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ARTICLES

COMPARING THE PSYCHOMETRIC PROPERTIES OF TWO MEASURES OF WISDOM: PREDICTING FORGIVENESS AND PSYCHOLOGICAL WELL-BEING WITH THE SELF-ASSESSED WISDOM SCALE (SAWS) AND THE THREE-DIMENSIONAL WISDOM SCALE (3D-WS)

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Two recently developed scales of wisdom were compared on their abilities to have their dimensional structure replicated and to predict relevant personality (i.e., forgiveness) and life satisfaction (i.e., psychological well-being) variables. One hundred and seventy-six primarily (71%) Australian participants ranging in age from 18 to 68 years (M = 36.60, SD = 12.07) completed an online survey of the Self-Assessed Wisdom Scale (SAWS; Webster, 2003, Journal of Adult Development, 10, 13–22; 2007, International Journal of Aging and Human Development, 65, 163–183), the Three-Dimensional Wisdom Scale (3D-WS; Ardelt, 2003, Journal of Gerontology: Psychological Sciences, 52B, 15–27), the

Heartland Forgiveness Scale (Thompson et al., 2005, Journal of Personality, 73*, 313–360), Ryff's (1989,* Journal of Personality and Social Psychology, 57*, 1069–1081) measure of psychological well-being (PWB), and a measure of social desirability (BIDR; Paulhus, 1984,* Journal of Personality and Social Psychology, 46*, 598–609). Results indicated that the dimensional structure of the SAWS, but not the 3D-WS, replicated, and the 3D-WS, but not the SAWS, was contaminated by a social desirability response bias. Both scales predicted equally well PWB and forgiveness in predicted directions. Implications for future use of both scales are discussed.*

Wisdom has long been admired as a noble facet of personality (e.g., Ardelt, 2003; Baltes & Smith, 2007; Brugman, 2006; Staudinger, Lopez, & Baltes, 1997), as a virtue (e.g., Peterson & Seligman, 2004), and as an exemplary character trait (e.g., Baltes & Staudinger, 2000; Bluck & Gluck, 2004; Brugman, 2006; Sternberg, 1998; Webster, 2003, 2007). Considered a hallmark of psychosocial maturity and the apex of human development, wisdom evolves in a dynamic, dialectical fashion as life experiences and their evaluations channel later interactions into increasingly satisfactory directions. Wise persons are considered to be not only competent and fulfilled individually, but also disseminators of their hard won insights to others. Consequently, caring, compassion, and mutuality have long been considered typical personality dimensions of sages. Gerontologists and life span developmentalists (e.g., Clayton & Birren, 1980) originally turned to wisdom as one possible example of positive aging, an alternative focus to the decline and deficiency emphasis that tended to dominate the field. Investigating wisdom in older adults, of course, presupposes reliable and valid assessment instruments, the topic of the present brief report.

Despite the ostensible stellar qualities of wisdom, all of the ancient theological/philosophical work, and most of the early psychological work, in this area were limited to conceptualizations and discussions, rather than concrete testing of hypotheses. Scientific psychology has been a latecomer to the investigation of this venerable topic, in part, due to the difficulties inherent in capturing the complexities and subtleties of wisdom from a rigorous, empirical perspective. The dominant paradigm in this area has been the work conducted by Baltes and colleagues (e.g., Baltes & Staudinger, 2000; Baltes & Smith, 2007) at the Max Planck Institute in Berlin. Here, expert raters are trained to rate levels of wisdom from think-aloud protocols produced by asking participants what hypothetical characters should do

in response to difficult social events that are ostensibly normative, or non-normative, for a particular age group. Initially, this work focused on the cognitive dimension of wisdom as it followed their definition of wisdom as a form of expertise. Later work has augmented this intellectual emphasis with an interest in personality and motivational factors as well (e.g., Kunzman & Baltes, 2003).

Recently, two questionnaire measures of wisdom have emerged that emphasize personality qualities of wise persons rather than the cognitive sophistication of artificially elicited decisions prompted by hypothetical dilemmas. One measure, the 39-item Three-Dimensional Wisdom Scale (3D-WS; Ardelt, 2003) was constructed by selecting items from 20 previously existing measures (e.g., Dogmatism Scale, Rokeach, 1960; Ideas of Reference Scale, Sears, 1937; Pensacola Z Scale, Jones, 1957) originally intended to assess constructs other than wisdom and then augmenting these with new items. Participants responded to all items with either a Likert scale (1 = *strongly agree* to 5 = *strongly disagree*) or from 1 = *definitely true of myself* to 5 = *not true of myself*. Confirmatory factor analysis indicated the viability of a three-factor solution comprising a cognitive, a reflective, and an affective dimension consisting of 14, 12, and 13 items, respectively. The mean score for each of the three dimensions is computed and the mean of these three dimensional scores represents the overall wisdom score of a person. Cronbach alphas ranged from 0.74 to 0.78 and the 3D-WS had a 10-month test-retest reliability score of 0.85.

