

Development, Reliability and Validity of a Scale to Measure Intrinsic Motivation in Leisure.

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The purpose of the present study is to describe the development of a theory-based instrument to measure individual differences in the disposition toward intrinsic motivation in leisure behavior, and to report data from nine studies examining the reliability and validity of the instrument (total $n = 1866$). Based on the conceptual work of Deci and Ryan (1985a), Kobasa (1979), and their associates, the Intrinsic Leisure Motivation Disposition is defined as a tendency to seek intrinsic rewards in leisure behavior. It is assumed that the strength of this tendency will differ across individuals, but will remain relatively stable within individuals and across situations. The 24-item Intrinsic Leisure Motivation (ILM) Scale displayed Cronbach alpha coefficients ranging from .872 to .913. The four theoretically derived subscales (Self-Determination, Competence, Commitment, Challenge), each with six items, had alphas ranging from .638 to .832. Confirmatory factor analysis was used to explore the structure of the four subscales. Construct validity data showed that the ILM scale correlated in the hypothesized manner with 13 other measures of theoretically related variables. In six studies that tested for gender differences in ILM scores, only one found significant differences. Discussion of possible research applications for the ILM Scale is presented.

Introduction

Intrinsic motivation theory has been applied to such diverse areas of leisure behavior as therapeutic recreation (Caldwell & Weissinger, 1994; Levy, 1971; Mahon, 1994; Peterson & Gunn, 1984), children's play (Barnett, 1980; Csikszentmihalyi, 1975b), leisure and physical health (Coleman, 1993; Weissinger & Iso-Ahola, 1984), evaluation of leisure services (Iso-Ahola, 1982), the experience of flow (Bradley & Mannell, 1982; Mannell, Zuzanek & Larson, 1988), discontinuing leisure activities (Backman & Crompton, 1990), leisure identity salience (Shamir, 1992), work/leisure distinctions in sport (Wagner, Lounsbury & Fitzgerald, 1989), school and leisure (Bergin, 1992), shopping (Lesser & Forsythe, 1989), and tourism behavior (Iso-Ahola, 1983). These studies, which span more than two decades of leisure research, would seem to suggest that many leisure settings provide opportunities for people to select behaviors that provide intrinsic rewards.

Early conceptualizations of the intrinsic motivation construct (Deci, 1975; Lepper & Greene, 1978) assumed that the activation of intrinsic mo-

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tivation was determined by characteristics of the task (e.g., how interesting it was) or situation (e.g., what type of reward contingencies existed). This resulted in a large number of experimental studies, in which tasks and situations were manipulated and the resultant effects on intrinsic motivation were assessed (see DeCharms & Muir, 1978; Ryan & Deci, 1980 for reviews). But this task/situation approach was faulted for its failure to consider the influence of person variables, either conceptually or methodologically (Deci, 1980).

In response to these criticisms, Deci and Ryan (1985a) reformulated the Cognitive Evaluation Theory of intrinsic motivation to accommodate a person X situation approach. They suggest that individuals differ in the degree to which they desire intrinsic rewards, and that these differences influence behavioral choices (Figure 1). Individual differences mediate cognitive interpretations of perceived needs, or motives. These motives then energize goal selection and goal directed behavior. The theory states that this "autonomy" orientation is characterized by a tendency to select behaviors that provide intrinsic rewards. Similarly, Maddi and Kobasa (1981) present evidence for the "hardy personality" which they also characterize as a predisposition for intrinsically motivated behavior.

Neither of these reformulations denies the influence of task and situation variables on the activation of intrinsic motivation. Rather, each is concerned with possible consistencies within individuals in their perceptions and reactions across tasks and situations. This "interactionist" approach assumes that certain tasks and situations may arouse intrinsic motivation in some individuals, but not others. Similarly, personality dispositions may influence the likelihood that a given individual will experience intrinsically motivated behavior across many situations.

Graef, Csikszentmihalyi and Gianinno (1983) provide evidence of individual differences in intrinsic motivation experienced during everyday activities. In their sample of 107 working men and women, the percentage of activities perceived as extrinsically motivated by any given individual ranged from 0 percent to 83 percent, while the percentage of activities perceived as intrinsically motivated ranged from 0 percent to over 68 percent. In addition, nearly 10 percent of the objectively "obligatory" activities were perceived as intrinsically motivated, and almost 13 percent of the objectively "discretionary" activities were perceived as lacking any intrinsic motivation. One explanation for these findings may be some sort of dispositional variable that mediate people's responses to tasks and situations.

