

What is Wisdom? The Development and Validation of a Multidimensional Measure

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This study develops a multidimensional scale for measuring the concept of wisdom. Through synthesizing and augmenting multiple conceptualizations and operationalizations of wisdom, we propose and validate a twenty-one item measure of wisdom. This measure integrates literature from both the implicit and explicit theories of wisdom in psychology and also incorporates recent management literature. Two studies are conducted and both demonstrate support for dimensionality, reliability and validity of the proposed scale. This scale offers a more complete and theoretically grounded measure of wisdom in a workplace context, thus contributing to the extant literature.

INTRODUCTION

The concept of wisdom has fascinated both scholars and laypersons for decades, yet a clear definition of wisdom still remains unknown. Considerable debate has emerged over the necessary elements of wisdom and two prominent literature streams have evolved. Specifically, Ardel (2003) explains that empirical research on wisdom typically (1) evaluates implicit theories or the meaning of wisdom among laypeople or (2) measures people's degree of wisdom or their wisdom-related performance founded on implicit or explicit theories.

The first literature stream focuses on implicit theories that individuals hold about the nature of wisdom and the characteristics that comprise wise individuals (Baltes & Smith, 2008). This side concentrates on measuring the dimensions of wise individuals themselves, in which wisdom can be argued as a personality characteristic instead of a performance-based characteristic that might be context specific (Ardelt, 2003; Webster, 2003). Moreover, this line of research conceptualizes wisdom as including cognitive, affective, and reflective personality characteristics (Ardelt, 2003), and often demonstrates that wise individuals are knowledgeable, mature, tolerant, emphatic, experienced and intuitive (Baltes & Smith, 2008)

The second stream of research focuses on explicit theories, in which "explicit theories are constructions of (supposedly) expert theorists and researchers rather than laypeople" (Sternberg, 1998, p. 349). The Berlin Paradigm defines wisdom as an "expert system dealing with the meaning and conduct of

life” (Baltes & Staudinger, 2000, p. 124). This paradigm indicates that the term “expertise” is intended to denote that it is not intelligence in the typical sense, but instead, a considerably more multifaceted system of knowledge, procedural strategies, and intuition. (Baltes & Smith, 2008). The expert knowledge system can be reflected in human behavior and decision making, such as how individuals answer: Which future life goals to pursue and how? How to deal best with critical problems? How best to make sense of our life history and past experiences? (Baltes & Smith, 2008). Unlike the preceding group, implicit measures of wisdom are intended to evaluate an individual’s wisdom-related performance compared to personality characteristics (Ardelt, 2003). Moreover, it has been argued that by conceptualizing wisdom as an “expert knowledge system,” wisdom exists externally from individuals, whereas the other literature stream suggests that wisdom is within wise persons (Ardelt, 2004).

Despite the differences between the two prominent literature streams, there is a general agreement that wisdom is a multidimensional construct (Ardelt, 2003; Webster, 2003). Although the concept of wisdom is prevalent throughout psychology literature, it is only minutely integrated into management research (McKenna, Rooney, & Boal, 2009). Recently, a call for such research has been made. McKenna et al. (2009, p. 177) argue that “leadership requires wisdom to provide excellence in judgment, insight and character and that if the principle features of wisdom are understood, leaders can be evaluated according to a robust criteria based on these principles.”

Thus, the fundamental objective of this work is to establish an encompassing and organizationally relevant measure of wisdom that can be used in assessing this individual trait. By integrating management literature and both psychology streams, we present a multidimensional conceptualization of wisdom that is applicable in a generalized organizational and managerial context. Accordingly, we offer a comprehensive definition of wisdom, such that wisdom can be operationalized as possessing seven dimensions: reflective, openness, interactional aptitude, practical, ethical sensibility, paradoxical tolerance and experience. This operationalization is tested through two studies, in which the second study (Phase III) utilizes full-time employees. These dimensions are expanded on subsequently.

DIMENSIONS OF WISDOM

Practical

The practical dimension of wisdom refers to an individual’s ability to reason carefully. More specifically, this relates to an individual’s ability to screen incoming information and to be able to select or focus on the aspect that is most critical. Research has suggested that wise people must be able to create and comprehend logical arguments that are founded on thorough propositions (McKenna, et al., 2009). Moreover, wise individuals are often skeptical and question other’s assertions or question commonly accepted views (McKenna, et al., 2009; Sternberg, 1990). Additionally, it has been argued that wise individuals direct their attention to the precise level or to the key pieces of information by selecting the most prominent facts in a particular situation (Eflin, 2003). Malan and Kriger (1998, p. 246) state that wise individuals “filter and interpret the noise from within their own organizations and determine the salient points on which to act.”