Findings using this scale have shown that wise persons tend to have higher life satisfaction, sense of mastery, general well-being, and purpose in life, whereas scores on the 3D-WS are negatively correlated with depressive symptoms, feelings of economic pressure, death avoidance, and fear of death (Ardelt, 2003), illustrating various forms of validity.

A second measure, the Self-Assessed Wisdom Scale (SAWS; Webster, 2003, 2007) was constructed after a review of the literature suggested five integral components of wisdom: emotional regulation; humor; critical life experiences; reminiscence and life reflection; and openness to experience. Forty items (eight per dimension) were written to reflect each of the five components. Participants responded to all items using the same 6-point Likert type scale where 1 = *strongly disagree* to 6 = *strongly agree*. Raw scores are summed to produce a total wisdom score. Exploratory and confirmatory factor analysis indicated the viability of a five-factor model. Cronbach's alpha for the overall scale was 0.904 and the SAWS had a 2-week test-retest reliability value of 0.84 (Webster, 2007).

Findings using this scale have shown that wise persons tend to score higher on measures of generativity, ego integrity, and positive attachment and are negatively associated with foolishness and unrelated to age and educational level, illustrating various forms of validity.

To our knowledge, the original psychometric findings of the 3D-WS have not been replicated, whereas those of the SAWS have. Moreover, to date, there has been no direct comparison of the 3D-WS and the SAWS, an important procedure specifically suggested by Ardelt (2003) and a crucial step in evaluating measurement instruments in the field (Sternberg, 1990).

It is important to note, as suggested by both reviewers of this article, that the construction and preliminary validation of both scales differ in important respects. Items for the SAWS were written to explicitly tap five interrelated dimensions of wisdom as suggested by an extensive literature review. Subsequently, all items were factor analyzed. In contrast, for the 3D-WS a team of raters selected items from several previously existing scales not originally designed to measure wisdom and assigned each item to one of the three dimensions (i.e., cognitive, reflective, and affective). Subsequently, all items were investigated in relation to a host of statistical properties (e.g., skewness, variance, interitem correlations) and items failing to meet criteria were eliminated. Originally, then, the 3D-WS was not constructed using factor analytic techniques, whereas the SAWS was. Additionally, the 3D-WS was constructed to measure wisdom specifically in older adults (age range $= 52$–87 years; $M = 71$ years), whereas the SAWS was constructed to measure wisdom across the entire adult life span (age range $= 18$–88 years; $M = 39.2$ years).

As Worthington and Whittaker (2006) remind us, factor analysis is used to identify "... or confirm a smaller number of factors or latent constructs from a large number of observed variables (or items)" (p. 807), with one of its most prevalent uses being "... to support the validity of newly developed tests or scales—that is, does the newly developed test or scale measure the intended construct(s)" (p. 807). Given that the 3D-WS was constructed using raters selecting items from a heterogeneous pool of items, we believe it is important to investigate if in fact factor analysis can statistically reproduce the three dimensions proposed by Ardelt. Although Ardelt (2003) claimed that "... the individual dimensions of the 3D-WS are not unidimensional but cover a broader range of personality characteristics ..." (p. 294), she also stated that "... items that correlated negatively or very weakly with other items from the same dimension of the wisdom scale were eliminated" (pp. 293–294), which suggests a relatively tight,

internally consistent structure that should be captured via factor analysis.

The purpose of the present paper, therefore, is to (1) replicate the dimensional structure of both the SAWS and 3D-WS using factor analysis and then (2) directly compare the two instruments in relation to a measure of social desirability, the personality trait of forgiveness, and the psychological quality of subjective well-being.

METHODS

Participants

An online questionnaire was posted on the Internet using Opinio software. The online data collection required participants to complete the survey in one session of approximately 30 min with the wisdom scales preceded by a string of demographic questions. To reach participants a ''snowball'' data collection technique was used. Potential subjects were sent an invitation to participate, a link to the questionnaire, and were also requested to forward the link to other individuals. The data were collected over 8 weeks from the start of June to the end of July 2006.