Intrinsic Motivation as an Individual Difference Variable

Based on observations of substantial individual differences in reactions to tasks and situations, Deci and Ryan (1985a) suggested the existence of three personality orientations (autonomy, control, impersonal) that influence behavioral choices. Specifically relevant here, the autonomy orientation is characterized by a tendency to seek out opportunities to be in control of

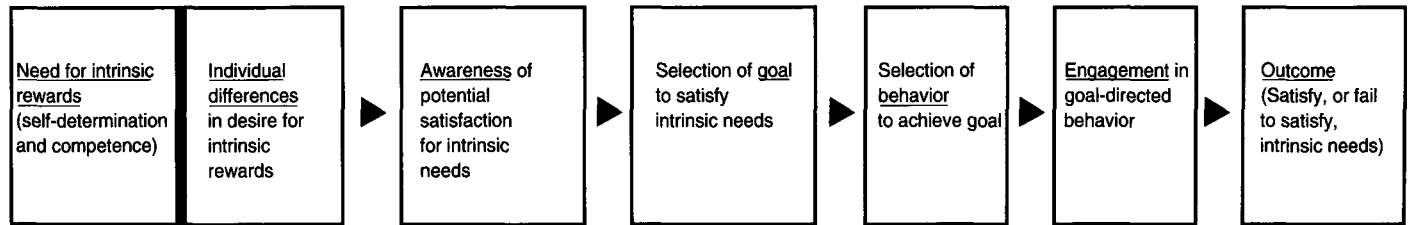


Figure 1. Schematic representation of self-determination theory (adapted from Deci & Ryan, 1985:240).

one's environment, and to select behaviors that provide information about competence and self-determination. In other words, individuals who possess this disposition display a tendency toward intrinsically motivated behavior. Even when the environment presents extrinsic reinforcements and constraints, persons high in the autonomy orientation may not attend to these reinforcements and tend not to generalize these contingencies to other behaviors, as would be predicted by the classic overjustification hypothesis that dominated the intrinsic motivation literature in the 1970s (Lepper, Greene, & Nisbett, 1973). This is because they tend to make choices based on an awareness of internal informational cues (feelings of self-determination and competence), rather than extrinsic cues or reinforcements. Relevant to leisure behavior, Deci (1980) hypothesized that an individual high in this orientation "is more likely to experience what Csikszentmihalyi (1975a) called flow . . ." (p. 125).

Similarly, Kobasa (1979) hypothesized the existence of a personality type, the "hardy" personality, which may mediate the effects of stress on illness. Maddi and Kobasa (1981) elaborated by suggesting that this personality orientation is best characterized as a predisposition toward desiring intrinsic rewards (control, commitment and challenge). Maddi and Kobasa argue that the traditional task/situation view of intrinsic motivation resulted in a multitude of research findings that lacked cohesion (see also Day, 1981). They believe that it is more useful to conceptualize intrinsic motivation as an interaction of person and task, emphasizing that certain personality characteristics (tendency to desire control, commitment and challenge) may predispose persons to be intrinsically motivated in behavior.

Statement of the Problem

One implication of this person approach is the need to develop instrumentation to measure individual differences in intrinsic leisure motivation. Traditional experimental operationalizations (e.g., task enjoyment, free choice participation, etc.) are inadequate for this purpose. Kobasa (1979) and Deci and Ryan (1985b) have developed scales to measure "hardiness" and "autonomy" dispositions respectively, but these instruments do not specifically measure intrinsic motivation in leisure contexts. Neither do other scales that have been created to measure intrinsic motivation in academic or sport settings (Cacioppo, Petty, & Kao, 1984; Harter, 1981; Mitchell, 1992; Vallerand, Pelletier, Blais, Briere, Senecal & Vallieres, 1992). Mannell (1984) has argued for the development of leisure-specific measures of dispositional constructs. He notes that while generalized constructs may be used in explaining leisure behavior, it may also be helpful to develop measures of constructs that are specifically germane to the use of free time and leisure. Mannell speculates that the process of conceptualizing these leisure-specific constructs will stimulate more complex theoretical models. Furthermore, if the leisure-specific constructs are based on sound theories, the development

and use of new measures will help to connect leisure research to the larger body of social science research.

The purpose of the present study is to describe the development of a theory-based instrument to measure individual differences in the orientation toward intrinsic motivation in leisure behavior, and to report data from nine studies examining the reliability and validity of the instrument. Sample characteristics for all nine studies are presented in Table 1. Brief descriptions of each study follow, but the reader is directed to the original works for additional details.

Methods

Conceptual Definitions

Based on the proceeding discussion of work published by Deci and Ryan (1985a), Kobasa (1979), and their associates, the following conceptual definitions of the intrinsic leisure motivation disposition and its four components are offered:

Intrinsic Leisure Motivation Disposition: The Intrinsic Leisure Motivation Disposition is defined as a tendency to seek intrinsic rewards in leisure behavior. It is assumed that the strength of this tendency will differ across individuals, but will be relatively stable within individuals and across situations.

