Assessment
20(1) 68–85

DOI: 10.1177/1073191111421303
http://asm.sagepub.com
SAGE

Development and Validation of the Multidimensional State Boredom Scale

Shelley A. Fahlman[1], Kimberley B. Mercer-Lynn[1], David B. Flora[1], and John D. Eastwood[1]

Abstract

This article describes the development and validation of the Multidimensional State Boredom Scale (MSBS)—the first and only full-scale measure of state boredom. It was developed based on a theoretically and empirically grounded definition of boredom. A five-factor structure of the scale (Disengagement, High Arousal, Low Arousal, Inattention, and Time Perception) was supported by exploratory factor analyses and confirmatory factor analyses of two independent samples. Furthermore, all subscales were significantly related to a single, second-order factor. The MSBS factor structure was shown to be invariant across gender. MSBS scores were significantly correlated with measures of trait boredom, depression, anxiety, anger, inattention, impulsivity, neuroticism, life satisfaction, and purpose in life. Finally, MSBS scores distinguished between participants who were experimentally manipulated into a state of boredom and those who were not, above and beyond measures of trait boredom, negative affect, and depression.

Keywords

boredom, scale development, engagement, attention, time perception

Boredom is the experience of being disengaged from the world and stuck in a seemingly endless and dissatisfying present—when bored, our surroundings wither and become barren. Although not all boredom is excruciating, one should not underestimate the potential pain and destruction it can cause. Consider the following:

> I feel like I'm not alive in this moment in time, as if I am a spectator to life and to myself. I feel detached from others around me. I feel I lack a sense of purpose, and completeness. Most of all, I feel extremely bored. Bored of everything—work, friends, hobbies, relationships, music, reading, movies, bored all the time . . . No matter what the activity it leaves me feeling unfulfilled. I'm bored of thinking, of talking, of feeling bored with being bored. (Maltsberger, 2000, p. 84)

This man's emotional pain was so great he tried to kill himself twice. According to his psychiatrist, he did not meet the diagnostic criteria for a mental disorder such as depression but rather suffered from severe and chronic boredom.

Empirical research has demonstrated the detrimental impact of boredom, connecting it to various mental health conditions, such as traumatic head injury (e.g., Seel & Kreutzer, 2003), depression and anxiety (Farmer & Sundberg, 1986; Sommers & Vodanovich, 2000), apathy (Ahmed, 1990), negative affect (Gordon, Wilkinson, McGown, & Jovanoska, 1997), hostility and anger (Rupp & Vodanovich, 1997), alexithymia (Eastwood, Cavaliere, Fahlman, & Eastwood, 2007), somatization complaints (Sommers & Vodanovich, 2000), overeating and binge eating (Abramson & Stinson, 1977; Ganley, 1989; Stickney & Miltenberger, 1999), pathological gambling (Blaszczynski, McConaghy, & Frankova, 1990; Mercer & Eastwood, 2010), marijuana use (Lee, Neighbors, & Woods, 2007), alcohol abuse (Wiesbeck et al., 1996), job dissatisfaction (Kass, Vodanovich, & Callender, 2001), and low achievement in school (Jarvis & Seifert, 2002). Boredom has also been associated with lowered levels of life meaning (Fahlman, Mercer, Gaskovski, Eastwood, & Eastwood, 2009; Weinstein, Xie, & Cleanthous, 1995), assertiveness (Tolor, 1989), self-actualization (McLeod & Vodanovich, 1991), and life satisfaction (Farmer & Sundberg, 1986). Taken together, boredom is associated with significant social, psychological and physical health difficulties. Surprisingly, there is no comprehensive measure of the state of boredom. Furthermore, there is no comprehensive and theoretically grounded definition of boredom on which such a measure could be based.

[1]York University, Toronto, Ontario, Canada

Corresponding Author:
John D. Eastwood, Department of Psychology, York University, 4700 Keele Street, Toronto, Ontario, Canada M3J 1P3
Email: johneast@yorku.ca

Theories of Boredom

Theories of boredom can be divided into four distinct groups: psychodynamic, arousal, attention, and existential theories. Each theory proposes a somewhat different explanation for why the bored individual is unable to achieve satisfying engagement with the world. *Psychodynamic theories* argue that boredom is caused by an inability to consciously determine what is desired because the desire is threatening and therefore repressed. As a result, the bored individual looks to the external world to find satisfaction but inevitably feels deprived and frustrated when the external world does not resolve the problem (Fenichel, 1953; Greenson, 1953; Wangh, 1975). *Arousal theories* propose that boredom is caused by nonoptimal arousal that ensues when there is a mismatch between an individual's need for arousal and the availability of environmental stimulation (i.e., its degree of challenge, complexity, intensity, and variety; Berlyne, 1960; Csikszentmihalyi, 1975/2000, 1997; De Chenne, 1988; Hebb, 1966; Klapp, 1986; Zuckerman, 1979). *Attentional theories* propose that boredom is caused by a failure of attentional processes resulting in an inability to focus or engage attention (Fisher, 1993; Hamilton, 1981). Finally, *existential theories* argue that boredom is caused by a lack of life meaning or purpose; boredom ensues when an individual gives up on or fails to articulate and participate in activities that are consistent with his or her values (Bargdill, 2000; Fahlman et al., 2009; Frankl, 1959, 1962, 1984; Maddi, 1967, 1970).

Although the various theories propose different explanations of boredom, they exhibit overlap in terms of the key defining elements that constitute the experience of boredom. Below we will summarize these common elements to propose a transtheoretical definition of "boredom."

Definition of Boredom

All theories suggest that the central defining feature of boredom is the aversive experience of wanting, but being unable, to engage in stimulating and satisfying activity (e.g., Berlyne, 1960; Csikszentmihalyi, 1975/2000; De Chenne, 1988; Fenichel, 1953; Fiske & Maddi, 1961; Greenson, 1953; Hebb, 1966; Mikulas & Vodanovich, 1993; O'Hanlon, 1981; Sundberg, Latkin, Farmer, & Saoud, 1991; Todman, 2003). However, there are a number of additional associated features that give boredom its distinct cognitive, emotional, and behavioral profile.

Boredom is often conceptualized as an aversive state of underarousal that occurs when "information" or environmental "stimulation" is redundant, monotonous, of low intensity, or meaningless (e.g., Berlyne, 1960; Fiske & Maddi, 1961; Geiwitz, 1966; Hebb, 1966; Mikulas & Vodanovich, 1993; Posner, Russell, & Peterson, 2005). Yet boredom is also frequently characterized by high arousal states such as restlessness, agitation, and frustration (e.g., Berlyne, 1960; Fisher, 1993; Harris, 2000; Hill & Perkins, 1985; Klapp, 1986; London, Schubert, & Wasburn, 1972; Martin, Sadlo, & Stew, 2006; O'Hanlon, 1981; Pattyn, Neyt, Henderickx, & Soetens, 2008; Smith, 1981). In fact, some theorists have highlighted the contrasting experiences of agitation and restlessness versus lethargy and tiredness as being key to the definition of boredom (e.g., Berlyne, 1960; Bernstein, 1975; Fenichel, 1953; Fiske & Maddi, 1961; Greenson, 1951). Fiske and Maddi (1961), for example, noted that "lethargic feelings and overt reactions of irritability and restlessness" accompany boredom (p. 110). Similarly, Bernstein (1975) stated that either restlessness or apathy can "dominate the picture of one person's boredom while the other may dominate the next, or their dominance may alternate within one person, but restlessness and apathy are always present together to some degree in boredom" (p. 516).

As discussed by Hamilton (1981), these defining elements of high and low arousal are not necessarily inconsistent if the high arousal seen in boredom is viewed as a compensatory attempt to self-stimulate (a similar argument is made by O'Hanlon, 1981, and Smith, 1981). Thackray (1981) suggests that high arousal boredom may occur when an individual is required to maintain mental alertness and high performance in the context of a monotonous task. Hamilton (1981) makes a similar argument regarding the role of forced attention in high arousal boredom, but also notes that it can occur in response to an *overload* of information. She states,

> A high "cortical" arousal type of boredom might indeed be expected with information overload (such as memorizing the phone book or meaningless acronyms); when one is constrained from opting out of the situation, then the overload may be experienced as worthless and boring as well as frustrating, anxiety provoking, and arousing. (p. 287)

Theorists also converge on the notion that cognitive processes are changed in boredom. For instance, a commonly described feature is distorted time perception such that time is perceived to move more slowly during the experience of boredom (e.g., Conrad, 1997; Fenichel, 1953; Greenson, 1953; Hartocollis, 1972; O'Connor, 1967; Wangh, 1975). In addition, theories of boredom emphasize that bored individuals suffer from poor concentration and are forced to control their attention with effort (Bernstein, 1975; Fisher, 1993; Harris, 2000; Hartocollis, 1972; Leary, Rogers, Canfield, & Coe, 1986; Martin et al., 2006; Todman, 2003).

In summary, a synthetic review of the literature suggests the following transtheoretical definition of boredom: Boredom is the aversive experience of having an unfulfilled desire to be engaged in satisfying activity. In terms of arousal,

the bored individual experiences either agitated, high arousal and/or lethargic, low arousal. Cognitively, the bored individual experiences a slow passage of time and an inability to focus his or her attention. Thus, boredom includes (a) lack of engagement, (b) low arousal negative affect, (c) high arousal negative affect,[1] (d) the experience of a slow passage of time, and (e) difficulty focusing attention.

Existing Measures of Boredom

There are a number of self-report scales used to measure boredom, including the Boredom Susceptibility Scale (Zuckerman, 1979; Zuckerman, Eysenck, & Eysenck, 1978), Job Boredom Scale (Lee, 1986), Boredom Coping Scale (Hamilton, Haier, & Buchsbaum, 1984), Leisure Boredom Scale (Iso-Ahola & Weissinger, 1990), Free Time Boredom Scale (Ragheb & Merydith, 2001), and the Sexual Boredom Scale (Watt & Ewing, 1996). However, all of these tools lack utility as they are either subfactors of scales measuring other constructs or they are very narrow in scope (i.e., only look at boredom in one particular context such as leisure time or sexual relationships). Furthermore, with the exception of the Boredom Susceptibility Scale —a subfactor of the Sensation Seeking Scale—these boredom scales have received little empirical attention.

