Development and Validation of a Short Form of the Occupational Work Ethic Inventory

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Abstract

The Occupational Work Ethic Inventory (OWEI) has been widely used to measure work ethic constructs by professionals in the fields of Career and Technical Education (CTE) and Human Resource Development (HRD). However, there are circumstances when a shorter instrument would have advantages, especially when a measure of work ethic is needed along with other instruments. We developed a short version of the Occupational Work Ethic Inventory (OWEI), the OWEI-SF. A subset of items from the original OWEI was identified, using a confirmatory factor analysis. The instrument was reduced from 50 items to 12 items. Item selection, parameter estimation, cross-validation, and comparisons with the original OWEI are presented and discussed. Results indicated that the shortened version demonstrates psychometric properties similar to the original full version and is practical and efficient to administer.

Keywords: work ethic, cross-validation, model indices

Introduction

Essential skills needed in the twenty-first-century workplace are repeatedly stressed by scholars and experts in education. The World Economic Forum published a report (World Economic Forum, 2015) and defined a set of 16 skills as crucial proficiencies that students should develop in the twenty-first century. The 16 skills were categorized into three domains: "foundational literacies, competencies, and character qualities" (World Economic Forum, 2016, p. 4). Foundational literacies included "literacy, numeracy, scientific literacy, information and communication technology (ICT) literacy, and cultural and civic literacy" (p.4). "Critical thinking and problem-solving, creativity, communication, and collaboration" (World Economic Forum, 2016, p. 4) were identified as needed competencies. Character qualities included "curiosity, initiative, persistence and grit, adaptability, leadership, and social and cultural awareness" (World Economic Forum, 2016, p. 4). These 16 skills overlap with the attributes encompassed by work ethic and lend support to work ethic being an essential in the twenty-first-century world of work.

Rojewski and Hill (2014) identified work ethic along with career navigation and innovation as essential competencies that job seekers and employees must have or develop in the twenty-first-century workplace. As the world has become globalized more rapidly, employers need employees who can perform their jobs with a positive work ethic, regardless of their ethnic background and religions. Considering that many enterprises from various countries collaborate with one another to produce goods, work ethic attributes such as communication skills and dependability are essential in the globalized workplace where cooperation and collaboration are

emphasized (Park & Hill, 2016). Employees who are adept at collaboration, communication, and problem-solving are better positioned for success in the rapidly evolving digital world (World Economic Forum, 2016).

A strong work ethic as a component of employability skills has long been identified as important in vocational education, business, athletics, and many other contexts. Employers place a positive value on doing a good job and continue to seek workers with a strong work ethic (Hill & Fouts, 2005; Park & Hill, 2016). Employers often state that a strong work ethic is one of the most desired characteristics of a new employee (Hill & Fouts, 2005). Work ethic can be defined as a set of characteristics and behaviors that reflect a person's beliefs, values, attitudes, and behaviors toward work (Hill & Fouts, 2005; Meriac, Woehr, Gorman, & Thomas, 2013; Park & Hill, 2016; Petty & Hill, 2005). Thus, establishing an educational basis and environment for students to reflect on occupational work ethic and further develop employability skills is meaningful. To this end, research to develop a concise measure of work ethic attributes would provide a useful tool to enhance work ethic instruction.

Purpose of the Study

The purpose of this study was to develop a short version of the Occupational Work Ethic Inventory (OWEI-SF) that would yield psychometric properties similar to the original OWEI, but require a shorter administration time. The goal was to provide researchers and practitioners in CTE and other training settings with a brief work ethic measure that could be combined with other instruments depending on their research needs. A long survey instrument can decrease response rate (Rogelberg & Luong, 1998). Even though the OWEI has been found to be a sound psychometric measure of work ethic across diverse demographic samples and cultures, the length of the instrument can sometimes be a concern when conducting research, particularly when being combined with other instruments to measure many variables at the same time.

Theoretical Framework

Bandura's (1989, 2005) social cognitive theory (SCT) provides a theoretical foundation for exploring the dynamic of contemporary work ethic, where work ethic involves being personally accountable and responsible for one's work (Park & Hill, 2016; Petty & Hill, 2005). Based on social cognitive theory, people learn by observing and modeling people in positions of influence. These might be teachers, parents, and managers in work settings. The extent to which a person adopts a positive work ethic is expressed in that person's internal beliefs and external behaviors. Work behaviors are shaped by environmental influences as well as personal factors such as self-efficacy and self-regulation (Bandura, 2005). Policies, laws, and social expectations and norms affect individuals' personal qualities and behaviors. People are self-organizing, proactive, self-regulating, and self-reflecting as contributors to their environments as well as products of them (Bandura, 2005). Thus, the three agents of an environment, personal factors, and behaviors have been identified as affecting each other reciprocally.

