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Measuring Dimensions of Body Connection: Body Awareness and Bodily Dissociation

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ABSTRACT

Objective: This study aimed to test the preliminary psychometric properties of the Scale of Body Connection (SBC), a 20-item self-report measure, designed to assess body awareness and bodily dissociation in mind–body intervention research.

Methods: The SBC items were based on common expressions of awareness in body therapy. Content validity was established by a panel of experts. The validity and reliability of the scale was examined with an undergraduate sample. To assess the scale's discriminant validity, the respondents were asked to indicate exposure to specific traumas.

Results: Confirmatory factor analysis, used to examine the scale's construct validity, indicated acceptable goodness-of-fit indices, and revealed uncorrelated subscales, reflecting independent dimensions. Cronbach's alpha revealed equal internal consistency reliability for each subscale for both men and women. Body awareness scores did not differ between individuals with and without reported trauma exposure. Bodily dissociation scores differed between individuals with and without past experience with physical trauma, suggesting the applicability of this subscale for use with populations with trauma histories.

Conclusions: The results provide preliminary evidence of the construct validity and internal consistency reliability of the SBC.

INTRODUCTION

Many therapeutic interventions in complementary and alternative therapies are designed to enhance the mind–body connection. Measures of body awareness and bodily dissociation are needed to explicate the underlying mechanisms involved in physical and mental health improvements, particularly in interventions aimed at populations with somatic problems associated with dissociation or lack of body awareness. This research describes the development and psychometric evaluation of a self-report scale to measure body awareness and bodily dissociation in clinical research.

Background and definitions

Mind–body connection is a "buzzword" in alternative and complementary therapy and integrative medicine. This term refers to the intertwined relationship between soma and psyche[1,2] but is not specific to awareness. Typically, the term is used to refer to the underlying process of most self-regulatory therapies that are designed to increase physical and mental well-being in mainstream approaches, such as cognitive behavioral therapy and biofeedback, as well as in alternative therapies, such as bodywork and somatic therapies, meditation, and yoga. Being cognizant of the relationship or connection between bodily state (somatophysical) and men-

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tal state (psychoemotional) is considered fundamental to the success of mind–body therapies and occurs when an individual becomes conscious of his or her bodily experience as a result of therapy.[3] However, measurement of this awareness process in mind–body research is often missing. For the purpose of this paper the term "psychophysical awareness" is used to refer to the conscious processes involving the mind–body connection.

In somatic theory, psychophysical awareness is linked to the conscious internal processes of self-knowledge and regulation that facilitate human growth and well-being.[3–7] To successfully engage in psychophysical awareness, it is necessary to gain access to inner bodily stimuli and to achieve a state of observational awareness of inner body experience. This involves presence in and acceptance of bodily experience (i.e., bodily association) versus the avoidance or dissociation from bodily experience.[8–10] Thus, the concepts of body awareness and bodily dissociation are involved in the construct of psychophysical awareness.

Body awareness and bodily dissociation, often not clearly defined, are discrete but experientially linked concepts.[10] Body awareness is multifaceted. It involves sensory awareness—the ability to identify and experience inner sensations of the body (e.g., a tight muscle) and the overall emotional/physiologic state of the body (e.g., relaxed, tense). Body awareness also involves attending to bodily information in daily life, noticing bodily changes/responses to emotion and/or environment. The concept of bodily dissociation is characterized by avoidance of internal experience. Bodily dissociation has experiential aspects including normal everyday experiences, such as distraction from bodily experience; this dissociation also includes the experience of separation from bodily experience or bodily self, and emotional disconnection—difficulty with identifying, expressing, and attending to emotion. Bodily dissociation is thought to be a protective strategy against painful memories, thoughts, or feelings and is a mechanism commonly used to cope with physical pain,[3,11] and trauma.[12–14] The conceptualizations used here are drawn from the clinical literature in alternative and complementary therapies, psychology, and psychiatry; the overall result is a broader definition for both terms than is typically found in any one field.

Theoretically different explanations are used to describe the awareness processes underlying psychophysical awareness. Psychologic theories emphasize the reflexive nature of self-awareness, including cognitive processes such as reflection or the objectification of thought and feeling. Theories of holistic interventions, designed to promote psychophysical awareness, offer mindfulness as another perspective for understanding the processes involved.[15] Mindfulness is a meditation process involving the practice of attention to in-the-moment experience.[16] This meditation emphasizes a prereflexive process involving perceptual presence based in subjective experience.[9,17] A primary distinction between the processes of reflection and prereflexivity is the frame of reference for understanding conscious process: The former is inherently more analytical and behavioral, while the latter is more experiential and somatic. In this paper, the conscious processes involving reflection on *and* attendance to internal experience are implicit in the definition of psychophysical awareness.