The sample consisted of 176 respondents, 113 (65%) female and 60 (35%) male. Ages ranged from 18 to 68 years ($M = 36.60$, $SD = 12.07$). There were 8 participants (4% of the original sample) that were excluded from the analysis due to substantial numbers of missing values.

The sample was highly educated with 60% of participants having completed a tertiary degree and 16% a TAFE Diploma. The majority of participants were Australian ($n = 121$), 17 English, 26 were from other countries, and 8 respondents did not record their nationality. Respondents who reported being of no religious denomination made up 49% of the sample, 36% were Christian, 12% were of other denominations, and 4 participants did not respond.

Measures

Wisdom
Wisdom was measured with the SAWS and 3D-WS as detailed above.

Forgiveness
Forgiveness was measured using the Heartland Forgiveness Scale (HFS) developed by Thompson et al. (2005). The HFS consists of

18 items and is a self-report measure of dispositional forgiveness. It contains three, six-item subscales that measure forgiveness of Self (e.g., "I hold grudges against myself for negative things I've done"), forgiveness of Others (e.g., "If others mistreat me, I continue to think badly of them"), and forgiveness of Situations (e.g., "I eventually make peace with bad situations in my life"). Participants indicated the extent to which they disagreed or agreed with each item using a 7-point Likert scale ranging from 1 ("strongly disagree") to 7 ("strongly agree"). Nine items were reverse scored and the HFS total scale (range 18–126) was calculated by summing the items on each subscale with higher scores indicating higher levels of forgiveness. Thompson et al. (2005) reported a Cronbach's alpha reliability of 0.87 for the HFS and demonstrated validity with the scale positively related to other measures of forgiveness. Cronbach's alpha for the current study was 0.83.

Psychological Well-Being
Well-being was measured using a shortened version of Ryff's (1989) Psychological Well-Being (PWB) scale. The short version of the PWB scale consists of 30 items and is a self-report measure of positive psychological functioning. It contains five, six-item subscales that measure Environmental Mastery (e.g., "In general, I feel in charge of the situation in which I live"), Personal Growth (e.g., "I am not interested in activities that will expand my horizons"), Self-Acceptance (e.g., "I like most aspects of my personality"), Autonomy (e.g., "I tend to be influenced by people with strong emotions"), Purpose in Life (e.g., "I live one day at a time and don't really think about the future"), and Positive Relations with Others (e.g., I feel like I get a lot out of my friendships"). Participants indicated the extent to which they disagreed or agreed with each item using a 6-point Likert scale ranging from 1 ("strongly disagree") to 6 ("strongly agree"). Fifteen items were reverse scored and the PWB total score (range 30–180) was calculated by summing the items on each subscale, with higher scores indicating higher levels of psychological well-being. Cronbach's alpha of the overall scale for the current study was 0.89. Ryff (1989) demonstrated validity with PWB positively correlated with measures of positive functioning and negatively correlated with measures of negative functioning.

Social Desirability
Social desirability was measured using the Balanced Inventory of Desirable Responding (BIDR; Paulhus, 1984, 1991). The BIDR consists of 40 items and is a self-report measure of socially desirable

responding. It contains two subscales. The Self-Deceptive Positivity (SD) subscale has 20 items (e.g., I never regret my decisions) designed to measure overconfidence in one's judgments and rationality. Paulhus (1991) notes that positive self-deception is actually linked to positive traits such as self-esteem, low neuroticism, and low social anxiety. Scores on this subscale of the BIDR, therefore, should be positively correlated with wisdom. The Impression Management (IM) subscale consists of 20 items (e.g., "I have some pretty awful habits") designed to measure respondent's likelihood of overreporting desirable behaviors and underreporting undesirable behaviors. Paulhus (1991) states that "...the IM scale correlates highly with a cluster of measures traditionally known as lie scales...and role-playing measures..." (p. 38.) We expect wisdom scores to be unrelated to this subscale of the BIDR.

Participants indicated the extent to which they disagreed or agreed with each item using a 7-point Likert scale ranging from 1 ("strongly disagree") to 7 ("strongly agree"). Participants receive a score of 1 for each statement reflecting an extreme score (i.e., 6 or 7) and therefore scores can range from 0 to 20 for each subscale, with higher scores indicating a higher level of socially desirable responding. The two subscale scores can be totaled to produce an overall score. Paulhus (1991) reports a test-retest correlation of 0.65 and high alpha reliability of 0.83 for the overall scale and demonstrated concurrent validity with the BIDR positively correlated with the Marlowe-Crowne Social Desirability Index.

