association between healthy leisure and
substance use. It was hypothesized that (1) at a between-person level, lower levels of trait
healthy leisure would tend to be associated with higher levels of substance use, (2) at a
within-person level, on occasions when a student is lower than average on state healthy
leisure, he or she will tend to use more substances, (3) perceived parental over-control
(PPOC) will moderate the association at both the state and trait level such that even individuals with high health levels of healthy leisure may use more substances when PPOC is high, and (4) treatment will moderate the relationship between substance use and healthy leisure. In addition, gender, cohort, and school were included in the model as confounders.

**Methods**

**Participants and Procedures**

Participants \((N=5799)\) consisted of students from nine schools in Mitchell’s Plain, a low-income township approximately 15 miles outside of Cape Town, South Africa who participated in an effectiveness trial of HealthWise South Africa, a school-based life skills curriculum intervention addressing adolescent health risk behavior (see Caldwell et al., 2004). At the outset of the trial, 25 schools in the local area were considered for inclusion. Of these, four were excluded due to implementation concerns, four were randomly assigned to receive the HW curriculum, and five schools were chosen as matched no-treatment control schools. As previously mentioned, this homogeneous sample was chosen specifically in an attempt to control for environmental and socio-economic factors thereby allowing within-person differences to stand out more clearly.

The study and its passive parental consent and adolescent assent procedures were approved by the Institutional Review Boards at study-affiliated universities and by school administrators. Students were followed longitudinally in three cohorts starting in 8th grade. Cohort 1 was followed from 8th through 11th grade with data collected at eight biannual measurement occasions between March 2004 and October 2007. Cohort 2 was
followed from 8<sup>th</sup> to 10<sup>th</sup> grade with data collected at six bi-annual measurement occasions between March 2005 and October 2007. Cohort 3 was followed from 8<sup>th</sup> to 10<sup>th</sup> grade with data collected at five bi-annual measurement occasions between March 2006 and March 2008. Students completed bi-annual surveys using personal digital assistants (PDAs) at the beginning and end of each grade during school hours for approximately 30 minutes. The survey was available in two languages and administered in the student’s home language (English or Afrikaans). Research staff was available at survey administrations to answer questions or assist with difficulties.

**Treatment**

Individuals in the treatment or intervention schools participated in an effectiveness trial of the HealthWise South Africa: Life Skills for Adolescents curriculum, which targets prevention of substance use and sexual risk through healthy use of leisure time (see Caldwell et al., 2004 and Caldwell et al., 2012 for more detail). Supported by ecological systems theory (Bronfenbrenner, 1995) and positive youth development, the HW curriculum was implemented in grades 8 (12 lessons) and 9 (6 lessons) and was taught within the life orientation curriculum mandated by the local education district (Metro South Education District). In grade 8, HW covered topics (presented in order of lesson) including self-awareness, managing anxiety, managing anger, exploring free time, free time in the community, beating boredom and developing interests, overcoming roadblocks, decision-making, managing risk, avoiding risky sexual behavior, myths and realities of drug use, and avoiding and reducing risk; while in grade 9 lesson topics include a review of grade 8, leisure motivation, community connections, planning/managing leisure, relationships and sexual behavior, and conflict resolution.
This effectiveness trial has demonstrated positive results related to reducing both substance use and sexual risk (Smith et al., 2008) and understanding the relationship between leisure factors (e.g., boredom, activity participation) and substance use and sexual risk (Caldwell, Patrick, Smith, Palen, & Wegner, 2010; Tibbits, Caldwell, Smith, & Wegner, 2009).

**Measures**

**Substance use.** Substance use variables were collected at each measurement occasion. A composite substance use index was created based on recency and frequency of use for five substances (i.e., alcoholic drinks, tobacco, tik/methamphetamines, dagga/marijuana, and inhalants) by level of use. Students indicating no lifetime use on all measurement occasions were excluded from respective analyses. The summed index was created by assigning a higher value to higher levels of substance use. For example, alcoholic drinks was indexed as 1=Lifetime use but no past month use, 2=Lifetime use and one or fewer drinks in the past month, 3=Lifetime use and two to three drinks in the past month, and 4=Lifetime use and four or more drinks in the past month. All five substances were indexed in this manner and summed together to obtain a substance use composite.

**Healthy leisure.** To determine which healthy leisure items would be included in analyses, a principal components exploratory factor analysis with promax rotation was conducted with SAS FACTOR using 15 survey items on the full sample (see Table 2.1). Items were chosen from the full survey if they referred to subjective evaluations or specific behaviors of healthy leisure characteristics including initiative, challenge,
planning, and restructuring\(^1\). Of the 15 items, seven items were removed due factor loadings below 0.50 or crossloadings, resulting in eight items loading on two factors (identified from scree plot method; Costello & Osborne, 2005). The Kaiser MSA overall score was 0.88 and all of the final eight items had MSA scores of 0.85 or above, indicating the data were suitable for factor analysis (Tabachnick & Fidell, 2013). The final two factors accounted for 43% of the variance in the eight items and could be easily interpreted with regard to the general concept of healthy leisure. For all eight items, participants answered the extent to which they agreed with each statement using a 5-point Likert scale from 0 (\textit{strongly disagree}) to 4 (\textit{strongly agree}). Responses were averaged over the four items in each factor to obtain two latent measures where higher scores indicated higher levels of healthy leisure.

Factor 1 (see Table 2.2 for loadings) included items representing subjective perceptions of healthy leisure and was comprised of the following four items ($\alpha=.77$; see Table 2.3): “I get a lot of benefits (good things) out of my free time activities,” “The things that I do in my free time are healthy,” “I feel good about myself in my free time,” and “Having healthy free time activities can help me avoid risky behavior.” Items in this factor are similar to previous measures of healthy leisure in Sharp and colleagues (2011) analyses which found higher levels of healthy leisure tended to be associated with lower rates of substance use. This factor most closely represents a general measure of perceptions of healthy leisure and is further referred to as the \textit{healthy leisure} factor.

Factor 2 was comprised of four items ($\alpha=.76$; see Table 2.3) of: “I am confident I can plan activities for myself without help from my parents,” “I know how to plan my

\(^1\) Participants were not provided with a definition of leisure or free time at any point during survey administration.
free time activities,” “I make good decisions about what to do in my free time,” and “I know how to get the information needed to make the best choice of what to do in my free time.” Items within this factor referenced the ability to plan free time activities and is further referred to as the leisure planning efficacy factor. We hypothesized that adolescents who were able to structure their free time by making good decisions and planning for healthy activities were more likely to engage in developmentally beneficial activities.

**Moderators/confounders.** Additional variables included in the model as moderators or confounders of the association between healthy leisure factors and substance use were treatment, perceived parental over-control (PPOC), gender, cohort, and school. Both treatment and gender were dummy coded such that a value of zero referred to control participants and males respectively and then centered by subtracting the sample mean. Perceived parental over-control was measured using the average of three items (α=.73; see Table 2.3) including “My parents have too much control over what I do in my free time,” “I think my parents interfere too much in my free time,” and “There are things I would like to do in my free time but I am not allowed to do them.”

**Cohort ranged from 1-3 while school ranged from 1-9.**

**Analytic Plan**

Generalized linear multilevel models (Snijders & Bosker, 1999) were used to examine associations between state and trait healthy leisure and substance use while accommodating the nested nature of the data (measurement occasions nested within students). Multi-level models can best account for the hierarchical nature of the data and examine sources of variation both within- and between-subjects, aspects that would be
muddled with more aggregate analytic techniques. Models were estimated using PROC GLIMMIX in SAS 9.3, with incomplete data across the three cohorts treated as missing as random (Little & Rubin, 1987).

To begin, the intra-class correlation coefficients (proportion of within- and between-person variance) of healthy leisure factors were examined to determine the degree of within-person and between-person variability. High degrees of within-person variability facilitated examination of both within- and between-person associations. Biannual healthy leisure factors were then person-centered and separated into occasion-specific and person-specific components (Bolger, Davis, & Rafaeli, 2003; Schwartz & Stone, 1998).

For example, TraitHealthyFac_\text{i}, a person-level variable, was calculated as the within-person mean of a student’s healthy leisure factor scores. StateHealthyFac_\text{ti} was then calculated for each measurement occasion as the deviation of occasion-specific score from the individual mean. These scores were then used in a multi-level Poisson regression (due to the substance use composite score being non-normally distributed count data) to examine if and how student’s substance use was coupled with healthy leisure and if and how these couplings were moderated by treatment and perceived parental over-control, while controlling for gender, school, and cohort. The model was specified as:

\[
\text{Level 1: } \log(\text{SubUse}_{\text{ti}}) = \beta_{0i} + \beta_{1i}(\text{wave}_\text{ti}) + \beta_{2i}(\text{wave}^2_\text{ti}) + \beta_{3i}(\text{StateHealthyFac1}_{\text{ti}}) + \beta_{4i}(\text{StateHealthyFac2}_{\text{ti}}) + \beta_{5i}(\text{OverControl}_{\text{ti}})
\]

(1)

where student i’s substance use composite score at time t (SubUse_{\text{ti}}) was modeled as a function of person-specific substance abuse composite (\beta_{0i}), person-specific state healthy
leisure factor ($\beta_{3i}$, $\beta_{4i}$), and person-centered perceived parental over-control ($\beta_{5i}$), while controlling for the quadratic developmental course of substance use over time (see Substance Use Development results below; $\beta_{1i}, \beta_{2i}$). Person-specific parameters (level 2) were modeled as:

$$
\text{Level 2: } \beta_{ki} = \gamma_{k0} + \gamma_{k1}(\text{TraitHealthyFac1}_{i}) + \gamma_{k2}(\text{TraitHealthyFac2}_{i}) + \gamma_{k3}(\text{OverControlC}_{i}) + \gamma_{k4}(\text{GenderC}_{i}) + \gamma_{k5}(\text{TreatmentC}_{i}) + \gamma_{k6}(\text{School}) + \gamma_{k7}(\text{Cohort})
$$

where parameters include a function of the sample average ($\gamma_{k0}$), trait healthy leisure factors ($\gamma_{k1}$, $\gamma_{k2}$), mean-centered perceived parental over-control ($\gamma_{k3}$), mean-centered gender ($\gamma_{k4}$), mean-centered treatment variable ($\gamma_{k5}$), school ($\gamma_{k6}$), and cohort ($\gamma_{k7}$).

**Results**

**Sample**

The present analyses ($N=3383$) included both treatment and control students who indicated substance use at any wave and provided at least four waves of data. The sample retained for analyses was 13.8 years old ($SD=0.73$, range 12-18 years old) on average at Wave 1, predominantly Coloured (mixed ancestry; 91%), 53% were female ($n=1803$), and 63% ($n=2148$) were in the control group (see Table 2.4). To compare dropouts ($n=1294$; i.e., those with three or fewer measurement occasions) with non-dropouts, t-tests were conducted comparing dropouts and non-dropouts on age, substance use, and both healthy leisure factors while chi-square was used to compare gender at wave one. T-test results found dropouts tended to be older ($M=14.2$ vs. $M=13.8$; $t(4608) = 14.44$, $p <.0001$), used more substances ($M=4.3$ vs. $M=3.2$; $t(4675) = 11.38$, $p <.0001$) and had lower levels of both the healthy leisure factor ($M=2.6$ vs. $M=2.8$; $t(4675) = -8.83$, $p$
and the leisure planning efficacy factor ($M=2.6$ vs. $M=2.8$; $t(4675) = -8.49, p <.0001$). Chi-square test indicated dropouts tended to be male ($\chi^2(1,N=4679) = 45.49, p <.0001$).

**Substance Use Development**

The current sample was restricted to individuals who had identified lifetime substance use at any wave. To model the developmental course of substance use, linear, quadratic, and cubic growth curve models were estimated. A quadratic model fit the substance use composite index the best ($\gamma_{01}=0.279, p <.0001$; $\gamma_{02}=-0.041, p <.0001^2$) with substance use levels increasing, peaking around Wave 7, then beginning to decrease. Based on these results, a quadratic growth of substance use was controlled for in the full model ($\gamma_{10}=-0.095; \gamma_{20}=-0.044$). Gender interactions with both linear and quadratic growth were included as covariates in the full model. Results indicate males demonstrate higher levels of substance use overall ($\gamma_{04}=-0.22, p <.001$) and there are differences in growth of substance use over time by gender such that females demonstrate shallower trajectories of substance use development as compared to males ($\gamma_{14}=-0.10, p <.001$; $\gamma_{24}=-0.01, p <.001$; see Figure 2.2).

**Healthy Leisure Factors**

To determine the extent of within- and between-person variability in healthy leisure and perceived parental over-control predictors, the intra-class correlation coefficients were examined. All predictors analyzed demonstrate high levels of within-person variability including the healthy leisure factor with 64% and the leisure planning efficacy factor having 63% of the total observed variance was due to within-person

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2 Model includes only intercept, linear, and quadratic growth predicting substance use. Table of results is not provided.
variability (proportion of within- and between-person variance), facilitating examination of both state and trait associations. Perceived parental over-control (PPOC; 62%) demonstrated similar levels of within-person variability, further justifying the examination of moderating influences at both the between- and within-person level.

Table 2.5 presents results from the full model. On average, when trait healthy leisure was low, participants tended to use more substances ($ \gamma_{01} = -0.201$; see Figure 2.3). Similarly, on occasions when state healthy leisure was lower than average, participants also tended to use more substances ($ \gamma_{30} = -0.068$; see Figure 2.4). Furthermore, trait healthy leisure moderated the relationship between state healthy leisure and substance use ($ \gamma_{31} = -0.057$).

