

Development of a Leisure Experience Battery for Adolescents: Parsimony, Stability, and Validity

Linda L. Caldwell
University of North Carolina at
Greensboro

Edward A. Smith
University of North Carolina at
Greensboro

Ellen Weissinger
University of Nebraska

This study reports the development of a battery of scales measuring selected dimensions of leisure experience of adolescents. Four leisure dimensions were included in the battery: boredom, awareness, anxiety, and challenge. The reliability and validity of these scales were established with a sample of 1,407 adolescents. The goal of the analysis was to produce parsimonious yet internally consistent measures of selected dimensions of the adolescent leisure experience. To accomplish this, the original, longer version of the battery was shortened. Both Cronbach's alpha and factor analyses confirmed the internal consistency reliability of the reduced dimensions. Test-retest reliability was established over a twelve month interval. Correlations with theoretically related measures suggested initial construct validity.

KEYWORDS: *Adolescents, leisure experience, parsimony, reliability, validity*

Research interest in adolescents and leisure gained momentum in the late 1970s after Csikszentmihalyi, Larson and Prescott (1977) conducted one of the first empirical adolescent studies to examine leisure. Their study was based on the premise that social psychological forces during the adolescent developmental phase could be better understood if we knew *what* adolescents did with their time during a typical week, *why* they did what they did, and *how they felt* when they did it. Since that time, although there has not been a plethora of information, this line of inquiry has been a subject of continued interest (cf. Ellis & Rademacher, 1987; Kleiber, Larson, & Csikszentmihalyi, 1986; Mobily, 1989).

It is not common, however, to read literature that relates free time¹ experiences and activities of adolescents with deviant, high risk behavior—especially literature outside the field. This is curious since there is a strong

The data for this study were collected through a grant to K. Stephen Brown and J. Allan Best, University of Waterloo from the Ontario Ministry of Health. Funding for the analysis of the data came from the Office of Research Services, University of North Carolina at Greensboro. Requests for reprints should be directed to Linda L. Caldwell, Department of Leisure Studies, University of North Carolina at Greensboro, Greensboro, North Carolina, 27412-5001. Appreciation is extended to three anonymous reviewers for their helpful comments.

¹While free time and leisure are arguably two distinct concepts with idiosyncratic meanings to leisure researchers, these two terms have been used to convey the same meaning in this study. The words "free time" were used with adolescents because of their relative clarity as an objective condition of leisure (Kleiber, Larson, & Csikszentmihalyi, 1986; Iso-Ahola, 1979).

emphasis today on mitigating adolescent drug abuse, alcoholism, precocious sexual activity, sexually transmitted diseases (STDs), and cigarette use. Moreover, deviant activities are one of the five most common types of leisure pursuits of adolescents (Larson & Kleiber, 1991).

Since free time activities comprise between 40% to 50% of an adolescent's life (Csikszentmihalyi & Larson, 1984; Larson & Richards, 1989), and since it is logical to assume that most deviant, high risk behavior takes place in an adolescent's free time, it is therefore important to understand the relationship between adolescent experience and behavior in free time activities and high risk behavior. Unfortunately, this appears to be an area where clinicians (Larson & Kleiber, 1991), public health officials, and school personnel have not devoted sufficient attention.

While free time activities and experiences offer adolescents a place of their own where they can take charge of their lives and personal development, experiment with roles, and take part in self-appraisal (Kleiber & Rickards, 1986; Oerter, 1986), leisure and free time themselves are not necessarily positive for an adolescent, or produce positive results. Preliminary evidence suggests that much of adolescent negative leisure behavior is motivated by a lack of optimal arousal or, conversely, need for challenge (Kleiber & Rickards, 1985; Iso-Ahola & Crowley, 1991). In a discussion regarding adolescent delinquency and stimulation seeking behavior, Hamilton (1983) concludes that adolescent sociopaths have a high optimal level of stimulation (in other words, have a high need for stimulation) and often turn to negative behavioral actions to achieve this need for stimulation. Iso-Ahola (1980) suggests that unless leisure is optimally arousing, it may not be psychologically rewarding. In adolescence, the absence of meaningful uses of free time can have not only severe psychological effects, but can lead to a problematic developmental process as well (Larson & Kleiber, 1991).

The general purpose of this paper is to report the development of a battery of scales designed to understand selected qualitative aspects of adolescent leisure experience. The scale development effort described herein is important for three main reasons: (1) scales have been developed from theoretical constructs; (2) both internal consistency and test-retest reliability are assessed; and (3) the scales described are parsimonious, yet they still retain acceptable reliability scores (internal consistency and test-retest).

While some current scale development activity in leisure research recognizes the need for parsimonious yet statistically rigorous scale construction (cf. Aguilar & Petrakis, 1989; Witt & Ellis, 1985), and many scales are theoretically derived (Allen, Donnelly, & Warder, 1984; Crawford & Godbey, 1986; Lounsbury & Hoopes, 1988), scale development efforts have not adequately addressed the important issue of stability of measurement over time. The uniqueness of this research is that it examines test-retest reliability of a parsimonious battery of scales on a large sample, a process which has received scant attention in the leisure literature (Lounsbury & Hoopes, 1988).