The practical dimension of wisdom also refers to an individual’s decision making style, such that they look at a problem from multiple perspectives. McKenna et al. (2009) argue that wise leaders understand that decision-making seldom requires applying absolute principles. Therefore, wise individuals not only know absolute principles, but also know how and why to apply them in a complex world (McKenna, et al., 2009). This dimension also relates to “the fundamental pragmatics of life” in the Berlin paradigm (Baltes & Smith, 2008), such that individuals can wisely address which future life goals to pursue and how? Ardelt’s (2003) arguments also provide support for this dimension. Specifically, she argues that wise people look at phenomena from different perspectives and attempt to remove subjectivity from decision making (Ardelt, 2003).

Taken together, previous research indicates support for a dimension of wisdom that considers a person’s carefulness, and we label this dimension *practical*. We take the position that the practical dimension of wisdom is reflective, such that wise people possess the ability to reason carefully.

Reflective

The reflective dimension of wisdom refers to an individual's ability to reminisce on one's past and present life. Webster (2003, p.14) indicates that reflecting on one's past performs a mass amount of important psychological functions, "including identity formation and maintenance, self-understanding, problem-solving, and adaptive coping". Ultimately, reflecting upon one's life allows an individual to acknowledge both personal strengths and weaknesses; this further presents an opportunity to enhance personal strengths while attenuating weaknesses (Webster, 2003).

This dimension also relates to Baltes and Smith's (2008) life review, which addresses how to understand one's life history and past experiences. Similarly, Ardel (2003) argues that wisdom contains a dimension of reflectivity. Particularly, she argues that reflectivity is a prerequisite to wisdom's cognitive and affective components, and that it is through this dimension that individuals learn to not react to unpleasant circumstances and to acknowledge the reality of the current situation (Ardelt, 2003). Therefore, we believe that being reflective is an important component to wisdom, such that we label this dimension *reflective*. Moreover, we believe that this dimension will act as a reflective indicator of wisdom.

Openness

Openness to experience is one of the "big five" dimensions of personality (Digman, 1990). Specifically, openness refers to an individual's creativeness, imagination, and intellectual curiosity (Digman, 1990). Several researchers have suggested that being open to alternative views or open to views unlike one's own is a key component to wisdom (Webster, 2003; Baltes & Smith, 2008). Likewise, openness relates to listening to and being tolerant of alternative views and possible solutions to problems. Webster (2003, p. 15) argues that, "rigid and inflexible responses to life's demands make an individual unwise". Additionally, Baltes & Smith (2008, p. 58) present a dimension of wisdom they term relativism, such that "expressing tolerance and respect for beliefs or actions unfamiliar or contrary to one's own" is an outcome of wisdom. Taken together, previous research lends support for a dimension of wisdom we label *openness*; and consistent with previous research, we believe openness will be a reflective indicator of wisdom.

Interactional Aptitude

Interactional aptitude refers to an individual's ability to regulate one's own emotions and expressions and to understand other's emotions and behaviors. In other words, this dimension includes emotional, social, and communication skills. Several researchers have argued that affect sensitivity and emotional regulation are critical components to wisdom (Webster, 2003). Wise individuals are able to attune their emotions and present appropriate expressions for the situation at hand. Webster (2003, p. 14) states that "Recognizing, embracing, and employing emotions in a constructive way is a benchmark of wisdom." Moreover, Webster (2003) suggests that wise individuals are able to recognize and distinguish among mixed emotions, and use this information to assist in problem resolution. Furthermore, during interactions with others, wise individuals are able to comprehend other's expressions and use this information to further understand the individual, including the individual's beliefs, attitudes, values, abilities, and inabilities (Webster, 2003). Taken together, previous research indicates that wise people have high interpersonal skills, and we therefore label this dimension *interpersonal aptitude*; likewise, we believe interpersonal aptitude will be a reflective indicator of wisdom.

Paradoxical

The paradoxical dimension of wisdom refers to an individual's ability to tolerate uncertainty and ambiguity. It has been argued that wise people have the ability to tolerate uncertainty, such that wise leaders envision and pursue long-term goals. Likewise, wise leaders can picture the effects of alternative courses of action in the long-term (McKenna & Rooney, 2005). Furthermore, wise individuals can "grasp and reconcile the paradoxes, changes and contradictions of human nature" (McKenna, et al., 2009, p.177). In short, previous research lends support for a dimension of wisdom we term *paradoxical*, and we believe that this dimension will be a formative indicator of wisdom.

Ethical Sensibility

The ethical sensibility dimension of wisdom refers to an individual's ethics and ethical judgments. Aristotle strongly encouraged the role of ethics and virtue, which has been claimed to be a central component to practical wisdom (Baltes & Smith, 2008). Moreover, Sternberg's three-part Balance Theory of Wisdom largely centers on values, such that wisdom reveals itself by displaying concern for others (Sternberg, 1990). However, no empirical measure or published article relating ethics to wisdom could be found by the researchers. Therefore, we attempt to integrate ethics into a measure of wisdom, and we term this dimension *ethical sensibility*. Thus, we believe ethical sensibility will be reflective indicator of wisdom.

