INTEREST CONGRUENCE AND JOB SATISFACTION: A QUANTITATIVE REVIEW

BY

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THESIS

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ABSTRACT

The purpose of the present paper is to revisit studies examining the relation between interest congruence and job satisfaction. Despite evidence from three previous meta-analyses, literature widely used by researchers and career counselors has yet to accept the finding that interest congruence is not related to job satisfaction. The present analysis comprised of 79 studies, 988 correlations, and 140 samples addresses methodological issues presented in the three previously published meta-analyses, finding significant corrected correlations between job satisfaction and interest congruence measured by matched scale score at ρ=.20, 95% CI [.15, .24] and interest congruence measured with congruence indices at ρ= .08, 95% CI [.04, .11]. A significant relationship between overall interest congruence and satisfaction was found at ρ = .09, 95% CI [.06, .12]. A theoretical shift away from the use of interests to values may be necessary to implement a practical method of fitting individuals to occupations that lead to job satisfaction.

Keywords: interests, interest congruence, satisfaction, work environment, person-environment fit

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Interest Congruence and Job Satisfaction: A Quantitative Review

Three published meta-analyses (Assouline & Meir, 1987; Tranberg, Slane, & Ekeberg, 1993; Tsabari, Tziner, & Meir, 2005) have been conducted to investigate the relation between interest congruence and job satisfaction with results showing no relation between the two. Each meta-analysis has examined research studies in a piecemeal fashion spanning different time periods and literatures. These meta-analyses have also exclusively focused on Holland's assumption of congruence, not including early literature and research that has directly examined the interest-satisfaction link (e.g., Strong, 1943, 1955). The current study uses meta-analysis to comprehensively review the association between vocational interests and job satisfaction. I begin by discussing the concepts of interests, interest congruence, and job satisfaction noticing that almost all interest-satisfaction studies are based on the idea of congruence. The discussion includes the theoretical reasons why interests will predict job satisfaction. Then, I review meta-analyses that have examined Holland's (1997) model of interest congruence and job satisfaction focusing on methodological issues and reactions to these findings. Finally, I pose several hypotheses that guided the analyses.

Interests

The model used frequently in vocational interest research is Holland's *theory of vocational personalities and work environments* (Holland, 1997). In this model, Holland organized interests into six types: realistic (R), investigative (I), artistic (A), social (S), enterprising (E), and conventional (C). Each interest type can be characterized in depth; however, for the purpose of this paper, only a brief summary of the interest types will be provided to create a basis for understanding the concept of person-environment fit. Individuals with realistic interests are generally focused on working with things rather than people; investigative interests tend to go along with enjoyment of science; individuals with artistic

interests tend to gravitate toward creative expression and patterns. Social interests are focused on helping people through areas such as education, social work, and counseling; enterprising individuals enjoy business, leadership, and management positions, and individuals with conventional interests prefer highly structured environments. Just as Holland's (1997) model uses interests to describe people, the theory also uses the six types of interests to depict specific environments. For example, individuals with social interests are likely to be found in a social environment in which their social needs are met and their interests are fostered (Holland, 1997).

Interest Congruence

The first interest congruence research began with Strong's development of occupational scales for the Strong Vocational Interest Blank (SVIB; Strong, 1927a). Although Strong never used the term "congruence" when describing occupational scales, these empirical keys were created to assess an individual's interest-fit with members of an occupation. Early research (Strong, 1955) showed a relation between scores on the occupational scales and job satisfaction. Kuder (1966) also, developed empirical, occupational scales that are expected to be related to job satisfaction.

Holland (1985) directly introduced the term of congruence in the interest literature as central to his theory of vocational personalities and work environments. Within this theory, the RIASEC model is used to create "Holland codes" that best describe a person's vocational interests. The Holland types can be formatted into three-letter codes (e.g., RIA, SAE, CRI, etc.). These individual codes can then be compared to codes in a variety of occupations. The online database, Occupational Information Network (O*NET), provides the common Holland codes for approximately 1,000 occupations (O*NET online, 2010). The RIASEC model is organized in a hexagonal fashion to help demonstrate the concept of congruence, a type of person-environment

fit (Holland, 1997). RIASEC codes for the person and environment can be compared to determine level of interest congruence or person-environment fit (Holland, 1997).