Related Literature

The battery of scales presented here was intended to measure four salient dimensions of the leisure experience of adolescents: boredom; challenge; anxiety; and awareness. A review of related literature follows.

Boredom

Optimal arousal has been linked with terms such as boredom (cf. Iso-Ahola & Weissinger, 1990), challenge (cf. Larson & Kleiber, 1991), and anxiety (cf. Csikszentmihalyi, 1975). With regard to adolescents, understanding levels of these aspects of optimal arousal in leisure may help to understand negative and high risk use of free time. For example, boredom has been linked with frequency and quantity of alcohol use among female college students (Orcutt, 1984), deviant behavior at school for high school male and female students (Wasson, 1981), and over-eating (Mehrabian & Riccioni, 1986). These findings are particularly salient to this study as Vandewiele (1980) indicates that one third of the secondary school students in his sample reported that they were often bored.

One cognitive view of boredom is that it stems from perceptions of behavior as instrumentally unsatisfying (Hill & Perkins, 1985). This conceptualization may have some special interest in the study of optimally arousing free time experiences of adolescents since it has been suggested that adolescent leisure is largely instrumental (Kleiber & Rickards, 1985; Noe, 1969). Along these lines, Hamilton (1983) suggests that boredom in adolescents may occur as the result of activities being perceived as worthless or meaningless. Hill and Perkins (1985) also suggest that activities that are frustrating and/or monotonous are likely to produce boredom. Their conclusion is extended by Iso-Ahola and Weissinger (1990) who suggest that frustration is a result of perceived or actual constraints that limit the availability of optimally satisfying experiences. An adolescent may translate this sense of frustration into deviant, high risk behavior in hopes of regaining a level of optimal arousal that is under his or her control. For example, participation in delinquent or deviant free time activities may produce enjoyment, opportunity for skill development, and self-determination and regulation (Csikszentmihalyi & Larson, 1978; Hendry, 1983; Larson & Kleiber, 1991). It is possible that these deviant behaviors are instrumental and provide meaning to the adolescent, as well as provide the excitement that is concomitant with illicit behavior.

Challenge

Another component of the adolescent leisure experience may be the result of the match between skill level and challenge; too little challenge coupled with a high skill level is likely to produce boredom and, conversely, too much challenge and too little skill may produce anxiety (Csikszentmihalyi, 1975). With regard to challenge, whether it stems from the adolescent, the activity, or an adult probably has some influence as to how the ado-

lescent views the challenge. (That is, whether the challenge is positive and optimally arousing or anxiety or boredom producing.) For example, Larson and Kleiber (1991) posit that an adult's provision of structure to an adolescent may facilitate optimal arousal if the structure is viewed as a challenge. They continue to suggest that it is important to assess whether an adolescent experiences challenge and enjoyment from self-initiated free time activities.

Anxiety

Anxiety is generally construed to be a multidimensional construct which includes cognitive-worry and emotional-arousal components (c. La-bored & Morris, 1967; Morris, Davis, & Hutchings, 1981) or, similarly, cognitive and somatic components (cf. Burton, 1988; Martens, Vealey, & Burton, 1990). Cognitive and somatic anxiety are thought to be independent of each other, although they do co-vary (Morris, Davis, & Hutchings, 1981). Somatic anxiety, which refers to the physiological and affective elements of anxiety (Martens et al., 1990), was not of interest to this study.

Cognitive anxiety refers to negative expectations about personal success in an activity (Martens et al., 1990) and may hold promise in understanding adolescent leisure experience. This type of anxiety has been related to fear of failure and fear of evaluation by others (Brown, O'Keeffe, Sanders, & Baker, 1986; Passer, 1983). Given the social nature of many adolescent leisure experiences, adolescents may become anxious about impending free time if they perceive its demands and opportunities as threatening. On the other hand, despite the largely social nature of adolescent free time, it also offers opportunity for aloneness and introspection. While this introspection may serve an important role in adolescent development, it may also produce anxiousness (Levy & Farber, 1986).

Cognitive anxiety is also closely associated with arousal (Martens et al., 1990). There is some evidence to suggest that the likelihood of substance use in adolescents increases as a function of sensation-seeking and anxiety state, among other factors (Botvin, Baker, Tortu, & Dusenbury, 1989; Teichman, Rahav, & Barnea, 1988).

These findings suggest that anxiety may result not only from a mismatch of skill level and challenge in a specific activity (cf. Csikszentmihalyi, 1975), but also from a fear of free time in general. This fear or worry may emanate from fear of evaluation by others or may stem from the anxiety of being "alone" with one's own thoughts.

Awareness

Deci's (1975, 1980; Deci & Ryan, 1986) conceptualization of the motivational process suggests that one must be aware of the potential contribution of an activity or action to one's satisfaction before one will be motivated to seek engagement in that activity. In a sample of adults, for example, awareness of the psychological benefits of participation in leisure

was the strongest predictor (negative) of perceiving leisure as boredom (Iso-Ahola & Weissinger, 1990). Although untested this same phenomenon may apply to adolescents.