Experience

The experience dimension of wisdom refers to an individual's experience with challenging life situations. Webster (2003, p. 14) states that, "Wisdom cannot develop in a vacuum. Rather, it emerges during the exigencies of life, the rough and tumble of everyday existence." Nonetheless, it is argued that is it not just accumulated general experience, but instead, experiences that are difficult or morally challenging that allows wisdom to grow (Webster, 2003). Thus, we believe experience is an important component of wisdom, such that we term this dimension *experience*. Moreover, we believe that this dimension will act as a formative indicator of wisdom.

As detailed above, the seven proposed dimensions of wisdom are theoretically supported. These dimensions integrate literature from management and incorporate both implicit and explicit theories of wisdom provided in the psychology literature. We believe that the experience and paradoxical dimensions will act as formative indicators of wisdom, whereas the practical, reflective, openness, interpersonal aptitude, and ethical sensibility dimensions will act as reflective indicators of wisdom. The proposed measure of wisdom is examined in the subsequent studies which adhere to the scaling procedures advocated by Netemeyer, Bearden, and Sharma (2003).

METHOD

Following scaling procedures, the research was composed of three phases (Netemeyer, Bearden, & Sharma, 2003). Phase I entailed a comprehensive compilation of measures representing each of the above domains, as well as the use of three expert raters to clarify and refine the items prior to piloting the measure. Phase II entailed a pilot study of student respondents in an effort to further refine and clarify the measure. In this phase we specifically sought to assess the dimensionality and reliability of the items, and given this aspiration and the nature of the wisdom construct, a student sample was appropriate. Phase III sought to establish the content domain of the measure and tested the proposed scale in a field setting.

Phase I

As alluded to above, once all of the items for each domain were compiled, a panel of three raters familiar with the extant wisdom literature were used to rate each item for clarity and domain specification. Each rater began by classifying each item to a hypothesized dimension of wisdom; only items that were correctly classified by all three raters were retained, thus there needed to be 100% inter-rater reliability in order for an item to be advanced to use in Phase II. Once this was complete, the raters were then asked to look at the set of items within each domain to ensure it adequately captured the dimension of interest. Of the sixty-two items that were originally compiled to measure wisdom, the inter-rater agreement suggested that a forty-six item measure be used in Phase II.

Phase II

Two hundred and six undergraduate students from four sections of introductory management and marketing courses at a large southeastern university were surveyed. Student participation was incentivized with extra credit. Participants were assured that their responses would remain kept confidential and that only aggregate data would be reported. The sample (N=221) consisted of 117

females (53%) and 103 males (47%). The average age of the participants was 22.68 years (range 19-57), 13% were employed full-time, 41% were employed part-time, and 46% were full-time students/unemployed. Participant ethnicity was primarily Caucasian (80%), with 11% indicating Black or African American, and 4% Hispanic or Latino.

Wisdom Measures

The items used to measure each of the proposed dimensions of wisdom are as follows. Please note that all items were measured by a five-point Likert-type scale that was anchored by “strongly disagree” and “strongly agree.” All items are provided in the Appendix.

The interactional aptitude dimension of wisdom was measured with ten items adopted from Goleman (1995) representing emotional intelligence and seven items adopted from Ferris et al. (2001) representing social skill. A representative item is “In social situations, it is always clear to me exactly what to say and do.” The practical dimension of wisdom was measured with two items adopted from Davis (1980) representing perspective taking and six items adopted from Heppner & Peterson (1982) representing problem-solving confidence and approach/avoidance style. A representative item is “I believe there are two sides to every question and try to look at them both.” The paradoxical dimension of wisdom was measured with six items adopted from Freeston, Rheame, Letarte, Dugas, & Ladouceur (1994). A representative item is “The ambiguities in life stress me.” The ethical dimension of wisdom was measured with four items adopted from Brown, Trevino, and Harrison (2005) and two items adopted from Reichel & Neumann (1988). A representative item is “I define success not just by results but also by the way that they are obtained.” The experience dimension of wisdom was measured with two items adopted from Webster (2003) and three items adopted from Webster (2007). A representative item is “I have lived through many difficult life transitions.” The reflective dimension of wisdom was measured with four items adopted from Webster (2003). A representative item is “I often think about my past.” The openness dimension of wisdom was measured with ten items adopted from Goldberg et al. (2006). A representative item is “I enjoy hearing new ideas.”

Other Measures

Four constructs expected to positively correlate with wisdom were included in the study to provide evidence of convergent and discriminant validity. These constructs consisted of self-monitoring, core self-evaluations, self-reported grade point average (GPA) and age.