Self-Determination. Self-determination is characterized by awareness of internal needs, and a strong desire to make free choices based on these needs. Persons high in this intrinsic motivation component tend to want to

TABLE 1
Sample Characteristics for Nine Studies (Total n = 1866)

Study	n	Gender		Age Range	Mean Age
		Males	Females		
1. Weissinger, 1985	164	48%	52%	17-64	21.3
2. Weissinger, 1986	150	32%	68%	18-47	21.4
3. Ellis & Yessick, 1989	64	55%	45%	NA	NA
4. Bunnenberg, 1992	65	21%	79%	NA	71.0
5. Hoff & Ellis, 1992	409	49%	51%	NA	21.7
6. Morris, 1992	97	54%	46%	18-42	22.5
7. Weissinger, et al, 1992	460	58%	42%	18-40	20.9
8. Mobily, et al, 1993	125	32%	68%	NA	68.6
9. Weissinger, 1995	332	42%	58%	18-49	21.3

NA = Not Available

Note: All n's represent sample sizes after deletion of missing data.

feel in control of their leisure behavior, and display a high degree of willfulness.

Competence. Competence is characterized by attention to feedback that provides information about effectiveness, ability, and skill. Persons high in this intrinsic motivation component tend to seek out leisure behaviors which convey competence feedback.

Commitment. Commitment is characterized by a tendency toward deep involvement in, rather than detachment from, leisure behaviors. Persons high in this intrinsic motivation component tend to value leisure behaviors, and feel dedicated to leisure in their lives.

Challenge. Challenge is characterized by a tendency toward seeking leisure experiences that stretch one's limits and provide novel stimuli. Persons high in this intrinsic motivation component tend to select leisure behaviors that slightly exceed their skills, and should perceive this state as challenging rather than aversive or threatening.

Description of the Studies

Study 1: Weissinger (1985). Phase One: Development of the ILM Scale. An initial pool of 44 items (11 items in each of the four theorized components) were written. Item stems were taken directly from sentences in the previously cited theoretical literature. The goal in item writing was to capture aspects of each subscale construct that were emphasized in the original theoretical literature. The 44-item instrument was administered in a classroom setting (items were in random order) to 55 college undergraduates recruited from a health education class. Internal consistency reliability coefficients and factor loadings from an exploratory factor analysis were calculated. Cronbach's alpha for the total 44-item scale was .789. Initial 11-item subscale alphas for self-determination, competence, commitment and challenge were .739, .690, .739, and .780 respectively. With a goal of maximizing subscale reliabilities and decreasing the number of items, six items from each subscale were selected based on factor loadings and item-total correlations. Alphas for the four six-item subscales were: Self-Determination, .637; Competence, .689; Commitment, .727; and Challenge, .724. The total 24-item scale produced an alpha of .856.

This final 24-item version of the Intrinsic Leisure Motivation (ILM) Scale demonstrated satisfactory reliability, and its shorter length made it more practical for use in most research settings (Figure 2). The scale utilizes a seven-point response range (1 = Very Strongly Disagree to 7 = Very Strongly Agree). It is scored by reversing codes for three negatively-worded items (items 6, 13, 18), then taking an average across items. Thus, total scale or subscale scores can range from 1.00 to 7.00, with 7 indicating high intrinsic motivation.

Phase Two: Reliability and Validity Survey. Subjects were 164 undergraduate students enrolled in a health education class at a Maryland university. Phase two of Study 1 utilized the following variables: ILM scores were hy-

Directions: This survey is intended to find out how you feel about the things you do in your leisure time. By "leisure time" we mean the non-work hours of your day, or your "free time."

Please respond by circling the number that represents your agreement or disagreement with each statement as it applies to your leisure time. Please use the following scale:

1 = Very Strongly Disagree

2 = Strongly Disagree

3 = Disagree

4 = Neutral

5 = Agree

6 = Strongly Agree

7 = Very Strongly Agree

	Very Strongly Disagree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Very Strongly Agree
1. I feel in control of my life during my leisure time.	1	2	3	4	5	6	7
2. I am as dedicated to leisure as I am to other parts of my life.	1	2	3	4	5	6	7
3. I know what I want from my leisure time activities.	1	2	3	4	5	6	7
4. I strive to be effective in my leisure pursuits.	1	2	3	4	5	6	7
5. I like leisure time activities that are a little beyond my ability.	1	2	3	4	5	6	7
6. I feel like I don't get to do what I want with my leisure time.	1	2	3	4	5	6	7
7. I am aware that I feel good about my ability to use my leisure time.	1	2	3	4	5	6	7
8. My leisure time activities absorb all of my attention.	1	2	3	4	5	6	7
9. My friends think that I am skilled at leisure time activities.	1	2	3	4	5	6	7
10. I like a challenge in my leisure time.	1	2	3	4	5	6	7
11. My leisure time activities are a central part of my life.	1	2	3	4	5	6	7
12. Leisure time is important in my life.	1	2	3	4	5	6	7
13. Leisure is OK, but other things are more important in my life.	1	2	3	4	5	6	7
14. I am willing to try the unknown in my leisure time.	1	2	3	4	5	6	7
15. I feel good when my leisure time activities challenge my skills.	1	2	3	4	5	6	7
16. My participation in leisure time activities makes me feel competent.	1	2	3	4	5	6	7
17. The thing I like best about my leisure time is that I make free choices.	1	2	3	4	5	6	7