Work ethic is considered one of the important soft skills that can determine work-related attitudes and behaviors in the workplace (Miller, Woehr, & Hudspeth, 2002; Park & Hill, 2016), and has an influence on important organizational behaviors such as job performance, quality of

work, productivity, and organizational citizenship. Work ethic is a skill that can be learned and developed during a person's lifetime by watching and modeling people and then articulating one's own attitudes and behaviors. These learnings can be expressed in external work behaviors, work attitudes, and work habits. Mann, Taber, and Haywood (2013) proposed that "work ethic is developed from personal experiences and learned from those in positions of influence" (p. 68) such as teachers, parents, friends, supervisors, managers, and even celebrities over time.

Literature Review

Different views on work ethic in different eras existed in human history (Hill, 1992b). Since Weber introduced the concept of the Protestant ethic in 1904 and 1905 (Weber, 2005) and proposed that the economic growth in America was influenced by the Protestant ethic, the affective attributes of workers have been an important consideration when examining worker preparation and productivity. The Protestant ethic evolved over time to be simply known as the work ethic in Western countries. Numerous instruments were developed to measure individuals' work ethic, but most of the instruments were developed based on the Protestant ethic. Also, different instruments had different constructs depending on the context they were to be used in.

In the field of Career and Technical Education (CTE), several instruments were developed. One was produced as a product of the work ethic program established by the Georgia Department of Technical and Adult Education (Boatwright & Slate, 2002). Others were the Occupational Work Ethic Inventory (OWEI; Hill & Petty; 1995; Petty & Hill, 1994; Petty & Hill, 2005), and the Employability Skills Assessment (ESA; Park & Hill, 2016), developed to provide CTE professionals with tools to measure work ethic so that school educators and trainers could better prepare students for successful employment. Of these three instruments, the OWEI has been the most widely used. Researchers who used the OWEI have agreed that the OWEI identified essential skills that characterized the contemporary occupational work ethic (Boatwright & Slate, 2002).

The Occupational Work Ethic Inventory

By using a panel of experts and reviewing previous research related to success at work, Hill established content validity for the OWEI (Hill, 1992a). Next, Hill and Petty (1995) conducted a factor analysis and extracted the four factors: interpersonal skills, initiative, dependability, and instrument items that were reversed. The OWEI consists of 50 one- or two-word descriptors. The first factor, interpersonal skills, consists of 17 descriptors related to personal characteristics that promote favorable interactions with other people. These qualities can enhance job performance in settings where cooperation is emphasized. The second factor, initiative, includes 16 items and encompasses qualities that facilitate moving forward on a job. Persons with initiative tend to not be content with the status quo. The third factor, being dependable, consists of seven descriptors and represents attributes that fulfill the expectations for satisfactory job performance and living up to commitments. The fourth factor of the OWEI consists of 10 reversed items that are described in the negative. These reversed items were intentionally included in the instrument design to prevent participants from developing a response pattern without reading or understanding the actual items (Hill, 1997; Hill & Petty, 1995; Petty & Hill, 2005). They elicited responses, however, such that they clustered based on

being stated in the negative rather than because of their original meanings with respect to work ethic. Thus, the first three factors of interpersonal skills, initiative, and being dependable were meaningfully interpreted as subscales measuring work ethic attributes and the reversed items were identified as not useful in assessing work ethic (e.g., Harvell, 2009; Hatcher, 1995; Joseph, 2010; Petty & Hill, 2005; Tydings, 2003). The four dimensions of the OWEI and items included in each factor are summarized in Table 1.

Table 1
The OWEI Factors and Items

Factor	Sample items
Interpersonal skills (17 items)	Courteous, friendly, cheerful, considerate, pleasant, cooperative, helpful, likeable, devoted, loyal, well groomed, patient, appreciative, hard-working, modest, emotionally stable, and stubborn
Initiative (16 items)	Perceptive, productive, resourceful, initiating, ambitious, efficient, effective, enthusiastic, dedicated, persistent, accurate, conscientious, independent, adaptable, persevering, and orderly
Being dependable (7 items)	Following directions, following regulations, dependable, reliable, careful, honest, and punctual
Reversed items (10 items)	Hostile, rude, selfish, devious, careless, irresponsible, negligence, depressed, tardy, and apathetic

Note. The table was based on the table created by Hill & Petty (2005).

Previous research has tested the content validity and the internal consistency of the OWEI and the OWEI showed excellent or good reliabilities using empirical data. Hill (1997) tested the reliabilities of each factor of the OWEI, employing Cronbach's index of internal consistency. The results showed high reliabilities: for interpersonal skills (α =.88), for initiative (α = .90), and for dependability (α = 86). In a study that Hill and Rojewski (1999) conducted with 152 responses, the internal consistency was acceptable for interpersonal skill (r = .92), initiative (r = .90), and being dependable (r = .86). Another study conducted by Hill and Fouts (2005) suggested that each factor of the OWEI showed acceptable reliability coefficients for internal consistency with 373 responses; interpersonal skills (r = .90), initiative (r = .88), and being dependable (r = .78). Hill and Petty (1995) identified that a four-factor model explained 48 out of 50 items contained on the OWEI and accounted for 38.86% of the total variance. According to Brauchle and Azam (2004), the OWEI's factors are replicable across different populations with the comment that "evidence exists for construct validity of this instrument" (Brauchle & Azam, 2004, p. 128).