Leisure Experience Battery for Adolescents

Based on the previous literature, four dimensions were included in the Leisure Experience Battery for Adolescents (LEBA): boredom in leisure; leisure awareness; leisure challenge; and leisure anxiety. Table 1 contains the questions utilized to measure each of these dimensions. The

TABLE 1
Original Scale Items

Directions: Free-time refers to the time outside of scheduled school and/or work and required home activities. The following questions are about how you feel about your free time. Read each statement and think about it.

Circle the one number that best describes how you usually feel, using the scale given below.

	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
--	---------------------------	---------------	--------------	------------	------------------------

Boredom Items

Q114 For me, free time just drags on and on.*

Q117 Free time is boring.*

Q121 In my free time, I usually don't like what I'm doing, but I don't know what else to do.*

Q126 I usually become very absorbed by what I do in my free time.^a

Q128 During my free time, I almost always have something to do.**

Q132 My friends and I often talk about how bored we are.

Awareness Items

Q115 In the community where I live, I am aware of exciting things to do in my free time.*

Q116 I know of places where there are lots of things to do.*

Q127 I've never really given much thought to whether free time could be good for me.*

Q133 My community lacks things for people my age to do.**

Challenge Items

Q118 I like free time activities that are a little beyond my ability.*

Q119 If I think I might fail at an activity during my free time, I won't do it^a

Q123 I like a challenge in my free time.*

Q129 I am willing to try the unknown in my free time.*

Q134 I feel good when my free time activities challenge my skills.*

Anxiety Items

Q120 When I know I'm going to have some free time, I generally feel anxious.

Q125 The worst feeling I know is when I have free time and don't have anything planned.*

Q131 I get uptight when I have a whole weekend with nothing to do.*

Q136 I feel relaxed about free time when I don't have any plans.**

^aItems reverse-coded.

*Items used in reduced model.

boredom in leisure scale was adapted from Iso-Ahola and Weissinger (1987) and the leisure awareness scale was adapted from Iso-Ahola and Weissinger (1987) and Weissinger, Caldwell, and Mobily (1987). The leisure challenge scale was based on the theoretical work of Deci (1980), Csikszentmihalyi (1975), and Kobasa (1979) and was adapted from Weissinger (1985). The leisure anxiety scale was developed for this research project and was derived from the previously reviewed literature.

The dual purposes of this paper are to (1) describe the development of the LEBA to measure selected leisure experiences of an adolescent population in a multidisciplinary study in which the focus was to understand adolescent smoking behavior and (2) to describe the reliability (internal consistency and test-retest) and validity of the instrument with this population.

Methods

In the larger, multidisciplinary research effort from which this study is derived, cigarette smoking was the main health variable of interest. In adolescence, the social and behavioral correlates of smoking are considered more problematic than the physiological outcomes (Silvis & Perry, 1987) because smoking in early adolescence is a strong predictor of more severe delinquent and high risk behaviors in later years (Kandel, 1975; Perry & Murray, 1985). In addition, smoking has been shown to be an outlet for coping with the affective states of boredom, anxiety, tension, and fatigue (Lichtenstein & Brown, 1982). Gilbert (1979) also concluded that smoking reduces anxiety and at the same time increases performance on tasks demanding alertness.

Sample

The data reported on here were collected as part of a longitudinal panel study on the onset of cigarette smoking during adolescence. The project was conducted by the Waterloo Smoking Projects, University of Waterloo, with support from the Ontario Ministry of Health and from the National Heart, Lung, and Blood Institute. Students from 66 schools in Ontario were originally recruited in grade 6 (1983); these same students were recontacted every Spring through 1988. Schools were stratified on three criteria associated with youth smoking in order to assure that students in both conditions were approximately at the same level of risk: socioeconomic status (i.e., average household income); prevalence of principal and teacher smoking (based on prior surveys conducted with these individuals); and prevalence of older-peer smoking (based on a prior student survey). These schools were randomly assigned either to receive a smoking prevention curriculum or to function as controls. The smoking prevention program was delivered in grades 6, 7, and 8. The Leisure Experience Battery for Adolescents was added to the annual questionnaires in 1987 and 1988.

Two data sets were utilized for this study. Data set "A" was comprised of 1,407 students in the 10th grade in 1987 (91.4% of the original cohort recruited in 1983). Data set "B" was comprised of these same students recontacted in grade 11 in 1988 ($n = 1,346$; 95.7% of the 10th grade respondents). Forty-seven percent (47%) of the students were male and 53% were female.

Analysis Strategy

The statistical analyses for these data consisted of: (1) reliability analysis (Cronbach's alpha); (2) factor analysis (principle components with orthogonal rotation); and, (3) correlational analysis. Reliability analysis was performed not only to assess the reliability of each dimension, but also to reduce the number of items in each scale. Principal components factor analysis, which complimented the item reduction objective of the reliability analysis, simultaneously provided a test of the overall structure of the covariance matrix among all items. This step allowed an assessment of the existence of four distinct dimensions.