The only full-scale measure of boredom that has been used extensively in empirical research is the Boredom Proneness Scale (BPS; Farmer & Sundberg, 1986). The BPS measures trait boredom—the general propensity to experience boredom across a wide variety of situations. More specifically, Farmer and Sundberg (1986) defined boredom as the degree of "connectedness with one's environment on many situational dimensions, as well as the ability to access adaptive resources and realize competencies" (p. 10). The original BPS consisted of 28 true–false items, had an internal consistency alpha of .79, and a 1-week test–retest reliability of .83 (Farmer & Sundberg, 1986). Vodanovich and Kass (1990b) converted the BPS into a 7-point Likert-type format in order to increase its sensitivity. The internal consistency of this version has been reported to range from .79 to .83 (Ahmed, 1990; McLeod & Vodanovich, 1991; Vodanovich & Kass, 1990b), with a 1-week test–retest reliability of .79 (Polly, Vodanovich, Watt, & Blanchard, 1993).

Although Farmer and Sundberg (1986) originally developed the BPS to measure a unitary construct, several studies have examined possible factor structures of the scale (see Melton & Schulenberg, 2009; Vodanovich, Wallace, & Kass, 2005). Yet no clear conclusion regarding the factor structure of the BPS has been reached, perhaps in part because of notable variability in statistical standards and methods (Melton & Schulenberg, 2009). Vodanovich et al. (2005) attempted to evaluate previously proposed factor structures, and they concluded that two factors labeled Internal and External Stimulation fit the data best. Furthermore, they proposed a shortened 12-item version of the BPS that resulted in a better two-factor solution and was invariant across gender. Melton and Schulenberg (2009), however, failed to find evidence for these two factors of the short version of the scale. In summary, a clear factor structure for the BPS has yet to be established, but taken as a whole, the literature is most consistent with a two-factor solution as proposed by Vodanovich et al. (2005).

State Versus Trait Boredom

Notably, the BPS measures one's tendency to become bored (trait boredom) and does not assess the actual experience of boredom in a given moment (state boredom). The lack of a measure of state boredom is a critical limitation. Investigators have argued that the trait of boredom proneness may be psychologically different from the state of boredom (e.g., Neu, 1998; Todman, 2003)—most simply, the trait may be more strongly determined by internal psychological characteristics, whereas the state may be more strongly determined by external situational factors. Neu (1998), for example, has discussed this issue in terms of *endogenous* boredom (i.e., boredom from within) versus *reactive* boredom (i.e., boredom in response to the environment). Todman (2003) has made a similar distinction between situation-independent boredom and situation-dependent boredom.

Rationale for a New Measure of Boredom

In light of the growing relevance of and interest in studying boredom, the measurement of boredom must be improved. As Vodanovich (2003) concluded in his review of extant boredom measures:

> It would be beneficial for future researchers to focus on the development of additional measures of boredom, particularly those that are both multidimensional and full-scale in nature. Ideally, the construction of such measures would be guided by an integrated theory and definition of boredom. . . . In addition, it would be useful for researchers to differentiate between (and assess) state and trait boredom. (pp. 588-589)

In the present article, we describe the development of the Multidimensional State Boredom Scale (MSBS), which was designed to address these recommendations and improve the measurement of boredom.

Study 1a: Qualitative Analysis and Item Creation

After completing a synthetic review of the theoretical literature, which resulted in the definition of boredom

described above, we began the empirical component of our scale development by completing a qualitative analysis of the experience of boredom. The purpose of Study 1a was to (a) empirically confirm our definition of boredom and (b) develop an initial pool of items. We chose to generate items based on a qualitative analysis to ensure that the items had ecological validity and incorporated the language that is used by individuals when they describe their experience of boredom.

Method

Participants and procedure. One hundred and ninety-nine undergraduate students (81% female, 19% male) were recruited from introductory psychology courses. Participants' mean age was 20.7 years (SD = 5.0, range 17-53). Participants were asked to provide written responses to two open-ended questions: (a) "Describe what the experience of boredom means to you" and (b) "What is the experience of boredom like for you? Please describe what you think/feel/experience while you are bored."

A modified grounded theory analysis (Strauss & Corbin, 1998) was conducted on written responses. For each question, the analysis was completed in three stages: (a) open coding, (b) axial coding, and (c) selective coding. However, because participants only provided short sentences or phrases to each question, the data did not support valid selective coding; thus, the final axial coding categories and illustrative quotes were taken as the final results.

Results

Definition of boredom. Analyses indicated that to be bored is to perceive one's environment as inadequately providing for one's need for engagement in satisfying activities. Boredom was most commonly referred to as a lack of activity (including not knowing what it is that one wants to do) or the presence of activity that one does not desire. Whereas some participants described a desire for activities that were interesting, exciting, or entertaining, others emphasized the desire for activities with some form of meaning, purpose, or personal significance. In sum, boredom was predominantly described as feeling disengaged from interesting or meaningful activity.

In addition to the core component of "doing nothing," participants described negative affective states associated with high or low levels of arousal. Specifically, participants described high arousal states such as anxiety, irritability, agitation, and restlessness, and low arousal states such as dysphoria, emptiness, and fatigue. Cognitive changes were also described, including distractibility and problems in concentrating, as well as the perception that time is passing slowly.

In summary, the grounded theory analysis resulted in a total of six final themes—namely, (a) a disconnection or struggle to engage in one's surrounding environment, (b) boredom as a negative or undesirable experience, (c) emotional and cognitive experiences that accompany boredom, (d) changes in time perception, (e) coping with boredom, and (f) not being bored. Theme 5 (i.e., what people did to cope with boredom) and Theme 6 (i.e., statements to the effect "I don't get bored because I am too busy") were not related to the definition of boredom per se. The remaining themes were judged to be consistent with, and thus empirically confirmed, our theoretically derived definition of boredom. Our definition is repeated below and its overlap with results from the qualitative study is indicated:

> Boredom is the aversive experience (Theme 2) of having an unfulfilled desire to be engaged in satisfying activity (Theme 1). In terms of arousal, the bored individual experiences either agitated, high arousal and/or lethargic, low arousal (Theme 3). Cognitively, the bored individual experiences a slow passage of time and an inability to focus his or her attention (Themes 3 and 4).

Item construction. The first author created 68 items that were verbatim copies of descriptions provided by participants from the qualitative study and that were also consistent with the theoretically derived definition of boredom. The 68 items were reviewed and revised in a group meeting. The group was composed of a professor and four graduate students who were knowledgeable about the boredom literature and actively studying boredom. At the time of review, the group generated an additional 8 items. After revisions, all 76 items were judged to be coherent, readable, representative of the qualitative study, and also representative of all components of boredom contained in the theoretically derived definition. At this stage, some redundancy of item content was permitted. Each of the final 76 items was constructed with a 7-point Likert-type format to maximize the sensitivity of the scale. All items were worded in the same direction (i.e., the answer "agree" always reflected higher boredom) to avoid confusing participants and to avoid artificially creating a factor structure based on direction of wording (DeVellis, 2003).

Study 1b: Analysis of Initial Item Pool

Method

Participants and procedure. The 76 items were administered to 1,028 undergraduate participants from two large universities in Ontario, Canada. Data from 16 participants were eliminated because of extreme responding (i.e., choosing only 1s or 7s), resulting in a final sample size of 1,012. Seventy-two percent of participants in the final sample

were female (n = 731), and the mean age was 19.6 years (SD = 3.1, range 16-46). Information on participants' ethnic background was available for n = 705 (70%): 50% identified as White/Caucasian, 13% as South Asian, 11% Chinese, 6% Arab/West Asian, 6% Black, 4% biracial, 3% Latin Canadian, 2% West Indian, 2% Filipino, 2% Korean, 2% Southeast Asian, 1% Aboriginal/First Nations, 1% Japanese, and 1% "Other."

Results

Initially, 32 items were eliminated because of extreme skewness (i.e., skewness >.9) or poor item–total correlations (e.g., <.30).[2] This elimination resulted in 44 remaining items. These items retained content validity in that they captured the dimensions and themes that emerged from the qualitative analysis and theoretical definition.

Next, exploratory factor analysis (EFA) was used to suggest a possible factor structure for the pool of 44 items and further eliminate poor items. Because the initial items were designed to represent the five components of state boredom contained in our definition, we anticipated that the MSBS would likely contain multiple factors. One third of the data set from Study 1b (n = 315) was randomly chosen for EFA. All items had a 7-point scale format and lacked excess skewness and kurtosis and thus were considered suitable for factoring methods for continuous distributions (Finney & DiStefano, 2006). Principal axis factoring with a quartimin rotation was performed on the 44 items. The number of factors was determined by examining the scree plot, total variance accounted for, and the root mean square error of approximation (RMSEA) statistic. Additionally, multiple factor models were estimated, requesting both greater and fewer factors than the number suggested by the scree plot (as recommended by Costello & Osborne, 2005, and Fabrigar, Wegener, MacCallum, & Strahan, 1999). In total, four models were estimated, requesting three, four, five, and six factors.

The three-, four-, five-, and six-factor models accounted for 48.0%, 51.4%, 54.3%, and 57.1% of total variance, with RMSEA values (and 90% confidence intervals) of .072 (.069, .076), .068 (.064, .072), .058 (.053, .062), and .053 (.049, .058), respectively. Although the six-factor model had the lowest RMSEA value, the sixth factor was uninterpretable; thus, the five-factor model was chosen for the final solution.

An item was considered salient for a given factor if it loaded on that factor at .35 or higher and <.30 on other factors. We used these arguably liberal criteria in the exploratory scale development phase so that we could evaluate a larger number of candidate items for a given factor in subsequent analyses. Importantly, our follow-up confirmatory analyses gave us the opportunity to remove items that did not show a robust relationship to a given factor. These criteria resulted in the removal of 18 items. Two items did not meet these criteria but were retained at this stage of the analysis pending the results of subsequent analyses because it was felt that removing them would reduce the content validity of the scale in light of theory and our qualitative study. After removing items without salient loadings, 26 items formed a new shortened set of items (see Table 1). The five factors were named as follows: (a) Disengagement (DIS; 9 items), (b) High Arousal (HA; 6 items), (c) Low Arousal (LA; 5 items), (d) Inattention (IN; 4 items), and (e) Time Perception (TP; 2 items). Table 2 contains the factor correlations, which ranged from .26 to .58. These five factors were consistent with our theoretically derived definition of boredom suggesting that the shortened set of items retained content validity. The summed scores of items loading on each factor had internal consistency coefficient alpha values of .87, .86, .88, .83, and .73, respectively.