Body awareness and bodily dissociation in clinical care and research

The importance of body awareness and the detrimental effect of bodily dissociation in health and healing is described in the clinical care of individuals in recovery from psychologic and/or physical traumas[13,14,18] substance abuse,[19,20] and eating disorders,[21–23] as well as in the care of chronic pain.[24,25] Sexual symptoms and dysfunction, common sequels of sexual abuse,[26] are also thought to be related to bodily dissociation.[27]

There are many studies involving mind–body interventions. However, few studies are explicitly focused on increasing and/or measuring psychophysical awareness. The exceptions include studies of mindfulness,[28,29] body-oriented therapy,[30,31] yoga,[32] and a psychophysical therapy treatment used in Nordic countries called Body Awareness Therapy.[8] The populations associated with these studies include individuals with chronic pain conditions, heart disease, childhood sexual abuse, depression, disordered eating, anxiety, and cancer. The results provide evidence of the positive health impact of therapeutic methods specifically aimed at body awareness and association (versus dissociation) to the body. Understanding interventions designed to improve the mind–body connection requires examining body awareness and bodily dissociation in order to explicate the mechanisms that underlie improvements in physical and mental health, particularly for interventions aimed at populations with somatic problems associated with dissociation or a lack of body awareness.

Bodily dissociation and trauma

Individuals with trauma histories make up one population for which bodily dissociation appears to be linked to health. Research on somatoform dissociation and depersonalization suggests the importance of, and possible link between, bodily dissociation and health status in certain conditions. Somatoform dissociation is the activation of somatic symptoms during a dissociative state or reaction; studies provide evidence that symptoms of somatic dissociation are integral to dissociative pathology[33] and are associated with trauma.[34,35] Depersonalization is an aspect of dissociation involving dissociation from the body as a primary symptom (e.g., feeling "cut-off" from the body or having the experience of looking at or sensing one's body from the outside, rather than the experience of being physically "inside" oneself).[36] Studies indicate that depersonalization is common

among individuals with dissociative disorders and post-traumatic stress disorders (PTSD) that are associated primarily with psychologic and physical trauma.[37,38] Although depersonalization symptoms are frequent among individuals with dissociative disorders, they are also common to dissociative experiences among individuals in the general population, particularly among individuals with chronic pain and in situations that involve marked emotional distress.[39,40] These findings suggest the importance of examining the relationship between bodily dissociation and health outcomes among individuals with trauma histories, pain, and severe emotional distress.

Gender and trauma

Exposure to interpersonal violence is associated with equivalent psychologic and physical distress and pathology among males and females.[41] Gender differences exist. Males have a higher prevalence of lifetime trauma exposure compared to women,[42] and women have a higher exposure to violent interpersonal trauma associated with more severe distress.[41] This might explain why studies consistently find that women compared to men report more symptoms of post-traumatic distress.[42,43] In light of the possible link between trauma and bodily dissociation, these findings suggest the importance of examining gender differences in bodily dissociation.

Existing measures and their limitations

Existing measures of body awareness do not address psychophysical awareness. Rather, these instruments measure either nonemotive physical cues such as feelings involving hunger, fatigue, and energy level,[44] or focus on sensory awareness involving, for example, a dry mouth, a beating heart, or a change in body temperature.[45] Measures of mindfulness often have one or two items that address psychophysical awareness as indicators of presence[46] or indicators of mindful observation[47]; however, these scales are not designed as measures of body awareness or bodily dissociation.

Despite the prevalence of dissociative experiences involving the body, there are no measures of bodily dissociation. A scale specific to somatic dissociation, the Somatoform Dissociation Questionnaire (SDQ-20) assesses the presence of somatic symptoms that may accompany dissociative disorders.[48] This scale was designed specifically for use with a clinical population with dissociative disorders—the majority of the items measure severe symptoms, for example, temporary paralysis—and it this scale is consequently not applicable to intervention studies for the general population. Thus, although existing scales may contain specific items that address body awareness or bodily dissociation, these scales are limited in their applicability to the measure of body awareness or bodily dissociation assessed in intervention research designed to enhance psychophysical awareness.

