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Michelle Bongermano-Rose  
*Binghamton University, mbonger1@binghamton.edu*

Gary D. James  
*Binghamton University*

Sarah H. Gueldner  
*Kennesaw State University*

Celia Grace Murnock  
*Icahn School of Medicine*

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## Evaluating a Non-verbal Assessment Tool in Nursing Students and Staff at the University of Botswana

Michelle Bongermينو-Rose<sup>1\*</sup>, Gary D. James<sup>2,3</sup>, Sarah H. Gueldner<sup>4</sup> and Celia Grace Murnock<sup>5</sup>

<sup>1</sup>Dept. of Anthropology, Binghamton University, Vestal NY

<sup>2</sup>Laboratory of Biomedical Anthropology and Neurosciences, Binghamton University

<sup>3</sup>Decker School of Nursing, Binghamton University Nursing

<sup>4</sup>Welstar School of Nursing, Kennesaw State University, Kennesaw Georgia

<sup>5</sup>Icahn School of Medicine, Mount Sinai, New York NY

\*Corresponding author: Michelle Bongermينو-Rose, Dept. of Anthropology, Binghamton University, Vestal NY, Tel: 607-777-6309; Fax: 607-777-6329; E-mail: [mbonger1@binghamton.edu](mailto:mbonger1@binghamton.edu)

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### Abstract

Evaluating well-being in non-Western populations has been hampered by the fact that most psychometric instruments are not culturally sensitive. One possible way to remove cultural biases is by eliminating the verbal content from the assessment. The Well-Being Picture Scale (WPS) is a ten item conceptual assessment that has been used to evaluate well-being in a variety of populations. The purpose of this study was to examine its utility in a sample of nursing students and staff from the University of Botswana in Gaborone, Botswana. The WPS and a traditional English language based depression scale, the Zung Self-rated Depression Scale (SDS) were distributed to students and staff at the school of nursing; 71 (31 male, 40 female (mean age= 28.2 years) returned the questionnaires. Reliability of the scales was assessed using Cronbach's alpha. Validity of the WPS was evaluated by examining its sensitivity and specificity using the SDS as a referent, with previously published cut-points denoting either well-being or depression from the scales. The results show that the WPS has good reliability ( $\alpha=0.863$ ) and that when compared to the SDS depression scale, has excellent specificity in identifying positive well-being, but poor sensitivity in detecting depression. The poor sensitivity could be the result of the WPS being a state indicator, while the SDS is a trait measure, or that sociocultural and linguistic factors are affecting the scale comparisons. Nonetheless, the results suggest that the WPS may be useful as way to measure an emotional state of well-being that is independent of cultural context.

**Keywords:** Psychometric instruments; Assessment; Depression scale; Reliability; Sensitivity; Linguistic factors

### Introduction

Well-being and depression are invariably linked to how an individual perceives the world through the lens of lived experience, sociocultural setting, and other behavioral and environmental factors [1]. Life histories shape and influence the way people approach their well-being and address illness, by providing a framework through which people filter information. Thus, there is a conceptual link between what is deemed an appropriate response within the confines of sociocultural norms and an individual's response [1]. Nevertheless, there is significant discontinuity in medical and psychiatric care which is often based on Western generalizations of health and well-being without essential cultural context. These generalizations and the impetus to find biological answers for mental health homogenize mental health and reinforce the mind/body dichotomy [2,3]. This trend is what Nancy Scheper-Hughes refers to as being "trapped by the Cartesian legacy," [3] or the failure of the biomedical community to connect the mind to the body and both to society.

Psychology often falls back on insufficient explanatory concepts and terms regarding the "ways in which the mind speaks through the body, and the ways in which society is inscribed on the expectant canvas of human flesh" [3]. Medical Anthropology has worked for decades

toward a global and reflexive approach to medical prevention and intervention in biomedicine, with a particular focus on protecting vulnerable populations. Still, "reflexivity requires a certain degree of structural flexibility that allows, or forces, the blending of biomedical paradigms with patient culture and history". In order to accommodate the distinctive cultural and situational needs of a patient, particularly within psychiatric frameworks, the field must continue to validate methods of assessment in diverse sociocultural settings.