Next, to verify the five-factor structure found with EFA, a confirmatory factor analysis (CFA) was conducted on the remaining two thirds (n = 697) of the Study 1b data set. We predicted that a five-factor model would provide a better fit to the data than a four-factor model (representing a combined high and low arousal factor—the two most highly intercorrelated factors) or a one-factor model (representing a unidimensional conceptualization of boredom). In addition, because the five factors were intended to be subcomponents of boredom, we predicted that a second-order model, with five first-order factors and one second-order factor, "General Boredom," would also fit the data well.

In all, 26 participants had missing data and were excluded from the CFA, resulting in a final sample size of n = 671. CFA models were then fitted to the 26-item version of the MSBS using maximum likelihood estimation. Model fit was evaluated with the chi-square (χ^2) test, Tucker–Lewis index (TLI), comparative fit index (CFI), and RMSEA along with its 90% confidence interval.

The five-factor model fit the data well, $\chi^2(289) = 886.07$, TLI = .98, CFI = .98, RMSEA = .056, and fit better than either a four-factor or one-factor model (see Table 3). Standardized loadings were all strong, ranging from .54 to .82 (Table 4). Of particular note is that the potentially problematic items identified in the EFA loaded .63 and .71 with their designated factor, DIS. Correlations among the factors were also strong, ranging from .54 to .86 (Table 5).

Second-order model. Because the five factors were intended to represent specific, correlated aspects of boredom, a model with a single, second-order factor was also estimated. The fit of this model was good, $\chi^2(294) = 900.48$, TLI = .98, CFI = .98, RMSEA = .055. First-order standardized loadings were virtually identical to the previous five-factor model, again ranging from .54 to .82 (Table 4). With respect to the second-order loadings, the DIS factor had the strongest relationship with the second-order factor (.97), and the loadings for HA, LA, IN, and TP were also strong

Table 1. Exploratory Factor Analysis, Retained Items and Loadings

	Factor				
Item text	DIS	HA	LA	IN	TP
I am wasting time that would be better spent on something else.	**.65**	.07	−.05	.09	.09
I feel like I'm sitting around waiting for something to happen.	**.51**	.07	.09	.20	.09
I am stuck in a situation that I feel is irrelevant.	**.46**	.25	.09	.05	.15
I seem to be forced to do things that have no value to me.	**.43**	.09	.06	.17	.12
Everything seems repetitive and routine to me.	**.43**	.14	.01	−.13	.15
I want something to happen but I'm not sure what.	**.39**	.00	.20	.10	.01
I wish I was doing something more exciting.	**.36**	−.02	.20	.14	.05
I am indecisive or unsure of what to do next.[a]	**.29**	.08	.04	.35	.10
I want to do something fun, but nothing appeals to me.[a]	**.27**	.12	.15	.10	.37
Everything seems to be irritating me right now.	.15	**.71**	.04	−.06	.10
I feel agitated.	.14	**.68**	−.07	.05	.05
I am more moody than usual.	−.05	**.60**	.19	.09	−.01
I feel tense.	−.04	**.58**	.10	.14	−.20
I am annoyed with the people around me.	−.18	**.55**	.18	.05	.28
I am impatient right now.	.23	**.52**	−.09	.23	−.08
I am lonely.	.01	−.06	**.78**	.07	.00
I feel empty.	.09	−.07	**.71**	.14	.10
I feel cut off from the rest of the world.	.03	.06	**.65**	.03	.05
I feel depressed.	−.04	.23	**.63**	.04	.06
It seems like there's no one around for me to talk to.	.04	.16	**.54**	−.13	.14
It is difficult to focus my attention.	−.08	.03	.00	**.84**	.04
I am easily distracted.	.01	−.03	−.09	**.72**	−.04
My mind is wandering.	.08	.07	.12	**.64**	.02
My attention span is shorter than usual.	.08	.02	.05	**.56**	.12
Time is moving very slowly.	.17	−.16	.12	.17	**.41**
Time is dragging on.	.12	.00	.22	.16	**.35**

Note. DIS = Disengagement; HA = High Arousal; LA = Low Arousal; IN = Inattention; TP = Time Perception.
Values in bold-face represent items that were salient on that factor (i.e., they loaded on the factor at .35 or higher and <.30 on other factors)
a. Despite higher loadings on other factors, item was retained on DIS at this stage in scale construction for its representative content with respect to "doing."

Table 2. MSBS Exploratory Factor Analysis, Factor Correlations

Factor	1	2	3	4	5
1. DIS	—	.44	.52	.45	.32
2. HA		—	.58	.46	.27
3. LA			—	.46	.39
4. IN				—	.26
5. TP					—

Note. MSBS = Multidimensional State Boredom Scale. DIS = Disengagement; HA = High Arousal; LA = Low Arousal; IN = Inattention; TP = Time Perception.

Table 3. Fit Statistics for 26-Item MSBS Confirmatory Factor Analysis ($N = 671$)

	Model			
	5-Factor	4-Factor[a]	1-Factor	Second-order[b]
χ^2	886.07	1576.17	2519.19	900.48
df	289	293	299	294
TLI	.98	.97	.94	.98
CFI	.98	.97	.95	.98
RMSEA	.06	.08	.11	.06
RMSEA 90% CI	.05, .06	.08, .09	.10, .11	.05, .06

Note. MSBS = Multidimensional State Boredom Scale. *df* = degrees of freedom; TLI = Tucker–Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; RMSEA 90% CI = root mean square error of approximation 90% confidence interval.
a. Four factors = Disengagement, Arousal (High Arousal and Low Arousal items combined), Inattention, and Time Perception.
b. Second-order factor = General Boredom; First-order factors = Disengagement, High Arousal, Low Arousal, Inattention, Time Perception.

(.81, .88, .71, and .70, respectively). These results indicate that *the total score of the MSBS is meaningful.* That is, because the second-order factor provides a theoretically guided and statistically parsimonious explanation for the correlations among the first-order factors, the first-order

Table 4. Factor Loadings for 26-Item Confirmatory Factor Analysis ($N = 671$)

Item text	Loadings	
	First-order model	Second-order model
Disengagement (DIS)	—	**.97**
I wish I was doing something more exciting.	.57	.57
I seem to be forced to do things that have no value to me.	.58	.58
I feel like I'm sitting around waiting for something to happen.	.72	.72
I want something to happen but I'm not sure what.	.61	.61
I am indecisive or unsure of what to do next.	.63	.63
I am wasting time that would be better spent on something else.	.61	.61
I want to do something fun, but nothing appeals to me.	.71	.71
I am stuck in a situation that I feel is irrelevant.	.73	.73
Everything seems repetitive and routine to me.	.58	.58
High Arousal (HA)	—	**.81**
I feel tense.	.55	.54
I am impatient right now.	.54	.54
Everything seems to be irritating me right now.	.82	.82
I am more moody than usual.	.68	.68
I am annoyed with the people around me.	.70	.70
I feel agitated.	.78	.77
Low Arousal (LA)	—	**.88**
I feel empty.	.81	.81
I am lonely.	.77	.77
I feel cut off from the rest of the world.	.75	.75
It seems like there's no one around for me to talk to.	.75	.75
I feel depressed.	.81	.80
Inattention (IN)	—	**.71**
My attention span is shorter than usual.	.71	.71
I am easily distracted.	.69	.70
My mind is wandering.	.70	.70
It is difficult to focus my attention.	.82	.82
Time Perception (TP)	—	**.70**
Time is dragging on.	.80	.80
Time is moving very slowly.	.68	.68

Note. Values in boldface represent first-order factor loadings on second-order "General Boredom" factor.

Table 5. Factor Correlations for 26-Item Confirmatory Factor Analysis, First-Order Model ($N = 671$)

Factor	1	2	3	4	5
1. DIS	—	.77	.86	.70	.68
2. HA		—	.73	.61	.54
3. LA			—	.57	.64
4. IN				—	.54
5. TP					—

Note. DIS = Disengagement; HA = High Arousal; LA = Low Arousal; IN = Inattention; TP = Time Perception.

factors can be thought of as specific components of a single, general construct of boredom rather than separate constructs that are simply correlated with one another. Therefore, although the first- and second-order models both had very good fit, the second-order model was theoretically and statistically preferred and was chosen as the final structural model for the MSBS.

Study 2

The purpose of Study 2 was to increase the number of items on two of the factors, to replace a potentially problematic item, and to cross-validate the revised scale with a new set of participants. To this end, 5 items were added to the MSBS. Four of these items increased the number of items on the DIS[3] and TP factors, and a fifth item, "I feel down," was intended to replace the item "I feel depressed" to move away from content explicitly associated with clinical depression. This new MSBS subsequently contained 31 items.

Method

Participants and procedure. The 31-item MSBS was administered to a new sample of undergraduate student participants (N = 209). Demographic information was available for 193 (92%) participants: 76% (n = 147) were female, and the mean age was 19.7 years (SD = 3.1, range 17-44). Information on ethnic background was available for 156 (75%) participants: 51% identified as White/Caucasian, 14% as South Asian, 11% Chinese, 7% Black, 5% Arab/West Asian, 4% Latin Canadian, 3% Filipino, 3% Korean, 1% Southeast Asian, and 1% Japanese.

Results

Original items were examined first. The item "I feel tense" was the only item whose deletion would increase the full-scale coefficient alpha; it was thus eliminated. The five new items had strong item–total correlations (r = .49-.67), and the deletion of any of them would decrease the full-scale coefficient alpha. Thus, the new items were retained, and the original "I feel depressed" item was replaced by "I feel down."

In sum, two items ("I feel tense" and "I feel depressed") were deleted from the 31-item version, resulting in the 29-item final version of the MSBS (see the appendix). The coefficient alpha values for the 29-item final version were .88 for DIS, .84 for HA, .86 for LA, .80 for IN, .92 for TP, and .95 for the full scale.