Significant two-way interactions were probed with the Johnson-Neyman technique (Johnson & Neyman, 1936) using an online calculator (Preacher, Curran, & Bauer, 2006). The healthy leisure state by trait interaction was significant for trait values over -0.57 (lower bound was outside of value range; values ranged from -2.36 to 1.18) and state values over -0.78 (lower bound was outside of value range; values ranged from -3.20 to 2.46). Thus as illustrated in Figure 2.5, lower state healthy leisure was associated with lower levels of substance use, but even more so for individuals with low levels of trait healthy leisure, or participants with low trait demonstrated shallower trajectories of substance use.

There were no significant results for the leisure planning efficacy factor at the state or trait level or for interaction terms.

Perceived Parental Over-Control as a Moderator
PPOC demonstrated a positive relationship with substance use at both a within- and between-persons level. On average, when average levels of PPOC were high, participants tended to use more substances ($\gamma_{03}=0.106$) and on measurement occasions when participants were higher than their average on PPOC, they also tended to use more substances ($\gamma_{50}=0.063$). While PPOC did significantly predict substance use, it did not moderate the relationship between healthy leisure and substance use at either the state or trait level.

**Remaining Predictors**

There were no significant main or interaction effects for treatment and it did not moderate the relationship between healthy leisure factors and substance use. School and cohort were included in the model as covariates and they were not significant so the addition of a third level (e.g., occasions nested within individuals within cohort) was not warranted.

**Discussion**

**State and Trait Healthy Leisure**

Results identified associations at both the trait and state level. We hypothesized that lower levels of trait and state healthy leisure would be associated with higher levels of substance use (hypotheses #1 & 2). These hypotheses were partially supported. Higher levels of trait healthy leisure were associated with a tendency to use fewer substances. Furthermore, on occasions when individuals experienced higher than normal levels of healthy leisure, they tended to use fewer substances. However, there was no significant association for leisure planning efficacy at either the trait or state level.
Based on Problem Behavior Theory and its extension to adolescent health behavior (Donovan et al, 1991), adolescents with greater conventionality (e.g., following parental, societal, and institutional norms) would also engage in health maintaining behaviors (e.g., exercise, healthy leisure activities, and healthy foods). Our results support PBT such that individuals who are experiencing healthy leisure also report less substance use.

**Healthy leisure factor.** There are multiple facets of the SA context that may be influencing the relationship between substance use and healthy leisure at both the trait and state level. Before discussing these influences, it should be noted that within the current study, measurement occasions occurred during each school semester or once in March and once in October. Consequently, when state healthy leisure is referred to, it represents bi-annual fluctuations of healthy leisure. However, even with this limitation, a significant association was found between state healthy leisure and substance use, indicating that these measurement occasions are sufficient enough to capture fluctuations.

Because measurement occasions coincided with the school semester, school regulatory structures such as the lack of sports offerings being absent during the winter semester and the scheduling of exam or testing periods may impact engagement in healthy leisure activities in the short term. Adolescents may have excess free time in winter non-sport months or restricted free time and elevated stress levels during exam periods, which typically last approximately one week. Interpersonal factors such as peer approval (as previously discussed), peer pressure, and relationship status may serve as additional influences.
Morojele and colleagues (2006) collected qualitative data regarding SA adolescent risk behavior and results identified peer pressure and normative peer use as justifications of substance use. Additional qualitative data collected regarding motivations for SA adolescent substance use found adolescents reported using substances to avoid negative social interactions such as peer rejection; a motivation mentioned in all 15 focus groups conducted (Patrick et al., 2009). Finally, religion may play a role in state healthy leisure. For example, individuals who are Muslim may be required attend services and religious studies, as well as fast on holy days, which may limit their ability to engage in physical activity (Palen et al., 2010).

Influences on trait healthy leisure may involve the lack of recreational opportunities (discussed in more detail within the Leisure Planning Efficacy Factor section), adolescents who serve as the head of the household, community safety, and religion. Child-headed households have emerged as an increasing issue within SA such that in 2006, federal legislation was passed to protect children in this specific situation (Meintjes, Hall, Marera, & Boulle, 2010). Within these households, the head of the house may be under the age of 18 years old, or the primary caretaker may be under the age of 18 years old even though an adult is technically residing within the home. If adolescents are spending their time caring for younger siblings and running the household, they may have no time left to engage in healthy leisure activities and they may not have an appropriate role model to demonstrate healthy leisure engagement.

Although the current studies excluded individuals who had fewer than four measurement occasions, comparisons found dropouts to exhibit even higher levels of substance use from the sample used for analyses. When individuals drop out of school,
they often lack the skills necessary for employment and end up more likely to engage in substance use and even gangsterism (Makiwane & Kwizera, 2009). Gangsterism is more common in predominantly Coloured areas and due to a multitude of contextual factors including school drop-out, unemployment, poverty, and the forced re-location of communities under Apartheid (Daniels & Adams, 2010). Gangsters make it difficult for adolescents to freely engage in healthy leisure activities, as they fear for their safety. Adolescents are limited to participating in leisure pursuits within their home or in on the porch/yard area around the home due to safety concerns. In a previous qualitative study on leisure constraints, one adolescent female described the difficulty of dealing with gangsters, especially when they control the local community stating “if you stand along against those gangsters, then it’s like they gonna overpower you… If the community is too scared to stand up to them, one person can’t just do it alone” (Palen et al., 2010, p. 447).

**Leisure planning efficacy factor.** One explanation for the lack of significant results related to the leisure planning efficacy factor is that none of the leisure planning efficacy items specifically refer to leisure time as ‘healthy;’ rather the items target the ability to get information and plan activities independently to make good decisions about how to spend free time. Although this is a facet of engaging in healthy leisure activities, these specific questions may also apply to risky leisure activities that are not perceived as risky. For example, participants may possess the skills to obtain the resources and independently plan an activity they perceive as a ‘good’ decision even though it incorporates risk behavior.
Although this factor represents leisure planning efficacy, it may also serve as a proxy for adolescent independence. As adolescents develop, they spend less time under parental supervision and more time in autonomous activity (Silbereisen, 2003; Tapert, Aarons, Sedlar, & Brown, 2001), often within the leisure context, which provides the greatest opportunity for such autonomous engagement (Caldwell, 2005). Consequently, this factor may be capturing normative autonomy development rather than planning specific to healthy leisure.

An alternative explanation for the lack influence of leisure planning efficacy may be due to the lack of structured recreational opportunities within developing countries. Silbereisen (2003) stated that “active leisure pursuits require initiation, planning, and organization of place, time, and content;” experiences that foster adolescent development (p. 97). When these opportunities are not present, adolescents may be left with unstructured, unsupervised free time as a normative leisure experience.

Wegner (2011) conducted a photoelicitation study of SA adolescents to better understand leisure boredom. One main theme of the adolescents’ photos was ‘no entry-no exit’ which referred to the lack of leisure and recreation resources and opportunities. Wenger’s photos illustrated parking lots used as playing/sports areas due to developed sports fields being secured with gates and barbed wire to deter illegal activity consequently keeping all adolescents out. The lack of community opportunities created an environment with “few options for exposure to, and participation in, leisure activities” (p. 21). It should be kept in mind that both Black and Coloured communities are receiving increased attention and focus (both politically and economically) since the disbanding of Apartheid and these conditions are most likely an improvement over the
past two decades. However, not only do adolescents continue to lack recreational opportunities currently, but they also may lack positive role models who demonstrate and teach the skills to engage in meaningful leisure activities.

**Perceptions of Parental Over-Control**

A positive association was identified between perceived parental over-control (PPOC) and substance use such that substance use was higher when average levels of PPOC were high and on occasions when individuals were higher than their normal on parental control. Results support the view that high levels of parental control, or “over-control,” are associated with negative adolescent outcomes (Kerr & Stattin, 2000; Magnussen, 1991). Although previous studies have looked into the relationship between parental monitoring and risk behavior in SA (substance use, violence; Brook, Pahl, Morojele, & Brook, 2006; Morojele & Brook, 2006; Petersen, Bhana, & McKay, 2005), few studies have analyzed the influence of perceived parental over-control on substance use in a sample of SA adolescents. Results suggest SA parent-adolescent relationships may demonstrate similar patterns to Western samples where high levels of parental monitoring are detrimental. When discussing leisure constraints in a focus group setting with SA adolescents, parents were mentioned as the most common interpersonal constraint, similar to US adolescents (Palen et al., 2010). Adolescents stated they addressed this challenge by disobeying parental limits and rules.

Aside from these main effects, unexpectedly, PPOC did not moderate the relationship between healthy leisure factors and substance use. Amoateng, Barber, and Erickson (2006) suggest Black and Coloured adolescents in the Cape Town area experience both economic and familial disadvantages (e.g., lack of father), and therefore
monitoring is often conducted by others within the kinship system or from neighboring homes. Due to residences within such close proximity, neighboring adults or older students may serve as role models and even providers of alcohol and other substances. Consequently, because the current study asked specifically about perceived parental over-control and interference, it may not have captured control from extended family members or other social structures.

**Influence of HealthWise**

HealthWise South Africa targets healthy leisure through specific curriculum lessons in Grade 8 of exploring free time, free time in my community, beating boredom and developing interests, overcoming roadblocks, decision making, and managing risk and in Grade 9 with leisure motivation, community connections, planning and managing leisure, and conflict resolution. Previous evaluations of the impact of HW on leisure measures have demonstrated positive treatment effects. Caldwell and colleagues (2008) analyzed the effect of HW on leisure motivation and results identified a main effect for motivation such that HW participants’ amotivation decreased. One high implementation school was identified and additional main effects were found for introjected (HW participants decreased), identified (HW participants remained stable compared to decreases in control), and intrinsic motivation (HW participants increased) when comparing control participants with high implementation school participants (Caldwell et al, 2010).

Results from the current study did not find treatment to moderate the relationship between healthy leisure and substance use. Given the previously identified HW effects on substance use (see Smith et al., 2008), this discrepancy may be due to the use of a
substance use composite score rather than past month use of individual substances. One additional explanation for lack of treatment effects may be the shared lack of recreational resources and opportunities participants face, as previously mentioned. All participants resided in the Mitchell’s Plain area, a low-income township within Cape Town. Palen and colleagues (2010) collected qualitative data regarding leisure constraints from adolescents within the same geographical area and found that within the majority of focus groups, participants frequently mentioned a lack of facilities, equipment, and/or resources as a main constraint. One female participant stated, “there’s no place where you can play the sports” (p. 444). Even within the school system, it is uncommon for individual schools to have recreational facilities and equipment to provide healthy leisure opportunities.

**Gender as a Confounder**

Based on previous findings of gender differences in leisure measures within a similar SA sample, we included gender within the current analyses. Caldwell and colleagues (2010) found gender differences in leisure motivation such that males reported lower levels of intrinsic motivation (found to be positively associated with healthy development) and higher levels of introjected, extrinsic, and amotivation (found to be associated with risk behavior). Additionally, males demonstrated a shallower trajectory of introjected and extrinsic motivation than females. Palen and colleagues (2010) found constraints and discrimination due to gender were mentioned where females reported not engaging in typically ‘male’ activities (e.g., soccer, playing video games) due to not possessing the skills and activity preferences for such ‘male’ activities or due to males telling females to not participate in ‘male’ activities. Tibbits and colleagues (2009) used
latent class analysis to identify sub-groups of activity participation in South African adolescents. Separate gender analyses found five sub-groups of activity participation for males (uninvolved; sports and volunteer; mixed, recreation, and hobbies; mixed artistic; and highly involved) and four sub-groups for females (uninvolved, uninvolved but social, mixed, and highly involved). Using the same eight activities, different solutions were identified as best fitting for male and female groups.

Current results demonstrated that although gender differences were identified in both the degree of substance use and substance use development over time, gender was not related to either healthy leisure factor. This suggests the relationships found between healthy leisure and substance use hold regardless of gender. Females consistently demonstrated higher means than males on both healthy leisure factors across all waves however, results were not consistently significantly different (females were significantly higher than males for healthy leisure on Waves 3 & 7 and for leisure planning efficacy on Waves 1, 2, 3, & 7; results not reported). Both healthy leisure factors remained stable over time for both genders; a finding Sharp and colleagues (2011) also identified for the healthy leisure factor. Given the lack of knowledge and evidence specific to healthy leisure, it is possible this construct is stable and does not vary significantly by gender or even within the SA context. Additionally, the sample’s homogeneity with respect to race (91% Coloured) may be too similar to identify differences in healthy leisure.

Overall, results support a limited association between substance use and healthy leisure at both a state and trait level. Information gained from the current study serves (1) to better understand South African adolescent risk behavior, specifically as it relates to Coloured adolescents, (2) as a starting point for conceptualizing healthy leisure, and (3)
to identify how healthy leisure relates to adolescent substance use. Although HW did not act as a moderator in this model, results demonstrated the importance of addressing subjective leisure experiences, including identifying and participating in healthy leisure pursuits (i.e., leisure education) when addressing adolescent risk behavior. This is especially critical in the developing context of South Africa where underprivileged adolescents lack recreational resources and opportunities and may lack role models for engaging in healthy, developmentally appropriate leisure activities.

**Limitations and Future Directions**

Potential limitations of the current study should be addressed as they may influence results obtained and interpretation of the same. First, data were collected from adolescent self-report measures, which are prone to self-report and/or social desirability bias. Such bias may result in responses that both under- and over-estimate measures. One method of addressing this issue in future data collections may be to capture social desirability through the use of a scale (e.g., Marlowe-Crowne Desirability Scale; Crowne & Marlowe, 1960); however this would result in additional survey questions and may be too taxing on participants. A second option is to collect observed measures along with subjective measures.