A new measure

The purpose of this study was to construct a self-report scale of body connection for use in body therapy intervention research. The specific aims were to develop a measure of body awareness and bodily dissociation, to evaluate construct validity of the scale, to assess discriminant validity by comparing scale scores of groups with and without histories of trauma exposure, to describe the internal consistency of a pool of items, and to examine gender differences based on scale response. It was anticipated that these two constructs would be correlated and would together provide a composite of body connection.

METHODS

Sample description

The sample consisted of 291 undergraduate students, 162 females (55%), and 119 (41%) males; 10 (4%) of the respondents did not identify their genders or respond to questions regarding trauma exposure. The majority of sample was Caucasian, however racial/ethnic demographics were not collected. The average age of study participants was 20 years with a median of 20 and a mode of 19. While the age range extended to 46 years, 95% percent of the sample was less than 25 years old.

Measurement

Instrument development. Initially, a pool of 26 items was formulated based on expressions of awareness, both positive and negative, common in body therapy. The items were developed to represent two dimensions: body awareness and bodily dissociation. Clinical literature in the fields of bodywork, body psychotherapy, and trauma recovery were reviewed as part of the item generation process. Upon completion of the initial draft, the Scale of Body Connection was distributed to 12 Nursing Science doctoral students in an instrument development course for feedback on item clarity and meaning. Specifically, the volunteers were instructed to rate the degree to which each item was clearly stated using a scale of 1–5 to indicate the number of cues or ideas present in each item statement, to judge "yes" or "no" whether the meaning of each statement was clear, and to assess redundancy among items. Finally, the volunteers were asked to examine the items, which were grouped by theorized dimension, and to indicate if the subscale differentiation seemed logical.

The revised items were subsequently evaluated for content validity by four body therapist clinicians with expertise in trauma recovery, and by two researchers in psychosocial nursing with expertise in scale development. The experts were asked, via open-ended questions specific to each item on a scale evaluation form, to judge the meaningfulness of

the questionnaire items: whether the item captured the dimension of body awareness or bodily dissociation, and whether the item was placed in the appropriate scale. Space was provided for the experts to propose alternative suggestions for item wording. This process resulted in the removal of one item, generation of two new items, and the rewording of items to enhance specificity.

The instrument administered for this study thus consisted of 27 items reflecting two theorized dimensions. The scale instructions indicated that the questionnaire asked about frequency of experience of, and response to, body awareness. Respondents were instructed to "check the box that best answers the way you generally feel." They were also told: "There are no right answers, please answer as truthfully as you can." Item response options were based on a 5-point, Likert-type scale ranging from 1 meaning "not at all" to 5 meaning "all of the time."

Trauma exposure. Questions assessing prior exposure to trauma were included, prior to filling out the actual instrument, to explore the scale's discriminant validity. Commonly assessed trauma experiences[49] were included: childhood physical abuse; childhood sexual abuse; witness to serious accident, natural disaster, or violence; nonsexual assault as an adult; sexual assault as an adult. Response options were "yes" or "no."

Demographic variables. Demographic questions included measures of participants' age and genders.

Data collection

Following review and approval of all research procedures by the University's institutional review board, approximately 350 students were recruited from a northwestern university. This large sample was required to ensure stable parameter estimates for the confirmatory factor analysis (CFA).[50] We contacted 16 professors from undergraduate departments and requested permission to administer the scale to students at the end of their classes. Four (4) professors agreed, and the scale was administered to students in 2 history and 2 anthropology courses within a 2-week period. Data collection included a full information statement consistent with federal and university regulations and was fully anonymous.

Two hundred and ninety-one (291) students returned completed questionnaires, representing an approximated 90% completion rate. The majority of the students returned questionnaires and all questionnaires were used in this analysis. Typically, there was less than 1.5% missing data on the specific scale items. There were, however, two items—one specific to body awareness during sexual activity and one specific to bodily dissociation during sexual activity—that were left blank by 22 respondents (7.6%), who also reported absence of sexual activity.