Study 3

Studies 3 and 4 represent the validation of the final, 29-item MSBS. In Study 3, the dimensionality, measurement invariance by gender, and convergent validity of the MSBS were assessed. First, the fit of the second-order model previously identified was examined via CFA. Next, measurement invariance was examined across gender in light of findings suggesting that there are gender differences in the propensity to experience boredom (e.g., Vodanovich et al., 2005; Vodanovich & Kass, 1990a; Watt & Vodanovich, 1992). Finally, the MSBS was correlated with hypothetically related constructs to assess its convergent validity. Hypothesized correlations were predicted based on theory and past research. We expected MSBS total scores to be positively correlated with a measure of trait boredom and with measures of anxiety, depression, anger, inattention, neuroticism, and impulsivity. We also expected MSBS scores to correlate negatively with measures of purpose in life and life satisfaction. Finally, to establish that MSBS responses are not unduly biased by social desirability, we explored the correlation between the MSBS and a measure of social desirability.

Participants and Procedure

The final version of the MSBS was administered to 576 undergraduate participants. The sample was 55% female (n = 318), with a mean age of 20.0 years (SD = 4.1, range 17-56). The sample was ethnically diverse: 41% identified as White/Caucasian, 15% as South Asian, 10% Arab/West Asian, 9% Chinese, 6% biracial, 5% Black, 4% Southeast Asian, 3% West Indian, 3% Korean, 2% Filipino, 2% Latin Canadian, 1% Aboriginal/First Nations, 1% Japanese, and 1% "Other."

All participants completed the measures of boredom (BPS, MSBS). To reduce the burden on participants, Subsample 1 (n = 243) completed one set of measures (State-Trait Personality Inventory [STPI], Center for Epidemiologic Studies Depression Scale [CESD], Adult ADHD Self-Rating Scale–Inattention Subscale [ASRS-IN], and Balanced Inventory of Desirable Responding [BIDR]; see below), and Subsample 2 (n = 333) completed a different set of measures (Big Five Inventory–Neuroticism Subscale [BFI-N], Barratt Impulsivity Scale [BIS-11], Purpose in Life Test [PIL], and Satisfaction With Life Scale [SWLS]; see below).

Measures

Boredom. In addition to administering the final version of the MSBS, trait boredom was measured by the BPS, the psychometric properties of which were described above. In the present study, its coefficient alpha was .80.

State-Trait Personality Inventory. The STPI (Spielberger, 1995; Spielberger & Reheiser, 2004) contains both state and trait measures of depression, curiosity, anxiety, and anger. It consists of 80 items with 10 items per subscale. In the present study, the trait and state measures of depression (T-Depression, S-Depression), anxiety (T-Anxiety, S-Anxiety), and anger (T-Anger, S-Anger) were included. In an adult sample, coefficient alphas for these subscales have been reported to range from .91 to .93 for T-Depression, .87 to .93 for S-Depression, .88 to .92 for T-Anxiety, .91 to .94 for S-Anxiety, .88 to .92 for T-Anger, and .93 to .94 for S-Anger (Spielberger, 1995). Subscales had similar coefficient alphas in the present study: .90 for T-Depression, .86 for S-Depression, .66 for T-Anxiety, .85 for S-Anxiety, .81 for T-Anger, and .91 for S-Anger.

Center for Epidemiologic Studies Depression Scale. The CESD (Radloff, 1977) is a 20-item scale that measures current level of depressive symptomatology in the general public. According to Radloff, the internal consistency is .85 and the test–retest reliability ranges from .45 to .70. In the present study, coefficient alpha was .90.

Adult ADHD Self-Rating Scale–Inattention Subscale. The ASRS (Kessler et al., 2005) contains 18 items assessing

recent symptoms of adult attention deficit hyperactivity disorder. Nine of the items assess "Inattention" and nine assess "Impulsivity." Only the Inattention subscale (ASRS-IN) was used in the present study, for which the coefficient alpha was .76.

Balanced Inventory of Desirable Responding. The BIDR (Paulhus, 1991) measures "self-deceptive positivity (the tendency to give self-reports that are honest but positively biased) and impression management" (p. 37). It contains 20 items assessing self-deceptive enhancement (SDE) and 20 items assessing impression management (IM). Total scores are computed only from items with extreme responses (i.e., 6 or 7). Coefficient alpha has been reported to range from .68 to .80 for SDE and .75 to .86 for IM (Paulhus, 1991). In the present study, coefficient alpha was .73 for SDE and .81 for IM.

Big Five Inventory–Neuroticism Subscale. The Neuroticism subscale of the BFI (Benet-Martinez & John, 1998) contains eight items assessing the personality trait of neuroticism, which "contrasts emotional stability with a broad range of negative affects, including anxiety, sadness, irritability, and nervous tension" (p. 730). Coefficient alpha of this subscale has been reported to range from .80 to .84 (Benet-Martinez & John, 1998) and was .83 in the present study.

Barratt Impulsivity Scale. The BIS-11 (Patton, Stanford, & Barratt, 1995) is a 30-item measure of personality trait of impulsiveness. Coefficient alpha of the BIS-11 was reported to range from .79 to .84 (Patton et al., 1995) and was .81 in the present study.

Purpose in Life Test. The PIL (Crumbaugh, 1968; Crumbaugh & Maholick, 1964) contains 28 items measuring the degree to which a participant experiences purpose in life. The internal consistency of the PIL has been reported to range from .90 to .92 (Crumbaugh & Maholick, 1964; Reker, 1977). In the present study, coefficient alpha was .84.

Satisfaction With Life Scale. The SWLS (Diener, Emmons, Larsen, & Griffin, 1985) is a five-item scale measuring global life satisfaction. Coefficient alpha was reported to be .87 with a 2-month test–retest reliability of .82 (Diener et al., 1985). In the present study, coefficient alpha was .85.

Results

MSBS Factor Structure

Confirmatory factor analysis of second-order model. The second-order model (Figure 1) for the final, 29-item MSBS fit the data well, $\chi^2(372) = 1329.77$, TLI = .97, CFI = .97, RMSEA = .067. First-order standardized factor loadings were consistently strong, ranging from .48 to .88 (Table 6), as were the loadings of the first-order factors on the second-order factor (.95 for DIS, .86 for HA, .85 for LA, .85 for IN, and .58 for TP). These results confirm the finding from Study 1 that the MSBS items measure five specific factors that combine to form a single general construct of boredom.

Score reliabilities. In the present study, MSBS coefficient alphas were .87 for DIS, .85 for HA, .86 for LA, .80 for IN, .88 for TP, and .94 for the full scale.

Measurement invariance. Measurement invariance of the MSBS across gender was examined with a series of nested multiple-group CFA models. In Model 1, the second-order model was used as a baseline model to assess configural invariance. The variance of the second-order "General Boredom" factor was constrained to 1.00, and all other parameters were freely estimated. This simultaneous analysis indicated that the second-order model had good fit for both females and males, $\chi^2(744) = 1731.00$, CFI = .97, RMSEA = .068.

Although nested model comparisons using multiple-group CFA have often relied on the χ^2 difference test, recent methodological research (e.g., Cheung & Rensvold, 2002) suggests that examining alternative fit indices is preferable for this purpose because the χ^2 statistic is overly sensitive to sample size and ignores model parsimony. Thus, following Cheung and Rensvold (2002) and Chen (2007), in the current analyses two models were considered to have equivalent fit if the decrease in CFI (ΔCFI) was .01 or less and if the increase in RMSEA (ΔRMSEA) was not greater than .01.

In Models 2 and 3, partial invariance of the MSBS was tested to examine whether first- and second-order factor loadings were invariant across gender. Specifically, in Model 2, all first-order loadings were constrained. Model 2 did not have significantly different fit from Model 1, the baseline model (ΔCFI = .00, ΔRMSEA = –.01), indicating that the first-order factor loadings are invariant across females and males. Model 3 tested the invariance of the second-order loadings over and above the constrained first-order loadings. This model did not have significantly different fit from Model 2 (ΔCFI = .00, ΔRMSEA = .00), indicating that second-order factor loadings are also invariant across gender.

Finally, given that partial invariance was established with Models 2 and 3, strict invariance was assessed by examining equivalence of the error variances of observed variables. Thus, Model 4 was identical to Model 3, with the exception of all error variances of observed variables constrained to be equal across gender. Model 4 did not fit significantly differently from Model 3 (ΔCFI = .00, ΔRMSEA = .00).

In sum, these analyses suggest that the measurement of boredom and its five lower-order factors using the MSBS is strictly equivalent across gender. That is, the relationships between the observed item responses and the lower order factors do not differ across gender nor do the relationships between the lower order factors and the second-order General Boredom factor.