RESULTS

Factor Analyses

SAWS
A principal components analysis using an equamax rotation with factors set to five was performed on the SAWS as previously done by Webster (2007). The data were suitable for a factor analysis with (a) an acceptable sample size (over 100); (b) linearity was met; (c) significant Bartlett's Test of Sphericity (3210.45 (780), $p < .001$); and (d) the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (0.82) demonstrating an acceptable degree of multivariate normality of the set of distributions or common variance among the variables. Given the sample size ($N = 176$), factor loadings below a critical value of 0.384 were deemed nonsignificant (Stevens, 1992) for both the SAWS and 3D-WS analyses.

Five factors were extracted and together they explained 48.30% of the total variance. The eight items that were intended to measure Reminiscence and Reflectiveness all loaded significantly only on the first factor, with factor loadings ranging from 0.61 to 0.75. The eight items that were intended to measure Humor all loaded significantly only on the second factor, with factor loadings ranging from 0.50 to 0.73. Six of the eight items that were anticipated to measure Experience loaded significantly on Factor 3, with one item loading 0.42 on Factor 2 (Humor) and one item not loading on any factor, with significant factor loadings ranging from 0.48 to 0.82. Seven of the eight items that were intended to measure Emotional Regulation loaded significantly only on the fourth factor. No items cross-loaded. Factor loadings ranged from 0.42 to 0.79, with one item not loading on any factor. Four of the eight items that were anticipated to measure Openness loaded significantly on Factor 5 with no cross-loading. Two items did not load on any factor, one loaded 0.43 on Factor 3 (Experience), one loaded 0.44 on Factor 2 (Humor), and one loaded 0.39 on Factor 3 (Experience). Significant loadings ranged from 0.53 to 0.70. Given that the definition of openness is the willingness to sample myriad thoughts, actions, and emotions, the above-mentioned cross-loadings with experience and humor factors is to be expected.

Cronbach's alpha for the total SAWS in the current study was 0.90, indicating an excellent internal reliability for the overall scale. The subscale reliabilities were 0.78, 0.78, 0.88, 0.85, and 0.68 for the Experience, Emotional Regulation, Reminiscence and Reflectiveness, Humor, and Openness dimensions, respectively, indicating acceptable internal consistency within the subscales.

3D-WS

The factor analysis results of the 3D-WS revealed that the integrity of the scale structure was not being maintained. A principal components analysis with three set factors and an oblique rotation was used, with factors expected to correlate as indicated by Ardelt (2003). Assumptions of linearity were met, and the Kaiser-Meyer-Olkin value (.76), and Bartlett's Test of Sphericity results (2598.75 (741), $p < .001$), indicated that the data were suitable for factor analysis.

The principal components factor extraction only explained 32.98% of the variance and items did not load into theoretically meaningful or distinct factors as outlined by Ardelt (2003). Of the 14 items designed to measure the Cognitive component of wisdom, 9 loaded on Factor 1, 1 on Factor 3, and 4 not at all. Of the 12 items designed to measure the Reflective component of wisdom, 5 loaded on Factor

2, 6 on Factor 3, and 1 not at all. These results would seem to indicate two distinct sets of items measuring separate components of wisdom. This interpretation is further supported as Factors 2 and 3 showed a very weak correlation ($r = .13$). Of the 13 items designed to measure the Affective component of wisdom, 3 loaded on Factor 3, and 10 did not load significantly on any factor, which suggests that the Affective component of wisdom in the 3D-WS is mostly redundant in the current sample. In addition, Factor 3 was made up of a combination of cognitive (1), reflective (6), and affective (3) items, which made meaningful interpretation problematic at best.

Correlational Analyses

Before testing the correlational hypotheses the data were screened. There were no out of range values for the continuous variables of wisdom, forgiveness, psychological well-being (PWB), and social desirability. Only a small number of missing values were present. Taking into consideration the size of the sample ($N = 176$), and also wanting to maintain the mean of the distribution as a whole, each missing value was replaced with the variable mean (Tabachnick & Fidell, 2001).