The thirteen item scale developed by Lennox & Wolfe (1984) was used to measure self-monitoring. Given that self-monitoring captures both ability to modify self-presentation and sensitivity to expressive behavior of others, it should positively correlate with wisdom; such that those high in wisdom should be able to scan their environment and modify their behavior accordingly. This scale utilized a five-point Likert-type scale anchored by “strongly disagree” and “strongly agree.” A representative item is “I have the ability to control the way I come across to people, depending on the impression I wish to give them.” The internal-consistency estimate of reliability for this scale was $\alpha = .75$.

The twelve-item scale developed by Judge, Erez, Bono, & Thoresen (2003) was used to measure core self-evaluations (CSE). CSE is an especially relevant construct as it represents four core traits (each of which should be positively related to Wisdom): self-esteem, generalized self-efficacy, neuroticism, and locus of control. This scale utilized a five-point Likert-type scale anchored by “strongly disagree” and “strongly agree.” A representative item is “I determine what will happen in my life.” The internal-consistency estimate of reliability for this scale was $\alpha = .82$.

To attain grade point average information, respondents were asked to report their GPA at the end of the previous semester. GPA was collected as a proxy for intelligence (e.g. Farsides & Woodfield, 2003; Gutman, et al., 2003) and conscientiousness (Honeycutt, 2008), in which both constructs should be positively correlated with wisdom. Though this is a crude measure, there is no reason to suspect students would intentionally misrepresent this information. Additionally, fear of academic dishonesty repercussions should actually have a reverse effect to any social desirability bias, thus incentivizing honesty.

Lastly, extant literature has shown age to be positively correlated with wisdom (e.g. Staudinger, Smith, & Baltes, 1992). As such, this demographic variable was collected for use as a correlate in addition to its demographic function.

Though multiple measures hypothetically could serve to help establish convergent and discriminant validity, the research team felt the above measures best represented the breadth of the literature and still fit within reasonable space and time constraints. As an example to this point, whereas conscientiousness hypothetically fit, it alone is ten items. The core self-evaluations scale is a twelve item measure that has been empirically established, is widely accepted, and represents four relevant yet distinct traits. Additionally, as noted above, GPA has been used as a proxy for conscientiousness and intelligence.

Controls

Except for age, the extant literature did not suggest the necessity of controlling for any specific demographics or variables when studying wisdom. Age has been commonly used, however given Ardelit (2003) the researchers found age more prudently used as a correlate than a control. Gender, Race, and years of job experience were gathered out of prudence, but no relationships were hypothesized nor were any subsequently detected.

Results

The primary objective of the study was to act as pilot test to assist in item trimming and to act as an initial validity testing procedure. Exploratory factor analysis (EFA) and item analyses were used to refine the scale and to analyze a theoretical a priori initial factor structure. As encouraged by Netemeyer et al. (2003), common factor analysis (Principal Axis Factoring) and an oblique rotation method (Direct Oblimin) were used. These methods are suggested to be more relevant in scale development, since common factor analysis is typically more associated with recognizing the underlying dimensions of a set of items and because EFA--based common factor analyses often generalize to CFA more so than principle components factor analysis. Likewise, Direct Oblimin assesses the extent to which multiple dimensions correlate, yielding more meaningful theoretical factors.

Six of the seven proposed dimensions maintained adequate factor structure (Figure 1). Both the scree plot and the total variance explained supported the six dimension solution. Specifically, the scree plot's elbow broke at the sixth dimension, and the total variance explained per dimension became less than four after the sixth dimension as well. Hair, Tathman, and Black, (1998) suggest that at least 5% of the variance explained should be associated with a factor in order for that factor to be meaningful. Therefore, the author's agreed that since the sixth factor explained 4.66% of the total variance, it ought to be kept in the solution; whereas the seventh factor only explained 3.46% of the total variance. The majority of the items representing the ethical dimension of wisdom did not load onto any of the factors, or else indicated poor loadings ($<.4$). After considering that the researchers could not find any published empirical measure of ethics relating to wisdom and that the ethical items indicated poor loadings, they were removed from the subsequent analyses. Overall, in the subsequent analyses, items with poor loadings were removed from the analysis and factor analysis was repeated until all cross-loadings were nonexistent in the factor structure. The final analysis supported six factors and twenty-six indicators.

As noted by Netemeyer et al. (2003), it is important to assess internal consistency in the initial stages of scale development. This includes internal consistency estimates of reliability (coefficient alphas), average inter-item correlations, corrected item-to-total correlations, item variances, and item-wording redundancy. Therefore summated scales were created for each dimension of wisdom and internal consistency was assessed. The sub-dimensions each had acceptable reliability estimates: Paradoxical ($\alpha = .85$), Experience ($\alpha = .84$), Openness ($\alpha = .82$), Interactional ($\alpha = .65$), Reflective ($\alpha = .82$), and Practical ($\alpha = .77$). Admittedly, the Interactional sub-dimension scale was lower than the .7 target, but the researchers felt it was still sufficient given it was above .6 and was only a three item measure. The corrected inter-item correlations for all of the retained items were $>.5$, thus meeting the recommendation of Bearden and Netemeyer (1998).