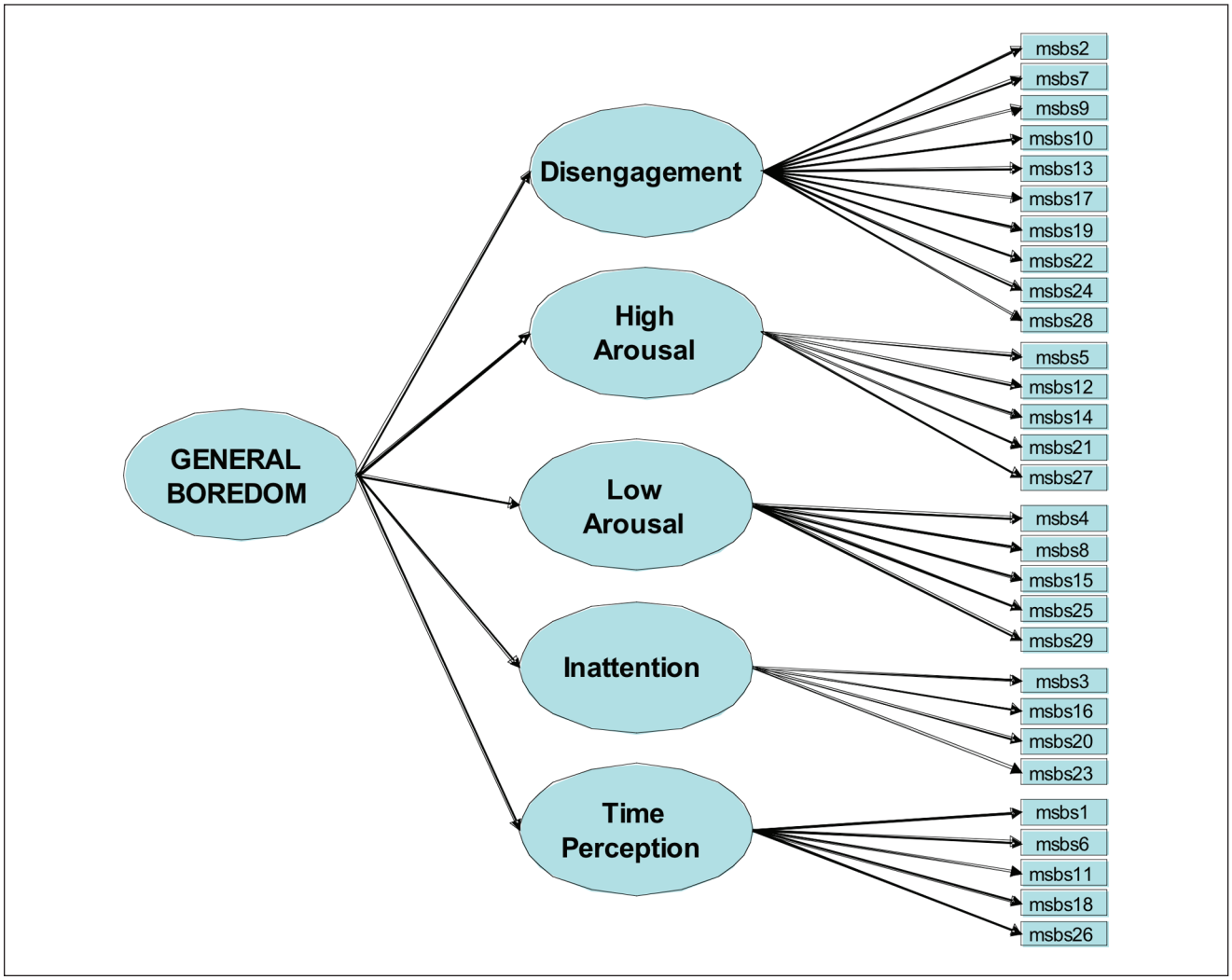

Figure 1. Structural and measurement model of 29-item Multidimensional State Boredom Scale (MSBS)

MSBS Convergent Validity. Several outliers (i.e., greater than three standard deviations above or below the mean) were detected on the validation measures, one each on BPS, CESD, ASRS-IN, SDE, and BIS, two on IM and PIL, and five on S-Ang These scores were deleted. Tables 7 and 8 contain the correlations among MSBS scores and the validation measures. As predicted, MSBS total score and subscale scores were significantly correlated with an existing measure of trait boredom, BPS (r = .44-.62 in Subsample 1 and r = .39-.63 in Subsample 2). MSBS total scores were also significantly correlated with measures of depression, anxiety, anger, inattention, neuroticism, and impulsivity (r = .30-.68), and they were significantly negatively correlated with purpose in life (r = −.52) and life satisfaction (r = −.45). Neither MSBS total scores nor subscale scores were positively correlated with the measure of impression management (r = −.03 to −.15). Taken together, these results provide support for the convergent validity of the MSBS.

Study 4

The purpose of Study 4 was to establish the construct and incremental validity of the MSBS by investigating its sensitivity to experimentally manipulated variations in state boredom. The MSBS was first compared with an existing measure of trait boredom (BPS) for its ability to distinguish between individuals who were induced into a state of boredom and those who were not (i.e., construct validity). Second, the MSBS was compared with measures of trait boredom, negative affect, and depression for its ability to predict group membership (i.e., incremental validity). The incremental validity analysis assessed whether MSBS predicted state boredom better than measures of trait boredom and negative mood in general.

Table 6. Factor Loadings for 29-Item Confirmatory Factor Analysis, Second-Order Model (N = 576)

Item text	Loading
Disengagement (DIS)	**.95**
I am stuck in a situation that I feel is irrelevant.	.54
Everything seems repetitive and routine to me.	.55
I seem to be forced to do things that have no value to me.	.61
I feel bored.	.67
I am indecisive or unsure of what to do next.	.71
I want to do something fun, but nothing appeals to me.	.65
I wish I was doing something more exciting.	.66
I am wasting time that would be better spent on something else.	.48
I want something to happen but I'm not sure what.	.71
I feel like I'm sitting around waiting for something to happen.	.76
High Arousal (HA)	**.86**
Everything seems to be irritating me right now.	.80
I am more moody than usual.	.73
I feel agitated.	.83
I am impatient right now.	.61
I am annoyed with the people around me.	.67
Low Arousal (LA)	**.85**
I am lonely.	.74
I feel down.	.77
I feel empty.	.80
I feel cut off from the rest of the world.	.74
It seems like there's no one around for me to talk to.	.66
Inattention (IN)	**.85**
I am easily distracted.	.63
It is difficult to focus my attention.	.78
My attention span is shorter than usual.	.76
My mind is wandering.	.65
Time Perception (TP)	**.58**
Time is passing by slower than usual.	.68
I wish time would go by faster.	.73
Time is dragging on.	.77
Time is moving very slowly.	.88
Right now it seems like time is passing slowly.	.80

Note. Values in boldface represent first-order factor loadings on second-order "General Boredom" factor.

Method

Participants and Procedure. A total of 75 undergraduate students participated in Study 4. The sample was 84% female (n = 63), with a mean age of 21.2 years (SD = 6.9, range 17-53). Participants reported identification with the following ethnic groups: 41% White/Caucasian, 15% South Asian, 13% Black, 8% Chinese, 7% Arab/West Asian, 4% West Indian, 4% "Other," 3% Korean, 1% Aboriginal/First Nations, and 1% Latin Canadian.

Sessions were conducted individually for approximately 60 to 90 minutes. Participants were randomly assigned to one of three experimental conditions (25 to each): overstimulating boredom (OSB), understimulating boredom (USB), or a nonboredom (NB) control condition. All participants watched a video clip that varied across experimental conditions. Specifically, participants in the OSB condition watched a 25-minute clip on advanced computer graphics and modeling techniques (Rose & McDermott, 1998), which was perceived as highly overstimulating, in both its content difficulty and visual stimulation. With an abundance of incomprehensible, "noisy" information, participants were expected to disengage and become bored (Klapp, 1986). Participants in the USB condition watched a 25-minute clip on learning English as a second language (Video Tutor, 1995). This clip was seen as monotonous, well below participants' skill level, and therefore highly understimulating. In contrast, participants in the NB condition watched a 25-minute clip of the action movie *Speed* (de Bont, 1994), taken from the middle of the film and chosen for its high-action content.

To maximize the effects of the manipulation, participants' perception of volition and experience of time were also manipulated. Participants in both boredom conditions were led to believe that they had no choice in which video they would watch. They were told that other participants were being asked to choose between two videos for the task, but because of technical difficulties, they had no choice. The perceived lack of choice was thought to maximize the desired effect of the manipulation by making participants feel forced into a boring situation (London & Monello, 1974). Participants in the boredom conditions were also told that the video would be stopped after exactly 20 minutes. However, the videos were actually stopped after 25 minutes, creating the feeling of a slow passage of time (Troutwine & O'Neal, 1981).

Conversely, participants in the NB condition were falsely led to believe that they *did* have choice in which video they would watch. Each participant was given descriptions of two possible video clips, but in actuality they were different descriptions of the same film. Thus, regardless of which option was chosen, all participants in the NB condition watched the same clip. The illusion of choice was used to make participants feel personally responsible for their decision and, thus, more engaged in what they were doing. Participants in the NB condition were also told that the clip was 30 minutes in length; however, the video was stopped after 25 minutes, creating the feeling that time had passed quickly.

Table 7. Correlations Between MSBS and Related Constructs, Subsample 1 ($N = 243$)

Scale	7	8	9	10	11	12	13	14	15	16	17
1. MSBS-Tot	**.62**	**.66**	**.68**	**.56**	**.59**	**.56**	**.46**	**.30**	**.37**	**−.29**	−.11
2. DIS	**.61**	**.56**	**.59**	**.54**	**.49**	**.55**	**.36**	**.30**	**.37**	**−.28**	−.09
3. HA	**.47**	**.61**	**.66**	**.48**	**.64**	**.45**	**.58**	**.24**	**.26**	**−.22**	−.07
4. LA	**.53**	**.70**	**.74**	**.62**	**.59**	**.61**	**.40**	**.25**	**.27**	**−.22**	−.03
5. IN	**.44**	**.51**	**.43**	**.35**	**.44**	**.43**	**.34**	**.24**	**.45**	**−.27**	**−.15**
6. TP	**.45**	**.35**	**.36**	**.24**	**.26**	**.23**	**.24**	**.18**	**.17**	**−.20**	−.10
7. BPS	—	**.53**	**.50**	**.54**	**.39**	**.51**	**.30**	**.37**	**.51**	**−.43**	**−.20**
8. CESD		—	**.71**	**.71**	**.64**	**.67**	**.41**	**.29**	**.34**	**−.23**	−.08
9. S-Dep			—	**.73**	**.73**	**.65**	**.55**	**.23**	**.26**	**−.31**	−.06
10. T-Dep				—	**.62**	**.75**	**.34**	**.32**	**.23**	**−.35**	**−.16**
11. S-Anx					—	**.59**	**.58**	**.29**	**.25**	**−.26**	−.04
12. T-Anx						—	**.29**	**.43**	**.37**	**−.37**	−.13
13. S-Ang							—	**.24**	**.16**	**−.19**	**−.15**
14. T-Ang								—	**.31**	−.10	**−.19**
15. ASRS-IN									—	**−.29**	**−.23**
16. SDE										—	**.32**
17. IM											—
α	.80	.90	.86	.90	.85	.66	.91	.81	.76	.73	.81

Note. MSBS-Tot = MSBS Total Score; DIS = Disengagement subscale; HA = MSBS High Arousal subscale; LA = MSBS Low Arousal subscale; IN = MSBS Inattention subscale; TP = MSBS Time Perception subscale; BPS = Boredom Proneness Scale; ZBS = Boredom Susceptibility Scale; CESD = Center for Epidemiologic Studies Depression Scale; S-Dep = STPI State Depression; T-Dep = STPI Trait Depression; S-Anx = STPI State Anxiety; T-Anx = STPI Trait Anxiety; S-Ang = STPI State Anger; T-Ang = STPI Trait Anger; ASRS-IN = Adult ADHD Self-Rating Scale, Inattention subscale; SDE = Balanced Inventory of Desirable Responding, Self-Deceptive Enhancement subscale; IM = Balanced Inventory of Desirable Responding, Impression Management subscale. In all cases, higher scores mean more of the construct in question. $p < .05$ for correlations in boldface.