Data analysis

Scale validity. CFA was used to evaluate the theoretical measurement model reflected in the two dimensions of the SBC instrument using linear structured relations (LISREL).[51] CFA tests the interrelationships among scale items to determine if a set of items share common characteristics that define the construct; for this study, the item fit with the latent variables of body awareness and bodily dissociation were tested. Multiple criteria were used to evaluate the model fit, including the χ^2, the goodness-of-fit index (GFI), the comparative fit index (CFI), the normed fit index (NFI), the standardized root mean square residual (SRMS), and the root-mean-squared error of approximation (RMSEA). The χ^2 statistic is used to assess the fit between the statistical model and the data; the hypothesized model is considered a good fit if the χ^2 is small and statistically insignificant. Chi square, however, is sensitive to sample size, and thus specific indices of fit (GFI, CFI) provide estimates of the amount of variance and covariance explained by the model.[50] Generally, values between 0.9 and 1.0 indicate a good fit for GFI and greater than 0.93 for CFI.[52] A value of less than 0.08 is considered acceptable for SRMS. For the RMSEA, the closer the value is to 0, the better the model fit; a value of less than or equal to .08 is typically considered adequate and a value of less than or equal to .06 represents a good fit.[53–55]

To examine the association with known groups, independent *t*-tests were used to compare individuals with and without histories of trauma exposure.

Scale reliability. Internal consistency reliability was assessed using Cronbach's alpha (SPSS-PC 11.5; SPSS Inc., Chicago, IL, 1993). Alpha values of 0.70 or greater were interpreted as acceptable. We also examined interitem correlations and item-total correlations to assess the relevance of specific items within each scale. For missing data on two items (awareness during sexual activity), the items were scored "not at all" when lack of sexual activity was also marked on the questionnaires by respondents. Analyses were conducted with and without these cases, yielding comparable results. Other respondents ($n = 12$) who had missing values on one or more scale items were not included in the analysis. Gender and age associations were explored using correlations and *t*-tests.

RESULTS

Scale validity

Construct validity. Results from the final confirmatory factor analysis using structural equation modeling are detailed in Table 1. Seven items were eliminated due to cross-loadings (for example: "I am not aware of sensation in certain parts of my body"), or did not load on either of the two

Table 1. Confirmatory Factor Analysis: Item Loadings for Body Awareness and Bodily Dissociation (N = 241)

Construct/item description	Body connection scales: Body awareness	Body connection scales: Bodily dissociation
Body awareness		
1. Aware of tension	0.49 (0.65)	
2. Breathing becomes shallow when nervous	0.48 (0.83)	
3. Notice emotional response to caring touch	0.53 (0.70)	
4. Notice how body changes when angry	0.61 (0.95)	
5. Aware internal sensations during sexual activity	0.53 (0.78)	
6. Can feel breath travel	0.54 (0.90)	
7. Take cues from body	0.68 (1.04)	
8. Think about what might cause discomfort	0.48 (0.76)	
9. Listen from body about emotional state	0.76 (1.12)	
10. Notice stress in body	0.54 (0.72)	
11. Note where tension is in body	0.63 (1.00)	
12. Notice feeling different after peaceful experience	0.64 (0.99)	
Body dissociation		
13. Difficult to identify emotions		0.67 (1.59)
14. Looking at body from outside		0.50 (1.23)
15. Body feels frozen, numb		0.30 (0.80)
16. Feel separated from body		0.44 (1.00)
17. Hard to express emotions		0.73 (2.04)
18. Distract self from feelings of discomfort		0.40 (1.13)
19. Feel separated from body during sexual activity		0.47 (1.10)
20. Difficult to pay attention to emotions		0.72 (1.91)

c^2 = 283.34; 166 *df*; $p < 0.001$); fit indices: comparative fit index = 0.96; goodness-of-fit index = 0.89; normal fit index = 0.90; SRMS = 0.07; and root-mean-squared error of approximation = 0.05 (Confidence interval = 0.043–0.065).

Note: Standardized coefficients with unstandardized coefficients (in parentheses) are reported. Three correlated errors were included: between items 4 and 10 on Body Awareness; between 14 and 16, and between 15 and 19 on Bodily Dissociation. Analyses reported more based on cases with no missing data. Additional analyses conducted with imputed values for missing data yielded equivalent results.

factors (for example: "Even when I do not sleep, I am alert during waking hours"). The final scale* consisted of 20 items. No additional models were run. The overall fit statistics indicated an adequate-to-good fit between the data and the proposed model linking scale items with the constructs of body awareness and bodily dissociation. The chi square was significant (χ^2 = 283.34, 166 *df*, $p < 0.001$), reflecting in part the large sample size; values for specific fit indices suggested a good fit between the model and the data: CFI = 0.96; GFI = 0.89, NFI = 0.90, SRMR = 0.07, and RMSEA = 0.05 (confidence interval = 0.043–0.065). The CFI was strong, but the GFI value borderlined on the conventional standard for a good fit. These cut-offs, however, are considered arbitrary and are best used to compare research models.[50,52,56] Contrary to expectation, the dimensions of body awareness and bodily dissociation were not correlated (−0.08). All factor loadings on each dimension were statistically significant. For Body Awareness (Table 1), the strongest loading items (7 and 9) were focused on integration of physical and emotional experience via attendance to and reflection on inner body awareness (e.g., "listen for information from body about my emotional state" and "take cues from body to understand how I feel"). For Bodily Dissociation (Table 1), the strongest loading items (13, 17, and 20) reflected difficulty with expressing, attending to, and identifying emotion. It appears that, in both dimensions, the items with the strongest factor loadings involved emotional awareness.