**FIGURE 1
FACTOR LOADING PATTERN MATRIX**

	Dimensions					
	Paradoxical	Experience	Openness	Interactional	Reflective	Practical
PX5	.814					
PX4	.808					
PX3	.766					
PX6	.646					
PX2	.577					
PX1	.546					
E3		.857				
E1		.802				
E5		.709				
E2		.681				
E4		.483				
O7			-.831			
O1			.762			
O9			-.635			
O2			.627			
O6			-.557			
I4				.630		
I6				.602		
I3				.498		
R4					.753	
R1					.741	
R2					.707	
R3					.679	
P7						-.790
P6						-.677
P8						-.617

Construct validity of the proposed measure was assessed in multiple ways. First, as noted above the use of three expert raters to assign each item to a latent construct and only retaining items that had 100% inter-rater agreement provides strong support for face validity (Netemeyer, et al., 2003). Convergent validity was supported by (a) the high standardized factor loadings of each item (>.5, most >.71) indicating that in most cases the latent factor explains the majority of the variance in each item) (Hair, et al., 1998), and (b) sufficient internal consistency estimates of reliability for each sub dimension (noted above) (Hair, et al., 1998; Netemeyer, et al., 2003). Nomological validity was evidenced by the

correlations among the dimensions of wisdom, and through the correlations among the dimensions of wisdom to the proposed correlates (self-monitoring, core-self evaluations, and age). Table 1 shows that each sub-dimension was positively correlated to one, if not two or three of the correlates. GPA did not prove to be positively correlated with any of the six sub-dimensions, but admittedly it was a crude measure to begin with. Given the nomological net established by the other correlates, it is reasonable to conclude evidence of nomological validity for the proposed measure.

**TABLE 1
CORRELATIONS**

	E	I	R	O	PX	P	SM	CS	Age	GPA
Experience	1	.215**	.301**	.078	-.064	.207**	.268**	-.108	.194**	-.119
Interactional	.215**	1	.124	-.030	-.026	.323**	.644**	.316**	-.057	.043
Reflective	.301**	.124	1	.030	-.218**	.124	.202**	-.008	.023	.015
Openness	.078	-.030	.030	1	.252**	.302**	.160*	.078	.061	.013
Paradoxical	-.064	-.026	-.218**	.252**	1	.081	.011	.388**	.121	.075
Practical	.207**	.323**	.124	.302**	.081	1	.459**	.391**	.164*	.120
SelfMonitor	.268**	.644**	.202**	.160*	.011	.459**	1	.342**	-.017	.060
CoreSelf	-.108	.316**	-.008	.078	.388**	.391**	.342**	1	.022	.161*
Age	.194**	-.057	.023	.061	.121	.164*	-.017	.022	1	.091
GPA	-.119	.043	.015	.013	.075	.120	.060	.161*	.091	1

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Discussion

Phase II included a pilot test to assist in item trimming and to analyze initial validity. The results indicated that a six factor solution existed, such that wisdom can be thought to contain six dimensions. These dimensions include openness, reflective, experience, interactional aptitude, practical and paradoxical. The ethical dimension was not supported in the analysis, and may relate to why the researchers could not find any existing empirical support regarding the relationship between wisdom and ethics. Therefore, this dimension was removed from the following analyses and the operationalization of wisdom. Of the forty-six items that were formulated prior to Phase II, twenty items were removed, leaving twenty-six items to be examined in Phase III. Dimensionality, reliability, internal consistency, and construct validity of the measure were found to be acceptable; and nomological validity of the measure was supported by the significant correlations among the dimensions of wisdom and other meaningful constructs.

Phase III

Phase III sought to further refine and validate the wisdom scale. The twenty-six item measure of wisdom was analyzed using confirmatory factor analysis (CFA). The analysis included two stages (Hair, et al., 1998). The first stage assessed the measurement theory that related the indicators to the dimensions of wisdom, whereas the second stage assessed the structural paths of the dimensions of wisdom and evaluated alternative models.

Two hundred and eighty-nine full-time employees participated in the study. Participants were recruited with the assistance of MBA students enrolled in two sections of an Organizational Behavior course at a large southeastern university. Students were asked to solicit responses from up to five individuals meeting the following criteria: current employment (>30 hours per week), minimum of three years full-time work experience, and willingness to voluntarily participate in a research study. The sample consisted of one-hundred forty-two females (49.1%) and one-hundred forty-seven males (50.9%). The average age of the participants was 34.04 years. Participants also indicated their current position within their place of employment; 34.3% held non-managerial positions, 14.5% held lower-level managerial positions, 18.3% held mid to upper level managerial positions, and 32.9% indicated that they held a position other than what was provided in the survey.

Participants were assured that responses would remain confidential and that only aggregate data would be reported. To maintain data integrity, IP address verification was employed by the research team to ensure that the same individual did not complete the survey multiple times (no causes for concern were detected).