The correlational analysis achieved two objectives: (1) correlations across time within dimensions established test-retest reliability and (2) correlations within the same data set across dimensions provided evidence of construct validity. The principal components factor analysis and the reliability analysis were complimentary; both analyses were used together to determine the final structure of the scales. For the sake of clarity of presentation, each of these analyses will be described separately.

Three reliability issues were addressed in relation to the LEBA: (1) the need for parsimonious scales; (2) the need for internally consistent scales; and (3) the desire to determine stability of the scales across time. Cronbach's alpha was utilized to measure internal consistency in each of the sub-scales for the two rounds of data collection. It was important to keep in mind that the formula for Cronbach's alpha is based on the average inter-item correlation as well as the number of items in the scale. The easiest way to increase alpha is simply to increase the number of items in a scale that do not reduce the average inter-item correlation (Carmines & Zeller, 1979).

Given this relationship, an attempt was made to balance the desire for a parsimonious scale with the desire to have a scale with high internal consistency. Unfortunately, there are no steadfast rules to determine when the "trade off" between the parsimony achieved by reducing the number of items is counterproductive to the desire of a large alpha or the perhaps more important desire of tapping the full scope of the construct. For example, with the boredom construct, the removal of either Q126 or Q132 resulted in an alpha of .67. The inclusion of both items, on the other hand, produced an alpha of .68.

In order to follow a logical process which had both intuitive sense and which was productive to the task, the following decision rules were con-

structed: (1), if, with all items included, the alpha was improved by the removal of an item, the item was removed; (2) if, with all items included, the loss to alpha with the removal of an item was not greater than .01, the item was removed; (3) once the initial reduction of items from steps 1 and 2 was achieved, no further reduction of items was allowed that resulted in a loss to alpha.

Results

Reliability

The reliability decision rules described previously were applied to both grade 10 and 11 data. For each scale, the removal of one or two items either increased alpha, or reduced it by no more than .01 for each item removed. The same items were removed in the grade 11 data as were removed in the grade 10 data; similar alphas were also obtained. The only exception to this consistency was with Q118 in the challenge dimension. In the grade 11 data, this item could have been removed with no loss to alpha. In order to achieve comparability of reduced dimensions across rounds, however, this item was retained in the later analyses. The items retained for the LEBA are marked with an asterisk in Table 1.

The alpha scores on the reduced scales ranged between .55 and .70. The following alphas were obtained for each scale: boredom = .68, Grade 10 and .70, Grade 11 (4 items); awareness = .55, Grade 10 and .55, Grade 11 (3 items); challenge = .70, Grade 10 and .70, Grade 11 (4 items); and, anxiety = .62, Grade 10 and .63, Grade 11 (3 items). While these may be considered somewhat low, these scales contain only 3 or 4 items. Furthermore, since the items are not parallel (that is, do not have the same expected true scores and same error variances), alpha is a conservative estimate of a measure's reliability because alpha is the lower bound to the reliability of an unweighted scale of N items (Carmines & Zeller, 1979). Because of the conservative nature of alpha, and the extreme consistency of the measures across time, the scale seems to be a reasonable compromise between the concern for reliability and need for parsimony.

Factor Analysis

As an additional procedure to check the internal consistency of these scales, and to determine the existence of four distinct dimensions, the data were analyzed using principal components factor analysis with orthogonal rotation. This analysis was conducted for both the full set of items and the reduced set of items for both rounds of data collection (grades 10 and 11). Consistent with expectations, four factors emerged from this analysis; each item from each dimension loaded as predicted. Moreover, the weakest items in each factor are the same items which were excluded based on Cronbach's alpha (e.g., Q126 and Q132 in boredom). This same procedure was performed on the grade 11 data, and the results were similar.

Table 2 presents the results of the factor analysis on the reduced set of items. The resulting factors are clear and there is no ambiguity regarding factor structures. Perhaps the most important feature of this comparison is the consistency of factor structures and loadings across the two grades. Of the 14 items, only 2 have factor loadings which differ across grade by greater than .10: Q116 in awareness and Q131 in anxiety. This suggests that not only are the dimensions consistently being measured and comprised of the same items, but also that the relationship of each item to the overall dimension is consistent.

Correlational Analyses

To establish test-retest reliability, the same test was given to the same students at two different time points (in this case one year apart). Since the 10th and 11th grade data consist of the same subjects each time, these measures were correlated across time to assess the test-retest reliability of the measures. Results from this analysis are presented in Table 3. Correlations are presented for both additive scales and factor scales. In addition, for comparison purposes, the "best" single item of each scale was correlated across time. Whether the additive, reduced scales produced from Cronbach's alpha or the computed factor scores are utilized, there is a positive relationship between the dimensions across time (.36 to .46). The correlations for the single best items are also positive (.27 to .31), but are not as strong as the additive scales or the factor scores. This is not surprising because a single item measure is not as likely to be as stable as a multi-item, homogenous scale (Nunnally, 1978).