Figure 2. Leisure Time Questionnaire

18. <i>I don't enjoy leisure time if it challenges my skills.</i>	1	2	3	4	5	6	7
19. <i>I am not willing to compromise on my leisure time activities.</i>	1	2	3	4	5	6	7
20. <i>Leisure is what I am best at.</i>	1	2	3	4	5	6	7
21. <i>I seem to know what will make my leisure time satisfying.</i>	1	2	3	4	5	6	7
22. <i>The things I do in my leisure time make me feel good about my abilities.</i>	1	2	3	4	5	6	7
23. <i>My leisure time activities make me feel like an effective person.</i>	1	2	3	4	5	6	7
24. <i>I listen to my own needs when deciding how to use my leisure time.</i>	1	2	3	4	5	6	7

Figure 2. (Continued)

pothesized to correlate positively with the Self-As-Entertainment (SAE) Scale (Mannell, 1984), and Rosenberg's (1965) Self-Esteem Scale. The Leisure Boredom Scale (Iso-Ahola and Weissinger, 1990) was hypothesized to correlate negatively with ILM scores. In addition to the variables of conceptual interest, a methodological variable was measured. The Social Desirability Scale (Crowne & Marlowe, 1960) assesses the tendency for individuals to describe themselves in socially desirable terms. The ILM Scale was hypothesized to be uncorrelated with social desirability.

Study 2: Weissinger (1986): This study was designed to investigate the relationship between Type A behavior and selected leisure variables. Undergraduate students ($n = 150$) were surveyed in a leisure studies general education course at an Iowa university. Variables and their hypothesized relationship to ILM scores were: Pierce's (1984) Leisure Satisfaction Scale (positive), Jenkin's (1967) Type A Scale (negative), frequency of leisure activity index (positive).

Study 3: Ellis and Yessick, 1989: This study presented a LISREL model investigating relationships between several leisure related variables. Subjects ($n = 64$) were adult in- and out-patient clients being treated for substance abuse and/or depression in a western state. Variables and their hypothesized relationship to ILM scores were: SAE (positive), Witt and Ellis' (1988) Perceived Freedom in Leisure (PFL) Scale (positive), and Social Desirability (uncorrelated).

Study 4: Bunnenberg, 1992: This study addressed the relationship between hedonic variables and several leisure outcome measures. Subjects were 65 older adults recruited from senior centers and senior housing projects in Oregon. Variables and their hypothesized relationship to ILM scores were: Leisure Boredom (negative), PFL (positive), and Beck's (1988) Depression Inventory (negative).

Study 5: Hoff and Ellis, 1992: This study examined the relationship between agents of socialization and leisure self-efficacy. Subjects were 409 undergraduate students from 16 sections of a general education course at a California university. Variables and their hypothesized relationships to ILM scores were: SAE (positive), and PFL (positive).

Study 6: Morris, 1992: This study explored the relationship between perceived freedom in leisure and several dispositional measures. Subjects were 97 undergraduate students surveyed in introductory recreation courses at a Utah university. Variables included in this study, and their hypothesized relationships to ILM scores were: Leisure Boredom Scale (negative), SAE (positive), and PFL (positive).

Study 7: Weissinger, Caldwell, and Bandalos, 1992: This study investigated the relationship between intrinsic motivation and leisure boredom. Subjects were 460 undergraduate students from universities in Iowa, Nebraska and Ontario. Variables included in this study, and their hypothesized relationships to ILM scores were: frequency of activity participation (positive), Beard and Ragheb's (1980) Leisure Satisfaction Scale (positive), Crandall and Slivkins' (1980) Leisure Ethic Scale (positive), a single item measure of Life Satisfaction (positive), Leisure Boredom (negative), and single item ratings of mental and physical health (both positive).

Study 8: Mobily, Lemke, Ostiguy, Woodard, Griffiee, and Pickens (1993): This study investigated the relationship between exercise behaviors and competence in elderly persons. Subjects were 125 older adults recruited from two senior citizen centers in Iowa. Variables included in this study, and their hypothesized relationships to ILM scores were: Leisure Ethic (positive), and a ten-item Life Satisfaction Scale (positive).