Discriminant validity. As a test of scale validity, body awareness and bodily dissociation scores were examined by grouping participants based on reported trauma exposure. Eleven percent (11%) of the female participants and 5% of the male participants reported childhood sexual abuse; 9% of the female participants and 6% of the male participants reported childhood physical abuse. Eight percent (8%) of the female participants and 5% of the male participants reported adult physical assault; 10% of the female participants

*The Scale of Body Connection is available from the primary author. If interested, please contact Dr. Price via e-mail (see reprint address at the end of this paper).

and 1% of the male participants reported adult sexual assault. Thirty percent (30%) of the participants reported being witness to a serious accident, natural disaster, or violence (33% of the females, 30% of the males).

There were no differences in mean responses in body awareness or in bodily dissociation between individuals who did or did not indicate overall trauma exposure (sum of any type of trauma exposure). Examination of specific physical traumas (childhood sexual or physical abuse or adult sexual or physical assault but not witness to trauma), however, revealed that individuals who reported one or more experiences of physical trauma had significantly more bodily dissociation compared to individuals with no history of physical trauma (i.e., individuals who reported no trauma exposure or individuals who only reported being a witness to severe accident, natural disaster or violence [$t = 2.5$; $p < 0.01$]). There was no difference in body awareness between individuals who reported physical trauma versus those with no histories of physical trauma.

When the data were examined further by gender subgroups, there were no differences in body awareness by trauma exposure for females or for males. Nor were there significant differences in body awareness by any types of trauma exposure for males or for females. In contrast, gender comparisons of bodily dissociation by trauma exposure revealed that females who reported one or more trauma exposures had significantly more bodily dissociation compared to females who reported no trauma exposure ($t = 2.1$; $p < 0.04$). An examination by specific types of trauma exposure indicated that females who experienced childhood sexual abuse had significantly more bodily dissociation compared to females who did not ($t = 2.2$; $p < 0.025$). Females who experienced childhood physical abuse had marginally more bodily dissociation compared to females who did not ($t = 1.8$; $p = <0.08$). There were no other significant differences in bodily dissociation for females by trauma exposure. For males, those who reported experiences of physical assault had significantly more bodily dissociation compared to males who did not ($t = 2.5$, $p < 0.02$). There were no other significant differences in bodily dissociation for males by type of trauma exposure. Overall, these findings indicate that the scale of body awareness did not discriminate between individuals with or without exposure to trauma. In contrast, the scale of bodily dissociation did discriminate between individuals, both males and females, who reported exposure to physical trauma—specifically childhood sexual and physical abuse among females, and physical assault as an adult among males.

Internal consistency reliability

The internal reliability consistency was adequate for both measures (N = 279). The body awareness subscale was based on 12 items and had a Cronbach's alpha of 0.83. Corrected item-total correlations revealed that most item loadings were 0.50 or greater. The measure of bodily dissociation included 8 items and had a Cronbach's alpha of 0.78. Item total correlations indicated that the mean interitem correlation was 0.32, and corrected item-total correlations were 0.36 or greater. There was no evidence that deletion of one or more items from either scale would improve the internal consistency. The measures of body awareness and bodily dissociation were uncorrelated ($r = -0.08$, not significant).

Gender and age differences

Table 2 shows the mean and standard deviations for both scales by gender. For this convenience sample, there were no gender or age differences in mean responses to the body awareness subscale or to bodily dissociation subscale. There were, however, significant gender by trauma exposure interactions observed for bodily dissociation as described above.

DISCUSSION

This paper describes the development and preliminary validation of the SBC. The final confirmatory factor analysis produced two uncorrelated scales reflecting independent dimensions of body awareness and bodily dissociation; the results indicated adequate goodness-of-fit indices, supporting the scale's construct validity. The strong factor loadings on items reflecting emotional awareness, in both dimensions of the SBC, suggests that emotional awareness is integral to body awareness and bodily dissociation. Emotional awareness is a vital component of psychophysical awareness, pointing to the particular usefulness of the SBC in clinical intervention research involving mind–body therapies.