The current study only included individuals who provided at least four measurement occasions. Expectedly, comparisons between those retained for analyses and those who were excluded found those who dropped out to be older, more likely to be male, to demonstrate higher levels of substance use, and lower levels of both healthy leisure and leisure planning efficacy factors. These findings suggest the results found may be more severe within dropouts since the individuals who provided fewer
measurement occasions also exhibited greater undesirable behaviors. Consequently, the current study provides a conservative estimate of levels of substance use as extreme users are not present. Future work should target these students to fully understand the impact of leaving school early, their leisure experiences, and their engagement in risk behavior.

Given the lack of prior research on the concept of healthy leisure, there is no empirically validated scale for measuring it, and one can’t even be confident of how adolescents are personally conceptualizing the term. Future work needs to be done to understand healthy leisure from the adolescent perspective and to then develop and validate a measure or scale. Such a measure/scale should also reflect the cultural influences that may be present in the SA context as well as the parental influences (e.g., parental attitudes towards healthy leisure and modeling of healthy leisure behaviors).

Although both state and trait healthy leisure were used as predictors, healthy leisure may change within-person from situation to situation and the current study only provided bi-annual measurement occasions which may not accurately reflect changes in state concepts. However, findings from the current study demonstrate influences at the state level independent of trait influences, which suggests that even bi-annual measurement occasions may be capturing some state processes. Future studies should identify whether healthy leisure is a situation-dependent measure and differs based on type of activity involvement.

While the composite substance use measure makes use of all five substances measured and the intensity of their use, results cannot differentiate between consistent low or moderate use of multiple substances and infrequent, intense use of one substance.
Future analyses should attempt to account for poly-substance use as well as the intensity of substances used.

The current study makes use of participants in a control and an intervention/treatment group. One limitation of the intervention study design was five control schools were randomly selected, and then four intervention schools demonstrating promise of intervention compliance, were matched as closely as possible to the control schools therefore making this a quasi-experimental design rather than a true randomized trial. Given the structure and organization of high schools in the area, this was the best approach to take to ensure intervention schools were adequately functioning (Caldwell et al, 2004).
References


Figure 2.1.

Conceptual Model

State Healthy Leisure

Trait Healthy Leisure

Perceived Parental Over-Control

Substance Use
Table 2.1.

*Correlation Table of Potential Healthy Leisure Measures*

<table>
<thead>
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<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
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</thead>
<tbody>
<tr>
<td><strong>1</strong> I get a lot of benefits (good things) out of my free time activities</td>
<td>1.00</td>
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<td><strong>2</strong> The things that I do in my free time are healthy.</td>
<td>0.50</td>
<td>1.00</td>
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<tr>
<td><strong>3</strong> I feel good about myself in my free time.</td>
<td>0.50</td>
<td>0.58</td>
<td>1.00</td>
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<td><strong>4</strong> Having healthy free time activities can help me avoid risky behavior.</td>
<td>0.43</td>
<td>0.42</td>
<td>0.49</td>
<td>1.00</td>
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<tr>
<td><strong>5</strong> I am confident I can find free time activities to do in my community.</td>
<td>0.36</td>
<td>0.38</td>
<td>0.37</td>
<td>0.33</td>
<td>1.00</td>
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<tr>
<td><strong>6</strong> If nothing exists, I can organize leisure activities to do in my community.</td>
<td>0.34</td>
<td>0.35</td>
<td>0.34</td>
<td>0.30</td>
<td>0.53</td>
<td>1.00</td>
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<tr>
<td><strong>7</strong> In my free time, I know how to turn a boring situation into something that is more interesting to me.</td>
<td>0.37</td>
<td>0.32</td>
<td>0.38</td>
<td>0.37</td>
<td>0.30</td>
<td>0.32</td>
<td>1.00</td>
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<tr>
<td><strong>8</strong> I know how to keep up my interest in my free time activities.</td>
<td>0.41</td>
<td>0.37</td>
<td>0.43</td>
<td>0.39</td>
<td>0.37</td>
<td>0.35</td>
<td>0.56</td>
<td>1.00</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>9</strong> I am confident I can overcome things that get in the way of doing what I want to do in my free time.</td>
<td>0.32</td>
<td>0.29</td>
<td>0.33</td>
<td>0.31</td>
<td>0.30</td>
<td>0.31</td>
<td>0.35</td>
<td>0.38</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>10</strong> I have leisure activities that give me positive risks.</td>
<td>0.29</td>
<td>0.26</td>
<td>0.27</td>
<td>0.28</td>
<td>0.25</td>
<td>0.28</td>
<td>0.29</td>
<td>0.32</td>
<td>0.38</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>11</strong> I like a challenge in my free time.</td>
<td>0.34</td>
<td>0.31</td>
<td>0.36</td>
<td>0.35</td>
<td>0.27</td>
<td>0.28</td>
<td>0.37</td>
<td>0.39</td>
<td>0.39</td>
<td>0.39</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>12</strong> I am confident I can plan activities for myself without help from my parents.</td>
<td>0.25</td>
<td>0.22</td>
<td>0.26</td>
<td>0.27</td>
<td>0.21</td>
<td>0.23</td>
<td>0.29</td>
<td>0.30</td>
<td>0.29</td>
<td>0.24</td>
<td>0.31</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>13</strong> I know how to plan my free time activities.</td>
<td>0.33</td>
<td>0.32</td>
<td>0.36</td>
<td>0.32</td>
<td>0.29</td>
<td>0.31</td>
<td>0.37</td>
<td>0.41</td>
<td>0.35</td>
<td>0.29</td>
<td>0.38</td>
<td>0.48</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td><strong>14</strong> I make good decisions about what to do in my free time.</td>
<td>0.35</td>
<td>0.36</td>
<td>0.38</td>
<td>0.33</td>
<td>0.29</td>
<td>0.31</td>
<td>0.37</td>
<td>0.41</td>
<td>0.35</td>
<td>0.30</td>
<td>0.39</td>
<td>0.40</td>
<td>0.59</td>
<td>1.00</td>
</tr>
<tr>
<td><strong>15</strong> I know how to get the information needed to make the best choice of what to do in my free time.</td>
<td>0.34</td>
<td>0.33</td>
<td>0.35</td>
<td>0.33</td>
<td>0.30</td>
<td>0.31</td>
<td>0.36</td>
<td>0.39</td>
<td>0.37</td>
<td>0.32</td>
<td>0.37</td>
<td>0.37</td>
<td>0.48</td>
<td>0.52</td>
</tr>
</tbody>
</table>

*Note:* Darker shading represents stronger correlations.
### Table 2.2.

**Exploratory Factor Analysis of Healthy Leisure Items**

<table>
<thead>
<tr>
<th>Item</th>
<th>Healthy Leisure</th>
<th>Leisure Planning Efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel good about myself in my free time.</td>
<td>.67</td>
<td>.27</td>
</tr>
<tr>
<td>The things that I do in my free time are healthy.</td>
<td>.64</td>
<td>.25</td>
</tr>
<tr>
<td>I get a lot of benefits (good things) out of my free time activities</td>
<td>.58</td>
<td>.24</td>
</tr>
<tr>
<td>Having healthy free time activities can help me avoid risky behavior.</td>
<td>.55</td>
<td>.25</td>
</tr>
<tr>
<td>I know how to plan my free time activities.</td>
<td>.26</td>
<td>.66</td>
</tr>
<tr>
<td>I make good decisions about what to do in my free time.</td>
<td>.28</td>
<td>.66</td>
</tr>
<tr>
<td>I know how to get the information needed to make the best choice of what to do in my free time.</td>
<td>.28</td>
<td>.58</td>
</tr>
<tr>
<td>I am confident I can plan activities for myself without help from my parents.</td>
<td>.19</td>
<td>.50</td>
</tr>
</tbody>
</table>

| Eigenvalues | 2.96 | 0.51 |
| % of Variance | 36.9 | 6.4 |

*Note: N=5531. Factor loadings ≥ .50 are in boldface.*
Table 2.3.

*Healthy Leisure Factors and Perceived Parental Over-Control Scale Reliability and Descriptives from Wave 1*

<table>
<thead>
<tr>
<th>Factor</th>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Alpha if Item Deleted</th>
<th>Correlation with Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy Leisure (α=0.77)</td>
<td>I get a lot of benefits (good things) out of my free time.</td>
<td>2.60</td>
<td>1.18</td>
<td>0.73</td>
<td>0.55</td>
</tr>
<tr>
<td></td>
<td>The things that I do in my free time are healthy.</td>
<td>2.70</td>
<td>1.15</td>
<td>0.71</td>
<td>0.59</td>
</tr>
<tr>
<td></td>
<td>I feel good about myself in my free time</td>
<td>2.96</td>
<td>1.03</td>
<td>0.69</td>
<td>0.63</td>
</tr>
<tr>
<td></td>
<td>Having health free time activities can help me avoid risky behavior.</td>
<td>2.76</td>
<td>1.19</td>
<td>0.74</td>
<td>0.52</td>
</tr>
<tr>
<td>Leisure Planning Efficacy (α=0.76)</td>
<td>I am confident I can plan activities for myself without help from my parents.</td>
<td>2.57</td>
<td>1.20</td>
<td>0.75</td>
<td>0.47</td>
</tr>
<tr>
<td></td>
<td>I know how to plan my free time activities.</td>
<td>2.81</td>
<td>1.08</td>
<td>0.67</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td>I make good decisions about what to do in my free time.</td>
<td>2.86</td>
<td>1.06</td>
<td>0.68</td>
<td>0.61</td>
</tr>
<tr>
<td></td>
<td>I know how to get the information needed to make the best choice of what to do in my free time.</td>
<td>2.73</td>
<td>1.08</td>
<td>0.71</td>
<td>0.55</td>
</tr>
<tr>
<td>Perceptions of Parental Over-Control (α=0.73)</td>
<td>My parents have too much control over what I do in my free time.</td>
<td>1.97</td>
<td>1.31</td>
<td>0.66</td>
<td>0.55</td>
</tr>
<tr>
<td></td>
<td>I think my parents interfere too much in my free time.</td>
<td>1.92</td>
<td>1.33</td>
<td>0.59</td>
<td>0.60</td>
</tr>
<tr>
<td></td>
<td>There are things I would like to do in my free time but I am not allowed to do them.</td>
<td>2.03</td>
<td>1.32</td>
<td>0.69</td>
<td>0.52</td>
</tr>
</tbody>
</table>

*Note: N=5638 students, M=Mean, SD=Standard Deviation. Item response ranged from 0 (strongly disagree) to 4 (strongly agree). For inter-item correlations see Table 1.*
Table 2.4.

*Sample Characteristics*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Percentage (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>47% (1580)</td>
</tr>
<tr>
<td>Female</td>
<td>53% (1803)</td>
</tr>
<tr>
<td><strong>Age (at wave 1)</strong></td>
<td>13.8 (SD=0.73)</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
</tr>
<tr>
<td>Coloured (mixed ancestry)</td>
<td>91% (3077)</td>
</tr>
<tr>
<td>Black</td>
<td>6% (210)</td>
</tr>
<tr>
<td>White</td>
<td>2% (75)</td>
</tr>
<tr>
<td>Indian/Other</td>
<td>&lt;1% (21)</td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
</tr>
<tr>
<td>Christian (non-Catholic)</td>
<td>42% (1416)</td>
</tr>
<tr>
<td>Islam</td>
<td>28% (936)</td>
</tr>
<tr>
<td>Christian (Catholic)</td>
<td>26% (901)</td>
</tr>
<tr>
<td>Other</td>
<td>4% (128)</td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
<td></td>
</tr>
<tr>
<td>Control Group</td>
<td>63% (2148)</td>
</tr>
<tr>
<td>HealthWise Group</td>
<td>37% (1235)</td>
</tr>
</tbody>
</table>

*Note: N=3833. SD=standard deviation.*
Figure 2.2.

_Average Substance Use Development by Gender_

*Note: N=3383. Female means over time are represented by a solid red line while male means over time are represented by a dashed blue line.*
Table 2.5.