As the instrument was designed to provide a measure of work ethic attributes in workplace settings, the OWEI has been widely used in CTE and industrial training environments (Azam & Brauchle, 2003; Kim, 2007). For example, Hill (1992a) investigated differences in the work ethic of workers employed in public and private businesses and industries across occupations, level of education, gender, age, and full-time work experience. Petty and Hill (1994) compared the four subscales of the OWEI for gender and different occupations. Hatcher (1995) examined the differences in the four dimensions of the OWEI between apprentices and instructors for job titles, specialization, full-time work experience and participation in apprenticeship programs.

Also, interactions between independent variables were examined as well. In 1996, Hill compared work ethic between vocational students and full-time workers grouped by gender, age, and employment status (Hill, 1996). Another study that investigated group differences in work ethic by gender and age was conducted by Hill in 1997. Hill and Rojewski (1999) conducted a research study to determine work ethic differences among 9th-grade students by gender and risk of school failure. Hill and Womble (1997) studied effects of an instructional unit of work ethic on development of work ethic, appropriate work attitudes, and employability skills of high school students. Hollingsworth, Brewer, and Petty (2002) investigated the relationship between leadership orientation and work ethic among extension family and consumer educators. Tydings (2003) identified how advisory committee members, instructors, and students perceived work ethic descriptors of the OWEI and compared differences of ratings on the descriptors depending on the positions of respondents associated with a technical college. Brauchle and Azam (2003) compared factor structures and subscale responses for the OWEI between self-perceived work attitudes of manufacturing employees and their supervisors' ratings of those same employees. Brauchle and Azam (2004) investigated the effects of information job, non-information job, gender, age, level of education, and length of full-time employment on employee work attitudes. Hill and Fouts (2005) examined differences in the four dimensions of the OWEI for jobseekers grouped by employment status, age, and gender.

Further, Petty and Hill (2005) examined differences in the four dimensions of the OWEI between employees and their supervisors. Brauchle and Azam (2006) examined if the descriptor, *apathetic*, could be identified using the OWEI with a sample of employees in manufacturing companies and their supervisors. Kim (2007) translated the OWEI into Korean and explored the factors of a Korean version of the OWEI. The differences in extracted subscales of the Korean OWEI were examined using Korean workers as a sample grouped by occupation, level of education, age, gender, and full-time work experience. Petty, Lee, Yee, and Fontan (2008) examined the effect of self-directed work teams on four dimensions of the OWEI of production workers categorized by gender, level of education, supervisory experience, and work shift preference. Harvell (2009) examined the differences in the four dimensions of workers categorized by occupation, level of education, gender, age, and full-time work experience. Joseph (2010) compared differences in the four dimensions of the OWEI grouped by four generations, gender, and personality. Petty (2013) investigated differences in the work ethic of K-12 educators between Generation X teachers and Baby Boomer teachers.

In sum, at least 20 studies have used the OWEI as a measure for purposes of work ethic research. Out of these nine studies (45%) examined the four dimensions of the OWEI as dependent variables with gender, occupation, work experience, and/or level of education as independent variables (e.g., Brauchle and Azam, 2004; Harvell, 2009; Hill, 1992a; Hill, 1997; Hill & Fouts, 2005; Petty, 1995a, 1995b; Petty & Hill, 1994; Sullivan, 1999). Eight studies (40%) added one or two independent variables to those demographic variables such as psychometric properties of the OWEI (e.g., Hill, 1992a; Hill & Petty, 1995; Kim, 2007; Petty & Hill, 1994, 1996, 2005), personality (e.g., Joseph, 2010), generation (e.g., Joseph 2010; Petty, 2013), participation in apprenticeship programs (e.g., Hatcher, 1995), supervisory experience (e.g., Petty et al., 2008), employment status (Hill, 1996), and risk of school failure (e.g., Hill & Rojewski, 1999). Four studies (20%) focuses on perceptions of work ethic depending on job positions (e.g., Azam & Brauchle, 2003; Brauchle & Azam, 2003; Petty & Hill, 2005; Tydings,

2003). One study (4.2%) used the OWEI after an intervention of an instructional unit on work ethic (e.g., Hill & Womble, 1997). One study (4.2%) examined the relationship between work ethic and leadership orientation (e.g., Hollingsworth et al., 2002). One study (4.2%) was a validation study of the OWEI (e.g., Brauchle and Azam, 2006). Few studies combined the OWEI with other measures in their studies (e.g., Hollingsworth et al., 2002; Joseph, 2010). This suggested that research on work ethic in CTE using the OWEI might benefit from an instrument that could more readily be combined with other measures.