The correlational results are presented in Table 1. As can be seen, both the SAWS and 3D-WS, as predicted, were positively correlated with both forgiveness and psychological well-being. Neither measure, again as predicted, was correlated with age, which replicates earlier

Table 1. Zero order correlations among the wisdom, age, and predictor variables

	SAWS	3D-WS	SD	IM	HFS	PWB	Age
SAWS	—						
3D-WS	.33**	—					
SD	.257**	.195**	—				
IM	−.016	.238**	.319**	—			
HFS	.350**	.567**	.301**	.156*	—		
PWB	.455**	.644**	.360**	.169*	.666**	—	
Age	.076	−.056	.160*	.082	.078	.113	—

Note. SAWS = Self-Assessed Wisdom Scale; 3D-WS = Three-Dimensional Wisdom Scale; SD = Social Deception subscale of the Balanced Inventory of Desirable Responding; IM = Impression Management subscale of the Balanced Inventory of Desirable Responding; HFS = Heartland Scale of Forgiveness; PWB = shortened version of Psychological Well-Being; Age = chronological age.
*$p < .05$ level (two-tailed); **$p < .01$ level (two-tailed).
$N = 176$.

findings reported by both Webster (2003) and Ardelt (2003). Both measures were correlated with each other ($r(176) = .33$, $p < .001$), providing preliminary convergent validity evidence for both scales. The SAWS was not associated with a social desirability bias as measured by the total BIDR score ($r(176) = .138$, $p = .068$, *ns*), whereas the 3D-WS was significantly correlated with the total BIDR score ($r(176) = .268$, $p < .001$), which failed to replicate nonsignificant findings reported earlier by Ardelt (2003).

When total BIDR score was decomposed into the Self-Deception (SD) and Impression Management (IM) subscales an interesting pattern emerged. Consistent with predictions, both the SAWS and the 3D-WS were positively correlated with SD, suggesting that wise individuals maintain healthy levels of "positive illusions" (e.g., Taylor & Brown, 1988). In contrast, IM scores, which measure the tendency to try to impress others by saying the right things, were uncorrelated with the SAWS, but positively correlated with the 3D-WS. At least with respect to the current sample, therefore, it appears as if there is a modest social desirability bias associated with the 3D-WS. Finally, we note that Ardelt (2003) only (1) used the SD subscale of the BIDR and therefore missed the opportunity to assess the potentially negative impact of impression management tendencies on self-report measures, and (2) did not compute the BIDR as described by Paulhus (1991) (i.e., a 7-point scale in which 1 point is awarded for an extreme score of 6 or 7) but rather used a 5-point scale and only used 1 extreme score (i.e., a value of 5). The consequences of this scoring modification are unknown.

DISCUSSION

For the first time, two measures of wisdom have been directly compared in terms of the replication of psychometric properties and their ability to predict theoretically relevant (i.e., forgiveness and psychological well-being) relationships. Although both measures proved successful and essentially equal on the latter, only the SAWS was successful on the former. Ardelt's (2003) 3D-WS failed to produce a factor structure consistent with hypothesized dimensions, with many original items cross-loading on other factors and 15 of 39 (38.4%) items not loading on any factor at all. Moreover, the positive association with a measure of impression management suggests some items in the 3D-WS may produce a tendency for participants to bias their responses. The current study, however, should not, and does not, conclude that the 3D-WS is an unreliable

and invalid research tool. To this end, Ardelt (2003) stipulates that the 3D-WS was designed for older respondents and that future research should assess the reliability and validity of the scale in younger samples. Although Ardelt (2009) has recently compared the responses of younger participants with her original sample of older persons, this study did not investigate factorial structure between age groups on the 3D-WS and so it is still currently unknown whether or not item loadings are similar for both younger and older participants. The current study has provided initial evidence that there may in fact be some interesting differences.

In contrast, the SAWS factor structure was well replicated and there was no evidence of impression management. These findings build on earlier work by Webster (2003, 2007) and increase the confidence in the reliability and validity of the SAWS as a measure of wisdom. For instance, Webster (2010) has recently shown that the SAWS successfully differentiates between eudaimonic and hedonistic values, predicts possible antecedent conditions of wisdom development such as attachment avoidance/anxiety, as well as positively correlates with a measure of integrative complexity. Moreover, given that the participants were primarily Australian, these results provide tentative evidence of the SAWS's cross-cultural relevance.

The relation between personality and wisdom is an intimate one and having psychometrically sound, easily administered instruments will facilitate research in this important area. Researchers now have a choice of at least two measures of wisdom. Although some important differences between the SAWS and the 3D-WS are reported in this paper, the measures also have much in common, including their multidimensional nature and inclusion of important noncognitive factors. Nevertheless, given that the reported correlation between the two is a modest 0.33, it is clear that each instrument is measuring somewhat different facets of wisdom. The current study provides preliminary information that researchers can use to help decide whether the SAWS or 3D-WS is the most appropriate choice for their work.

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