**Multi-Level Model for Healthy Leisure Factors as a Function of Substance Use**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Estimate (Standard Error)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept, $\gamma_{00}$</td>
<td><strong>1.154</strong>* (0.072)</td>
</tr>
<tr>
<td>Trait Healthy Leisure, $\gamma_{01}$</td>
<td><strong>-0.201</strong>* (0.077)</td>
</tr>
<tr>
<td>Trait Leisure Planning Efficacy, $\gamma_{02}$</td>
<td>0.096 (0.079)</td>
</tr>
<tr>
<td>Average PPOC, $\gamma_{03}$</td>
<td><strong>0.106</strong>* (0.039)</td>
</tr>
<tr>
<td>Gender, $\gamma_{04}$</td>
<td><strong>-0.221</strong>* (0.058)</td>
</tr>
<tr>
<td>Treatment, $\gamma_{05}$</td>
<td>-0.021 (0.081)</td>
</tr>
<tr>
<td>Wave, $\gamma_{10}$</td>
<td><strong>-0.095</strong>* (0.013)</td>
</tr>
<tr>
<td>Wave*Trait Healthy Leisure, $\gamma_{11}$</td>
<td>0.047 (0.032)</td>
</tr>
<tr>
<td>Wave*Trait Leisure Planning Efficacy, $\gamma_{12}$</td>
<td>-0.051 (0.033)</td>
</tr>
<tr>
<td>Wave*Average PPOC, $\gamma_{13}$</td>
<td>-0.030 (0.016)</td>
</tr>
<tr>
<td>Wave*Gender, $\gamma_{14}$</td>
<td><strong>-0.102</strong>* (0.024)</td>
</tr>
<tr>
<td>Wave*Treatment, $\gamma_{15}$</td>
<td>0.007 (0.025)</td>
</tr>
<tr>
<td>Wave², $\gamma_{29}$</td>
<td><strong>-0.044</strong>* (0.001)</td>
</tr>
<tr>
<td>Wave²*Trait Healthy Leisure, $\gamma_{21}$</td>
<td>0.000 (0.004)</td>
</tr>
<tr>
<td>Wave²*Trait Leisure Planning Efficacy, $\gamma_{22}$</td>
<td><strong>-0.008</strong>* (0.004)</td>
</tr>
<tr>
<td>Wave²*Average PPOC, $\gamma_{23}$</td>
<td>-0.002 (0.002)</td>
</tr>
<tr>
<td>Wave²*Gender, $\gamma_{24}$</td>
<td><strong>-0.012</strong>* (0.003)</td>
</tr>
<tr>
<td>Wave²*Treatment, $\gamma_{25}$</td>
<td>0.003 (0.003)</td>
</tr>
<tr>
<td>State Healthy Leisure, $\gamma_{30}$</td>
<td><strong>-0.068</strong>* (0.014)</td>
</tr>
<tr>
<td>State*Trait Healthy Leisure, $\gamma_{31}$</td>
<td><strong>-0.057</strong>* (0.027)</td>
</tr>
<tr>
<td>State*Trait Leisure Planning Efficacy, $\gamma_{32}$</td>
<td>-0.006 (0.027)</td>
</tr>
<tr>
<td>State*Average PPOC, $\gamma_{33}$</td>
<td>0.022 (0.014)</td>
</tr>
<tr>
<td>State*Gender, $\gamma_{34}$</td>
<td>-0.013 (0.022)</td>
</tr>
<tr>
<td>State*Treatment, $\gamma_{35}$</td>
<td>0.005 (0.022)</td>
</tr>
<tr>
<td>State Leisure Planning Efficacy, $\gamma_{40}$</td>
<td>-0.017 (0.014)</td>
</tr>
<tr>
<td>State*Trait Healthy Leisure, $\gamma_{41}$</td>
<td>0.018 (0.030)</td>
</tr>
<tr>
<td>State*Trait Leisure Planning Efficacy, $\gamma_{42}$</td>
<td>-0.044 (0.027)</td>
</tr>
<tr>
<td>State*Average PPOC, $\gamma_{43}$</td>
<td>-0.029 (0.015)</td>
</tr>
<tr>
<td>State*Gender, $\gamma_{44}$</td>
<td>0.020 (0.022)</td>
</tr>
<tr>
<td>State*Treatment, $\gamma_{45}$</td>
<td>0.011 (0.022)</td>
</tr>
<tr>
<td>Individual PPOC, $\gamma_{50}$</td>
<td><strong>0.063</strong>* (0.009)</td>
</tr>
<tr>
<td>Monitoring*Trait Healthy Leisure, $\gamma_{51}$</td>
<td>0.023 (0.019)</td>
</tr>
<tr>
<td>Monitoring*Trait Leisure Planning Efficacy, $\gamma_{52}$</td>
<td>-0.018 (0.019)</td>
</tr>
<tr>
<td>Monitoring*Average PPOC, $\gamma_{53}$</td>
<td>0.006 (0.011)</td>
</tr>
<tr>
<td>Monitoring*Gender, $\gamma_{54}$</td>
<td>0.008 (0.015)</td>
</tr>
<tr>
<td>Monitoring*Treatment, $\gamma_{55}$</td>
<td>-0.012 (0.015)</td>
</tr>
<tr>
<td>School, $\gamma_{06}$</td>
<td>0.002 (0.013)</td>
</tr>
<tr>
<td>Cohort, $\gamma_{07}$</td>
<td>0.037 (0.021)</td>
</tr>
</tbody>
</table>

-2LL                                                                 80220.46
AIC                                                                 80326.46

*Note: Table includes unstandardized estimates and standard errors (in parentheses). Model based on up to 8 occasions nested within 3,383 students for a total of 19,564 observations used. AIC = Akaike Information Criterion; -2LL = -2 Log Likelihood, relative model fit statistics. Bolded estimates are significant *** $p < .001$, ** $p < .01$, * $p < .05$. 83
Figure 2.3.

*Association between Trait Healthy Leisure and Substance Use*

*Note:* Sample association for ID=6050. No vertical axis labels are provided as the figure illustrates the association between two variables.
Figure 2.4.

Association between State Healthy Leisure and Substance Use

Note: Sample association for ID=181. No vertical axis labels are provided as the figure illustrates the association between two variables.
Figure 2.5.

Association between Interaction of State and Trait Healthy Leisure and Substance Use

Note: Results of Johnson-Neyman interaction probing. Legend depicts state healthy leisure including average (dashed red line) and +/- one standard deviation.
Chapter 3. THE INFLUENCE OF HEALTHY LEISURE ON TRAJECTORIES OF SUBSTANCE USE DEVELOPMENT IN SOUTH AFRICAN ADOLESCENTS: A PERSON-CENTERED APPROACH

Introduction

Adolescent substance use has been associated with a variety of long- and short-term risk outcomes including risky sexual behaviors (Flisher, Ziervogel, & Charlton, 1996), academic challenges/school dropout (Sutherland & Shepherd, 2001) future substance use/abuse (Grant et al., 2006), and injury, violence, and suicide (Bauman & Phongsavan, 1999). Although reducing adolescent substance use is a goal of many countries, it is especially critical in South Africa (SA), a developing nation with an increasing adolescent substance use problem (Pasche & Myers, 2012; Wegner, Flisher, Muller, & Lombard, 2006).

It is well understood that not all adolescents follow the same pattern of substance use initiation and development (Tucker, Ellickson, Orlando, Martino, & Klein, 2005). Although studies within the United State (US) have started to elucidate sub-groups of substance use trajectories and predictors of these sub-groups, little is known about this topic within SA. Therefore, the first primary purpose of this study was to provide insight into substance use trajectories among SA adolescents. Better understanding how adolescent substance use develops and the varying trajectories of development is an important first step which allows for further investigation into pathways that lead to low versus high and escalating versus stable levels of substance use. In this study we used a person-centered approach to identify different developmental trajectories of substance
use among SA adolescents which can provide the foundation for the development of prevention programs that may better target sub-groups of adolescents demonstrating greater risk.

The second primary purpose of this study took a prevention approach to understanding influences of developmental trajectory groups identified from the first aim. There are a number of substance use prevention programs that have promising evidence in the US, but these programs are largely lacking in the SA context. The HealthWise South Africa: Life Skills for Young Adults (HW) intervention is one SA program that targets both substance use and sexual risk and has had promising results (Smith et al., 2008). One of the reasons it may have been successful is that it uniquely targets aspects of leisure behavior and experience of adolescents and educates youth on how to engage in healthy, meaningful leisure. Among other things, HW teaches youth leisure skills such as constraint negotiation, developing positive leisure interests and skills, avoiding boredom, learning about community resources, and the ability to restructure unhealthy leisure pursuits into healthy ones (Caldwell et al., 2004). These lessons target aspects of leisure experience and behavior that have been linked with increased substance use (e.g., boredom in leisure; Wegner et al., 2006) or preventing substance use (e.g., ability to restructure leisure experiences into something more interesting). Taken together, conceptually the HW program teaches skills and encourages youth to think about and gain skills toward participating in healthy leisure.

**South African Adolescent Substance Use**

In SA, adolescent drug use is widespread. Flisher, Parry, Evans, Muller, and Lombard (2003) surveyed students in grades 8 through 11 in the Western Cape, SA and
found past month substance use rates to be 31% for alcohol, 27% for tobacco, and 7% for marijuana, with increasing rates of use between grade 8 and grade 11 (except for Black females). The most recent SA Youth Risk Behavior Survey (SAYRBS; Reddy et al., 2010) conducted in 2008 suggested even higher levels of use for adolescents within the Western Cape than previously reported by Flisher and colleagues. The 2008 survey reported past month alcohol, tobacco, and marijuana rates of 53%, 37%, and 16% respectively. These rates within the Western Cape represent the highest prevalence rates within the country. SA adolescents have demonstrated similar patterns of initiation to those of US adolescents where alcohol or tobacco is tried first, followed by marijuana and inhalants. However, there is evidence that South African adolescents transition through substances at a faster rate than US adolescents (Patrick et al., 2010).

**Benefits of Person-Centered Approaches**

The pattern of substance use initiation and development is not well established among SA adolescents. Some abstain while others engage in substance use at a young age and continue to increase use over time. Since we are aware of heterogeneity within developmental patterns of substance use, using methodological tools that capture individual change, such as person-centered approaches, provides a richer and more detailed understanding of substance use development. Unlike traditional variable-centered approaches, person-centered approaches assume heterogeneous growth within the population, and manifest this through latent sub-groups of development, or in our case, developmental trajectories of adolescent substance use.

Connell, Dishion, and Deater-Deckard (2006) emphasized the need to identify and understand these trajectory sub-groups and suggested when substance using adolescents
“are not distinguished from the rest of the sample, we run the risk of overemphasizing risk dynamics among youth who are otherwise on a normative developmental trajectory” (pp. 424-425). Identifying trajectories of substance use development may be even more urgent in developing countries such as SA given the increased context of risk present (e.g., high incidence of HIV/AIDS, prevalence of poverty, lack of healthy leisure opportunities) and where, to date, there is only a crude understanding of how substance use develops over time.

Few studies addressing substance use have even taken a person-centered approach within the SA context. Patrick and colleagues (2010) used latent transition analysis to identify patterns of substance use onset and Tibbits, Caldwell, Smith, and Wegner (2009) used latent class analysis with covariates to assess adolescent activity participation and its association with substance use behaviors.

**Role of Leisure in Adolescent Substance Use**

The opportunities leisure presents for both risk and development are multi-faceted (Zaslow & Takanishi, 1993). Although some leisure concepts have been previously addressed (e.g., leisure motivation, Caldwell, Patrick, Smith, Palen, & Wegner, 2010; Palen, Caldwell, Smith, Gleeson, & Patrick, 2011; leisure constraints, Palen et al., 2010; activity participation, Tibbits et al., 2009), others are not well understood and lack empirical support, especially within developing contexts. There is a need to better elucidate the impact of leisure experiences, including healthy leisure, in a prevention setting to inform interventions targeting substance use.

Healthy leisure is a fairly new concept within both leisure and developmental research with limited research from both developed and developing countries. Little is
known about the leisure experiences of adolescents from developing countries and one cannot assume that the context, characteristics, and meanings of leisure are homogenous across cultures. Since healthy leisure is so poorly defined, the current study took an exploratory approach and used factor analysis to identify latent constructs indicative of adolescent healthy leisure. This process was guided by the Leisure Activities-Context-Experience model (LACE; Caldwell, 2011), which provided a broad ecological framework for understanding the interpersonal, intrapersonal, and environmental factors that may contribute to or detract from positive, meaningful leisure experience.

For example, safety concerns are common within impoverished areas of SA and this environmental element may influence engagement in healthy leisure in multiple ways. First, it may lead to parents exerting excessive control over how adolescents are spending their leisure time with the perception that the adolescent will be safer than if the parent provided greater freedom (Palen et al., 2010). However, parental over-control has the potential to diminish the ability to successfully engage in meaningful leisure pursuits and negotiate stressful experiences; two factors which may in turn lead to substance use behaviors (Fox & Calkins, 2003; Krohne & Hock, 1991). Second, adolescents who report safety concerns state they are limited to engaging in leisure pursuits in their home and the surrounding yard as local gangs have been known to rob their peers of their clothing, sporting equipment, and money (Palen et al., 2010). When adolescents are limited regarding what they can do and where they can go in their leisure time, they may begin to experience feelings of boredom and seek out fun through risky activities (Wegner, 2011).
Problem Behavior Theory

From a theoretical standpoint, Problem Behavior Theory (PBT; Jessor & Jessor, 1977) and its recent extension to health behavior was used to understand the relationship between healthy leisure and differing substance use trajectories. PBT is a social psychological framework where interactions between intrapersonal (e.g., personality, goal motivation, personal values, expectations, control), environmental (e.g., social context, peer and family approval), and behavioral systems (e.g., conventional vs. problem behavior structures) serve to facilitate or inhibit risk behavior (e.g., substance use, risky sexual behaviors). Jessor (2008) extended PBT to focus on health behaviors suggesting the interactions that served to explain problem behaviors (i.e., health compromising behaviors) also explained health-enhancing behaviors (e.g., diet, exercise).

When health-enhancing behaviors are viewed as socially normative and supported by society, institutions, parents, and peers, adolescents are encouraged to adopt them (Donovan, Jessor, & Costa, 1991). Within the SA context, adolescents report perceptions of parental, educator, and peer disapproval of substance use (Morojele, Brook, Kachieng’a, 2006) however, the normative perceptions of healthy leisure as not as well understood. From a conceptual standpoint, Donovan, Jessor, and Costa (1993) found engagement in health-enhancing behaviors including sleep, diet, exercise, dental care, and low sedentary behavior all loaded on one factor, which indicated a health-focused lifestyle. Similarly, we view healthy leisure as an additional facet of a health-focused lifestyle and therefore part of the health-enhancing orientation.