In order to assess the construct validity of the measures, the theoretical relationships among the measures were first specified. It was expected that adolescents who were more bored in their free time would also be those that were less aware of leisure opportunities. Adolescents who were low on awareness were also expected to be low on affinity for challenge. Those who enjoyed a challenge in their free time were hypothesized to be less bored in their leisure. Finally, those who were more bored were expected to be more anxious about free time.

Table 4 displays the respective correlations for these hypothesized relationships for both time points. For simplicity, only the correlations between the additive reduced scales are shown; the corresponding correlations between the reduced factor scores do not differ from these results by more than .03. These correlations suggest a great deal of consistency of relationships across time. Furthermore, the correlations follow the hypothesized relationships. Boredom, for example, has a negative correlation with awareness: $-.27$ in the 10th grade and $-.29$ in the 11th grade. Awareness and challenge are positively related (.28 in the 10th grade and .27 in the 11th grade) as are boredom and anxiety (.18 and .21). Challenge and boredom are, as predicted, negatively related (.26 in both rounds). We interpret the consistency of these predicted relationships to suggest the construct validity of these measures.

TABLE 2
Principle Components Analysis on Reduced Items (Rotated Factor Matrix)

	Grade 10 ^a			
	Factor 1 Challenge	Factor 2 Boredom	Factor 3 Awareness	Factor 4 Anxiety
Q118	.64728	.00889	.10026	-.10253
Q123	.74858	-.06489	.12661	.03826
Q129	.66633	-.18536	.05933	.10445
Q134	.76460	-.03191	.02333	.03334
Q114	-.00471	.73261	.07039	.05614
Q117	-.02179	.76493	-.12753	.02036
Q121	-.09128	.64557	-.16472	-.15678
Q128	-.37931	.53317	-.19458	-.04770
Q115	.24604	-.07274	.75354	-.01724
Q116	.26454	-.22145	.64907*	.02126
Q133	-.11996	-.03933	.74381	-.16310
Q125	.07673	.16046	.00319	.70580
Q131	.05352	.06330	-.04534	.79872*
Q136	-.07704	.00592	-.09890	.66475
Eigenvalue:	3.14	1.95	1.32	1.18

	Grade 11 ^b			
	Factor 1 Challenge	Factor 2 Boredom	Factor 3 Anxiety	Factor 4 Awareness
Q118	.62580	.01647	-.04675	.14059
Q123	.76520	-.07410	-.01359	.18094
Q129	.66208	-.18007	.04470	-.02630
Q134	.78236	-.12026	.01590	.04046
Q114	-.00049	.76465	.06381	-.01553
Q117	-.02756	.80347	.02488	-.11180
Q121	-.13044	.69313	.13067	-.11870
Q128	-.27725	.59226	.08962	-.14116
Q125	.10826	.12281	.77072	-.04419
Q131	.01524	.11374	.78925*	-.06229*
Q136	-.11244	.02016	.68088	-.03716
Q115	.17164	-.11061	.00918	.75179
Q116	.26954	-.17601	.02138	.60379*
Q133	-.08134	-.05382	-.18525	.73543
Eigenvalue:	3.25	1.94	1.39	1.19

^a% of Total Variance = 54.3

^b% of Total Variance = 55.5

*Factor Loading Difference > .10 between Grades 10 and 11

TABLE 3
Reduced Construct Correlations Across Time for Scales and Factors
(Grades 10 and 11)

	Scales	Factors	Single Items
Boredom	.39	.40	.27
Awareness	.45	.46	.31
Challenge	.39	.40	.31
Anxiety	.36	.37	.28

There are two other columns in Table 4. The column labeled "single item" used the same items as in Table 3. When these correlations are compared across rounds (i.e., 10th vs. 11th grades), with each other, and with the overall scales (of which they are a part), they are neither as consistent nor do they display as strong a relationship as was hypothesized.

Finally, the column labeled "correction" displays the correlations between these scales correcting for attenuation. That is, one can build into the observed correlation a factor which corrects for the degree of unreliability found in the scales due to random measurement error (Carmines & Zellner, 1979). In this case, correcting for attenuation increased the magnitude of the correlations between the leisure dimensions.

TABLE 4
Correlations Among Dimensions, Grades 10 and 11

Dimensions	Scales*	Correction**	Single Item
<i>Grade 10</i>			
Boredom-Awareness	-.27 ^a	-.45 ^a	-.16 ^a
Awareness-Challenge	.28 ^a	.45 ^a	.22 ^a
Challenge-Boredom	-.26 ^a	-.38 ^a	-.07 ^b
Boredom-Anxiety	.18 ^a	.28 ^a	.09 ^a
<i>Grade 11</i>			
Boredom-Awareness	-.29 ^a	-.47 ^a	-.15 ^a
Awareness-Challenge	.27 ^a	.44 ^a	.19 ^a
Challenge-Boredom	-.26 ^a	-.37 ^a	.15 ^a
Boredom-Anxiety	.21 ^a	.32 ^a	.11 ^a

*Results for Factors and Scales do not differ by more than .03.