The Occupational Work Ethic Inventory and the Employability Skills Assessment

Research by Hill and Petty in 1995 established the subscales for the OWEI that have been commonly used to interpret data collected with this instrument. The three subscales, interpersonal skills (17 items), initiative (16 items), dependability (7 items), and a fourth subscale consisting of reversed items (10 items), have proven to be reliable and influential. Hill also developed the Employability Skills Assessment (ESA) in 1995 based on research conducted using the OWEI. Using a factor analysis of OWEI data, he dropped items which had factor loadings less than .45 as well as reversed items and finally selected 23 items for the ESA. In the ESA, the 23 items were developed in statements instead of descriptors and he adjusted three of the phrases to provide some reversed items. Both the OWEI and the ESA are available for free on a work ethic website that Hill developed for educational purposes (Park and Hill, 2016). Descriptors selected from the OWEI by Hill and developed into statements for the ESA are provided in Tables 2, 3, and 4.

Table 2
Items for Interpersonal Skills in the OWEI and the ESA

Interpersonal skills	OWEI	ESA
Selected items (8)	courteous	Do you have good manners?
	friendly	Do you like to be with other people?
	cheerful	Are you a happy person?
	considerate	Are you thoughtful of others?
	pleasant	Do other people enjoy being with you?
	cooperative	Do you work well with others?
	helpful	Do you look for ways to help other people?
	likeable	Do people like you?
Dropped items (9)	devoted, loyal, well groomed, patient, appreciative, hard-working, modest, emotionally stable, and stubborn	

Note. OWEI indicates the Occupational Work Ethic Inventory, and ESA indicates the Employability Skills Assessment.

Even though the ESA has a fewer number of items than the OWEI, there are situations where a still shorter instrument to measure work ethic attributes would be useful. Whether for instructional use in a class where data is quickly collected and simple statistics run to illustrate analytical procedures or research conducted where a measure of work ethic is needed alongside other instruments, having a brief, reliable, shortened version of the OWEI would be useful.

Table 3
Items for Initiative in the OWEI and the ESA

Initiative	OWEI	ESA
Selected items (9)	perceptive	Are you aware of what is going on around you?
	productive	Do you waste time? *
	resourceful	Is it difficult for you to find solutions to problems on your own? *
	initiating	Do you do more than is required or expected of you?
	ambitious	Are you eager to be successful?
	efficient	Do you do things right the first time?
	effective	Do you accomplish your goals?
	enthusiastic	Are you eager to complete the work that you have to do?
	dedicated	Are you committed to doing good work?
Dropped items (7)	persistent, accurate, conscientious, independent, adaptable, persevering, and orderly	

Note. OWEI indicates the Occupational Work Ethic Inventory, and ESA indicates the Employability Skills Assessment. Reversed items are indicated by *.

Table 4
Items for Dependability in the OWEI and the ESA

Dependability	OWEI	ESA
Selected items (6)	following directions	Are you good at following instructions?
	following regulations	Do you follow the rules even if you disagree with them?
	dependable	Do you ever disappoint people? *
	reliable	When you say you will do something, do you do it?
	careful	Do you take your time and avoid making careless mistakes?
	honest	Do you tell the truth?
Dropped item (1)	punctual	

Note. OWEI indicates the Occupational Work Ethic Inventory, and ESA indicates the Employability Skills Assessment. * indicates reversed items.

Short Form Development of an Instrument

Many scholars with expertise in measurement have questioned the development of a short form of self-report questionnaires because of its equivalent psychometric properties such as validity and reliability compared to its full form. Smith, McCarthy, and Anderson (2000) pointed out two general errors that short-form developers can make. The first concern that they pointed out was the equivalent validity and reliability of a short form as compared to its full form, a characteristic that is difficult to achieve. The second assumption that short form

developers have sometimes made was that a short form may require less evidence of its validity, which is not true. Smith, McCarthy, and Anderson (2000) insisted that "a short form developers must meet the same standards of validity as required for any test" (p. 103).

Even though there are challenges in developing a short form of an instrument, there are requests for short forms as well. Stanton, Sinar, Balzer, and Smith (2002) argued that in many empirical research studies, constructs have been measured "alongside numerous other constructs" (p. 168). In addition, many organizational members think that they are exposed to too many surveys, which could lead to "the likelihood of nonresponse" and "survey fatigue" (Stanton et al., 2002, p. 168). As many researchers collect data online using the Internet, concise and focused measurement instruments are needed since the interface of the Internet requires more pages than paper materials (Stanton et al., 2002).

Researchers on short form development recommend several strategies to develop short forms of measurement instruments. First, it is important to secure the internal item qualities. Item Response Theory or internal consistency maximization can be a basis for short-form development. Factor analysis also can be used to reduce scales. Items with high loading values can be selected while items with loading values of .30 or .40 can be discarded (Stanton et al., 2002). Researchers on short forms of scales have also suggested that a short form should have the same factor structure as its original measure for purposes of content validity (Smith, McCarthy, & Anderson, 2000). Smith et al., (2000) suggested that using a cross-validation strategy using different samples can be a method to test if a short form operates the same way with external variables as the full version.