The measurement of well-being in psychology is a relatively recent phenomenon. In the late 1980s, Ryff proposed a six dimensional model of well-being that identifies (1) purpose in life, (2) environmental mastery, (3) positive relationships, (4) personal growth, (5) autonomy, and (6) self-acceptance using a 54 item questionnaire [4-6]. These dimensions are a projection of the motivations behind two approaches to defining well-being, the eudaimonic and hedonic. Eudaimonic well-being is described as self-fulfillment and the realization of one's own natural strengths, whereas, hedonic well-being is linked to pleasure [4]. Studies have found that among groups in the United States, those who score high on the six dimensional scales which largely focus on eudaimonic well-being tend to have more positive health outcomes suggesting that positive well-being creates optimal physiological functioning [5,6]. It should be noted, however, that much of this positive outcome is also associated with social factors such as socioeconomic status, coping, and social support [4].

The evaluation of well-being using this approach has largely been limited to population groups in the United States. However, recently Curham et al. [7] did a comparative study examining the relationships between well-being and subjective and objective social hierarchies associated with social status and their effect on health outcomes in Japan and the United States. Objective status was defined as social status that is recognized by society (occupation, level of education, etc.), whereas subjective status was based around the individual's "own view of where they stand in the social hierarchy" [7]. Utilizing Ryff's approach, the results showed that certain subjective aspects, which predicted purpose in life and self-acceptance, had higher associations in the U.S. while other objective aspects, which predicted positive relations with others and self-acceptance, were more strongly related in Japan. Overall, the results suggested that the relationship between social hierarchy and individual well-being differed with cultural context [7]. What the results also suggest, however, is that cultural perceptions may have affected the way subjects responded to the questionnaire.

While culture should define what induces well-being and the context in which it is expressed, the feeling of well-being itself, like other emotions, is independent of culture and its measurement should reflect that. The Well-Being Picture Scale (WPS) is an assessment tool that was designed as an alternative method to Ferenc's Human Field Image Metaphor Scale (HFMT) for evaluating well-being in elderly patients who had difficulty with traditional language centered scales [8,9]. The scale was developed to address the difficulties residents were having with the three word metaphors by designing pictures to take their place. Keeping with the Rogerian notion of humans as dynamic energy fields, this conceptual figure-based instrument treats well-being as a reciprocal system of interconnectivity between the individual and their environment [9]. These images represent "well-being relative to self-image" [9] in regard to frequency (intensity), awareness, action, and power or the ability to purposely change [9].

The WPS has been validated for use in relation to mood profiles in a number of populations including groups from Taiwan, Japan, Zambia, and the United States where both adults and children have been assessed [9-11]. It appears to provide a unique assessment that can circumvent the need to for literacy or verbal ability and thus may be independent of cultural context. While the WPS has been examined in relation to mood in several populations, its use in non-Western settings as an indicator of general well-being is limited. Hence, the purpose of this study was to examine the reliability and utility of the WPS to assess general well-being. This was an opportunity to sample a non-Western population, specifically nursing students and staff from the University of Botswana in Gaborone, Botswana. To further assess the validity of the WPS in evaluating well-being, responses were compared to the Zung Self-rated Depression Scale (SDS). Given the reciprocal relationship between well-being and depression, it was hypothesized that there would be an inverse relationship between the scales. Finally, demographic variation in the WPS and SDS responses were also examined.

## Methods

### Setting

The Republic of Botswana is a landlocked country surrounded by South Africa to the south, Namibia to the west and north, and Zimbabwe to the northeast [12]. The landscape is dominated by the Kalahari Desert which covers 80% of the county [12]. The nation is

home to approximately 2 million people, with 20 different ethnic groups speaking languages that fall into two of the four major language families in Africa: Khoisan and Bantu. While the national language Setswana (Bantu) is spoken by a majority of the population, English is the official language of education and the government [12]. The present study was conducted at the University of Botswana, which became an independent entity with its main campus located in the capital city of Gaborone in 1982, where it has since grown exponentially. The university is divided into Faculties of Business, Education, Engineering and Technology, Health Sciences, Humanities, Medicine, Science, Social Sciences, and the School of Graduate Studies [13]. While the University's total enrollment in 2005-6 was reported at 15,710 students, the School of Health Sciences enrollment was at 346 students [14].

### Subjects and Protocol

The subjects were Botswanan students, faculty, and staff from the School of Nursing in the Faculty of Health Sciences who volunteered to participate in a survey study designed to evaluate the psychometric properties of the WPS. All signed informed consent and the project was approved by the Health Ministry Research Unit, Ministry of Health, Botswana, and the Human Subjects Committee at Binghamton University. In total, there were 71 respondents who returned the distributed materials, 31 (43%) male and 40 (56%) female who all self-identified as black African. Sixty-seven (94%) of the respondents listed their birth country as Botswana; three (4%) reported being born in Zimbabwe and one (1%) reported their birth in South Africa. The average age of the participants was 28.2 years, with the average age for females (31.6 years) being higher than that for males (23.6 years) ( $p < .001$ ). Some 52% reported student as their social status while professionals (faculty or staff) comprised 21% of the study population; 27% of respondents did not report their occupation.