**Correction for attenuation where: corrected r = observed r /square root of the (reliability of x)*(reliability of y).

^a $p < .000$

^b $p < .006$

Discussion

Taking into consideration the results from the internal consistency reliability analyses and factor analyses, it appears that the reduced scales may hold promise as reliable measures. The somewhat low internal consistency scores (.70 Boredom; .55 Awareness; .70 Challenge; and .63 Anxiety, Grade 11) are not necessarily due to systematic error, but are perhaps due in part to the relatively low number of items in each scale (4, 3, 4, and 3, respectively). The fact that the factor analyses compliment the reliability analysis also suggests one could view the scales with some confidence.

Since the best single items in each dimension did not correlate as well across time as either the factor scales or additive scales (Table 3), there is an indication of a need for a multi-item scale to fully tap the dimension under study. The inadequacy of single items is also evident in Table 4 where none of the single items correlate as well with each other as do their scale counterparts (see Nunnally (1978) or Thorndike (1982) for further discussion of the instability of single items). Based on these findings, one could conclude that a reasonable balance was achieved between the need for parsimony and the need for internal consistency.

Perhaps a more important finding is the relative stability of these measures across a year's time. The pattern of the factor structure is virtually identical in grades 10 and 11. Correlations of the scales and factors across time are also indicative of stability of measurement, although the correlations are moderate.

Why aren't the test-retest correlations higher? A number of reasons are possible. First, random fluctuations from time one to time two, such as testing conditions (weather, distractions) or personal conditions (fatigue, recent experiences) may have reduced the correlations (Anastasi, 1982). Also, retest correlations decrease as the time between instrument administration increases. In a study to develop and validate the Boredom Prone-ness Scale, Farmer and Sundberg (1986) reported a test-retest correlation of $r = .83$. Their scale, however, had 28 items and was retested over a one week interval. This short test interval is problematic (Anastasi, 1982) and is susceptible to overestimation of the correlation due to memory (Carmines & Zellner, 1979).

Finally, the construct itself may have changed. This last consideration is a possibility which needs to be further investigated. Adolescents are going through a time of transition into adulthood, and it is unknown whether these leisure dimensions would have changed during a year. There is evidence to suggest that adolescents are developing life interests during their teenage years (Csikszentmihalyi & Beattie, 1979). Further, identity formation and the development of intrinsic interests are reciprocally linked (Hamilton, 1983). Therefore, it is a possibility that some of the instability in the measures were due to maturation. On the other hand, the trial-and-error nature of the discovery of enjoyable activities in adolescence (Hamilton, 1983) may suggest that this process is not one that would occur in a

year, especially without some sort of intervention, such as a leisure education program. While the data do suggest that the leisure dimensions measured are more trait than state, due to the transitional nature of adolescence this issue should be investigated further.

The overall purpose of this endeavor was to develop a battery of scales which would be useable in research projects on adolescents. While the LEBA still needs more research and further refinement, the utility of using leisure dimensions in studies of adolescent problem behavior may be promising. Since there is suggestion of consistency in the dimensions over time, one could have more faith in interpreting change in scores as due to the intervention rather than to systematic error variance. This may be particularly helpful, for example, in evaluating the efficacy of leisure education programs designed to address leisure dimensions in this study, whether part of a larger project or not.

Recently health promotion programs targeted toward teenagers have attempted to employ comprehensive approaches to improve adolescent health. Such programs attempt to improve life skills and not simply to prevent single negative behaviors (e.g., drug use) (c.f., Dryfoos, 1990). It seems natural that leisure education can be an integral component of these efforts. Botvin (1985), for example, describes a Life Skills Training Program (LSTP) as a health promotion strategy. The purpose of the LSTP is to facilitate the development of personal and social skills in adolescents, with emphasis placed on the development of skills for coping with peer pressure to participate in negative behavior. It is possible that some of the social anxiety adolescents feel about impending free time is due to their concern over being able to and how to "just say no" to their peers. When Csikszentmihalyi and Larson (1984) discuss friendship among adolescents, they suggest that skills of friendship include the ability and comfortability to mutually define a set of acceptable boundaries for behavior, while at the same time having fun.

The administration of the LEBA, as part of a larger evaluation effort, could help evaluate the effects of a specifically designed leisure education component of a larger health promotion program designed to teach boredom coping skills, leisure preparedness and anxiety coping skills, and so on. In this manner, LEBA could be employed to assess changes within leisure boredom, anxiety, awareness and challenge and/or to assess the relationship between such changes and other program goals (e.g., drug use, teenage pregnancy, delinquency, etc.).

For example, using the LEBA on cross-sectional data, Smith and Caldwell (1989) found that adolescents who smoked cigarettes were more bored, felt less challenged, and felt less competent than their peers in their free time in general. These findings were consistent when specific leisure activities were used as independent variables. Other studies specifically related to boredom have focused on the period of adolescence (Hamilton, 1983; Orcutt, 1984; and Wasson, 1981). These studies have found significant relationships between boredom and deviant and/or unhealthy be-

havior. The further application of the LEBA in other health promotion efforts may be useful as we attempt to measure change within these dimensions as a function of planned interventions.