Method

Participants

This study utilized archival data electronically collected through a website at the University of Georgia (UGA; URL: workethic.coe.uga.edu) and saved on a UGA server (Park & Hill, 2016). The website was created to provide educators and human resource professionals with instructional resources related to work ethic (Park & Hill, 2016). This website is public and provides an electronic version of the OWEI. Anyone who can access the website, read and understand texts in English, can voluntarily and anonymously complete the OWEI for free and receive computed scores for the subscales of interpersonal skills, initiative, and dependability. The intent of the website was to distribute work ethic instructional materials rather than to conduct research, but the data collected in that process served as a basis for the current study. As of March 23, 2017, the online version of the OWEI had been used 263,557 times. Given the large volume of data, responses collected from August 2014 to August 2015 were selected for a cross-sectional study. Only participants who indicated that they were employed were used, with a total of 1598 respondents. Out of these responses, two data sets were selected using a simple random sampling technique available in SAS 9.4; sample one for the item selection for a short form, and sample two for the cross-validation of the OWEI and the short form developed. Two samples were intentionally used as recommended by researchers on model development (e.g., MacCallum, Roznowski, & Necowitz, 1992).

The first sample consisted of 799 full-time and part-time workers. Participants were 64.83% female, 69.84 % were between the ages of 24 and 44, and 30.16 % were between the ages of 45 and 64. Regarding education status, 9.89 % completed high school or GED, 20.65% finished two years of colleges, 27.03% completed a bachelor's degree, 37.55% completed a master's degree, and 4.88% had a doctorate degree. Respondents were from various occupations; service (9.51%), sales (3.88%), business (35.92%), professional (38.80%), medical professional (10.64%), and full-time homemaker (1.25%). The second sample was very similar to the first sample with respect to demographic statistics. The second sample also consisted of 799 responses. Participants were 65.46% female, 71.09% were between the ages of 24 and 44, and 28.91% were between the ages of 45 and 64. Regarding education status, 8.14 % completed high school or GED, 20.15% finished two years of colleges, 28.66% completed a bachelor's degree, 35.92% completed a master's degree, and 3.75% had a doctorate degree. Occupations of the respondents were service (10.39%), sales (3.63%), business (35.54%), professional (40.43%), medical professional (8.64%), and full-time homemaker (1.38%).

Instrumentation

The instrument used in this study was the Occupational Work Ethic Inventory, which consists of 50 one-word or short descriptors (Petty, 1993; Hill & Petty, 1995; Petty & Hill, 1996; Petty & Hill, 2005). The OWEI, as described earlier, has four subscales; interpersonal skills, initiative, being dependable, and reversed items (Petty & Hill, 2005) based on a seven-point Likert scale for rating each item with 1 (*never*); 2 (*almost never*); 3 (*seldom*); 4 (*sometimes*); 5 (*usually*); 6 (*almost always*); and 7 (*always*). Even though the administration time for the online OWEI was not recorded, it takes about four minutes for participants to electronically complete the OWEI, excluding the time of answering demographic questions.

Procedures and Data Analysis

Steps were taken to develop a short form of the OWEI (hereafter referred to as the OWEI-SF). In the first stage, the focus was on identifying an optimal subset of the original OWEI items to retain on the OWEI-SF. In order to establish the content validity of the OWEI-SF, items were selected separately by each factor so that the short form preserves the same factor structure as the original OWEI. Using sample one, a principal component analysis (PCA) was conducted for each factor to test unidimensionality of each factor of the original OWEI. Principal component analyses are often employed when testing dimensionality of measures (Dunteman, 1989). Next, an exploratory factor analysis was completed with the three-factor model of the original OWEI and selected items for which factor loading values were above .50 from each subscale. This strategy provided the best items for inclusion by retaining the unique characteristics of each dimension from the original OWEI. No reversed items were retained from the original OWEI since the fourth factor was not interpreted as a measure of work ethic in past studies using OWEI. Next, out of items selected with high factor loading values, the factor structures of different OWEI-SF models were tested, consisting of from 9 to 12 items. With models comprised of 9 items differently combined, an exploratory factor analysis was completed. Models with 10 items and 11 items were examined in the same manner. However, the models which consisted 9 items, 10 items, and 11 items had one-factor or two-factor structures and did not retain the same factor structure previously computed for the OWEI. A few

models with 12 items resulted in three-factor structures. Thus, a decision was made to retain at least 12 items so that the OWEI-SF could maintain the same structure as the original OWEI.