All surveys were distributed as paper copies in April, 2009. The respondents answered basic demographic questions (age, ethnicity, country of birth, social status (student, faculty, or staff), and number of years of schooling completed) in addition to the WPS and SDS questionnaires (see below).

### Questionnaires

**Well-being Picture Scale (WPS):** The original Well-Being Picture Scale was designed as a 75 item scale to be utilized in adult populations. A series of developmental phases over the course of a decade brought the WPS down to an 18 item scale, which was trial tested in children by Abbate [9,15]. Abbate found that some of the pictures were difficult for children to identify and modified the scale to a 10 item scale. This version of the picture scale was validated and refined in a number of populations [9] and was utilized in this study.

To answer an item on the WPS, the subject places an "x" in one of boxes between the two dichotomous pictures that best described how they conceptualize themselves on that pictorial dimension. Because there are seven possible boxes, each item is scored from 1-7 (rated from the picture on the left to the picture on the right) with items 1,3,5,6,9 and 10 being reverse scaled left to right (7-1) and items 2,4,7, and 8 being scaled 1-7 left to right. Higher numbers indicate a state of better well-being. Total scores (sum of the 10 items) of 50 or greater are indicative of an overall a state of general well-being [9]. A copy of the picture scale is shown in Figure 1.

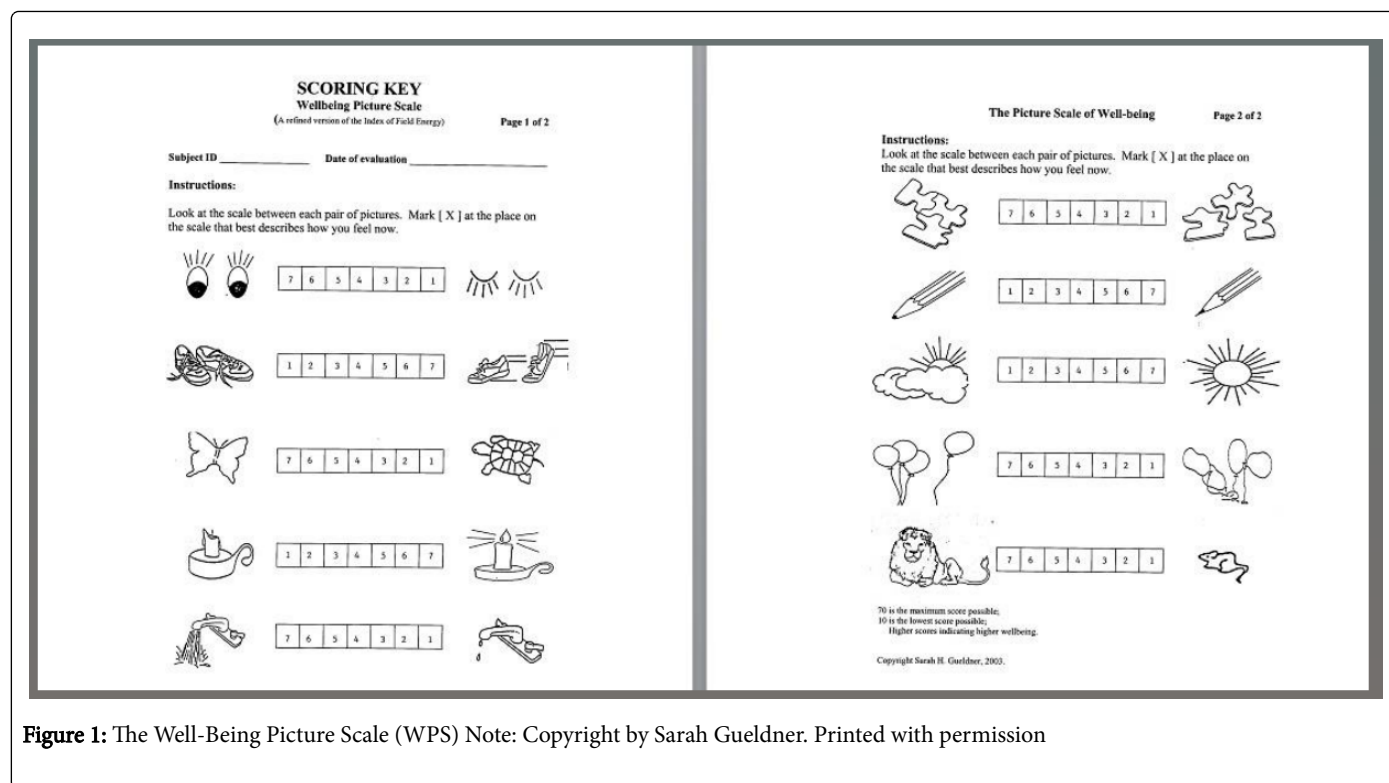


Figure 1: The Well-Being Picture Scale (WPS) Note: Copyright by Sarah Gueldner. Printed with permission

**Zung Self-rating Depression Scale (SDS):** The SDS is a written 20-item scale which evaluates depressive symptoms over the previous two weeks [16,17]. It consists of a series of short written or verbal phrases based on self-identification of symptoms [16,17]. Items are answered using a Likert scale with the following choices: “A little of the time”, “some of the time”, “good part of the time”, or “most of the time.” These items are scored 1-4, and a total for the scale is calculated (ranging from 20 to 80). Higher scores indicate increasing depression. A score greater than 50 suggests the possibility of a depression diagnosis [18].

The SDS has proven to be a useful and successful assessment in determining the presence of depressive symptoms [17]. While the Zung scale has not been validated in Botswana, it has been widely validated in a number of populations and is widely accepted for use as a traditional language based assessment [17].

It should be noted, however, that Campo-Arias et al.'s [17] assessment of the SDS for validation in Columbia found that “sociocultural and linguistic factors” might interfere with the accuracy of the answers [17].