Despite the promise of the LEBA, it should be used cautiously. While the preceding discussion suggests plausible explanations of the low reliability dimension scores, they are nevertheless weak. Further refinement of the LEBA is necessary before it can be used with total confidence, especially if it is to be used for individual diagnostic purposes. Additional research is needed to improve the operationalization of the dimensions of interest. It is also likely that other dimensions of leisure experience may be salient to this battery.

Finally, it is recommended that further research may want to address gender differences in these leisure dimensions for adolescents. Orcutt (1984), for example, found that males and females differed on various measures of boredom and quantity of alcohol consumption. It is possible that the leisure experiences and meanings may differ for adolescent males and females. In light of the current concern for and recognition of the difference in leisure meanings and leisure participation between males and females, this line of inquiry may also prove fruitful.

References

- Allen, L. R., Donnelly, M. A., & Warder, D. S. (1984). The stability of leisure factor structures across time. *Leisure Sciences*, 6, 221-237.
- Anastasi, A. (1982). *Psychological testing*. New York: MacMillan.
- Aguiar, T. E., & Petrakis, E. (1989). Development and initial validation of perceived competence and satisfaction measures for racquet sports. *Journal of Leisure Research*, 17, 77-91.
- Botvin, G. J. (1985). The Life Skills Training Program as a health promotion strategy: Theoretical issues and empirical findings. *Special Services in the Schools*, 1, 9-23.
- Botvin, G. J., Baker, E., Tortu, S., & Dusenbury, L. (1989). Smokeless tobacco use among adolescents: Correlates and concurrent predictors. *Journal of Developmental and Behavioral Pediatrics*, 10, 181-186.
- Brown, J. M., O'Keeffe, J., Sanders, S. J., & Baker, B. (1986). Developmental changes in children's cognition to stressful and painful situations. *Journal of Pediatric Psychology*, 11, 343-357.
- Burton, D. (1988). Do anxious swimmers swim slower? Reexamining the elusive anxiety-performance relationship. *Journal of Sport & Exercise Psychology*, 10, 45-61.
- Caldwell, L. L., & Smith, E. A. (1988). Leisure: An overlooked component of health promotion. *Canadian Journal of Public Health*, 79, S44-S48.
- Carmines, E. G., & Zeller, R. A. (1979). *Reliability and validity assessment*. Beverly Hills, CA: Sage University Press.
- Crawford, D. W., & Godbey, G. (1986). The stability of leisure preferences. *Journal of Leisure Research*, 18, 96-115.
- Csikszentmihalyi, M. (1975). *Beyond boredom and anxiety*. San Francisco: Jossey-Bass.
- Csikszentmihalyi, M., & Beattie, E. O. (1979). Life themes: An exploration of their origins and effects. *Journal of Humanistic Psychology*, 19, 45-63.
- Csikszentmihalyi, M., & Larson, R. (1984). *Being Adolescent*. New York: Basic Books.

- Csikszentmihalyi, M., Larson, R., & Prescott, S. (1977). The ecology of adolescent activity and experience. *Journal of Youth and Adolescence*, 6, 281-294.
- Deci, E. (1975). *Intrinsic motivation*. New York: Plenum.
- Deci, E. (1980). *The psychology of self-determination*. Boston: Lexington.
- Deci, E., & Ryan, R. (1986). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.
- Dryfoos, J. (1990). *Adolescents at risk: Prevalence and prevention*. New York: Oxford University Press.
- Ellis, G. D., & Rademacher, C. (1987). Development of a typology of common adolescent free time activities: A validation and extension of Kleiber, Larson, and Csikszentmihalyi. *Journal of Leisure Research*, 19, 284-292.
- Farmer, R., & Sundberg, N. D. (1986). Boredom proneness: The development and correlates of a new scale. *Journal of Personality Assessment*, 50, 4-17.
- Glibert, D. C. (1979). Paradoxical tranquilizing and emotion reducing efforts of nicotine. *Psychological bulletin*, 86, 643-661.
- Hamilton, J. A. (1983). Development of interest and enjoyment in adolescence. Part II. Boredom and psychopathology. *Journal of Youth and Adolescence*, 12, 363-372.
- Hendry, L. (1983). *Growing up and going out: Adolescents and leisure*. Aberdeen, Scotland: Aberdeen University Press.
- Hill, A. B., & Perkins, R. E. (1975). Towards a model of boredom. *British Journal of Psychology*, 76, 235-240.
- Iso-Ahola, S. E. (1979). Basic dimensions of definitions of leisure. *Journal of Leisure Research*, 11, 28-39.
- Iso-Ahola, S. E. (1987, October). Psychological and social psychological aspects of leisure behavior. Past, present, and future research. Featured Paper, SPRE Leisure Research Symposium, New Orleans, LA.
- Iso-Ahola, S.E., & Crowley, E. D. (1991). Adolescent substance abuse and leisure boredom. *Journal of Leisure Research*, 23, 260-271.
- Iso-Ahola, S. E., & Weissinger, E. (1990). Perceptions of boredom in leisure: conceptualization, reliability, and validity of the leisure boredom scale. *Journal of Leisure Research*, 22, 1-17.
- Iso-Ahola, S. E., & Weissinger, E. (1987). Leisure and boredom. *Journal of Social and Clinical Psychology*, 5, 356-364.
- Kandel, D. B. (1975). Stages in adolescent involvement in drug use. *Science*, 190, 912-914.
- Kleiber, D. A., Larson, R., & Csikszentmihalyi, M. (1986). The experience of leisure in adolescence. *Journal of Leisure Research*, 18, 169-176.
- Kleiber, D. A., & Rickards, M. (1985). Leisure and recreation in adolescence: Limitations and potential. In M. G. Wade (Ed.), *Constraints on Leisure* (pp. 289-317). Springfield, IL: Charles C. Thomas
- Kobasa, S. (1979). Stressful life events, personality, and health: An inquiry into hardiness. *Journal of Personality and Social Psychology*, 37, 1-11.
- Larson, R., & Kleiber, D. A. (1991). Free time activities as factors in adolescent adjustment. In P. Tolan & B. Cohler (Eds.), *Handbook of Clinical Research and Practice with Adolescents*. New York: Wiley.
- Larson, R., & Richards, M. (1989). The changing life space of early adolescence (Special Issue). *Journal of Youth and Adolescence*, 18, 501-626.
- Levy, B. S., & Farber, B. A. (1986). Clinical implications of adolescent introspection. *Psychotherapy*, 23, 570-577.
- Lichtenstein, E., & Brown, R. A. (1982). Current trends in the modifications of cigarette dependence. In A. S. Bellack, M. Hersen, & A. E. Kazdin (Eds.), *International Handbook of Behavior Modification and Therapy*. New York: Plenum, 575-611.