Next, with different models having different combinations of 12 items and retaining the three-factor structure, confirmatory factor analyses were applied to produce model indices of each model using sample two. To find the best combination of items for each factor, repeated confirmatory factor analyses were conducted with different models to compare model fits. Confirmatory factor analysis provides indices of how well the factor structure fits the hypothesized structure for evaluating the extent of the short form's fitness to the original test (Smith et al., 2000). When different models have the same parameters estimated, several model fit indexes can be used to compare one to the other to inform selection of a better model. Akaike's information criterion (AIC) and the Bayesian information criterion (BIC) were used to select the best model fit from among the twelve-item models. Both AIC and BIC can be useful for comparing models that are not nested, and the model with the smaller value is usually preferred (Fan & Sivo, 2007; Sivo, Fan, Witta, & Willse, 2006). A three-factor-structure model with 12 items was selected based on the smallest value for the AIC, and the fit of the model to the data was tested. Model fit indexes that are sensitive to model misspecification but are not sensitive to sample size, estimation method, distribution, and model type can be considered ideal (Fan & Sivo, 2007). The chi-square goodness-of-fit and the goodness-of-fit index (GFI) tend to be sensitive to model misspecification (Fan & Sivo, 2007). Thus, in addition to the chi-square goodness-of-fit test and the GFI, additional model fit indexes including the root-mean-square error of approximation (RMSEA), the standardized root-mean-square residual (SRMR), and Bentler-Bonett non-normed fit index (BBNFI) were examined.

Based on all of these procedures, a model was selected that consisted of 12 items and retained the same factor structure identified for the original OWEI. Four items were selected from the first factor, interpersonal skills, five items from the second factor, initiative, and three items from the third factor, dependability. Therefore, the new OWEI-SF retained 12 items in total. Considering that each factor of the original OWEI has a different number of items, having a different number of items in each factor for a short form was understandable. The same choices for responses were adopted for the OWEI-SF as the original OWEI with a 7-point Likert scale (1 = never; 2 = almost never; 3 = seldom; 4 = sometimes; 5 = usually; 6 = almost always; and 7 = always) even though there may be limitations with seven-point Likert scales. Seven-point Likert items can be affected by response biases, which means that respondents display "a systematic tendency to respond to a range of questionnaire items on some basis other than the specific item content" (Dolnicar, Grun, Leisch, & Rossiter, 2011, p. 2) and seven-point Likert scales take longer for respondents to complete the questionnaire compared to a binary answer format (Dolnicar et al., 2011).

In summary, an exploratory factor analysis was completed using sample 1, and a confirmatory factor analysis was completed using sample 2 in order to test the fit of the selected OWEI-SF model in which 12 items in the original factor analysis served as manifest indicators of the work ethic dimensions of the original OWEI. Two samples were used for this analysis to provide a cross-validation of the original analyses. Smith et al., (2000) specified that the short form of a test should operate the same way with external variables as the original form. Using the second sample, the relationship between the OWEI-SF dimensions and the original OWEI

was evaluated to examine construct validity of the OWEI-SF. Finally, reliability coefficients using Cronbach's alphas were calculated to test internal consistency of the OWEI-SF. For this, the two samples were combined.

Findings

As a preliminary stage, sampling adequacy was tested using Kaiser's method, and the result indicated that the sample was adequate for an exploratory factor analysis with the value of .9023, which was considered excellent (Hutchen & Sofroniou, 1999). Also, to determine if the original data set was eligible for factoring, Bartlett's test of sphericity was employed, which tests the null hypothesis that the original correlation matrix is an identity matrix (Field, 2009). The results of Bartlett's test were highly significant with $p < .000$, indicating that there were some relationships between the variables with the data collected with χ^2 (66) = 197272.04, $p = .000$. All of the criteria used to evaluate the adequacy of the sample showed that a factor analysis of the data set collected should yield reliable factors (see Table 5).

Table 5
Sampling Adequacy and Significance Tests (n =799)

Kaiser's measure of sampling adequacy (MSA): Overall MSA		.9023
Significance tests	Chi-Square	197272.041
	df	66
	Sig.	.000

Note. *df* = degrees of freedom. Sig. indicates *p*-value.

Principal Component Analysis of the OWEI-SF

A principal component analysis was performed to examine the factor structure of the OWEI-SF. Eigenvalues greater than a value of one suggested a three-factor model for the OWEI-SF, which was the same factor structure as that of the OWEI. Items clearly loaded on the same factors as for the OWEI. The three factors combined accounted for 60.03% of the total variance. Factor loading values, eigenvalues, and variance explained after the varimax rotation are presented in Table 6.

For the first factor, interpersonal skills, out of the 17 descriptors on the OWEI, four items were selected. Factor loading values of the first factor ranged from .65 to .82 and explained 22.18% of the total variance.

For the second factor, initiative, out of 16 items for the second factor of the OWEI, five descriptors were chosen. Loading values for the second factor of the OWEI-SF ranged from .53 to .78, explaining 20.54% of the total variance.