Table 8. Correlations Between MSBS and Related Constructs, Subsample 2 ($N = 333$)

Scale	7	8	9	10	11
1. MSBS-Tot	**.62**	**.39**	**.44**	**−.52**	**−.45**
2. DIS	**.63**	**.37**	**.44**	**−.51**	**−.47**
3. HA	**.43**	**.24**	**.32**	**−.39**	**−.31**
4. LA	**.48**	**.40**	**.29**	**−.51**	**−.50**
5. IN	**.50**	**.36**	**.48**	**−.39**	**−.33**
6. TP	**.39**	**.18**	**.23**	**−.22**	**−.11**
7. BPS	—	**.34**	**.57**	**−.58**	**−.50**
8. BFI-N		—	**.19**	**−.38**	**−.35**
9. BIS			—	**−.46**	**−.35**
10. PIL				—	**.70**
11. SWLS					—
α	.80	.83	.81	.84	.85

Note. MSBS-Tot = MSBS Total Score; DIS = MSBS Disengagement subscale; HA = MSBS High Arousal subscale; LA = MSBS Low Arousal subscale; IN = MSBS Inattention subscale; TP = MSBS Time Perception subscale; BPS = Boredom Proneness Scale; BFI-N = Big Five Inventory, Neuroticism subscale; BIS = Barratt Impulsivity Scale; PIL = Purpose in Life Inventory; SWLS = Satisfaction with Life Scale. In all cases, higher scores mean more of the construct in question. $p < .05$ for correlations in boldface.

Measures. Immediately after the manipulation, participants completed measures of trait boredom (BPS), state boredom (MSBS), negative affect (Positive and Negative Affect Schedule–Negative Affect Subscale [PANAS-NA]), and depression (CESD). The psychometric properties of BPS and CESD have been described above. Broken down by experimental condition, MSBS coefficient alphas for the full scale and the DIS, HA, LA, IN, and TP subscales, in order, were .96, .90, .85, .82, .93, and .75 for the USB condition; .97, .92, .93, .81, .86, and .97 for the OSB condition; and .94, .83, .84, .78, .75, and .79 for the NB condition.

Positive and Negative Affect Schedule–Negative Affect subscale. The PANAS (Watson, Clark, & Tellegen, 1988) is a brief measure of positive and negative affect. Only the Negative Affect (NA) subscale was used in the present analysis. NA is defined as "a general dimension of subjective distress and unpleasurable engagement that subsumes a variety of aversive mood states, including anger, contempt, disgust, guilt, fear, and nervousness" (Watson et al., p. 1063). The PANAS consists of a list of 20 adjectives (10 per subscale) rated on a 5-point scale using the time instructions desired by the researcher. Present moment instructions were used in the

present study. The reliability for the present moment instructions for the NA subscale is reported to be .85 (Watson et al., 1988).

Manipulation Check. Participants listed four words describing their thoughts and feelings after watching the video. In total, 80% of individuals in the boredom conditions used the word *bored*, and 94% used the word *bored* or its synonyms. In contrast, only one person used the word *bored* in the control condition. Participants in the control condition wrote positive words such as *excited, interested, curious*, or *attentive*.

Results

Construct Validity of the MSBS. Separate one-way analyses of variance were conducted with the two boredom measures (BPS, MSBS) as the dependent variable. One outlier greater than three standard deviations above the mean was detected on each of PANAS-NA and BPS; these total scores were deleted.

The three conditions were not significantly different on the BPS, $F(2, 71) = 0.18$, $p = .84$, $\eta^2 = .01$ (USB $M = 98.00$, $SD = 15.95$; OSB $M = 95.25$, $SD = 17.04$; NB $M = 97.24$, $SD = 16.57$). However, there were significant differences between the groups on the MSBS, $F(2, 72) = 5.13$, $p = .01$, $\eta^2 = .13$. Specifically, post hoc comparisons (Tukey's honestly significant difference) indicated that participants in the USB condition ($M = 115.36$, $SD = 34.90$) and OSB condition ($M = 111.16$, $SD = 39.97$) had significantly higher state boredom scores than those in the NB condition ($M = 86.56$, $SD = 26.88$), $p = .01$ and $p = .04$, respectively. The USB and OSB conditions were not significantly different from one another on MSBS.

These results indicate that although the BPS is not sensitive to detecting differences in state boredom, the MSBS is able to detect such differences.

Incremental Validity of the MSBS. Using experimental condition as the dependent variable, hierarchical logistic regression was used to investigate whether MSBS scores could predict group membership (bored vs. not bored)[4] over and above trait boredom, negative affect, and depression. BPS, PANAS-NA, and CESD were entered in Step 1, and MSBS was entered in Step 2. Results indicated that BPS, PANAS-NA, and CESD, together, did not significantly predict membership in the bored condition ($\chi^2 = 0.62$, degrees of freedom [*df*] = 3, $p = .893$, Nagelkerke $R^2 = .01$). However, when MSBS was added to the model, the set of predictors did significantly predict membership in the bored condition ($\chi^2 = 18.93$, $df = 4$, $p = .001$, Nagelkerke $R^2 = .32$). In particular, the logistic regression coefficient for the MSBS was significant, $b = 0.06$, odds ratio = 1.06, Wald = 10.89, $p = .001$, indicating that higher MSBS scores were associated with a greater likelihood of membership in the boredom condition. Thus, the MSBS clearly has predictive utility over and above measures of trait boredom, negative affect, and depression.

General Discussion

Although historically boredom has received relatively little consideration in the psychological literature compared with other types of negative experience, there is growing interest in studying boredom. Perhaps more crucially, there is growing awareness of the need to understand this common and often detrimental experience. Thus, the new pan-theoretical definition of boredom, the development of the MSBS, and the conceptual clarity achieved through the present work all represent valuable contributions to this area of study. Indeed, we have proposed a definition of the state of "boredom" that is comprehensive and grounded in empirical observation and existing theory. We have also described the development of the MSBS—the first and only full-scale measure of state boredom—which was demonstrated to have good reliability and validity. It is our belief that this scale will have many fruitful applications in the study of boredom.

Integrating Our Definition of Boredom Within Broader Theoretical Models

Defining boredom as we have as *the aversive experience of having an unfulfilled desire to be engaged in satisfying activity* integrates the experience of boredom within broader psychological models such as White's (1959) theory of *effectance motivation* and Nakamura and Csikszentmihalyi's (2003) concept of *vital engagement*, which emphasize "engagement" as an important type of motivation or drive. Such integration further confirms the utility of our definition, illustrates that boredom is related to foundationally important human drives, and allows boredom to be researched in a larger psychological context.

White (1959) created his theory of effectance motivation as a solution to the inability of existing drive theories of motivation to account for exploratory behavior and needs for novelty and mastery. Based on a synthesis of trends in animal psychology, psychoanalytic ego psychology, developmental psychology, and personality psychology, White constructed the concept of *competence*, which he defines as "an organism's capacity to interact effectively with its environment" (p. 297). He argues that competence is pursued because of *effectance motivation*, which is not a deficit motive but a process-oriented motive that "aims for *the feeling of efficacy*, not for the vitally important learnings that come as its consequence" (p. 323). Thus, effectance motivation involves intentional, persistent action that is initiated "for the sole reward of engaging in it" (p. 323, italics added). The concepts of competence and effectance motivation emphasize humans' desire for satisfying interactions with their environment. As such, they are highly related to the concept of disengagement in boredom.

Nakamura and Csikszentmihalyi's (2003) *vital engagement* is also consistent with the definition of boredom as disengagement from satisfying activity. Within the context of the study of optimal development, they construe vital engagement as a type of relationship to the world involving "a strong felt connection" or a "completeness of involvement or participation" with an object or activity in work, love, or play (p. 87). The engagement is considered "vital" in the sense that the relationship is felt to be meaningful or important and in that an individual experiences in-the-moment vitality during a successful interaction. In other words, the sense of connection and involvement leads to enjoyment and absorption, otherwise known as *flow* (Csikszentmihalyi, 1975/2000, 1997). Thus, a vitally engaged relationship "is characterized *both* by experiences of flow (enjoyed absorption) *and* by meaning (subjective significance)" (Nakamura & Csikszentmihalyi, p. 87, italics added). This relationship endures over a long period of time: Such individuals do not simply have separate flow experiences but participate in "a flow activity with which they have become heavily identified and to which they have sustained a long commitment" (p. 89). In other words, given that flow can occur "in virtually *any* interaction, even the most trivial" (p. 90, italics added), it is imperative that the flow activity be valued by the individual, provide a sense of meaning, or serve a larger purpose.

Utility of the MSBS

Given the growing body of literature linking boredom with a variety of psychological, medical, and social problems (see introductory paragraphs), the immediate potential applications of a measure of state boredom are readily apparent. However, up until this point, researchers have resorted to creating provisional measures of state boredom (e.g., Cherrier, Small, Komo, & La Rue, 1997), resulting in a lack of standardization across studies as well as the use of scales that are typically not grounded in theory and have unknown psychometric properties. Furthermore, many theories on the causes and consequences of boredom specifically pertain to state boredom, and yet in the absence of a measure of state boredom, researchers have employed cross-sectional studies with the BPS, a trait measure. The trait of boredom, however, may not be a good proxy for the state of boredom. Thus, a measure of state boredom will better allow for experimental investigations into the potential causes and consequences of boredom. These are vitally important steps forward for the study of boredom that were not possible prior to a well-grounded and psychometrically sound measure of state boredom.

The Relation Between Trait and State Boredom

State boredom is a concrete experience that is situated in time. That is, we feel bored now or we felt bored yesterday during the lecture. In contrast, the propensity to experience boredom is an abstraction that never actually occurs: It is a retrospective summary of past concrete, situated experiences. When a person declares herself to be prone to boredom, she is claiming that she *frequently* experiences boredom or that she *possesses the qualities that predispose* her to experience boredom *given the right circumstances*. In either case, such claims are predicated on the ability to identify discrete, concrete experiences of boredom. That is, we cannot say whether or not someone is prone to boredom without first being able to say if someone is bored. If the propensity to boredom means frequently experiencing boredom, then we need to be able to measure and count instances of boredom. If the propensity to boredom means possessing the qualities that put one at risk for experiencing boredom, then we need to determine what psychological characteristics correlate with instances of boredom.