### Analysis

Of the 71 respondents who returned the surveys, 69 (97%) completed every item on the WPS, and, 43 (61%) completed every item on the SDS. There were 25 (35%) respondents who answered most of the SDS items (17 or more). A total score on the SDS for these respondents was determined after interpolating values for the missing items using the individual's item means.

The two respondents who did not complete the WPS also responded to fewer than 15 items on the SDS and one did not return the SDS, as such, these subjects were excluded from the scale evaluations and comparisons. Analyses unless otherwise noted were conducted on data

from the 68 (96%) people with complete WPS and either complete or adjusted SDS scores.

The survey responses and demographic data were entered into an Excel spreadsheet and then exported to SPSS Version 21 for analysis. Cronbach's Alpha was calculated to assess the reliability and internal consistency of the WPS and SDS scales in the total sample of respondents. A contingency analysis was conducted to further evaluate the relative independence of the two scales.

It was hypothesized that the preponderance of respondents scoring above 50 on the WPS would score less than 50 on the SDS scale indicating that those experiencing general well-being would not report depression. This premise was evaluated as a “sensitivity” and “specificity” assessment in which the WPS was evaluated with regard to its ability to identify “non-depressed” and “depressed” patients (or in other words those with positive well-being and those without).

To determine if there were differences in well-being and depression by gender, age group (18-24 years; 25-34 years and 35+ years), or occupational status (student, faculty and staff) WPS and SDS scores were compared using separate One-way ANOVAs. Where necessary, post-hoc comparisons were adjusted using the Bonferroni method.

### Results

Cronbach's alpha for the WPS was 0.863 and 0.828 for the SDS. These alphas would indicate that for both questionnaires, there was good internal consistency and reliability in the study group.

The results of the contingency analysis are shown in Table 1. Assuming that depression and positive well-being are antithetical, the analysis suggests that the WPS has 96.6% specificity, indicating it does well in identifying non-depressed subjects, or those with positive well-

being. However, at the same time, the scale has a sensitivity of 0% indicating that it does poorly in identifying those who are depressed.

Well Being Picture Scale					
Score					
		50+	<50	All	
Score					
Zung Self-Rating	<50	57	9	66	
Depression Scale	50+	2	0	2	
	All	59	9	68	

\*WPS Specificity assessed as: 57/59 or 96.6%.