For the third factor named dependability, out of 7 items on the OWEI, three descriptors were retained. Loading values for the third factor ranged from .64 to .79, accounting for 17.31% of the total variance (see Table 6).

Table 6
Factor Analytic Results of the OWEI-SF (n = 799)

	Eigenvalue	% of variance	Item	Loading	Mean	*SD*
Factor 1: Interpersonal Skills	2.66	22.18	Friendly (47)	.82	6.32	0.87
			Cheerful (37)	.79	5.80	0.99
			Likeable (28)	.72	5.99	0.95
			Courteous (42)	.65	6.31	0.86
Factor 2: Initiative	2.47	20.54	Initiating (10)	.78	5.35	1.24
			Perceptive (11)	.70	5.76	1.10
			Effective (7)	.64	6.01	0.96
			Ambitious (6)	.63	5.86	1.20
			Resourceful (49)	.53	6.20	0.92
Factor 3: Dependability	2.08	17.31	Following directions (4)	.79	6.20	0.88
			Following regulations (3)	.78	6.14	0.90
			Dependable (1)	.64	6.30	1.07

Note. SAS 9.4 was used and numbers inside parentheses indicate the item numbers of the OWEI. *SD* = standard deviation.

Confirmatory Factor Analysis

Results of the confirmatory factor analysis supported the three-factor model of work ethic, represented in the selected model of the OWEI-SF, and demonstrated a good fit with the data. The values for several model indices of the confirmatory factor analysis were produced using SAS 9.4. The selected OWEI-SF model with 12 items had good fit indices for the sample, $\chi^2(51, \mathrm{n} = 799) = 225.33$, $p < .001$, GFI = .96, AIC = 279.33, RMSEA = .06 with 90% CI [.05, .07] and $p < .001$, which was in the acceptable range (.06-.08), SRMR = .04, BBNFI = .94. Next, the model indices of the OWEI were compared with 50 items, $\chi^2(737, \mathrm{n} = 799) = 3950.80$, $p < .001$, GFI = .81, RMSEA = .07 with 90% CI [.06, .07] and $p < .001$, SRMR = .05, BBNFI = .85.

Internal Consistency Reliability Coefficients

To examine scale reliabilities, the full dataset was used, combining samples one and two (n = 1598). Internal consistency reliability coefficients (Cronbach's α) for each subscale of the OWEI and the OWEI-SF are reported in Table 7. Reliabilities of each subscale of the OWEI-SF ranged from .75 to .83, which were acceptable based on the recommended interpretation that values of .7 to .8 are desirable values for coefficient alpha (Cortina, 1993; Kline, 2000; Nunnally, 1978). The results indicated that *Interpersonal Skills* showed a similar pattern of reliability between the OWEI and the OWEI-SF. The reliability of *Initiative* was very good for the OWEI and that of *Dependability* was good for the OWEI, while those for the OWEI-SF were acceptable. As the number of items increases and a sample size becomes bigger, internal consistency

reliability coefficients tend to increase as well (Hattie, Jaeger, & Bond, 1999). Thus, considering that the OWEI-SF has fewer items than the OWEI, it is understandable that the results of the reliabilities of each factor of the OWEI-SF showed relatively lower reliabilities than those of the OWEI.

Table 7
Reliability Estimates of the Three Subscales of the OWEI and the OWEI-SF (n = 1598)

Subscale	OWEI	N of items	OWEI-SF	N of items
Interpersonal Skills	.90	17	.83	4
Initiative	.91	16	.75	4
Dependability	.85	7	.76	3

Note. Reliability coefficients were calculated using Cronbach's alpha. N = number.

Correlation Among Subscales between the OWEI and the OWEI-SF

The correlations between the subscales of the OWEI and those of the OWEI-SF and correlations among the three subscales were calculated. These correlations showed a highly similar pattern (mean deviation = .09) between the OWEI and the OWEI-SF.

Table 8
Correlations between the OWEI-SF and the OWEI (n = 1598)

Original scales	Short form scales		
	Interpersonal Skills	Initiative	Dependability
Interpersonal Skills	**.80***	.53*	.51*
Initiative	.65*	**.84***	.55*
Dependability	.60*	.63*	**.85***

Note. The asterisk (*) indicates that the *p*-value < .001. Values on the diagonal represent the correlation between the OWEI-SF and the OWEI for the same dimension. Values below the diagonal represent the correlations among the original OWEI scales and values above the diagonal represent the correlations among the short form OWEI scales.

Conclusions and Implications

Work ethic was viewed differently during different human eras (Hill, 1992b). Since Weber (2005) proposed that the American economic growth and success was partially a result of the Protestant ethic, the concept of work ethic has been encouraged as an important attribute for successful employment and the maintenance of a job (Park & Hill, 2016). As the world has become globalized, work ethic constructs do not represent a particular religion anymore (Christopher & Schlenker, 2005; Hill & Petty, 1995; Mann, Taber, & Haywood, 2013; Miller, Woehr, & Hudspeth, 2002; Pascarella, 1984; Ray, 1982). Instead, a secular work ethic construct based on economic development and characteristics leading to success in the workplace is the current norm. The goal of the current study was to develop a short form of the Occupational

Work Ethic Inventory to provide researchers on work ethic in Career and Technical Education and trainers in Human Resource Development with a tool to assess individuals' work ethic in a relatively short time and in combination with other instruments. Specifically, the OWEI-SF will be an efficient measurement instrument when it is administered online because of its concise and focused features.