In short, we feel it is premature to develop the concept of boredom propensity in the absence of a clear definition and way to measure the actual boredom experience. Thus, we argue that the MSBS is a potentially foundational tool for the study of both state boredom and boredom proneness. Armed with a clear, universally applicable definition of the experience of boredom and a reliable, well-validated measure of boredom, it is now possible to more fully articulate and understand the concept of boredom proneness. For example, to the best of our knowledge, no study has systematically investigated how boredom-prone individuals are affected by situations that are liable to trigger acute episodes of boredom. Perhaps personality and the situation interact alternatively; perhaps each contributes independent effects to the experience of boredom. Such fundamental questions can now be explored with a measure of state boredom.

Limitations and Future Research

There are a few limitations of the MSBS that should be noted. First, some researchers may find 29 items somewhat long for their specific research purposes. The necessity of a longer scale was dictated by the multidimensionality of the construct; however, future research could investigate the possibility of a valid short form of the MSBS. Second, the MSBS items are all positively keyed. This was done to avoid confusing participants and to avoid artificially creating a factor structure based on direction of wording (DeVellis, 2003); however, a scale with all positively keyed items is vulnerable to acquiescence bias. Another limitation is that the conceptualization of boredom, development of the scale, and the ensuing scale validation studies were all conducted with a young, fairly educated adult sample. Thus, researchers should be cautious when using the MSBS in populations with different demographic characteristics. Future research could examine the validity of the MSBS in different samples, including clinical populations.

In light of the growing interest in studying boredom, the present research represents a valuable contribution to the field. Not only is our definition and conceptualization of boredom both comprehensive and well-grounded in theory and empirical observation, but the subsequent development of the boredom instrument improves on existing measures. Thus, as a well-validated, multidimensional measure of state boredom, we hope that the MSBS will give rise to many useful applications in psychological research.

Appendix

Multidimensional State Boredom Scale (MSBS)

Instructions. Please respond to each question indicating how you feel right now about yourself and your life, even if it is different from how you usually feel. Use the following choices: 1 = *Strongly disagree*; 2 = *Disagree*; 3 = *Somewhat disagree*; 4 = *Neutral*; 5 = *Somewhat agree*; 6 = *Agree*; and 7 = *Strongly agree*.

1. Time is passing by slower than usual.
2. I am stuck in a situation that I feel is irrelevant.
3. I am easily distracted.
4. I am lonely.
5. Everything seems to be irritating me right now.
6. I wish time would go by faster.
7. Everything seems repetitive and routine to me.
8. I feel down.
9. I seem to be forced to do things that have no value to me.
10. I feel bored.
11. Time is dragging on.
12. I am more moody than usual.
13. I am indecisive or unsure of what to do next.
14. I feel agitated.
15. I feel empty.
16. It is difficult to focus my attention.
17. I want to do something fun, but nothing appeals to me.
18. Time is moving very slowly.
19. I wish I was doing something more exciting.
20. My attention span is shorter than usual.
21. I am impatient right now.
22. I am wasting time that would be better spent on something else.
23. My mind is wandering.
24. I want something to happen but I'm not sure what.
25. I feel cut off from the rest of the world.
26. Right now it seems like time is passing slowly.
27. I am annoyed with the people around me.
28. I feel like I'm sitting around waiting for something to happen.
29. It seems like there's no one around for me to talk to.

Scoring

MSBS Total Score: sum of all 29 items
Disengagement subscale: Items 2, 7, 9, 10, 13, 17, 19, 22, 24, 28
High Arousal subscale: Items 5, 12, 14, 21, 27
Inattention subscale: Items 3, 16, 20, 23
Low Arousal subscale: Items 4, 8, 15, 25, 29
Time Perception subscale: Items 1, 6, 11, 18, 26

Authors' Note

Portions of this research are based on the doctoral dissertation of the first author.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interests with respect to the research, authorship, and/or publication of this article.

Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This research was supported by Natural Sciences and Engineering Research Council of Canada and Ontario Problem Research Centre grants to J.D.E.

Notes

1. We recognize that some theorists would prefer to define boredom as always and only including low arousal. In our view, however, this would not capture the full, dynamic quality of boredom. Furthermore, our reading of the literature suggests that the majority of theorists would claim that boredom includes both high and low arousal. Finally, by developing a multidimensional state boredom scale, the issue of high and low arousal can be experimentally investigated, and if they so desire, researchers can choose to omit the high arousal factor.
2. We wanted to construct a multidimensional scale that generated a meaningful total score and that had the potential to possess a single second-order factor (see section on factor analyses); thus, we sought to maintain high item–total correlations.
3. Based on our review of theory and qualitative analysis, we saw "disengagement" to be the core component of boredom and thus wanted to ensure it was more heavily represented with items relative to the other factors. Furthermore, we wanted to ensure the "disengagement" factor included items pertaining to (a) having nothing to do, (b) not knowing what one wants to do, and (c) being forced to do something unwanted.

4. The two boredom conditions (OSB, USB), which did not differ on the MSBS, were collapsed into one in order to create a dichotomous variable.

References

Abramson, E. E., & Stinson, S. G. (1977). Boredom and eating in obese and non-obese individuals. *Addictive Behaviors, 2*, 181-185.

Ahmed, S. M. S. (1990). Psychometric properties of the Boredom Proneness Scale. *Perceptual and Motor Skills, 71*, 963-966.

Bargdill, R. W. (2000). The study of life boredom. *Journal of Phenomenological Psychology, 31*, 188-219.

Benet-Martinez, V., & John, O. P. (1998). Los Cinco Grandes across cultures and ethnic groups: Multitrait multimethod analyses of the Big Five in Spanish and English. *Journal of Personality and Social Psychology, 75*, 729-750.

Berlyne, D. E. (1960). *Conflict, arousal, and curiosity*. New York, NY: McGraw-Hill.

Bernstein, H. E. (1975). Boredom and the ready-made life. *Social Research, 42*, 512-537.

Blaszczynski, A., McConaghy, N., & Frankova, A. (1990). Boredom proneness in pathological gambling. *Psychological Reports, 67*, 35-42.

Chen, F. F. (2007). Sensitivity of goodness of fit indices to lack of measurement invariance. *Structural Equation Modeling, 14*, 464-504.

Cherrier, M. M., Small, G. W., Komo, S., & La Rue, A. (1997). Mood state and cerebral metabolism in persons with age-associated memory impairment. *Psychiatry Research: Neuroimaging, 76*(2-3), 67-74.

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indices for testing measurement invariance. *Structural Equation Modeling, 9*, 233-255.

Conrad, P. (1997). It's boring: Notes on the meanings of boredom in everyday life. *Qualitative Sociology, 20*, 465-475.

Costello, A. B., & Osborne, J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your data analysis. *Practical Assessment, Research & Evaluation, 10*(7), 1-9.

Crumbaugh, J. C. (1968). Cross-validation of Purpose-in-Life Test based on Frankl's concepts. *Journal of Individual Psychology, 24*, 74-81.

Crumbaugh, J. C., & Maholick, L. T. (1964). An experimental study in existentialism: The psychometric approach to Frankl's concept of noogenic neurosis. *Journal of Clinical Psychology, 20*, 200-207.

Csikszentmihalyi, M. (1997). *Finding flow: The psychology of engagement with everyday life*. New York, NY: Basic Books.

Csikszentmihalyi, M. (2000). *Beyond boredom and anxiety: Experiencing flow in work and play* (25th anniversary ed.). San Francisco, CA: Jossey-Bass. (Original work published 1975)

de Bont, J. (Director). (1994). *Speed* [Motion picture]. United States: Twentieth Century Fox.

De Chenne, T. K. (1988). Boredom as a clinical issue. *Psychotherapy: Theory, Research, Practice, Training, 25*(1), 71-81.

DeVellis, R. F. (2003). *Scale development: Theory and applications*. London, England: Sage.

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49*, 71-75.

Eastwood, J. D., Cavaliere, C., Fahlman, S. A., & Eastwood, A. E. (2007). A desire for desires: Boredom and its relation to alexithymia. *Personality and Individual Differences, 42*, 1035-1045.

Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods, 4*, 272-299.

Fahlman, S. A., Mercer, K. B., Gaskovski, P., Eastwood, A. E., & Eastwood, J. D. (2009). Does a lack of life meaning cause boredom? Results from psychometric, longitudinal, and experimental analyses. *Journal of Social and Clinical Psychology, 28*, 307-340.

Farmer, R., & Sundberg, N. D. (1986). Boredom proneness: The development and correlates of a new scale. *Journal of Personality Assessment, 50*, 4-17.

Fenichel, O. (1953). On the psychology of boredom. In O. Fenichel (Ed.), *The collected papers of Otto Fenichel* (Vol. 1, pp. 292-302). New York, NY: W. W. Norton.

Finney, S. J., & DiStefano, C. (2006). Non-normal and categorical data in structural equation modeling. In G. R. Hancock & R. O. Mueller (Eds.), *Structural equation modeling: A second course* (pp. 269-312). Greenwich, CT: Information Age.

Fisher, C. D. (1993). Boredom at work: A neglected concept. *Human Relations, 46*, 395-417.

Fiske, D. W., & Maddi, S. R. (1961). *Functions of varied experience*. Homewood, IL: Dorsey Press.

Frankl, V. E. (1959). *Man's search for meaning: An introduction to logotherapy*. London, England: Hodder Stoughton.

Frankl, V. E. (1962). *Man's search for meaning: An introduction to logotherapy*. New York, NY: Pocket Books.

Frankl, V. E. (1984). *Man's search for meaning: An introduction to logotherapy* (3rd ed.). New York, NY: Simon & Schuster.

Ganley, R. M. (1989). Emotion and eating in obesity: A review of the literature. *International Journal of Eating Disorders, 8*, 343-361.

Geiwitz, P. J. (1966). Structure of boredom. *Journal of Personality and Social Psychology, 3*, 592-600.

Gordon, A., Wilkinson, R., McGown, A., & Jovanoska, S. (1997). The psychometric properties of the boredom proneness scale: an examination of its validity. *Psychological Studies, 42*, 85-97.

Greenson, R. R. (1951). Apathetic and agitated boredom. *Psychoanalytic Quarterly, 20*, 346-347.

Greenson, R. R. (1953). On boredom. *Journal of the American Psychoanalytic Association, 1*, 7-21.

Hamilton, J. A. (1981). Attention, personality, and the self-regulation of mood: Absorbing interest and boredom. *Progress in Experimental Personality Research, 10*, 281-315.

Hamilton, J. A., Haier, R. J., & Buchsbaum, M. S. (1984). Intrinsic Enjoyment and Boredom Coping scales: Validation with personality, evoked potential and attention measures. *Personality and Individual Differences, 5*, 183-193.