Empirical applications support PBT’s extension to the health behavior domain and specifically when addressing substance use. Results indicated greater involvement in
risk behavior, including substance use, was associated with lower levels of engagement in healthy behaviors or a healthy lifestyle (e.g., value on health, health self-description; Donovan et al., 1991). Studies addressing leisure experience suggest a similar negative relationship between substance use and health behaviors such as physical activity and sport participation in youth (Kaczynski, Mannell, & Manske, 2008). Sharp and colleagues (2011) identified a negative association between subjective perceptions of healthy leisure and substance use within a SA adolescent sample; demonstrating cross-cultural application and collectively, supported PBT’s extension to health-enhancing behaviors. Within the current study, we anticipated a negative relationship between health-enhancing and health-compromising behaviors such that individuals with less extreme substance use trajectory patterns (e.g., lower initial levels of use, shallower trajectories over time) would be associated with higher levels of healthy leisure.

**Research Questions**

This study takes a person-centered approach to understanding the connection between healthy leisure and the development of substance use. To address this connection, two research questions were examined: (1) what are the distinctive developmental patterns of SA adolescent substance use and (2) what is the influence of healthy leisure on these subgroups of substance use development?

To answer research question #1 growth mixture models (GMM) were used to identify latent classes of substance use trajectories within South African adolescents. GMMs identified differing developmental paths and were used to examine and account for inter-individual differences in intra-individual change (Ram & Grimm, 2007). Identifying developmental trajectories is central to understanding how adolescents
change over time and by identifying clusters of developmental trajectories, the unobserved heterogeneity within the sample is modeled.

With respect to research question #2, once developmental trajectories of substance use were identified, the influence of healthy leisure on each sub-group was determined. Based on PBT, we expected trajectory classes with higher levels of substance use and/or higher growth over time to have lower levels of healthy leisure and accordingly, classes with low levels of substance use to be associated with higher levels of healthy leisure.

Methods

Participants and Procedures

Participants consisted of students from schools in Mitchell’s Plain, a low-income township approximately 15 miles outside of Cape Town, South Africa who participated in an effectiveness trial of HealthWise South Africa, a school-based life skills curriculum intervention addressing adolescent health risk behavior (see Caldwell, Smith et al., 2004). At the outset of the trial, 25 schools in the local area were considered for inclusion. Of these, four were excluded due to implementation concerns, four were randomly assigned to receive the HW curriculum, and five schools were chosen as matched no-treatment control schools.

The study and its passive parental consent and adolescent assent procedures were approved by the Institutional Review Boards at study-affiliated universities and by school administrators. Students were followed longitudinally in three cohorts starting in 8th grade. Cohort 1 was followed from 8th through 11th grade with data collected at eight bi-annual measurement occasions between March 2004 and October 2007. Cohort 2 was
followed from 8th to 10th grade with data collected at six bi-annual measurement occasions between March 2005 and October 2007. Cohort 3 was followed from 8th to 10th grade with data collected at five bi-annual measurement occasions between March 2006 and March 2008. Students completed bi-annual surveys using personal digital assistants (PDAs) at the beginning and end of each grade during school hours for approximately 30 minutes. The survey was available in multiple languages and administered in the student’s home language (English or Afrikaans). Research staff were available at survey administrations to answer questions or assist with difficulties.

**Measures**

**Substance use.** Substance use measures were collected at each measurement occasion. A composite substance use index was created based on recency and frequency of use for five substances (i.e., alcoholic drinks, tobacco, tik/methamphetamines, dagga/marijuana, and inhalants) by level of use. Students indicating no lifetime use on all measurement occasions were excluded from respective analyses. The summed index was created by assigning a higher value to higher levels of substance use. For example, alcoholic drinks was indexed as 1=Lifetime use but no past month use, 2=Lifetime use and one or fewer drinks in the past month, 3=Lifetime use and two to three drinks in the past month, and 4=Lifetime use and four or more drinks in the past month. All five substances were indexed in this manner and summed together to obtain a substance use composite.

**Healthy leisure.** To determine which healthy leisure items would be included in analyses, a principal components exploratory factor analysis with promax rotation was conducted with SAS FACTOR using 15 survey items on the full sample. Items were
chosen from the full survey if they referred to subjective evaluations or specific behaviors of healthy leisure characteristics including initiative, challenge, planning, and restructuring. Of the 15 items, seven items were removed due to factor loadings below 0.50 or crossloadings, resulting in eight items which loaded on two factors (identified from scree plot method; Costello & Osborne, 2005). The Kaiser MSA overall score was 0.88 and all of the final eight items had MSA scores of 0.85 or above, indicating the data were suitable for factor analysis (Tabachnick & Fidell, 2013). The final two factors accounted for 43% of the variance in the eight items and could be easily interpreted with regard to the general concept of healthy leisure.

Factor 1 included items representing subjective perceptions of healthy leisure and was comprised of the following four items (α=.77): “I get a lot of benefits (good things) out of my free time activities,” “The things that I do in my free time are healthy,” “I feel good about myself in my free time,” and “Having healthy free time activities can help me avoid risky behavior.” Items in this factor are similar to previous measures of healthy leisure in Sharp and colleagues (2011) analyses which found higher levels of healthy leisure tended to be associated with lower rates of substance use. This factor most closely represents a general measure of perceptions of healthy leisure and is further referred to as the healthy leisure factor.

Factor 2 was comprised of four items (α=.76) of: “I am confident I can plan activities for myself without help from my parents,” “I know how to plan my free time activities,” “I make good decisions about what to do in my free time,” and “I know how to get the information needed to make the best choice of what to do in my free time.”

---

3 Participants were not provided with a definition of leisure or free time at any point during survey administration
Items within this factor referenced the ability to plan free time activities and is further referred to as the *leisure planning efficacy* factor. We hypothesized that adolescents who were able to structure their free time by making good decisions and planning for healthy activities were more likely to engage in developmentally beneficial activities.

**Analytic Plan and Preliminary Steps**

GMM (see Figure 3.1 for GMM diagram) was employed using Mplus version 6.2 (Muthén & Muthén, 2005) to identify trajectory subgroups of substance use development. This was conducted in four steps outlined by Ram and Grimm (2009) including problem definition, model specification, model estimation, and model selection and interpretation.

**Problem definition.** Prior work using LGMM to identify substance use trajectories found three to five classes including both stable and increasing trajectories (Colder, Campbell, Ruel, Richardson, & Flay, 2002; Chassin, Flora, & King, 2004). A baseline growth model was identified by estimating a no-growth, linear, and quadratic multi-level model. This information was used to guide model specification in the next step where we expected to see both stable and increasing classes of substance use development.

**Model specification and estimation.** Although a quadratic model fit the entire sample best, we were estimating models with count data (Poisson outcome), so a linear growth was specified with each class model. Given previous work with GMM and adolescent substance use, models with between two and seven classes were estimated and parameter estimates and fit statistics were obtained for each model. Within each model, both intercept \((g_0)\) and slope mean \((g_1)\) were free to vary between classes. Due to the Poisson distribution of the data, all models included a forced class resulting in each
model producing a class with a low level of consistent substance use. Models were estimated in Mplus version 6.12. Mplus handles missing data using full information maximum likelihood (FIML) which makes use of all available data and assumes missing data are missing at random, producing results equivalent to imputed values (Graham, 2009).

**Model selection.** To determine the best fitting class model, we examined parameter estimates and assessed fit information criteria (Aikaike Information Criterion, AIC; Bayesian Information Criterion, BIC; and sample-size adjusted BIC), entropy, and likelihood ratio tests.

**Trajectory class predictors.** Once an acceptable solution was identified, mean trajectories were plotted and we determined to what extent healthy leisure predicted trajectories of substance use by assessing the association between the probability of belonging to a specific class (relative to a reference class) using logistic regression. Follow-up analyses (univariate analysis of variance and chi-square) were conducted using SAS version 9.3 to determine extent of between-person differences in trajectory classes. Individuals were assigned into trajectory classes based on the highest posterior probability produced from the GMM results. Demographic predictors included gender (dummy coded, males=0), age at Wave 1, proxies for socio-economic status (description of home dwelling, tap water present in the home, family owning a motor car, electricity present in the home), and religion. Given the majority of Coloured (mix of Black and White ancestry) within the sample (93%), racial group comparisons were not appropriate.

**Results**

**Substance Use Development**
**Descriptive statistics.** The current sample was restricted to individuals who had identified lifetime substance use at any wave. Descriptive statistics for group mean levels of substance use by grade are presented in Table 3.1. Using multi-level models, a quadratic model fit the substance use composite the best for the entire sample ($\gamma_01=0.279, p <.0001; \gamma_02=-0.041, p <.0001$) where substance use levels increased, peaked around the beginning of Grade 11, then began to decrease. The same pattern can be seen in Table 3.1 where the average level of substance use was 1.52 at the beginning of Grade 8 and increased to 4.75 at the beginning of Grade 11, then fell to 4.43 by the end of Grade 11.

**Model selection.** Poisson growth mixture models were estimated with between two and eight classes. Table 3.2 provides model fit information for each class solution. Solutions with between two and five classes all had significant LRTs indicating that each solution was preferable to a solution with one fewer classes. Solutions with between six and eight classes were eliminated due to non-significant LRTs indicating a solution with one fewer classes was preferable. The next step compared fit information criteria and determined the four and five class solutions provided better fit than the two and three class solution (which were subsequently eliminated). Entropy was slightly higher in the four than in the five class solution (.777 vs .772 respectively). However, each solution was plotted to determine practical interpretability and based on this, a four class solution was chosen. Within the five class solution, two classes appeared similar and posed no differential practical implications.

**Model interpretation.** All parameters were evaluated within the four class solution and demonstrated clear group differences. Table 3.3 presents parameter
estimates and class membership probability for each class. All membership probabilities were greater than .80 and individuals were subsequently placed in the class in which they had the largest probability of assignment. An intercept and slope mean were obtained for each class and then log transformed due to the Poisson distribution of the substance use composite (only log transformed values are presented). The four class solution identified three increasing trajectory classes and one stable trajectory class (see Figure 3.2). Due to sample exclusion of lifetime non-users, there is no abstinence class.

Class 1, the Early Escalators, comprised 16% \((n=337)\) of the sample and demonstrated the highest initial level of substance use at the beginning of Grade 8 and increased with each additional measurement occasion. This resulted in Early Escalators representing the highest levels of use across all measurement occasions. The Middle Escalators (Class 2) represented the largest group with 37% of the sample \((n=786)\). This class had the second highest initial level of substance use and also increased with each additional measurement occasion. The Late Escalators (Class 3) comprised the second largest group with 28% of the sample \((n=607)\). This class demonstrated similar escalation of use to the Early and Middle Escalators, but their initial level was the lowest (almost zero) and they began a sharp acceleration around the end of Grade 10. The final class (Class 4) was the Low/Rare Users, which represented 19% of the sample \((n=418)\) and maintained a low level of use throughout. This class started as the second to lowest users at the first measurement occasion, became the lowest users by the end of Grade 9, and remained there until the final measurement occasion.

By the end of Grade 11, the Late Escalators and Low/Rare Users look distinctly different and to examine this post-hoc, an analysis of variance was conducted between
substance use and both healthy leisure factors comparing each class at the end of Grade 11 only. For substance use, results indicated all classes had significantly different levels of substance use ($F(3, 420) = 132.09, p < .0001$).

**Influence of Healthy Leisure**

Both healthy leisure and leisure planning efficacy factors were included as between-person predictors of substance use trajectories. Results from a logistic regression, which used the Low/Rare Users class as the reference class, are presented in Table 3.3. Results indicated that individuals with higher levels of Healthy leisure were less likely to be in the Early Escalators (OR=0.42) and Middle Escalators (OR=0.56) classes than in the Low/Rare Users class. Results for the leisure planning efficacy factor demonstrated the opposite result where individuals with higher levels of leisure planning efficacy were more likely to be in the Early Escalators (OR=1.70) and Middle Escalators (OR=1.45) than in the Low/Rare Users Class.

**Demographic Sub-Group Characteristics**

To better understand characteristics of individuals within trajectory classes, follow-up analyses were conducted using demographic predictors of class membership (i.e., gender, age, SES, and religion). Table 3.4 presents between-person differences in trajectory classes. The only significant differences were found for age at Wave 1, which identified significant differences between the Early Escalators (13.92 years old) and Late Escalators (13.71 years old) and Late Escalators and the Low/Rare Users (13.83 years old), however the effect size was small ($\eta^2 = 0.01$). Two predictors of socio-economic status (i.e., electricity in the home, type of home dwelling) were excluded due to small cell frequencies. Within the sample, almost all respondents (99%) reported having
electricity in their home and their type of home dwelling was typically reported as a brick house (87%).

**Discussion**

The current study used a person-centered approach to identify subgroups of substance use development in South African adolescents and the influence of healthy leisure on group membership. Results identified four distinct patterns of substance use development with three increasing classes and one stable class. Additionally, the healthy leisure factor served to protect against substance use while individuals high in planning efficacy tended to have higher rates of use. This study is the first of its kind to focus on a sample of SA adolescents and serves to develop a richer understanding of substance use development and the role of healthy leisure on different developmental trajectories.

**Substance Use Development in South African Adolescents**

Through the implementation of a nation-wide Youth Risk Behavior Survey (Reddy et al., 2010) and a handful of studies obtaining prevalence rates from SA youth (Flisher et al., 2003; Parry et al., 2004), there is a general understanding of how frequently SA adolescents are engaging in substance use and the types and progression of substances being used (Flisher, Parry, Muller, & Lombard, 2002). However, what was lacking was an understanding of how substance use developed across this heterogeneous population. The current study supports general findings from previous studies within South Africa that substance use rates generally increase between Grades 8 and 11 (Flisher et al., 2003).