Results

The first analysis examined the measurement theory of wisdom. Confirmatory factor analysis was conducted on the twenty-six item measure of wisdom (items supported in Phase II). The model specified a first-order model in which all of the dimensions were correlated and the items were reflective of each specified dimension. The goodness-of-fit measures indicated that this model contained inadequate fit ($\chi^2 = 648.5$, $df = 284$, $p < .000$, TFI & CFI < .9). Nonetheless, RMSEA was supportive of this model (.067), and the ninety percent confidence interval was between .06 and .74; however, this is not surprising because RMSEA considers model complexity and sample size (Hair, et al., 1998). The factor loadings, residual matrices, and modification indices indicated that five items should be removed (Paradoxical 1 & 2, Openness 2 & 3, and Reflective 2). These items either had poor loadings (<.5), large modification indices (>4.0), or large standardized residuals (>4.0). Average variance extracted was partially acceptable, such that experience, paradoxical, interactional, and practical dimensions had more than fifty-percent variance extracted; however, openness and reflective had less than or equal to fifty-percent variance extracted. Composite reliabilities indicated that adequate reliability existed, such that each dimension was equated to have a reliability measure larger than .75 (Netemeyer, et al., 2003). Likewise, tests of discriminant validity supported that each dimension surpassed this examination.

TABLE 2
RESULTS OF MEASUREMENT MODEL 2

Dimension	Composite Reliability	Variance Extracted	Discriminant Validity (Squared Inter-construct Correlations)
Openness	.79	.56	.01, .01, .006, .004, .06
Interactional	.78	.56	.01, .21, .001, .07, .03
Practical	.81	.59	.01, .21, .06, .005, .09
Reflective	.78	.54	.006, .06, .05, .10, .03
Paradoxical	.86	.62	.05, .004, .001, .005, .05,
Experience	.84	.51	.06, .07, .09, .10, .05

After deleting the five items mentioned above, confirmatory factory analysis was repeated with the same model structure. Although the chi-square value was still significant ($\chi^2 = 318.4$, $df = 174$, $p < .000$), this is typical, because the measure is sensitive to sample size and model complexity (number of indicators). The results indicated acceptable fit (RMSEA = .054; CFI = .938; TLI = .925; and CMIN/DF = 1.830.) The factor loadings, residual matrices, and modification indices were also supportive of this model. Factor loadings were significant and the residual matrix and modification indices were < 4.0 . Also unidimensionality of each item and construct was established. The average variance extracted for each dimension was remarkably improved over the previous model, and composite reliabilities also indicated improvement. Likewise, tests of discriminant validity were surpassed as well (See Table 2).

The second part in the analysis examined four alternative models. The first model assessed the hypothesized model, which specified the experience and paradoxical dimensions as formative, and the openness, reflective, interactional and practical dimensions as reflective. The second model specified all indicators as reflective, whereas the third model specified all indicators as formative. Lastly, the fourth model, which was essentially equivalent to the hypothesized model, specified the experience, paradoxical, and practical dimensions as formative, and the reflective, interactional, and openness dimensions as reflective. The results indicated support for the hypothesized model ($\chi^2 = 359.1$, $df = 183$, $p < .000$, RMSEA = .058; CFI = .925; TLI = .914; and CMIN/DF = 1.962) (See Table 3). In addition, unidimensionality of the items and the dimensions was established. Reliability and validity, including construct validity, predictive validity, discriminant validity, and nomological validity were also supported in the hypothesized model.

TABLE 3
STRUCTURAL MODEL RESULTS

Model Description	χ^2	<i>df</i>	χ^2 Difference Test	RMSEA	RMSEA: C.I.	TFI	CFI	PNFI
Null Model	318.4	174		.054	.044-.063	.925	.938	.725
All dimensions reflective	355.2	183	4.089	.057	.048-.066	.916	.926	.750
Experience and Paradoxical are formative; Openness, Reflective, Interactional, and Practical are reflective	359.1	183	4.522	.058	.049-.067	.914	.925	.749
Experience, Paradoxical, and Practical are formative; Openness, Reflective, and Interactional are reflective	370.2	183	5.756	.06	.051-.068	.91	.92	.745
All dimensions are formative	2683.678	981	2.93	.078	.074-.081	.670	.078	.555

In order for the third model to be identified, the self-monitoring and core-self evaluations scales were incorporated into the model structure. As noted previously, there were very similar results in several of the models; however, the formative model indicated severely worse fit. Nonetheless, the formative model yielded support for predictive validity, such that wisdom related positively to the four dimensions of the core self-evaluations scale and wisdom also related positively to self-monitoring.