- Lounsbury, J. W., & Hoopes, L. L. (1988). Five-year stability of leisure activity and motivation factors. *Journal of Leisure Research*, 20, 118-134.
- Martens, R., Vealey, R. S., & Burton, D. *Competitive Anxiety in Sport*. Champaign, IL: Human Kinetics Press.
- Mehrabian, A., & Riccioni, M. (1986). Measures of eating-related characteristics for the general population: Relationships with temperament. *Journal of Personality Assessment*, 50, 610-629.
- Mobily, K. E., (1989). Meanings of recreation and leisure among adolescents. *Leisure Studies*, 8, 11-23.
- Morris, L. W., Davis, M. A., & Hutchings, C. H. (1981). Cognitive and emotional components of anxiety: Literature review and a revised worry-emotionality scale. *Journal of Educational Psychology*, 73, 541-555.
- Noe, F. (1969). An instrumental conceptualization of leisure for the adolescent. *Adolescence*, 4, 385-400.
- Nunnally, J. C. (1978). *Psychometric theory*. New York: McGraw-Hill.
- Oerter, R. (1986). Developmental tasks through the lifespan: A new approach to an old concept. In P. Baltes, L. Featherman, & R. Lerner (Eds.), *Lifespan Development and Behavior*, Vol. 7, Hillsdale, NJ: Lawrence Erlbaum, 233-269.
- Orcutt, J. D. (1984). Contrasting effects of two kinds of boredom on alcohol use. *Journal of Drug Issues*, 14, 161-173.
- Passer, M. W. (1983). Fear of failure, fear of evaluation, perceived competence, and self-esteem in competitive-trait anxious-children. *Journal of Sport Psychology*, 5, 172-188.
- Perry, C. L., & Murray, D. M. (1985). Preventing adolescent drug abuse: Implications of behavioral, etiological, developmental environmental models. *Journal of Primary Prevention*, 6, 31-52.
- Silvis, G. L., & Perry, C. L. (1987). Understanding and deterring tobacco use among adolescents. *Pediatric Clinics of North America*, 34, 363-379.
- Smith, E. A., & Caldwell, L. L. (1989). The perceived quality of leisure experiences among smoking and non-smoking adolescents. *Journal of Early Adolescence*, 9, 153-162.
- Teichman, M., Rahav, G., Barnea, Z. (1988). A comprehensive substance prevention program. An Israeli experiment. *Journal of Alcohol and Drug Education*, 33, 1-10.
- Thorndike, R. L. (1982). *Applied psychometrics*. Boston: Houghton-Mifflin.
- Vandeweile, M. (1980). On boredom of secondary school students in Senegal. *Journal of Genetic Psychology*, 137, 267-274.
- Wasson, A. S. (1981). Susceptibility to boredom and deviant behavior at school. *Psychological Reports*, 48, 267-274.
- Weissinger, E. (1985). The development and validation of an intrinsic leisure motivation scale. Unpublished dissertation, University of Maryland, College Park.
- Weissinger, E., Caldwell, L.L., & Mobily, K. E. (1987, September). Use of recreation majors as research subjects: Differences between majors and nonmajors on leisure related variables. Paper presented at the SPRE Leisure Research Symposium, New Orleans, LA.
- Witt, P. A., & Ellis, G. (1985). Development of a short form to assess perceived freedom in leisure. *Journal of Leisure Research*, 17, 225-333.

Received March 2, 1991

Accepted March 1, 1992