**Table 1:** Cross-tabulation of the Well-Being Picture Scale (WPS) and the Zung Self-Rating Depression Scale.

Characteristic	X ± S.D	p<F
Gender		0.17
Males	58.9±11.8	
Females	62.4±8.7	
Age Group (years)		0.94
18-24	61.2±9.2	
25-34	61.3±13.7	
35+	60.2±8.7	
Occupation		0.71
Student	60.5±9.7	
Faculty/Staff	59.4±9.7	

**Table 2:** WPS Score Comparisons by Gender, Age Group and Reported Social Status.

Total scores for the WPS ranged from 27 to 70, with 19 participants choosing seven for all items. The average score was 60.47±10.43 indicating that as a group, the respondents exhibited substantial well-being. Comparisons by gender indicate that females had slightly higher scores than males, but the difference was not significant. Likewise, there were no significant differences in score by age group. Differences between students, and faculty and staff were also not statistically significant. These mean comparisons are shown in Table 2.

Finally, Table 3 shows the comparisons for the SDS. The overall mean score was 36.4±8.49, and scores ranged from 23 to 59. There were significant differences in mean scores based on age, with participants aged 25-34 scoring nearly ten points higher on average than older or younger participants (p= 0.02).

## Discussion

The results show that the WPS had good internal consistency and reliability in this sample ( $\alpha = .863$ ), and that well-being as reflected in

the average scores on the scale did not differ by gender, age or social status. When cross-classified with the SDS with cut points of 50 for the WPS (poor/high well-being) and 50 for the SDS (depressed,/not depressed), the WPS demonstrated a high specificity in identifying those that were not depressed (with presumably high well-being), but had low sensitivity in that low WPS scores did not identify those who reported being depressed. The concepts of well-being and depression should be reasonably antithetical, so why did the WPS have such poor sensitivity? One possibility, as suggested by Terwilliger et al. [11], is that the WPS is measuring “in the moment” or more precisely is a state indicator, while the SDS may be more of a trait measure, meaning that it focuses on an enduring characteristic of the person.

Characteristic	X ± S.D.	p<F
Gender		0.75
Males	35.3±8.5	
Females	34.6±10.0	
Age Group (years)		0.006
18-24	33.2±7.5	
25-34	40.1±10.2	*
35+	30.9±8.5	
Occupation		0.74
Student	32.7±7.0	
Faculty/Staff	32.0±5.8	

\*p < 0.05 vs 18-24 and p < 0.05 vs 35+ age groups.

**Table 3:** SDS Score Comparisons by Gender, Age Group, and Reported Social Status.

Thus, the WPS may simply be picking up a momentary state of well-being in all persons, whether they are generally depressed or not. Another possibility for the poor sensitivity finding may be that sociocultural and linguistic factors are affecting the scale comparisons. That is, the SDS is constructed using culturally bound written and verbal phrases [17] while the WPS is a conceptually based [9]. The SDS scale may thus be measuring a culturally or socially defined concept of depression while the WPS scale is capturing a culturally unbound state of well-being. Subjects may be defining themselves as depressed within their cultural context, but at the same time have an emotional sense of well-being.

The reliability of the WPS in this study is also consistent with that found in other population groups. Among groups of adults from Taiwan, Japan and the United States in which the WPS was evaluated, Cronbach’s alpha was above 0.8 (Taiwan: 0.8602; Japan: 0.9129; USA; 0.8266) [9].

Finally, our results are also consistent with that of an earlier study that evaluated depression and well-being among adult men in Botswana [19]. That study examined the impact of globalization on individual well-being through the interplay of self and standard forms of lifestyle aspirations by comparing poor rural-dwelling men with urban well-off men from Gaborone (capital of Botswana). The study specifically tested the premise that the poor rural-dwelling Botswana men would suffer diminished well-being compared to their relatively

well-off urban counterparts. The results indicated that failed urban migration among the rural men was associated with high depressive affect and that the rural men exhibited a syndrome that was similar to post traumatic distress disorder, whereas, the urban men exhibited relatively greater well-being. The Gaborone based subjects in the present study also had a high degree of well-being which provides some support for the notion proposed by Decker [19] that participation in globalization contributes to well-being.

Although the present study confirms the reliability of the WPS and supports earlier assessments of well-being in Botswana, caution should be used in extrapolating the results. First, the study was conducted on a small, non-random sample of personnel from the School of Nursing at the University of Botswana which limits the generalizability of the findings. Additionally, the study respondents were highly educated students, staff, and faculty with a high level of secondary education who may have a greater understanding of the concept of well-being and the process of assessing it which could have skewed the results toward a report of positive well-being. Further, the WPS was compared to the SDS, and it is possible that had another depression scale [20] been used, the comparative results would change. Nonetheless, the results suggest that the WPS may be useful cross-culturally as a way to measure an emotional state of well-being [21]. Further validation studies using larger samples and a variety of cultural groups with diverse educational levels need to be conducted to improve the understanding of what the WPS is measuring.

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