Not only does theory support a second-order model, but also the empirical results shown in Table 3 indicate that a second-order factor structure yields equivalent results to that of a first-order structure, while being more parsimonious and possessing more degrees of freedom. It is asserted that a second-order model is supported when the model produces results that are as well as those attained from a first-order model (Hair, et al., 1998). Although, the chi-square difference statistic is often useful in comparing alternative models of the same order, it has been noted that this statistic is not as useful when comparing models of different orders (Hair, et al., 1998). Moreover, the first-order model should always attain better fit on absolute indices due to more paths describing equal degrees of covariance, whereas the second-order model is likely to perform better on fit indices that capture model parsimony (Hair, et al., 1998). As stated previously, nomological validity was also established with the hypothesized second-order model, which is described to strengthen support of a second-order model (Hair, et al., 1998). Therefore, the hypothesized second-order model not only demonstrates support through attaining nearly equivalent goodness-of-fit indices, but also through attaining nomological and predictive validity.

As noted, there are several equivalent models in this analysis. For example, model four is equivalent to model one. Thus, both models should contain similar results and goodness-of-fit indices. Nonetheless, theory demonstrates greater support for the hypothesized model, such that experience and paradoxical tolerance develop wisdom; whereas wise people demonstrate being open to new experiences and the ability to reason, reflect upon one's past, and interact with others (Webster, 2003). Ultimately, this analysis provides both empirical and theoretical support for our hypothesized model.

Lastly, invariance across males and females was examined. First, the least restrictive model was assessed using the second model structure in Phase III (study two) stage one. This test of invariance examines the extent to which an equivalent pattern of fixed and non-fixed parameters across both groups (males and females) exists. The results indicated reasonable fit ($\chi^2 = 474.56$, $df = 310$, $p < .000$., CFI = .923, RMSEA = .043, R.I. = .035-.051) ; all indicator loadings to relevant factors were significant; and discriminant validity was maintained. Thus, configural invariance was supported. The researchers examined metric invariance next, which assesses the extent to which factor loadings are equivalent across samples. The results indicated that metric invariance was attained across gender (χ^2 difference test = 23.557/14, $p > .05$, and CFI change = .004). Moreover, the model was not statistically different from the baseline model, which was supported by a p-value = .052 and a change in CFI $< .01$. Researchers indicate that a change in CFI less than .01 also supports metric invariance (Byrne, 2010). Assessing the loadings for each group (males and females) demonstrated that each indicator has nearly equivalent magnitude, the same direction, and loads on the same factor. As such, the support for metric invariance allows further examination of invariance between the two groups. Nonetheless, subsequent analyses including invariant scalar and factor covariance revealed that no other forms of invariance could be supported. All of the chi-square difference tests indicated that the models were significantly different from the baseline model. In conclusion, the results indicate that configural and metric invariance was supported.

Discussion

Phase III included another study to further examine and validate the twenty-six items that remained after Phase II. Confirmatory factor analysis was executed in Phase III, and indicated that five items fit poorly to the measurement theory. Therefore, those items were removed and the following analyses were conducted using a twenty-one item measure of wisdom. Evidence substantiated a second-order model of wisdom, such that the paradoxical and experience dimensions were shown to act as formative indicators of wisdom, whereas the remaining dimensions were reflective indicators of wisdom. This measure of wisdom demonstrated acceptable dimensionality, reliability, and validity. Additionally, alternative and equivalent structural models were assessed. Even though equivalent models exist, the hypothesized model maintains a theoretical background that is supportive of its nature. Moreover, nomological, predictive and concurrent validity was established through wisdom predicting or correlating with other theoretically supported constructs. Lastly, invariance assessments indicated support for configural and metric invariance.

GENERAL DISCUSSION

This research aimed to establish and validate a measure of wisdom that integrated two domains of wisdom in psychology, while also incorporating recent research in the management literature. Moreover, it was the goal to develop a scale of wisdom such that it could be applied in an array of contexts, including managerial or organizational settings.

There were three distinct phases in the research. Phase I indicated that forty-six items should be included to measure wisdom in Phase II. This initial scale was refined in Phase II, in which exploratory factor analysis demonstrated support for six dimensions of wisdom. Moreover, the analysis resulted in a twenty-six item measure of wisdom and provided evidence of nomological validity by relating wisdom to self-monitoring and the core-self evaluations scale. Phase III sought to further refine the scale by using confirmatory factor analysis. The results of Phase III also supported a six dimensional structure and a twenty-one item measure. Additionally, the results offered further evidence of nomological validity. Moreover, Phase III utilized participants that were employed full-time and held managerial positions at various levels.

The above findings should be considered in light of some limitations of this research. First of all, with formative models, all indicators that cause the construct should be included. Likewise, formative models need to be assessed by examining the context in which they are in. In other words, the meaning of formative constructs is often embedded within the other constructs or indicators that form the construct of interest. This research analyzed several different dimensions that may act as formative indicators of wisdom, yet it is possible that other constructs which were not included in the current research form wisdom. Thus, future research should attempt to further determine the constructs that allow wisdom to develop.