The Late Escalators represented the second largest trajectory group and were the only group to demonstrate a sharp acceleration around the end of Grade 10. Results of a
cross-sectional surveillance study reporting national prevalence rates of alcohol, tobacco, marijuana, and other illicit drugs support this acceleration showing the largest increase in the lifetime and past month use of alcohol, tobacco, marijuana, and inhalants to be between Grade 9 and Grade 10 (Reddy et al., 2010). By the end of Grade 10, students are approximately 16 years old on average and this escalation may be the result of multiple factors.

The South African educational system is structured such that school is mandatory up through Grade 9 with Grades 10-12 referred to as Senior Secondary School (Education USA, n.d.). Due to this structure, many adolescents drop out of school after completing their General Education and Testing Certificate to pursue employment resulting in only 69% of school-aged adolescents enrolled in Grade 11 and 52% in Grade 12 within the 2011 school year (Department of Basic Education, 2013). Not only is this a critical point within the education system, it is also a pivotal point for the adolescents who remain enrolled as being a senior is associated with higher status than underclassmen, similar to the status of seniors within the US public education system.

Outside of the educational system, all South Africans are required to possess an identity document, which is obtained after turning 16 years old. This passport-like book is not valid for travel, but rather allows interaction with government services such as voting, getting a driver’s license, and applying for social services as well as acquisition of a part-time job (Department of Home Affairs, 2013). For adolescents, possession of their ID book is a symbol of adulthood and although the legal drinking age in South Africa is 18 years old, it allows adolescents to enter bars or clubs that have lax security.
Comparison with US studies. Compared to adolescent substance use development within the US, SA adolescents demonstrate similar classifications and patterns. Earlier work in substance use development looked at tobacco and binge drinking finding 4 sub-groups for each substance. Tobacco use was associated with four classes of early stable, late stable, experimental, and quitting groups (Chassin, Presson, Pitts, & Sherman, 2000) and binge drinking also was associated with four classes of early heavy, late moderate, infrequent, and non-binging groups (Chassin, Pitts, & Prost, 2002). Previous work by Schulenberg and colleagues identified 6 a priori defined sub-groups of binge drinking using cluster analyses which included never, rare, chronic, decreased, increased, and ‘fling.’ Flory, Lynam, Milich, Leukefeld, and Clayton (2004) analyzed a US community sample of 481 individuals aged between 11 and 12 years old at Wave 1 to identify trajectories of alcohol and marijuana (using SAS PROC TRAJ). Three classes of each substance were identified including early onset use, late onset use, and non-users. Chassin and colleagues (2004) used GMM to identify trajectories of alcohol and drug (composite of illicit and prescription drugs) using five measurement occasions from 454 US adolescents who were 13 years old, on average, at Wave 1. They found three classes of both alcohol and drug use consisting of light, moderate, and heavy drinkers (alcohol) and rare, experimental, and heavy drug users.

Making direct comparisons between results from the current study and previous studies is challenging due to the different measures of substance use (e.g., composite, binge drinking), age range of sample, and type/format of questions. However, similar patterns of stable and increasing trajectories were found in both US studies and the current SA sample. The current study serves to support previous cross-cultural
similarities between the US and SA and although contextual factors may vary dramatically (e.g., post-Apartheid transitions, incidence of AIDS), the developmental patterns of substance use within the current study are also found within the US.

**Influence of Healthy Leisure**

Based on Problem Behavior Theory and its extension to adolescent health behavior (Donovan et al., 1991), adolescents with greater conventionality (e.g., following parental, societal, and institutional norms) would also engage in health maintaining behaviors (e.g., exercise, healthy leisure activities, and healthy foods). Our results support and continue to extend PBT such that individuals who are experiencing healthy leisure were more likely to be in the low/rare users class than in the early escalators or middle escalators, the highest two substance use classes. There was no difference between the low/rare users class and the late escalators class, and by looking at Figure 3.2, one can see that these trajectory classes both demonstrate low levels of use until Grade 10, when the late escalators accelerate.

Results from the healthy leisure factor suggest that adolescents who had high perceptions of their positive free time use used fewer substances. PBT would suggest that these adolescents are receiving contextual cues and are observing role models who value engaging in healthy leisure activities. Given the homogeneous characteristics of the sample (i.e., mostly Coloured and similar SES) and that they derived from the same township area, one would expect that access and availability of healthy leisure opportunities and equipment and facilities would be similar. This leaves factors such as perceptions of normative peer leisure engagement and parental leisure engagement,
which may be protecting these adolescents against substance use; unfortunately data on such factors was not available.

Results for the leisure planning efficacy factor indicated contrasting results when compared to the healthy leisure factor, finding individuals with higher levels of leisure planning efficacy were more likely to be in the early escalators and middle escalators classes than in the low/rare users class. Both factors were conceptualized as aspects of healthy leisure and consequently were expected to be associated with substance use in the same direction. When looking closer at the leisure planning efficacy factor, none of the specific items include the word ‘healthy.’ Instead, participants may have perceived that they were successful at planning free time activities and construed substance use as a good free time decision. These adolescents may have been confident that they could plan and organize their free time; unfortunately it may have been to engage in substance use behaviors.

These results are counter to the work done related to executive cognitive functioning (ECF), a construct related to planning, initiating, and regulating skills necessary for goal-directed behavior. ECF has been negatively associated with substance use and substance use disorders, although the directionality of the relationship is not well understood (Giancola & Tarter, 1999; Pentz & Riggs, 2013). The leisure planning efficacy items from the current study were not intended to target ECF and consequently may be capturing something other than cognitive functioning which is associated with greater substance use.

The current study found a positive association between substance use and leisure planning efficacy; a finding that may apply to other predictors of substance use including
sensation seeking and impulsivity. Much research has looked at the relationship between substance use and impulsivity from a social science and a neuropsychological perspective (e.g., Dawe, Gullo, & Loxton, 2004; Spear, 2000). These studies indicate a strong association between impulsivity and substance use finding substance users demonstrated higher levels of sensation seeking and neurologically, substance users maintained greater attention and sensitivity to the reward systems of the brain than light or non-users (Dawe & Loxton, 2004). However, results from the current study suggest individuals with greater ability to plan tend to use more substances, reflecting a more long-term process than explained by impulsivity. While impulsivity may contribute to initial substance use, perhaps the ability to plan (e.g., obtaining alcohol and/or drugs, finding a place to use them, knowing people to use them with) is also important to the maintenance of adolescent substance use. If these maintenance pathways can be better understood, they may become an additional target for reducing substance use.

**Prevention Implications**

From a prevention perspective, person-centered approaches are extremely important for (1) understanding the individual in context and the multi-faceted influence of risk and protective factors, (2) identifying individuals for targeted interventions, and (3) determining processes that result in intervention effects. The current study takes a first step at understanding how substance use develops in SA adolescents and the influence of leisure on this development. Acknowledging the heterogeneous nature of adolescent substance use development rather than masking it in aggregate techniques allows us to separate low users from heavy and/or escalating users for more targeted intervention. By
understanding influences of risk behavior development, we can continue to develop parsimonious intervention strategies to facilitate positive adolescent development.

Limitations and Future Directions

The current study aids in continuing to understand the relationship between substance use and healthy leisure in SA adolescents and provides a stepping stone for further research to extend current findings as well as address limitations of the study. Three main limitations were identified including the self-report nature of the data, the composite measurement of substance use, and the conceptualization of the healthy leisure construct.

First, data in the current study were obtained from adolescent self-report and therefore, are vulnerable to self-report bias. During data collection, steps were taken to reduce bias including having individuals answer survey questions on a personal digit assistant, or handheld computer device, to facilitate comfort with providing private information.

One of the challenges in analyzing substance use behavior is how one should measure or calculate a substance use variable. Within the current study, a composite of five substances was created. However, this composite may mask heavy users of one substance from experimental users based on the nature of the how the composite was created. Future analyses will replicate the current methodology looking at each of the five substances individually. This will provide for a better understand of individual substance use, including tik which is currently a popular drug of choice in SA.

Finally, the current study identified two latent constructs which are assumed to represent healthy leisure. To date, there have been no studies that have sought to
understand what healthy leisure means to adolescents and consequently, the measures used within the current study may not be valid measures of how SA adolescents conceptualize the construct. To fully understand what healthy leisure means to adolescents, qualitative data (e.g., focus groups, interviews, photoelicitation) is needed. Wegner (2011) successfully used a combination of photoelicitation and focus groups to understand leisure boredom in adolescents and the contextual factors that contribute to leisure boredom. A similar qualitative study may work well to gain an understanding of healthy leisure from the adolescent point of view.
References


Figure 3.1.

*Latent Growth Mixture Model Diagram*
Table 3.1.

*Sample Means and Standard Deviations for Substance Use and Healthy Leisure Factors*

<table>
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*Note:* Standard deviation in parentheses. Measures were collected at the beginning and end of Grades 8 through 11 occurring in October and March respectively. Substance Use composite ranged from 0-20. Leisure factors ranged from 0 (strongly disagree) to (4) strongly agree.)
Table 3.2.

Model Fit of All Growth Mixture Models

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Fit Criteria

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<td>.0662</td>
<td>.0146</td>
</tr>
</tbody>
</table>

Note: \(N=2249\) unless noted otherwise.
Table 3.3.

*Class Membership Probability, Latent Variable Means, and Predictors of Class Membership*

<table>
<thead>
<tr>
<th>Sample Size</th>
<th>Early Escalators</th>
<th>Middle Escalators</th>
<th>Late Escalators</th>
<th>Low/Rare Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average probability of class</td>
<td>.930</td>
<td>.913</td>
<td>.801</td>
<td>.824</td>
</tr>
<tr>
<td>membership</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept mean, ( g_0 )</td>
<td>5.90</td>
<td>2.19</td>
<td>0.33</td>
<td>1.00</td>
</tr>
<tr>
<td>Slope mean, ( g_1 )</td>
<td>1.65</td>
<td>2.77</td>
<td>1.25</td>
<td>1.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Healthy Leisure Predictors of Class Membership</th>
<th>OR</th>
<th>OR</th>
<th>OR</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy Leisure</td>
<td>0.42*</td>
<td>0.56*</td>
<td>1.22</td>
<td>Class</td>
</tr>
<tr>
<td>Leisure Planning Efficacy</td>
<td>1.70*</td>
<td>1.45*</td>
<td>0.67</td>
<td></td>
</tr>
</tbody>
</table>

*Note: N=2148. Reference category was always Low/Rare Users class (Class 4). *\( p < .05. *\)
Table 3.4.

Differences in Trajectory Class by Demographic Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Early Escalators $(n=337)$</th>
<th>Middle Escalators $(n=786)$</th>
<th>Late Escalators $(n=607)$</th>
<th>Low/Rare Users $(n=418)$</th>
<th>Omnibus Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender % $(n$ for males)</td>
<td>50% (170) (a)</td>
<td>47% (283) (a)</td>
<td>45% (357) (a)</td>
<td>46% (191) (a)</td>
<td>(\chi^2 (3) = 2.58), n.s.</td>
</tr>
<tr>
<td>Age at Wave 1 (M (SD))</td>
<td>13.92 (0.78) (a)</td>
<td>13.81 (0.68) (ab)</td>
<td>13.71 (0.67) (b)</td>
<td>13.83 (0.76) (a)</td>
<td>(F (3, 2125) = 7.00), (p &lt; .0001)</td>
</tr>
<tr>
<td>SES Running Water in the Home % ((n))</td>
<td>96% (324) (a)</td>
<td>94% (568) (a)</td>
<td>95% (739) (a)</td>
<td>95% (395) (a)</td>
<td>(\chi^2 (3) = 3.07), n.s.</td>
</tr>
<tr>
<td>SES Family Owns Motor Car % ((n))</td>
<td>65% (220) (a)</td>
<td>62% (378) (a)</td>
<td>68% (528) (a)</td>
<td>64% (264) (a)</td>
<td>(\chi^2 (3) = 5.03), n.s.</td>
</tr>
<tr>
<td>Religion % ((n))</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christian-Catholic</td>
<td>30% (100) (a)</td>
<td>23% (139) (a)</td>
<td>25% (196) (a)</td>
<td>24% (101) (a)</td>
<td></td>
</tr>
<tr>
<td>Christian-Other</td>
<td>38% (128) (a)</td>
<td>43% (260) (a)</td>
<td>44% (344) (a)</td>
<td>42% (177) (a)</td>
<td>(\chi^2 (9) = 8.01), n.s.</td>
</tr>
<tr>
<td>Islam</td>
<td>31% (104) (a)</td>
<td>32% (194) (a)</td>
<td>29% (228) (a)</td>
<td>31% (130) (a)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>1% (5) (a)</td>
<td>2% (13) (a)</td>
<td>2% (18) (a)</td>
<td>3% (10) (a)</td>
<td></td>
</tr>
</tbody>
</table>

*Note: N = 2148. Differing subscripts identify significant mean differences using Bonferroni post-hoc tests, \(p < .05\). Like subscripts indicate non-significant mean differences.*
Figure 3.2.

Substance Use Trajectory Classes (Mean Values Over Time)

- Early Escalators
- Late Escalators
- Middle Escalators
- Low/Rare Users

Beg - Grade 8 - End
Beg - Grade 9 - End
Beg - Grade 10 - End
Beg - Grade 11 - End

16%
37%
28%
19%
Chapter 4: GENERAL DISCUSSION

This final chapter first reviews each study including research aims and results and then the main contributions of the dissertation as a whole. The construct of healthy leisure is then discussed and a tentative model of how to conceptualize healthy leisure is proposed. The chapter concludes with future directions for research and some personal reflections of the dissertation process.