Study 9: Weissinger, (1995): This study examined the relationship between leisure and health in college students. Undergraduates ($n = 332$) from a university in Nebraska were surveyed in introductory statistics courses during two semesters. Variables included in this study, and their hypothesized relationships to ILM scores were: Leisure Boredom (negative), and single item indicators of mental and physical health (both positive).

Results

Descriptive Statistics

Table 2 presents total scale and subscale means, standard deviations and Cronbach alpha coefficients for Studies 1, 2, 7, 8, 9, and total scale alphas for Studies 3, 5, and 6. Scale and subscale descriptive statistics are similar across the five studies, with means generally between 4.5 and 5.0 on the seven point scale. Means for the self-determination subscale are consistently higher than other subscales.

Internal Consistency Reliability

Internal consistency reliability coefficients (Cronbach's alpha) for the total 24-item scale were similar across the nine studies, ranging from .872 to

TABLE 2
Means, Standard Deviations and Cronbach Alpha Coefficients (CAC) for Total Scale and Subscales in Five Studies

Scale	Study 1 <i>n</i> = 164			Study 2 <i>n</i> = 150			Study 7 <i>n</i> = 460			Study 8 <i>n</i> = 125			Study 9 <i>n</i> = 332		
	Mean	St. Dv.	CAC	Mean	St. Dv.	CAC	Mean	St. Dv.	CAC	Mean	St. Dv.	CAC	Mean	St. Dv.	CAC
Total ILM Scale	4.86	.576	.872	4.94	.683	.913	4.85	.596	.891	4.84	.64	.894	4.54	.643	.878
Self-determination	5.19	.802	.759	5.24	.685	.685	5.10	.708	.744	5.20	.77	.745	5.00	.835	.755
Competence	4.74	.712	.699	4.92	.788	.796	4.81	.706	.764	4.94	.83	.805	4.46	.752	.718
Commitment	4.49	.655	.661	4.76	.998	.832	4.47	.743	.650	4.42	.77	.638	4.65	.828	.757
Challenge	5.03	.832	.795	5.01	.852	.825	5.01	.800	.818	4.78	.74	.756	4.06	.872	.816

Note: Only total scale alphas were available from studies 3, 5, and 6; they were .890, .875 and .906, respectively. No reliability data were available from study 4.

.913 (Table 2). Reliability coefficients for the six-item subscales ranged from .638 to .832. The Commitment subscale had lower reliability coefficients than other subscales.

Tables 3 and 4 report item-total correlation coefficients and alpha-if-item-deleted figures for the total scale and subscales. These statistics allow a closer look at how each item contributes to the overall reliability coefficient. Table 3 shows that the 24 scale items demonstrate a high degree of internal reliability in the three reported samples. Only item 19, if deleted, would consistently increase the total scale alpha. Item 13, if deleted, would increase the alpha in two of the three studies.

Table 4 presents item data for the subscale reliability coefficients. Again, most items within each subscale reflect high internal consistency. Only item

TABLE 3
Comparison of Total Scale Reliabilities from Three Studies

Item #	Study 2 n = 150		Study 7 n = 460		Study 8 n = 125	
	ITC*	AID*	ITC	AID	ITC	AID
1.	.33	.91	.54	.90	.54	.89
2.	.64	.91	.60	.88	.59	.89
3.	.57	.91	.63	.88	.63	.89
4.	.53	.91	.65	.88	.58	.89
5.	.45	.91	.45	.89	.28	.90
6.	.39	.91	.26	.89	.15	.90
7.	.52	.91	.60	.88	.56	.89
8.	.41	.91	.32	.89	.43	.89
9.	.56	.91	.58	.88	.50	.89
10.	.66	.91	.59	.88	.57	.89
11.	.60	.91	.58	.88	.71	.88
12.	.64	.91	.55	.88	.59	.89
13.	.44	.91	.18	.90	.13	.90
14.	.37	.91	.43	.89	.37	.89
15.	.74	.91	.59	.88	.56	.89
16.	.54	.91	.63	.88	.72	.89
17.	.42	.91	.47	.89	.56	.89
18.	.42	.91	.35	.89	.28	.89
19.	.24	.92	.02	.90	.11	.90
20.	.41	.91	.31	.89	.45	.89
21.	.64	.91	.63	.88	.63	.89
22.	.77	.91	.64	.88	.75	.88
23.	.78	.91	.65	.88	.73	.88
24.	.51	.91	.55	.89	.51	.89
Total alpha		.913		.891		.894