Harris, M. B. (2000). Correlates and characteristics of boredom proneness and boredom. *Journal of Applied Social Psychology, 30*, 576-598.

Hartocollis, P. (1972). Time as a dimension of affects. *Journal of the American Psychoanalytic Association, 20*, 92-108.

Hebb, D. O. (1966). *A textbook of psychology*. Philadelphia, PA: W. B. Saunders.

Hill, A. B., & Perkins, R. E. (1985). Towards a model of boredom. *British Journal of Psychology, 76,* 235-240.

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.

Jarvis, S., & Seifert, T. (2002). Work avoidance as a manifestation of hostility, helplessness, and boredom. *Alberta Journal of Education Research, 48*, 174-187.

Kass, S. J., Vodanovich, S. J., & Callender, A. (2001). State-trait boredom: Relationship to absenteeism, tenure, and job satisfaction. *Journal of Business and Psychology, 16*, 317-327.

Kessler, R. C., Adler, L., Ames, M., Demler, O., Faraone, S., Hiripi, E., . . . Walters, E. E. (2005). The World Health Organization Adult ADHD Self-Report Scale (ASRS): A short screening scale for use in the general population. *Psychological Medicine, 35*, 245–256.

Klapp, O. E. (1986). *Overload and boredom*. Westport, CT: Greenwood Press.

Leary, M. R., Rogers, P. A., Canfield, R. W., & Coe, C. (1986). Boredom in interpersonal encounters: Antecedents and social implications. *Journal of Personality and Social Psychology, 51*, 968-975.

Lee, C. M., Neighbors, C., & Woods, B. A. (2007). Marijuana motives: Young adults' reasons for using marijuana. *Addictive Behaviors, 32*, 1384-1394.

Lee, T. W. (1986). Toward the development and validation of a measure of job boredom. *Manhattan College Journal of Business, 15*, 22-28.

London, H., & Monello, L. (1974). Cognitive manipulation of boredom. In H. London & R. Nisbett (Eds.), *Thought and feeling* (pp. 44-59). Chicago, IL: Aldine.

London, H., Schubert, D. S., & Washburn, D. (1972). Increase of autonomic arousal by boredom. *Journal of Abnormal Psychology, 80*, 29-36.

Maddi, S. (1967). The existential neurosis. *Journal of Abnormal Psychology, 72*, 311-325.

Maddi, S. R. (1970). The search for meaning. In W. J. Arnold & M. M. Page (Eds.), *The Nebraska Symposium on Motivation* (pp. 134-183). Lincoln: University of Nebraska Press.

Maltsberger, J. T. (2000). Case consultation: Mansur Zaskar: A man almost bored to death. *Suicide and Life-Threatening Behavior, 30*, 83-90.

Martin, M., Sadlo, G., & Stew, G. (2006). The phenomenon of boredom. *Qualitative Research in Psychology, 3*, 193-211.

McLeod, C. R., & Vodanovich, S. J. (1991). The relationship between self-actualization and boredom proneness. *Journal of Social Behavior and Personality, 6*, 137-146.

Melton, A. M. A., & Schulenberg, S. E. (2009). A confirmatory factor analysis of the boredom proneness scale. *Journal of Psychology, 143*, 493-508.

Mercer, K. B., & Eastwood, J. D. (2010). Is boredom associated with problem gambling behaviour? It depends on what you mean by "boredom." *International Gambling Studies, 10*, 91-104.

Mikulas, W. L., & Vodanovich, S. J. (1993). The essence of boredom. *Psychological Record, 43*, 3-12.

Nakamura, J., & Csikszentmihalyi, M. (2003). The construction of meaning through vital engagement. In C. L. M. Keyes & J. Haidt (Eds.), *Flourishing: Positive psychology and the life well-lived* (pp. 83-104). Washington, DC: American Psychological Association.

Neu, J. (1998). Boring from within: endogenous versus reactive boredom. In W. F. Flack & J. D. Laird (Eds.), *Emotions in psychopathology: Theory and research* (pp. 158-170). London, England: Oxford University Press.

O'Connor, D. (1967). The phenomena of boredom. *Journal of Existentialism, 7*(27), 381-399.

O'Hanlon, J. F. (1981). Boredom: Practical consequences and a theory. *Acta Psychologica, 49*, 53-82.

Patton, J. H., Stanford, M. S., & Barratt, E. S. (1995). Factor structure of the Barratt Impulsivity Scale. *Journal of Clinical Psychology, 51*, 768-774.

Pattyn, N., Neyt, X., Henderickx, D., & Soetens, E. (2008). Psychophysiological investigation of vigilance decrement: Boredom or cognitive fatigue? *Physiology & Behavior, 93*, 369-378.

Paulhus, D. L. (1991). Measurement and control of response bias. In J. P. Robinson, P. R. Shaver, & L. S. Wrightsman (Eds.), *Measures of personality and social psychological attitudes* (pp. 17-59). San Diego, CA: Academic Press.

Polly, L. M., Vodanovich, S. J., Watt, J. D., & Blanchard, M. J. (1993). The effects of attributional processes on boredom proneness. *Journal of Social Behavior and Personality, 8*, 123-132.

Posner, J., Russell, J. A., & Peterson, B. S. (2005). The circumplex model of affect: An integrative approach to affective neuroscience, cognitive development, and psychopathology. *Development and Psychopathology, 17*, 715-734.

Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*, 385-401.

Ragheb, M. G., & Merydith, S. P. (2001). Development and validation of a unidimensional scale measuring free time boredom. *Leisure Studies, 20*, 41-59.

Reker, G. T. (1977). The Purpose-in-Life Test in an inmate population: An empirical investigation. *Journal of Clinical Psychology, 33*, 688-693.

Rose, J., & McDermott, R. (Video tape cochairs). (1998). *SIGGRAPH 98: Computer graphics conference proceedings video tape* [Video recording]. New York, NY: ACM SIGGRAPH.

Rupp, D. E., & Vodanovich, S. J. (1997). The role of boredom proneness in self-reported anger and aggression. *Journal of Social Behavior and Personality, 12*, 925-936.

Seel, R. T., & Kreutzer, J. S. (2003). Depression assessment after traumatic brain injury: an empirically based classification method. *Archives of physical medicine and rehabilitation, 84*, 1621-1628.

Smith, R. P. (1981). Boredom: A review. *Human Factors, 23*, 329-340.

Sommers, J., & Vodanovich, S. J. (2000). Boredom proneness: its relationship to psychological- and physical-health symptoms. *Journal of Clinical Psychology, 56*, 149-155.

Spielberger, C. D. (1995). *Manual for the revised State-Trait Personality Inventory (STPI).* Palo Alto, CA: Mind Garden.

Spielberger, C. D., & Reheiser, E. C. (2004). Measuring anxiety, anger, depression, and curiosity as emotional states and personality traits with the STAI, STAXI, and STPI. In M. L. Hilsenroth & D. L. Segal (Eds.), *Comprehensive handbook of psychological assessment* (Vol. 2, pp. 70-86). Hobokon, NJ: John Wiley.

Stickney, M. I., & Miltenberger, R. G. (1999). Evaluating direct and indirect measures for the functional assessment of binge eating. *International Journal of Eating Disorders, 26*, 195-204.

Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Thousand Oaks, CA: Sage.

Sundberg, N. D., Latkin, C. A., Farmer, R. F., & Saoud, J. (1991). Boredom in young adults: Gender and cultural comparisons. *Journal of Cross-Cultural Psychology, 22*, 209-223.

Thackray, R. I. (1981). The stress of boredom and monotony: A consideration of the evidence. *Psychosomatic Medicine, 43*, 165-176.

Todman, M. (2003). Boredom and psychotic disorders: Cognitive and motivational issues. *Psychiatry, 66*, 146-167.

Tolor, A. (1989). Boredom as related to alienation, assertiveness, internal-external expectancy, and sleep patterns. *Journal of Clinical Psychology, 45*, 260-265.

Troutwine, R., & O'Neal, E. D. (1981). Volition, performance of a boring task, and time estimation. *Perceptual and Motor Skills, 52*, 865-866.

Video Tutor, Inc. (1995). *Easy English: Using numbers and money* [DVD]. Manasquan, NJ: Author.

Vodanovich, S. J. (2003). Psychometric measures of boredom: A review of the literature. *Journal of Psychology, 137*, 569-593.

Vodanovich, S. J., & Kass, S. J. (1990a). Age and gender differences in boredom proneness. *Journal of Social Behavior and Personality, 5*, 297-307.

Vodanovich, S. J., & Kass, S. J. (1990b). A factor analytic study of the boredom proneness scale. *Journal of Personality Assessment, 55*, 115-123.

Vodanovich, S. J., Wallace, J. C., & Kass, S. J. (2005). A confirmatory approach to the factor structure of the boredom proneness scale: Evidence for a two-factor short form. *Journal of Personality Assessment, 85*, 295-303.

Wangh, M. (1975). Boredom in psychoanalytic perspective. *Sociological Research, 42*, 538-550.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*, 1063-1070.

Watt, J. D., & Ewing, J. E. (1996). Toward the development and validation of a measure of sexual boredom. *Journal of Sex Research, 33*, 57-66.

Watt, J. D., & Vodanovich, S. J. (1992). An examination of race and gender differences in boredom proneness. *Journal of Social Behavior and Personality, 7*, 169-175.

Watt, J. D., & Vodanovich, S. J. (1999). Boredom proneness and psychosocial development. *Journal of Psychology, 133*, 303-314.

Weinstein, L., Xie, X., & Cleanthous, C. (1995). Purpose in life, boredom, and volunteerism in a group of retirees. *Psychological Reports, 76*, 482.

White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review, 66*, 297-333.

Wiesbeck, G. A., Wodarz, N., Mauerer, C., Thome, J., Jakob, F., & Boening, J. (1996). Sensation seeking, alcoholism and dopamine activity. *European Psychiatry, 11*, 87-92.

Zuckerman, M. (1979). *Sensation seeking: Beyond the optimal level of arousal*. Hillsdale, NJ: Erlbaum.

Zuckerman, M., Eysenck, S. B. G., & Eysenck, H. J. (1978). Sensation seeking in England and America: Cross-cultural, age, and sex comparisons. *Journal of Consulting and Clinical Psychology, 46*, 139-149.