Key Findings and Contributions

The purpose of this dissertation was to develop a more complete understanding of how healthy leisure in South African adolescents was associated with substance use. Although initial comparisons of both US and SA Youth Risk Behavior Survey’s suggest similar rates of substance use across cultures, SA adolescents initiate illicit substance use at an earlier age and transition through substances at a faster rate than their US counterparts (Patrick et al., 2010; Reddy et al., 2010). One means of delaying onset and reducing rates of substance use in adolescence is by targeting healthy leisure time use. However, little work has been done to understand the role of healthy leisure in adolescent substance use. Making use of previously collected longitudinal data (HealthWise), two studies were conducted to achieve this aim with study 1 taking a variable-centered and study 2 taking a person-centered approach. These studies were guided by Problem Behavior Theory which suggested that individuals engaging in health-enhancing behaviors (i.e., healthy leisure) would be less likely to engage in risk behavior (i.e., substance use).

Study #1
Study 1 analyzed the association between state and trait healthy leisure and substance use. It was hypothesized that lower levels of both state and trait healthy leisure would be associated with higher levels of substance use and this relationship would be moderated by perceived parental over-control and treatment while controlling for gender, cohort, and school. Since healthy leisure lacks a clear and consistent definition, both studies took an exploratory approach to conceptualizing healthy leisure by conducting a factor analysis resulting in two factors of healthy leisure: a healthy leisure factor, and a leisure planning efficacy factor.

Hypotheses from study 1 were partially supported. Results for the healthy leisure factor followed hypothesized directions finding low levels of trait healthy leisure to be associated with higher levels of substance use and on occasions when state healthy leisure was low, substance use was high. Additionally, trait healthy leisure moderated the relationship between state healthy leisure and substance use finding lower state healthy leisure to be associated with lower levels of substance use, but even more so for individuals with low levels of trait healthy leisure. In other words, participants with low trait healthy leisure demonstrated shallower trajectories of substance use. There were no significant results for the leisure planning efficacy factor at the state or trait level or for interaction terms. Unexpectedly, neither perceived parental over-control nor treatment was found to moderate the relationship between healthy leisure factors and substance use.

Study #2

Study 2 sought to identify distinctive developmental patterns of adolescent substance use development and then determine the influence of healthy leisure on subgroups of substance use development. A four-class solution was found to best fit the
data, demonstrating three increasing and one stable trajectory group. The increasing groups were identified as early, middle, and late escalators and were characterized by increasing rates of use over time but with differing initial levels. The Early Escalators had the highest initial level of substance use followed by the Middle and Late Escalators. The Low/Rare Users comprised the stable trajectory class and demonstrated consistently low levels of use. The Low/Rare Users class served as the reference group when looking at how each healthy leisure factor predicted class membership. Results found individuals with high levels of healthy leisure were more likely to be in the low/rare users than in the early or middle escalators class. The leisure planning efficacy factor demonstrated the opposite results where individuals with higher levels of leisure planning efficacy were more likely to be in the Early or Middle Escalators than in the Low/Rare Users class.

**Contributions**

The studies within this dissertation make both methodological and substantive contributions to the fields of leisure science and adolescent development including uncovering the developmental pattern of substance use in South African adolescents, applying techniques commonly used in analyzing ecological momentary assessment data to capture state and trait leisure experience, and developing a better understanding of how healthy leisure is associated with adolescent substance use. Each of these contributions will be discussed further.

**Substance use development.** Study 2 identified sub-groups of SA adolescent substance use development, something that is lacking within the SA substance use literature. Although separating development by each substance may be more beneficial, the substance use composite score suggests that SA adolescents develop in a similar
manner to US adolescents. By separating out development by substance, further implications may be reached. For example, data used within this dissertation comes from Mitchell’s Plain, an area located within the ‘Cape Flats’ that exhibits a high rate of gang culture and drug trade, especially for methamphetamines, or tik, which has had increasing use within the past decade (Pasche & Myers, 2012). Research related to tik suggests that targeting light users to aide in quitting may be more successful than targeting heavy users for quitting or attending rehabilitation (Nyabadza, Njagarah, & Smith, 2013). If we understood the development of tik use in adolescence, we could go one step further to identify who becomes light and heavy users, and target early users to reduce use and light users to delay onset of use.

**State vs. trait healthy leisure.** An important methodological contribution is the use of techniques common in datasets with intensive longitudinal data, to parse apart state and trait measures of healthy leisure. Given the context-dependent nature of leisure experience previously discussed, it is important to attempt to account for both within- and between-person variation and within study 1, results for the healthy leisure factor were obtained in the hypothesized direction using only biannual measurement occasions. This is a noteworthy finding given the multi-dimensional influences acting on leisure experience. More frequent measures would provide for an even clearer picture of how healthy leisure is fluctuating from day to day and even from activity to activity.

Disentangling state and trait influences is not a common methodological tool used by leisure scientists and study 1 serves as an example of how this information can be obtained from panel study data. In doing this study, part of my intention was to highlight this latent state-trait (LST) methodology and its potential uses within leisure sciences.
Other leisure applications of this, or similar, LST techniques could address research questions related to sensation seeking and free time use to parse apart sensation seeking personality traits versus contextual factors influencing experiences of sensation seeking.

**Healthy leisure and substance use.** The second substantive contribution this dissertation makes is better understanding what healthy leisure is and how it is associated with adolescent substance use. Michelle Obama spoke earlier this year about the consequences of gun violence in Chicago, the city where she also grew up. She attributed her success partially to engaging in personally meaningful activities stating, “In the end, that was the difference between growing up and becoming a lawyer, a mother and first lady of the United States, and being shot dead at the age of 15” (Corley, 2013). This statement could have as easily been made about substance use and the context of risk present in South Africa, especially within the Western Cape where the participants in the current studies resided.

The use of factor analysis to identify sub-constructs was simply an exploratory approach to begin to develop an understanding and meaning of healthy leisure. The four items which comprised the healthy leisure factor did seem to provide a subjective view of positive use of leisure time which mapped well on to healthy leisure in general. The items in the leisure planning efficacy factor were expected to represent the confidence in an adolescent’s ability to plan and structure positive free time activities; skills necessary for engaging in healthy leisure pursuits. However, results from study 2 did not support this view even though the healthy leisure and planning efficacy trait measures were highly, positively correlated (r=.72); suggesting these two factors are representing qualitatively different constructs.
Results from both studies 1 and 2 suggested the healthy leisure factor served as a protective mechanism against adolescent substance use. This supports Sharp and colleague’s (2011) finding of a negative relationship between past month adolescent use of alcohol, tobacco, and marijuana and healthy leisure, and is congruent with PBT’s perspective. Findings point to healthy leisure as an important aspect of adolescent development, similar to other leisure factors such as intrinsic motivation. Results from both studies serve as a jumping off point for further investigating the risk and protective mechanisms of the leisure context. For example, work within the US found participating in high school athletics was associated with increased alcohol use; however, it was also associated with liking school more than non-athletes, higher than expected GPA, and successful adult job placement (Eccles, Barber, Stone, & Hunt, 2003). Now that we understand the basic relationship between healthy leisure factors at both the state and trait level, we can begin to identify characteristics of users to better understand these complex substance use behaviors.

**Implications.** Within South Africa, healthy leisure activity, specifically soccer, is already being used to address substance use and HIV/AIDS. These programs (e.g., Grassroots Soccer, Training to Reduce the Incidence of AIDS Related Death Nkomazi Rush) aim to reduce HIV transmission and enhance life skills through the means of soccer. Soccer is the most popular sport in South Africa which makes it a familiar mechanism for promoting health.

Results related to healthy leisure from both studies may have large and small implications. Larger scale initiatives, such as HealthWise, have the potential to impact entire communities of adolescents, but are challenging to implement and require a strong
foundation of community support and involvement in order to be successful. Chapter 1 provided a photo of a new, but unused community center and one suggestion is to make use of these facilities and provide structured programming for adolescents both during and after school. Programs during the school day could target adolescents who have dropped out of school to engage them in healthy leisure activities while after school programming could provide a central, safe location for pursuing independent and group leisure activities.

During my time in SA, I had a chance to visit multiple high schools and as we were getting ready to leave after an educator training, we noticed a group of adolescent girls practicing a choreographed dance led by an older student. To me, this demonstrated a great example of a small initiative that could be implemented at other schools using older students as leaders and existing school grounds for practice. This would provide an outlet for adolescent girls to engage in a positive leisure activity within the relative safety of the school grounds.

*HealthWise South Africa.* Even using the broad, ill-defined concept of healthy leisure, both studies within this dissertation found subjective perceptions of healthy leisure to be protective against substance use. This supports the inclusion of addressing positive use of leisure time within risk behavior prevention programs in SA, such as with HealthWise. HW’s efficacy trial demonstrated positive effects on risk behavior and leisure experience (e.g., motivation; Caldwell et al., 2008; Smith et al., 2008). As is the case with all packaged interventions, this suggests that HW is effective, but doesn’t provide evidence of which components are influencing positive outcomes. Results of study 1 serve to inform HealthWise and emphasize the importance of targeting
perceptions of healthy leisure in reducing substance use. However, treatment was not a significant moderator of healthy leisure and substance use, providing guidance for future modifications to the HW curriculum. Additionally, if a more clear understanding of healthy leisure from the SA adolescent perspective is obtained, then measures related to student outcomes can be refined to target specific attributes of healthy leisure that are addressed within the curriculum and important to adolescents.

Limitations

Limitations have been addressed within each study specifically and the main issues will be briefly reviewed. In my view, one of the main limitations of both studies is the substance use composite index provides a general understanding of substance use, but illustrates little about what substances are being used, how many substances are being used concurrently, and the intensity of use. The use of a composite index limits the applicability of the results. For example, South Africa is currently experiencing a rise in the use of methamphetamines by adolescents and young adults (Pasche & Myers, 2012). By parsing out use by substance, we can not only identify differential developmental patterns of use, but also the influence of healthy leisure on different substances.

Another limitation, also due to measurement, is that HW provided for two measurement occasions per year for up to four years. This means we were extracting state measures from bi-annual measurement occasions. Given the context-dependent nature of leisure experience, these measurement occasions were not sufficient to capture changes which may be occurring multiple times within one activity. Study 1 managed to pull out significant state influences from the available data and more intensive measurement
occasions would provide a clearer picture of how healthy leisure is changing between and within activities.

**Other Theory**

The current studies made use of Problem Behavior Theory as a framework for understanding the relationship between healthy leisure and substance use in adolescents. Given the measures available for use within the HW dataset, this theory was helpful in anticipating and explaining results. However, PBT has some limitations (as discussed in study 1) and other theories, such as self-determination theory and reversal theory, may also be helpful in understanding the relationship between leisure and risk behavior.

Self-determination theory (SDT; Ryan & Deci, 2000) is a commonly used motivational theory within leisure science and states that intrinsic motivation, or doing an activity for the inherent enjoyment of doing it, is only possible when three psychological needs of competence, autonomy, and relatedness, are satisfied. If these needs are not met, motivation, and consequently well-being, will be diminished. SDT would be helpful in identifying what types of motivation are being experienced at varying levels of healthy leisure, or rather for hypothesizing whether SDT moderates the relationship between healthy leisure and substance use. Further, each basic need could be investigated to determine if one is more influential than another on this relationship. Many of the suggested characteristics of healthy leisure from the research synthesis referred to self-determined activity, indicating SDT is a logical next step for guiding future healthy leisure research.

Reversal Theory suggests that individual’s motivations are dynamic and ever-changing, dependent on their motivational style and situation-specific factors (Apter,
This theory is appealing to apply to leisure experience as it attempts to account for short term changes, or “reversals” in motivation through four mutually exclusive domains including telic - paratelic (most similar to intrinsic and extrinsic motivation in SDT), conforming - negativistic (most similar to conventionality and unconventionality in PBT), mastery - sympathy (most similar to TPB’s autonomy, competence, and relatedness), and autic - alloic (focusing on self vs focusing on others’ needs). Instead of characterizing individuals with personality traits, reversal theory suggests that personality can be found in the patterns of reversal over time. Although reversal theory is not as well-known and widely used as the other theories mentioned, there may be some application of it to understanding the fluctuating states of leisure experience.

**Conceptualization of Healthy Leisure**

This dissertation aimed to develop a more complete understanding of how healthy leisure in adolescence was associated with substance use. For me, this work has culminated in a more developed understanding of what researchers think healthy leisure should mean, the various contextual influences of healthy leisure, and where I see the future of healthy leisure going. Within this section, these topics will be addressed and integrated to form a tentative conceptual model of healthy leisure which can be used to guide future work.

**Suggested Characteristics of Healthy Leisure**

This dissertation took an exploratory approach to defining healthy leisure due to a lack of agreed upon definition. To better understand the state of research related to healthy leisure, a research synthesis was conducted collecting database (e.g., ProQuest) articles that referred to the term ‘healthy leisure’. This search turned up four articles that
referred to characteristics of healthy leisure. Janssen (2004) associated healthy leisure in older adults with self-determined leisure behaviors. Self-determination is a concept that has historically been associated with leisure and prior research has focused on the health outcomes of intrinsically motivated and amotivated leisure (Caldwell, Patrick, Smith, Palen, Wegner, 2010). Supporting this view, Iso-Ahola and Mannell contend that long term, “it is possible to maintain motivation for leisure activities (and thus for health) only if one’s participation is self-determined and intrinsically rewarding” (2004, pp. 189). In the second article, Barnes, Auburn, and Lea (2004) stated normal and healthy leisure is conducted within the confines of the law, thereby excluding illegal actions.