Another limitation of this research is that low parameter estimates were attained for both the openness and paradoxical dimensions. Openness has received a large amount of attention and support in the psychology literature; however, the paradoxical dimension has primarily been proposed but not empirically supported in management literature. Thus, even though both dimensions maintain theoretical or empirical support from previous research, further research should attempt further refine these measures to produce higher parameters.

In conclusion, wisdom has maintained the attention of both scholars and laypersons for decades; yet a clear conceptualization of wisdom has not been announced. Wisdom has recently received attention in the management literature; and it has been argued that wisdom relates to leadership, and if the fundamentals of wisdom are understood, managers can be evaluated through sound criteria (McKenna, et al., 2009). The fundamental objective of this research was to establish and validate a universal and multidimensional scale that could be generalized and applied in several settings. Through three phases and two samples, we provide support for the multidimensional scale of wisdom proposed in this research. This measure utilizes the dimensions of experience and paradoxical tolerance as formative indicators of wisdom, and the dimensions of openness, reflective, interactional aptitude, and practical as reflective indicators of wisdom. The authors hope that this research will encourage researchers to further understand the concept of wisdom and how it relates to a management context.

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APPENDIX

<i>Reflective Dimension Items</i>	Included in Phase II	Included in Phase III	Final Scale Item
1. I often think about my past.	X	X	X
2. Recalling earlier days helps me gain insight into important life matters.	X	X	
3. I often recall earlier times in my life to see how I have changed since then.	X	X	X
4. I reminisce quite frequently.	X	X	X
<i>Openness Dimension Items</i>	Included in Phase II	Included in Phase III	Final Scale Item
1. I believe in the importance of art.	X	X	X
2. I have a vivid imagination.	X	X	
3. I tend to vote for liberal political candidates.	X		
4. I carry the conversation to a higher level.	X		
5. I enjoy hearing new ideas.	X		

6. I am not interested in abstract ideas. (r)	X	X	
7. I do not like art. (r)	X	X	X
8. I avoid philosophical discussions.	X		
9. I do not enjoy going to art museums. (r)	X	X	X
10. I tend to vote for conservative political candidates.	X		
<i>Interactional Dimension Items</i>	Included in Phase II	Included in Phase III	Final Scale Item
1. I find it easy to put myself in the position of others.	X		
2. I am keenly aware of how I am perceived by others.	X		
3. In social situations, it is always clear to me exactly what to say and do.	X	X	X
4. I am particularly good at sensing the motivations and hidden agendas of others.	X	X	X
5. I am good at making myself visible with influential people in my organization.	X		
6. I am good at reading others body language.	X	X	X
7. I am able to adjust my behavior and become the type of person dictated by any situation.	X		
<i>Practical Dimension Items</i>	Included in Phase II	Included in Phase III	Final Scale Item
1. I try to look at everybody's side of a disagreement before I make a decision.	X		
2. I believe that there are two sides to every question and try to look at them both.	X		
3. I am usually able to think up creative and effective alternatives to solve a problem.	X		
4. When I make plans to solve a problem, I am almost certain that I can make them work.	X		
5. I trust my ability to solve new and difficult problems.	X		
6. When confronted with a problem, I stop and think about it before deciding on a next step.	X	X	X
7. When making a decision, I weigh the consequences of each alternative and compare them against each other.	X	X	X
8. When I am confused by a problem, one of the first things I do is survey the situation and consider all the relevant pieces of information.	X	X	X
<i>Ethical Dimension Items</i>	Included in Phase II	Included in Phase III	Final Scale Item
1. I speak out when others violate ethical standards.	X		
2. I conduct my personal life in an ethical manor.	X		
3. I define success not just by results but also the way that they	X		

are obtained.			
4. When making decisions, I ask “what is the right thing to do?”	X		
5. I view sick days as vacation days I deserve.	X		
6. While shopping at the supermarket, it is appropriate to switch price tags on packages.	X		
<i>Paradoxical Dimension Items</i>	Included in Phase II	Included in Phase III	Final Scale Item
1. Unforeseen events upset me greatly. (r)	X	X	
2. Being uncertain means that a person is unorganized. (r)	X	X	
3. When I am uncertain it means that I cannot go forward. (r)	X	X	X
4. Uncertainty keeps me from having a full life. (r)	X	X	X
5. Uncertainty makes me sad, vulnerable, or unhappy. (r)	X	X	X
6. The ambiguities in life stress me. (r)	X	X	X
<i>Experience Dimension Items</i>	Included in Phase II	Included in Phase III	Final Scale Item
1. I have experienced many painful events in my life.	X	X	X
2. I have experienced many moral dilemmas.	X	X	X
3. I have lived through many difficult transitions.	X	X	X
4. I have had to make many important life decisions.	X	X	X
5. I have seen much of the negative side of life (e.g., dishonesty, hypocrisy, etc.)	X	X	X