*ITC = Item-total correlation

*AID = alpha if item deleted

TABLE 4
Comparison of Subscale Reliabilities from Three Studies

Item #	Study 2 <i>n</i> = 150		Study 7 <i>n</i> = 460		Study 8 <i>n</i> = 125	
	ITC*	AID*	ITC	AID	ITC	AID
Self-determination						
1.	.42	.64	.54	.69	.57	.68
3.	.43	.63	.57	.68	.63	.67
6.	.22	.73	.30	.77	.25	.79
17.	.39	.65	.43	.72	.54	.70
21.	.57	.60	.61	.67	.56	.69
24.	.54	.60	.51	.70	.45	.72
Subsc. alpha		.685		.744		.745
Competence						
7.	.55	.76	.48	.74	.48	.79
9.	.61	.75	.53	.72	.47	.80
16.	.61	.76	.60	.72	.71	.74
20.	.35	.82	.29	.80	.40	.82
22.	.64	.75	.67	.69	.72	.74
23.	.67	.74	.67	.69	.68	.75
Subsc. alpha		.796		.764		.805
Commitment						
2.	.68	.79	.49	.56	.43	.57
8.	.47	.83	.35	.62	.32	.61
11.	.73	.78	.60	.52	.51	.58
12.	.70	.79	.48	.58	.45	.58
13.	.47	.83	.30	.64	.24	.64
19.	.64	.80	.11	.69	.25	.64
Subsc. alpha		.832		.650		.638
Challenge						
4.	.54	.81	.54	.80	.40	.74
5.	.58	.80	.52	.80	.37	.76
10.	.69	.78	.67	.77	.75	.65
14.	.50	.82	.54	.80	.54	.71
15.	.78	.76	.77	.75	.61	.69
18.	.50	.82	.47	.81	.33	.76
Subsc. alpha		.825		.818		.756

*ITC = item-total correlation

*AID = alpha if item deleted

6 in the Self-Determination subscale, and item 20 in the Competence subscale would, if deleted, increase respective subscale alphas.

Temporal Stability Reliability

During one semester of data collection in Study 9, undergraduate students ($n = 200$) were administered the ILM Scale on two occasions separated by an eight week interval. This test-retest interval was selected to decrease the likelihood of any memory effects. Test-retest correlation for the total scale was .628. Test-retest correlations for the four subscales were: Self-determination (.585), Competence (.605), Commitment (.584) and Challenge (.702). For the total scale and all subscales, internal consistency reliability coefficients were slightly higher at Time2 than Time1.

Confirmatory Factory Analysis of the ILM Subscales

The LISREL 7 program (Joreskog & Sorbom, 1988) was used to conduct a confirmatory factor analysis of the hypothesized four factor simple structure of the ILM Scale on data from Study 7 ($n = 460$). Each of the 24 items was allowed to load only on the factor it was hypothesized to measure. The variances of the factors were each set to 1.0 to provide a metric for the factors and to allow for identification of the model. The intercorrelations among the four factors and error variances for the 24 items were also estimated.

The obtained factor loadings and intercorrelations among the factors are shown in Table 5. All parameter estimates were statistically significant ($p < .05$) with the exception of the factor loading of item 19. This demonstrates that all but one item loaded on the correct hypothesized factor. The chi-square value for the model was 1163.75 with 246 degrees of freedom, the goodness of fit index was .81, normed fit index was .75 and non-normed fit index was .76, indicating that the four factor simple structure model did not provide adequate fit to the data.

Standardized residuals and LISREL modification indices (MIs) were examined to determine the source of the model misfit. These indexes suggested the presence of items that violated simple structure. That is, if allowed, they would have had loadings on more than one factor. For example, the model fit would have been significantly improved if item 4 had been allowed to load on all four factors, and fit could have been improved by allowing items 7, 16, and 20 to double load on the Self-Determination, Challenge and Commitment factors, respectively.

Convergent/Discriminant Validity of ILM Scale

Table 6 presents Pearson product-moment correlations for all hypothesized relationships between ILM scores and other measures. Almost all correlations follow predicted patterns of positive or negative relationships. Some relationships were tested in more than one study. In each instance, correlations are consistent in both direction and magnitude across studies. For ex-

TABLE 5
Confirmatory Factor Analysis (CFA) Results (Study 7, n = 460)

Item #	CFA Loadings			
	SD	CP	CM	CH
1	.64			
3	.76			
6	.41			
17	.53			
21	.72			
24	.63			
7		.66		
9		.65		
16		.60		
20		.40		
22		.69		
23		.71		
2			.84	
8			.53	
11			.96	
12			.74	
13			.44	
19			.08	
4				.70
5				.71
10				.90
14				.65
15				.90
18				.59

Pearson Correlations

	CP	CM	CH
SD	.911	.750	.638
CP		.759	.735
CH			.513

ample, relatively large negative correlations between ILM and Leisure Boredom are reported in five studies; large positive correlations between ILM and SAE are reported in four studies; and large positive correlations are reported between ILM and PFL in four studies. Only two hypotheses were rejected. The expected positive correlation between ILM and the Jenkins Type A Scale was not significant, and the expected negative correlation between ILM and Beck's Depression Inventory was not significant.