Wilhite, Keller, and Caldwell (1999) wrote about the Optimizing Lifelong Health through Therapeutic Recreation (OLH-TR) model, which uses Baltes and Baltes (1990) developmental model of selective optimization with compensation as a framework. Within this paper, healthy leisure was characterized as resulting from individuals who are actively participating in their health and well-being (i.e., self-determined activity). Wilhite and colleagues also stated “healthy leisure lifestyles include a flexibility that enables individuals to make continuous accommodations to internal and external changes” (p. 102). In a separate article, Wilhite, Keller, Hodges, and Caldwell (2004) used this model as a framework to interview individuals with multiple sclerosis and found that common themes to a healthy leisure lifestyle included appreciation, relaxation, relationship building, altruism, legacy building, enjoyment, and anticipation. Other sources (outside of the ProQuest search) previously addressed healthy leisure. Caldwell and Gilbert (1990) stated “the term “healthy leisure” implies harmony with the physical, emotional, and mental aspects of leisure behavior” (p. 118). Godbey (2008; 2010)
suggested characteristics that may make a leisure activity healthy such as: being an active participant in one’s environment, being creative, engaging in meaningful activities, being optimistic, using one’s senses to understand and appreciate surroundings, humor, and social relations or networks.

In comparison, items included in the factor analysis conducted for both studies were chosen if they related to subjective evaluations or specific behaviors of healthy leisure characteristics including initiative, challenge, planning, and restructuring. Some of these items overlap with Godbey’s characteristics (e.g., active participant, meaningful activities), but otherwise did not follow with other characteristics mentioned. The challenge in defining and measuring healthy leisure is not a new issue to the field of leisure sciences. Articles from the 1980’s can be found also grappling with this dilemma (Shaw, 1985). In Chapter 1, multiple ways of looking at leisure were reviewed demonstrating some of the more common manifestations of how leisure is used in research today. If the concept of leisure isn’t clearly defined, how can we expect healthy leisure, a sub-type of leisure, to develop a clear definition?

**Future of Healthy Leisure**

Personally, I foresee healthy leisure falling into a similar rut in which leisure finds itself today for a few reasons. First, when conducting the research synthesis of the topic, only 71 citations turned up, suggesting that healthy leisure isn’t a widely used term. The majority of those citations made off-hand references to healthy leisure, referring to a lifestyle, pursuit, experience, interest, activity, participation, functioning, or behavior. Only six articles provided characteristics of healthy leisure or measured and analyzed healthy leisure. The concept is so nebulous that researchers prefer to focus on specific
behaviors or characteristics (e.g., physical activity, leisure motivation) that are of interest. Second, when healthy leisure is referenced, it is from the researcher’s point of view and while this often takes into account previous empirical and theoretical work, the participant’s own voice is missing; an issue that will be discussed further related to future directions.

Studying leisure experience presents an additional challenge in that it is extremely context-dependent; so much so that Caldwell’s (2011) LACE model includes context as one of the main elements of leisure (along with activities/time use and experience). The presence of so many unknown variables makes it challenging to fully understand leisure experience and this may cause researchers to move to more concrete leisure behaviors rather than exploring healthy leisure in general. One means of addressing contextual elements is by using person-centered methodological approaches; techniques that few leisure researchers have adopted. Suggestions for applying person-centered methods within leisure science are also discussed related to future directions.

Finally, addressing healthy leisure within the developmental period of adolescence presents additional difficulties unique to this age group. Even if healthy leisure had a more concrete definition, it may not apply across the lifespan. Adolescence is a developmental time period marked by social, emotional, cognitive, and biological changes. Although this presents unique opportunities to intervene and facilitate positive development, it also means there are even more processes and influences to account for. For example, adolescents experience neurobiological changes including a “remodeling” of the pre-frontal cortex, an area responsible for goal-directed behavior and emotion processing, and connections to/from it (Spear, 2000). These two tasks of the pre-frontal
cortex are directly related to engaging in positive, healthy leisure activities where individuals must negotiate barriers and frustrations while pursuing meaningful, positive activities.

Within the current study, an exploratory factor analysis produced two factors assumed to be indicative of healthy leisure: a healthy leisure factor, and a leisure planning efficacy factor. The healthy leisure factor demonstrated negative relationships as hypothesized while the leisure planning efficacy factor did not, with no significant relationship to substance use in study 1 and where individuals with higher levels were more likely to be in undesirable substance use trajectory groups. These findings illustrate the complexity in understanding healthy leisure as described above.

**Tentative Conceptual Model of Healthy Leisure**

Based on the information gained and understanding developed from this dissertation, a tentative conceptual model of healthy leisure is postulated (see Figure 4.1) where risk behavior is influenced by healthy leisure, which is comprised of the interactions between intrapersonal, interpersonal, and environmental factors and specific measures of each factor. This model combines elements of self-determination theory (Ryan & Deci, 2000), leisure activities-context-experience model (Caldwell, 2011), flow theory (Csikszentmihalyi, 1990), social learning theory (Bandura, 1977), and leisure constraint theory (Crawford, Jackson, & Godbey, 1991) that support or impede healthy leisure. Although not exhaustive, this model, coupled with future qualitative data on healthy leisure, may serve as a starting point for conceptualization.

Intrapersonal factors are individual-specific attitudes, personality traits, and abilities. More specifically, this factor refers to individual characteristics such as
activity-specific skills and abilities, individual leisure interests, motivations for engaging in leisure activity, normative perceptions of others’ leisure, personality traits, and level of autonomy. For example, adolescents’ perception of normative behaviors has been shown to influence their own engagement in that behavior. In a study of adolescent physical activity, results indicated that higher levels of parent and peer physical activity were associated with higher levels of adolescent physical activity (Godin, Anderson, Lambert, & Desharnais, 2005).

Interpersonal factors refer to interactions between individuals including the presence of positive leisure role models from parents/siblings/peers, level of parental monitoring, and household responsibility. In Chapter 2 we posited the potential for child-headed households in SA to influence trait levels of healthy leisure. Adolescents who are the sole or primary caregiver for younger relatives may not be afforded the time or financial means to engage in healthy leisure pursuits. Instead they may spend what little free time they have engaging in behaviors that are not developmentally beneficial (e.g., substance use, watching excess TV; Juma, Askew, & Ferguson, 2007).

Finally, environmental factors include external contextual aspects that may influence healthy leisure engagement such as the safety of the neighborhood or community, availability of leisure and recreation resources, and cultural perceptions. Cultural view may dictate what is and is not appropriate for adolescents to engage in. For example, historically in South Africa the game of cricket has been a sport where spectators and participants were predominantly White. During Apartheid, non-White players were not allowed on teams and although a quota system has been in place since then, it remains a “White sport.” Adolescents may receive messages from family
members and the community as a whole that soccer, for example, rather than cricket, is the game of choice, consequently limiting their opportunities for sport involvement (Fisher, 2013).

Figure 4.1.

Tentative Conceptual Model of Healthy Leisure

- Risk Behavior (e.g., substance use, risky sexual behavior, delinquency)
- Healthy Leisure
  - Intrapersonal: Leisure skills/abilities, Interests, Normative perceptions, Leisure motivation, Personality, Autonomy
  - Interpersonal: Positive leisure role models, Parental/sibling healthy leisure behaviors/attitudes, Peer healthy leisure attitudes/behaviors, Parental monitoring, Household responsibilities
  - Environmental: Availability of leisure facilities and equipment, Cultural perceptions of leisure activity, Community safety

Note: The use of circles and boxes within this model is not indicative of latent and manifest variable types.
Future Directions

This dissertation makes great strides towards understanding healthy leisure and its association with adolescent substance use but it is only a first step. More needs to be done to fully understand what healthy leisure is, how it should be conceptualized, and how it relates to substance use. Next steps should be to collect qualitative data to conceptualize healthy leisure, to look at individual substances rather than a composite score, to test a causal model to determine whether healthy leisure is driving substance use or vice versa, and identify additional mediators of the relationship between leisure and risk behavior.

Qualitative data collection from in-depth interviews and focus groups with SA adolescents will help to understand South African adolescents’ meanings and perceptions of health and healthy leisure and its association to substance use. Thematic content derived from coded transcripts of qualitative data could be used to compare and contrast with measures of healthy leisure from this dissertation and the tentative conceptual model put forth. Research questions could include: (1) how do South African adolescents conceptualize health and healthy leisure and (2) how is healthy leisure related to health risk behaviors such as substance use, and (3) to what extent do the definitions and meanings of healthy leisure (qualitative data) agree with the previously collected HW measures of healthy leisure?

As mentioned previously the composite score used within both studies of this dissertation is a sum of five substances and consequently, cannot differentiate between heavy use of one drug over time from experimental use over time. Since previous studies in SA have not analyzed developmental trajectories, an important first step would be to model each substance separately. Similar to study 2, GMM could be used to identify sub-
groups of users and their trajectories of use over time and then determine their likelihood of group membership based on level of healthy leisure.

Study 1 and 2 do not get at the causal association between healthy leisure and substance use and it is now known if substance use is a result of, or produces low levels of healthy leisure. To address this, a cross-lagged model could be tested using structural equation modeling where healthy leisure and substance use each predict one another at each subsequent time point.

Finally, the information gained from this dissertation and the process of writing it resulted in a tentative conceptual model of healthy leisure. These specific contextual factors should be further addressed to identify moderators and influences of the relationship between healthy leisure and substance use. For example, family and peer modeling is expected to influence behavioral intentions and action. However, it would be interesting to explore if modeling has changed with the ending of Apartheid and implementation of social services to disenfranchised groups. How have families changed their leisure behaviors over the past 20 years and how have adolescents responded to this change?

In the immediate future, I plan on further refining study 1 and submitting it to the journal *World Leisure Journal*. For study 2, I plan on splitting the study into two studies. Study 2a would be an exploratory paper related to substance use development in SA adolescents and model trajectory classes by substance. This would be the first study of its kind in SA to model sub-groups of change over time. This article could be submitted to a South African journal such as the *South African Medical Journal* or to a development focused journal such as the *International Journal of Behavioral Development*. Study 2b
would take these trajectory classes for only a few substances (i.e., alcohol, tobacco, marijuana or tik) and determine the probability of class membership based on levels of healthy leisure. By separating these articles, it affords more detail about development in study 2a, but study 2b could delve into the activity types of each class and other predictors, to determine what makes each class unique.

**Reflections**

One of the reasons I was drawn towards studying healthy leisure and risk behavior in adolescence is because I have personally seen individuals benefit from a leisure education program where they learn how to identify their values and interests and take the steps needed to pursue those interests. However, I didn’t always feel this way. As an undergraduate studying recreational therapy, I learned about leisure education and had difficulty in understanding how or when I would apply this information and who would actually need it. It wasn’t until I began working with individuals with a mental illness to integrate them back into the community and individuals in physical rehabilitation who were learning to negotiate their surroundings with their new physical abilities, that I finally understood. These experiences helped me to see that people sometimes need assistance in finding and pursuing healthy leisure interests. Over the past five years at Penn State, I have also learned that by teaching these skills during adolescence, we may be able to prevent some of the barriers from participation later in life. Learning about the South African context, I found that leisure skills are especially important in an environment where such skills may not be modeled or shared otherwise and that is lacking in opportunities, facilities, and equipment for pursuing healthy leisure activity.
My time spent in South Africa was not only an amazing opportunity to get a feel for the HW project up-close, it also exposed me to the environment these adolescents live in and are faced with each day. I saw children playing soccer next to the highway amongst the garbage and raw sewage. I saw kids “sledding” down an overpass next to the highway on an upside-down car roof. Given the urban area, I was surprised to see really no usable recreational facilities; rather I saw large areas of dirt where children played. These experiences helped me to understand the need for leisure opportunity within these areas and motivated me to keep working in SA.

While in SA, the more I learned about Apartheid, and the experiences of those who lived through it, the more interested I became. I’ve mostly heard about the civil rights movement within the US and, although I didn’t pay a lot of attention at the time, I have at least lived through the end of racial segregation in South Africa. Given how disenfranchised some groups were, there is a lot of ground to make up and I look forward to continuing to contribute to healthier lives for South Africans.
References


Corley, C. (2013, April 10). Michelle Obama steps into gun control debate [Interview]. Retrieved from
http://www.npr.org/blogs/itsallpolitics/2013/04/10/176822207/michelle-obama-steps-into-gun-control-debate


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# VITA

**Elizabeth Hall Weybright**

## EDUCATION

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<th>Year</th>
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<td>2013</td>
<td>Ph.D., Recreation, Park and Tourism Management</td>
<td>The Pennsylvania State University</td>
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<td>2005</td>
<td>M.S., Recreation and Park Administration</td>
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<td>2003</td>
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## AWARDS

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<tr>
<td>2011-2013</td>
<td>Prevention and Methodology Training Pre-Doctoral Fellowship, National Institute on Drug Abuse</td>
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<tr>
<td>2011</td>
<td>Graduate School Teaching Certificate, The Pennsylvania State University</td>
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<tr>
<td>2010-2011</td>
<td>Department of Recreation, Park and Tourism Management Outstanding Graduate Student Award, The Pennsylvania State University</td>
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<td>2009</td>
<td>Small Project Grant, College of Health and Human Development Alumni Society, Pennsylvania State University</td>
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<td>2005</td>
<td>Recognition Award, Recreation Therapists of Indiana</td>
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## PUBLICATIONS


## RECENT PRESENTATIONS