The discriminate ability of the two scales differed. The Bodily Dissociation subscale discriminated between groups with and without exposure to physical trauma; specifically childhood sexual and physical abuse among females, and physical assault as an adult among males. This finding provides evidence of the conceptual link between physical trauma and bodily dissociation, and indicates that the scale may be a useful tool in interventions for individuals in

Table 2. Means and Standard Deviations (SDs) for Total Sample (N = 291) and for Male (N = 119) and Female (N = 162) Subsamples

	Total sample		*Males*		*Females*	
Body connection scales	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Body awareness	3.36	0.66	3.30	0.72	3.40	0.62
Body dissociation	2.07	0.63	2.01	6.00	2.11	0.66

Note: No statistically significant differences were observed between males and females.

trauma recovery. In contrast, the Body Awareness subscale failed to discriminate between individuals by trauma exposure; it is likely that having more or less body awareness is related to a myriad of factors and not closely linked to trauma.

This study also demonstrated the internal consistency reliability of the scales, which were equivalent for men and women. A concern related to the scale's reliability is that two items addressing awareness or dissociation during sexual activity were occasionally left blank. These two subscales also proved to be problematic in administration of the scale in a subsequent intervention study. Respondents who were not engaged in sexual relationships tended to leave the items blank. These items, however, are particularly important for individuals with histories of sexual violence because this population is often distressed by a lack of comfort with intimacy and sexuality.[57,27] A suggestion for future use of the scale is to provide explicit instructions to consider all aspects of sexual activity, including self-stimulation. The development of additional items aimed at physical discomfort with intimacy/sexuality might also be useful.

The scale name, Scale of Body Connection, was purposeful in that it was designed to address the overarching construct of psychophysical awareness. The study findings demonstrated the independent features of the subscales, and the need to score and interpret the findings separately. However, the name of the scale was retained because although independent, both body awareness and bodily dissociation are facets of body connection.

The SBC performed well when used in an intervention study conducted subsequent to this analysis of the scale's reliability and validity. Simple to administer, it is brief and easy to understand. In a repeated measures analysis, the scale responses indicated adequate variability and significant change across time, providing preliminary evidence of the positive change in body awareness and reduction in bodily dissociation in response to a body therapy intervention during psychotherapeutic recovery.[30] Increased body connection was also highly correlated with dissociation reduction across time.[58] These findings point to the importance of measuring body connection to examine process, underlying mechanisms, and the relationship between body connection and health outcomes.

There are study limitations to consider. The demographics of the convenience sample of undergraduate students does not compare well with the typical age, socioeconomic status (SES), or racial/ethnic identity of most populations who typically undergo clinical interventions. Likewise, the homogeneity of the study sample does not allow assessment of how other groups might respond to the SBC items. Future research ought to include testing the SBC with a more heterogeneous sample, as well as with populations that are typically chosen for mind–body interventions.

As a follow-up to the preliminary findings that indicated the discriminate ability of the Bodily Dissociation subscale, it will be important to examine the scale's validity among individuals exposed to physical violence. Further construct validity is needed comparing the SBC to other scales of body awareness and dissociation, as well as use of a validated instrument to assess trauma exposure. Comparisons based on other physical traumas such as car accidents that are also known to be associated with traumatic response or PTSD were also missing from this study; this too will be an interesting and important area for future evaluation to help establish the breadth of the scale's clinical utility. An examination of the relationship between bodily dissociation and health outcomes in traumatized versus nontraumatized populations is another important research question given the links between trauma, dissociation and poor physical/mental health.

CONCLUSIONS

In summary, the results provide strong evidence of the SBC's construct validity, partial evidence for discriminant validity and internal consistency reliability. The scale was developed for use in somatic therapy research; however, it is theoretically and practically applicable to many other therapeutic approaches. The development of the SBC addresses a methodological research gap with its emphasis on psychophysical awareness and relevance to body-mind intervention research.

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REFERENCES

1. Kamph M. Heal Yourself: Mind, Body, Spirit. Bandon, OR: Robert Reed Publishers, 2005.
2. Goiszek A. The Mind–body Connection: Using the Power of the Brain for Health, Self-Healing, and Stress Relief. Winston-Salem, NC: Healthnet Press, 2003.
3. Bakal D. Minding the Body: Clinical Uses of Somatic Awareness. New York: The Guilford Press, 1999.
4. Aposhyan S. Natural Intelligence: Body–Mind Integration and Human Development. Baltimore: Williams & Wilkins, 1999.
5. Hanna T. The Body of Life: Creating New Pathways for Sensory Awareness and Fluid Movement. Rochester, VT: Healing Arts Press, 1993.
6. Johnson DH, ed. Bones, Breath and Gesture: Practices of Embodiment. Berkeley, CA: North Atlantic Books, 1995.
7. Blackburn J, Price CJ. Further implications of presence. J Bodywork Movement Ther 2007;11:68–77.