TABLE 6
Pearson Correlations Between ILM Scale and Selected Scales from Nine Studies

Scale	Study 1 <i>n</i> = 164	Study 2 <i>n</i> = 150	Study 3 <i>n</i> = 64	Study 4 <i>n</i> = 65	Study 5 <i>n</i> = 409	Study 6 <i>n</i> = 97	Study 7 <i>n</i> = 460	Study 8 <i>n</i> = 125	Study 9 <i>n</i> = 332
L. Satisfaction Scale (Pierce)		.37							
Jenkin's Type A Scale		.06*							
Freq. of Activity Participation		.35					.30		
L. Satisfaction Scale (Beard)							.32		
Leisure Ethic Scale							.44	.21	
Life Satisfaction Scale								.34	
Life Satisfaction Item							.23		
Leisure Boredom Scale	-.59			-.58		-.72	-.67		-.57
Self-as-Entertainer Scale	.33		.61		.46	.57			
Self-Esteem Scale	.39								
Soc. Desirability Scale	.22		-.15*						
Per. Freedom in L. Scale				.51	.59	.69			
Beck Depression Inventory				-.19*					
Men. Health Rating Item							.17		.22
Phys. Health Rating Item							.31		.26

Note: All correlations significant beyond $p < .05$ unless marked (*).

Relationship Between ILM Scale and Social Desirability

Two studies tested the relationship between scores on the Social Desirability Scale and ILM scores. It was hypothesized that this relationship would not be significant, indicating that a social desirability bias was not likely to exist in ILM scores. Results from the two studies were mixed. Study 1 reported that Social Desirability was positively correlated with the ILM Scale ($r = .22, p = .003$), but Study 3 found no significant relationship.

Gender Differences in ILM Scores

Six studies (Studies 1, 2, 4, 6, 7, 9) tested for gender differences in total scale ILM scores. In five studies, mean scores for males and females did not differ significantly. In Study 9, significant gender differences were found ($F(1, 332) = 9.99, p < .01$), with the mean score for males (4.68) higher than the mean for females (4.46).

Discussion

Reliability Data

The stability of means and reliability coefficients across the nine studies is noteworthy, since they utilized diverse populations including six college student samples from throughout the US and Canada, two samples of elderly persons, and one sample of hospitalized adults. These results indicate that the ILM Scale demonstrates acceptable internal consistency reliability in every sample. Subscale reliabilities are lower than total scale coefficients. This is probably a result of the Cronbach formula, which is sensitive not only to homogeneity of item content, but also to the number of items in the scale. It is also important to recognize the unavoidable tension between total scale and subscale reliabilities. If one global construct underlies all subscales, then total scale alpha should be high. Yet if subscales are defensible components of the global construct, subscale alphas should also be at least moderately high. The alpha coefficients shown in the nine studies seem to meet both of these objectives.

Another aspect of this tension is the differences in alpha-if-item-deleted implications for total scale and subscales. That is, different items would be deleted depending on which analysis is used. For example, examination of total scale item data in Table 3 would seem to suggest that items 13 and 19 should be deleted, but subscale data in Table 4 indicate that deletion of items 6 and 20 would improve their respective subscale alphas. Decisions concerning scale revision must therefore take into account the relative importance of total scale and subscale scores.

Temporal stability across 8 weeks is minimally acceptable (.63), and typical of test-retest reliabilities reported for other personality measures. Schuerger, Tait and Tavernelli (1982), in a review of eight personality scales, report that test-retest coefficients ranged from .58 to .65 for intervals of 1 to 11 months.

Confirmatory Factor Analysis

It should first be noted that Nunnally and Bernstein (1994) argue against the factoring of item level data on the grounds that 1) Pearson correlations of dichotomous and Likert type items will underestimate the values of the relationships among items, and 2) item level data are often non-normally distributed, causing artificial factors to emerge. While these points are well taken in general, the use of item level data is justified in this study because 1) the items were measured on a 7 point scale, and Pearson correlations of Likert items show little information loss when more than 5 scale points are used, and 2) the levels of skewness and kurtosis for all items were well within the normal range. Thus, it is unlikely that distributional differences among items affected the factor analysis in this case.

Results of the confirmatory factor analysis indicated that the fit of the hypothesized four factor simple structure could be improved by allowing some items to load on more than one factor. The tendency for Self-determination and Competence items to load on the same factor is not surprising, given the high correlation between these constructs reported in the present analyses and elsewhere (Ellis & Witt, 1994; Searle, Mahon, Iso-Ahola, Sdrolias & van Dyck, 1995). It is also relevant to note that Deci and Ryan's (1985a) theoretical work does not suggest a strict separation between the two components. But a larger issue concerns the viability of simple structure models, in which items are allowed to load only on one hypothesized factor.