It is concluded that descriptors such as friendly, cheerful, likeable, and courteous can represent interpersonal skills needed in the workplace where communication skills are important. Initiating, perceptive, effective, ambitious, and resourceful are continually important qualities of initiative as a work ethic construct. Following directions, following regulations, and being dependable describe the work ethic attribute of dependability. Based on the literature reviewed, these personal characteristics and behaviors are emphasized as crucial competencies and character qualities for students to learn and develop in social learning environments in the twenty-first-century education (World Economic Forum, 2016). This study can be a basis that educators in K-12 educational settings as well as CTE institutes can use as they develop curriculum materials for students to foster soft skills and provide opportunities for character development.

The OWEI is a useful measure in that it was developed for students and employees who prepare for employment and want to assess their own work ethic. Likewise, the OWEI-SF developed in this study will provide a useful measure for an individual self-assessment and provide a good tool for researchers who desire an abbreviated measure that can be administered along with other scales in the workplace during a short period of time. The expected time for future participants to complete the OWEI-SF will be less than one minute, which is much less time than the initial OWEI. This will extend possibilities for work ethic research to more areas by examining other variables that can affect individuals' work ethic formation.

Limitations and Recommendations

The findings of this study have some limitations. First, to be consistent with the rating scale of the initial OWEI, the rating scale of the OWEI-SF is a seven-point Likert scale, which may limit respondents as they differentiate between ratings and require them to take a longer time to complete. To overcome this limitation, future users of the OWEI-SF may change the current seven-point Likert scale to a four-point Likert scale or the binary format.

Another limitation is due to the nature of the data collected for this study. The participants were selected from the archived data from The Work Ethic Site at the University of Georgia. This dataset was not originally intended for research but is rather a by-product of the website providing a self-scoring mechanism for end users. Also, considering that the OWEI was developed in 1995 along with the original subscales, the work ethic constructs of the OWEI-SF might involve different meanings due to changes in work ethic over the period of two decades since that time. Norms might have changed some during that time along with the expected behaviors within the cultural environment that a person belongs to (Park & Hill, 2016).

For developing the OWEI-SF, data collected between 2014 and 2015 was used. Thus, despite the limitations, the OWEI-SF does represent contemporary views about workers'

affective traits. The OWEI-SF can be used to examine the work ethic role and relationship with other workplace issues, such as such as job stress, job satisfaction, learning styles, career adaptation, personal growth, work volition, and well-being. Research that includes measures of these additional constructs will enhance the outcomes and findings of future studies of work ethic using the OWEI-SF.

Future research could provide validation studies for testing the OWEI-SF and its validity and reliability using different samples and different sample sizes. Also, the OWEI-SF could be translated into other languages, such as Korean, Chinese, Japanese, Spanish, German, French, Italian, and Arabic. Other factor analytical procedures applied to the OWEI-SF in those languages would make it possible for researchers to explore and compare work ethic in international work settings meaningfully but using a concise measure. Cross-cultural comparative research studies of work ethic across cultures would be particularly appropriate given the global economic environment in the twenty-first-century. The OWEI-SF questionnaire is presented in Appendix A.

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Appendix A

Occupational Work Ethic Inventory Short Form

Directions:

For each work ethic descriptor listed below, **circle the number** that most accurately describes your standards for that item. There are no right or wrong answers. There also is no time limit, but you should work as rapidly as possible. Please respond to every item on the list.

As a worker, I can describe myself as:

	Items	Never	Almost Never	Seldom	Sometimes	Usually	Almost Always	Always
1	Dependable	1	2	3	4	5	6	7
2	Ambitious	1	2	3	4	5	6	7
3	Following directions	1	2	3	4	5	6	7
4	Effective	1	2	3	4	5	6	7
5	Courteous	1	2	3	4	5	6	7
6.	Initiating	1	2	3	4	5	6	7
7	Perceptive	1	2	3	4	5	6	7
8	Likeable	1	2	3	4	5	6	7
9	Cheerful	1	2	3	4	5	6	7
10	Following regulations	1	2	3	4	5	6	7
11	Friendly	1	2	3	4	5	6	7
12	Resourceful	1	2	3	4	5	6	7

Note. Scoring: Interpersonal Skills: Items of 5, 8, 9, & 11 (range from 4 to 28). Initiative: Items of 2, 4, 6, 7, & 12 (range from 5 to 35). Dependability: Items of 1, 3, & 10 (range from 3 to 21).