8. Gard G. Body awareness therapy for patients with fibromyalgia and chronic pain. Disabil Rehab 2005;27:725–728.
9. Brown K, Ryan R. The benefits of being present: Mindfulness and its role in psychological well-being. J Pers Soc Psychol 2003;84:822–848.
10. Aposhyan S. Body–Mind Psychotherapy: Principles, Techniques, and Practical Applications. New York: W.W. Norton & Company, 2004.
11. Asmundson G, Norton L, Norton GR. Beyond pain: The role of fear and avoidance in chronicity. Clin Psychol Rev 1999; 1991:97–119.
12. van der Kolk B. Clinical implications of neuroscience research in PTSD. Annals N Y Acad Sci 2006;1071:277–293.
13. Herman J. Trauma and Recovery. New York: HarperCollins Publishers,1992.
14. Timms R, Connors P. Embodying Healing: Integrating Bodywork and Psychotherapy in Recovery from Childhood Sexual Abuse. Orwell, VT: The Safer Society Press, 1992.
15. Bishop S, Lau M, Shapiro S, et al. Mindfulness: A proposed operational definition. Clinical Psychol Sci Pract 2004;11: 230–241.
16. Kabat-Zinn J. Full Catastrophe Living: Using the Wisdom of Your Body and Mind to Face Stress, Pain, and Illness. New York: Dell Publishing, 1990.
17. Legrand D. The bodily self: The sensori-motor roots of pre-reflexive self-consciousness. Phenomenol Cogn Sci 2006;5: 89–118.
18. Briere J. Treating adult survivors of severe child abuse and neglect. In: Myers J, Briere J, Hendrix T, et al., eds. The APSAC Handbook on Child Maltreatment, 2nd ed. Thousand Oaks, CA: Sage Publications, 2002:175–204.
19. Breslin F, Zack,M, McCain S. An information-processing analysis of mindfulness: Implications for relapse prevention in the treatment of substance abuse. Clin Psychol Sci Pract 2002;9:275–299.
20. Marlatt GA, Ostafin B. Being mindful of automaticity in addiction: A clinical perspective. In: Wiers R, Stacy A, eds. Handbook of Implicit Cognition and Addiction. Thousand Oaks, CA: Sage Publications, 2005:489–493.
21. Zerbe K. The Body Betrayed: A Deeper Understanding of Women, Eating Disorders and Treatment. Carlsbad, CA: Gurse Books, 1995.
22. Raeburn S. Women and Eating Disorders. In: Straussner S, Brown S, eds. The Handbook of Addiction Treatment for Women: Theory and Practice. San Francisco: Jossey-Bass, 2002:127–153.
23. Kleinman S, Hall T. Dance/Movement Therapy: A Method for Embodying Emotions. The Renfrew Center Working Papers, vol. 1. Philadelphia: Renfrew Center Foundation, 2003.
24. Margoles M, Weiner R, eds. Chronic Pain: Assessment, Diagnosis and Management. Danvers, MA: CRC Press, 1999.
25. Astin J. Mind-Body Therapies for the Management of Pain. Clin J Pain 2004;20:27–32.
26. Briere J., Elliott D. Prevalence and psychological sequelae of self-reported childhood physical and sexual abuse in a general population sample of men and women. Child Abuse Neglect 2003;27:1205–1222.
27. Maltz W, Holman B. Incest and Sexuality: A Guide to Understanding and Healing. Lexington MA: Lexington Books, 1987.
28. Astin J. Stress reduction through mindfulness meditation: Effects on psychological symptomatology, sense of control, and spiritual experiences. Psychother Psychosomat 1997;66: 97–106.
29. Grossman P, Niemann L, Schmidt S, Walach H. Mindfulness-based stress reduction and health benefits: A meta-analysis. J Psychosomatic Res 2005;57:35–43.
30. Price C. Body-oriented therapy in recovery from childhood sexual abuse: An efficacy study. Alternat Ther Health Med 2005;11:46–57.
31. Price C. Body-oriented therapy in sexual abuse recovery: A pilot-test comparison. J Bodywork Movement Ther 2006;10: 58–64.
32. Daubenmier J. The relationship of yoga, body awareness, and body responsiveness to self-objectification and disordered eating. Psychol Women Q 2005;29:207–218.
33. Nijenhuis E. Somatoform Dissociation: Phenomena, Measurement and Theoretical issues. New York: W.W. Norton & Company, 2004.
34. Nijenhuis E, Spinhoven P, van der Dyck R, et al. Degree of somatoform and psychological dissociation in dissociative disorders is correlated with reported trauma. J Traumatic Stress 1998;11:711–730.
35. Nijenhuis E, van der Hart O, Karuger K, Steele K. Somatoform dissociation, reported abuse and animal defense-like reactions. Australia N Z J Psychiatry 2004;38:678–686.
36. Sadock B, Sadock V, eds. Kaplan and Saddock's Comprehensive Textbook of Psychiatry, Vol. 1, 7th ed. Philadelphia: Lippincott Williams & Wilkins, 2000.
37. van der Kolk B, Pelcovitz D, Roth S, et al. Dissociation, somatization, and affect dysregulation: The complexity of adaptation to trauma. Am J Psychiatry 1996;153:163–170.
38. Foote B, Smolin Y, Kaplan M, et al. Prevalence of dissociative disorders in psychiatric outpatients. Am J Psychiatry 2006;163:623–629.
39. Coons PM. The dissociative disorders: Rarely considered and underdiagnosed. Psychiatric Clin N Am 1998;21:637–648.
40. Aderibigbe Y, Bloch R, Walker W. Prevalence of depersonalization and derealization experiences in a rural population. Soc Psychiatry Psychiatric Epidemiol 2001;36:63–69.
41. Pimlott-Kubiak S, Cortina L. Gender, victimization, and outcomes: Reconceptualizing risk. J Consult Clin Psychol 2003; 71:528–539.
42. Seedat S, Stein D, Carey P. Post-traumatic stress disorder in women: Epidemiological and treatment issues. CNS Drugs 2005;19:411–427.
43. Stein MB, Walker JR, Forde DR. Gender differences in susceptibility to post traumatic stress disorder. Behav Res Ther 2000;38:619–628.
44. Shields S, Mallory M, Simon A. The Body Awareness Questionnaire: Reliability and validity. J Pers Assess 1989;53: 802–815.
45. Miller L, Murphy R, Buss A. Consciousness of body: Private and public. J Pers Soc Psychol 1981;41:397–406.
46. Brown K, Ryan R. The benefits of being present: Mindfulness and its role in psychological well-being. J Pers Soc Psychol 2003;84:822–848.
47. Baer R, Smith G, Allen K. Assessment of mindfulness by self-report: The Kentucky Inventory of Mindfulness Skills. Assessment 2004;11:191–206.