Measures which contain several subscales are usually designed so that both total scale and subscale scores have high internal consistency reliability. This practice is useful because it allows total scale and subscale scores to be used separately if desired. However, high internal consistency for the total scale can only be achieved if items are intercorrelated across subscales. This correlation across subscales implies that items may have substantial loadings on factors other than the predicted factor, making true simple structure a paradoxical ideal.

This is complicated even further by the conflict between psychometrics and theory. Some items that fare poorly in psychometric analyses (such as item 7, "I am aware that I feel good about my ability to use my leisure time.") are directly tied to an important aspect of the theoretical construct being measured.

It is also interesting to note that two of the most troublesome items in the reliability and factor analyses (6 and 13) are reverse coded items. Nunnally and Bernstein (1994) note that negatively worded items, even when reverse coded, may still have underlying distributions that are dissimilar from positively worded items. Thus it is possible that reverse coded items, even when they are good measures of the underlying construct, may not load highly on the hypothesized factor.

The above discussion suggests that decisions about retaining, modifying or deleting items are not simple. Different analyses suggest different decisions. While the data presented in these analyses certainly provide a detailed

look at item functioning, no definitive implications for scale revision are provided. Additional cross-validation and testing is required before scale modification is warranted.

Validity Data

All but two hypotheses concerning relationships between ILM scores and other measures were supported. Data from all nine studies show a consistent pattern of predicted relationships with theoretically related constructs. The process of establishing construct validity is best described as an on-going attempt to imbed the target construct in a constellation of hypothesized relationships. As these data accumulate, confidence in the nature of the underlying construct increases. The picture that emerges at this point seems to suggest that ILM scores behave as they should if the scale is actually measuring intrinsic motivation.

Potential Uses for the ILM Scale

First, it should be noted that the ILM Scale is not intended as a diagnostic tool. Nor is it designed to be used for individualized assessments. Normative data that would allow for the possibility of such uses have not been collected, and the degree of predictive validity that would be necessary for these purposes has not been established. The most appropriate applications for the ILM Scale are in studies that utilize aggregated data to test relationships among theoretical variables, in laboratory or field experiments that assess the interaction of dispositions and leisure-relevant interventions, and in studies that test models of the interaction between dispositional and situational aspects of leisure behavior.

The ILM Scale is intended for use as a measure of individual differences in the desire for intrinsic rewards in leisure behavior. As such, it is an indicator of variability in the desire for intrinsic rewards across individuals in a given situation, or within individuals across multiple situations (that is, the scale can be used in both between- and within-subject designs). It is appropriate to use the total score from all 24 items as a generalized measure of the intrinsic motivation disposition, or to use subscale scores as measures of desire for specific intrinsic rewards. One benefit of the scale's four-component structure is that it can be used to address only Deci's proposed components (self-determination and competence), or only Kobasa's components (self-determination, commitment, challenge). This would allow a researcher to work narrowly within either conceptual framework, or to take a broader approach.

The ILM Scale has many potential research applications. For example, it would be possible to study the antecedents of the intrinsic motivation disposition. Haywood and Burke (1977) suggest a number of specific and testable influences on the development of individual differences in intrinsic

motivation. Longitudinal and cross-sectional analyses could examine the ways that socialization is related to development of these differences. It would be interesting to study what kinds of socialization patterns (e.g., exposure to a wide variety of leisure experiences, or exposure to a few experiences with deeper involvement) influence motivational dispositions.

Conversely, it might be fruitful to study the consequences of individual differences in the desire for intrinsic rewards. Iso-Ahola (1989), in a thorough review and analysis of leisure motivation literature, notes several areas of needed research. For example, when does the disposition toward intrinsic motivation in leisure lead to potentially positive benefits (e.g., "serious leisure") or potentially negative effects (e.g., addiction to a particular leisure activity)? And what are the consequences when the desire for intrinsic rewards is unmet? What barriers or constraints frustrate attempts to select experiences that provide intrinsic rewards, and what psychological outcomes result when these barriers are present? What role does this disposition play in processes such as starting or ceasing a leisure activity, or in perceptions of substitutability of leisure behaviors? These and many other questions represent potential uses for the ILM Scale.

Conclusion

The information presented in the nine studies would seem to suggest that the ILM Scale and its subscales possess sufficient internal consistency to recommend their use in the present form. Factor loadings from the confirmatory factor analysis, though not fitting a simple structure model, do demonstrate that items load on their hypothesized factors. Validity data suggest a tentative conclusion that the scale does measure the underlying construct of intrinsic leisure motivation. In summary, the available data support the viability of the ILM Scale and its subscales as measurement instruments in research settings.

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