48. Nijenjuis E, Spinhoven P, van Dyck R, et al. The Development and Psychometric Characteristics of the Somatoform Dissociation Questionnaire (SDQ-20). J Nervous Mental Dis 1996;184:688–694.
49. Resnick HS, Falsetti SA, Kilpatrick DG, Freedy JR. Assessment of rape and other civilian trauma-related post-traumatic stress disorder: Emphasis on assessment of potentially traumatic events. In: Miller T.W., ed. Stressful Life Events. Madison, CT: International Universities Press, 1996:231–266.
50. Bollen KA. Structural equations with latent variables. New York: John Wiley & Sons, 1989.
51. Joreskog KG, Sorbom D. LISREL 8 User's Reference Guide. Chicago: Scientific Software International, 1993.
52. Byrne BM. Factor analytic models: Viewing the structure of an assessment instrument form three perspectives. J Pers Assess 2005;85:17–32.
53. Ullman J. Structural equation modeling. In: Tabachnik B, Fidell L, eds. Using Multivariate Statistics. New York, Harper Collins, 1996:709–819.
54. Kline RB. Principles and Practice of Structural Equation Modeling. New York: Guilford Press, 1998.
55. Hu L, Bentler P. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Struct Equation Model 1999;6:1–55.
56. Garson GD. Structural Equation Modeling. Online document at: www2.chass.ncsu.edu/garson/ pa765/strutur.htm Accessed March 5, 2006.
57. Briere J, Runtz M. Symptomatology associated with childhood sexual victimization in a nonclinical adult sample. Child Abuse Neglect 1988;12:51–49.
58. Price C. Dissociation reduction during sexual abuse recovery. Complement Therap Clin Pract 2007;13:116–128.

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