Other researchers have utilized the RIASEC model and its concept of congruence, but have measured congruence differently. For example, researchers have used the first-letter agreement between person and environment (occupation) codes, second-letter agreement, and comparisons of mean scores on measures such as the Self-directed Search (SDS) and Strong Vocational Interest Inventory (SVII) (Tranberg, Slane, & Eckberg, 1993). The development of various indices such as the Iachan's M-index (Iachan, 1948b), the Sb index (Gati, 1985), Wiggins-Moody Compatibility index (CI; Moody, 1983), C index (Brown & Gore, 1994), Kwak-Pulvino index (K-P index; Kwak & Pulvino, 1982), etc. are also used to operationalize congruence within empirical studies (Buchanan, 1987; Furnham, Toop, Lewis & Fisher, 1995; Hoeglund & Hansen, 1999). Further, congruence is not only measured through indices, but it can also be measured via matched scale score. This distinction between the two and their relations to satisfaction are addressed in the present paper.

Satisfaction

Related to the study of interests and person-environment fit is the study of satisfaction. There are several accepted definitions of satisfaction within the literature; for example, Locke (1969) defines job satisfaction as "the pleasurable emotional state resulting from the appraisal of one's job as achieving or facilitating the achievement of one's job values" (pp. 316-317) while Hulin and Judge (2003) define job satisfactions as "multidimensional psychological responses to one's job" (p. 255). Previous studies concerning both interests and satisfaction have used various kinds of satisfaction measures. Such studies have included measures of satisfaction in terms of

global satisfaction, well-being, academic satisfaction, occupational satisfaction, or some measurement that combines two or more types of satisfaction (Nye et al., 2012).

Within measures, there are often *facets* of satisfaction. For example, in the Minnesota Satisfaction Questionnaire (MSQ), satisfaction includes facets such as ability, achievement, co-workers, compensation, recognition, moral values, and social status and so on (Weiss, Dawis, England, & Lofquist, 1967). Such facets are believed to help paint a holistic picture of satisfaction according to the MSQ. The Cornell Job Descriptive Index (JDI) also assesses various facets of satisfaction. The JDI divides satisfaction into the categories of work, supervision, pay, and people (Lake, Gopalkrishnan, Silter & Withrow, 2010). Studying facets of satisfaction is useful in organizing the broad construct of satisfaction into efficient components. It is possible that certain facets of satisfaction are more central to interests than others; for example, satisfaction with the work itself may play a key role in the relationship with interests rather than facets that do not specifically capture intrinsic aspects of the job.

Previous Meta-Analyses

Assouline and Meir (1987) conducted the first meta-analysis, reviewing twenty-one studies pertaining to job satisfaction and its relation to interest congruence. With a mean correlation of .21, 95% CI [-.08, .50], no relationship was found between congruence and satisfaction; however, when the method of measuring congruence was examined, correlations between interest congruence and satisfaction showed the possibility of a moderator effect. For example, three studies using Wiggins and Moody's (1981) Compatibility Index (CI) produced a correlation with satisfaction of .55, 95% CI [.42, .67]. Additionally, five studies using the participant's score on a scale which exemplifies the environment as a measure of congruence correlated with satisfaction at r = .37, 95% CI [.22, .51].

Tranberg, Slane, and Ekeberg (1993) conducted the next meta-analysis that investigated twenty-seven congruence studies with the intention of examining the relation between congruence and job and academic satisfaction. Excluding the nine unpublished Masters theses included in Assouline and Meir's (1987) study, Tranberg et al. (1993) added 6 published studies since Assouline and Meir's (1987) study. The meta-analysis yielded a correlation between congruence and job satisfaction of .20, 95% CI [-.06, .45]. The nonsignificant results are almost identical to Assouline and Meir's (1987) finding of r = .21, 95% CI [-.08, .50].

Tranberg, et al.'s (1993) meta-analysis included studies that measured satisfaction in various ways including the use of single-item measures of overall job satisfaction and multi-facet job satisfaction measures. The use of such global measures may have skewed the results as the measures assess aspects of job satisfaction not limited to satisfaction with the work itself. Another methodological issue of note is that like Assouline and Meir's (1987) study, Tranberg et al.'s (1993) meta-analysis did not correct correlations for unreliability or sampling error.

Tsabari, Tziner, and Meir (2005) revisited Tranberg et al.'s (1993) meta-analysis with two major aims: a) to attempt a replication of the findings of previous meta-analyses and also to add recent studies and b) to examine several moderators of the congruence and satisfaction relations focusing on culture and age. Tsabari et al. (2005) developed an elaborate set of criteria to select one representative finding from each study. They justified these criteria that can lead to not only a loss of information but possible biased results because the results in each study were not independent. They also made many corrections for the artifacts that can influence correlations. For each study, corrections were made for sampling error, linear bias attenuation, and interest measurement error, and when appropriate a correction for dichotomous congruence indices. Also, "sporadic" corrections were made for unreliability of satisfaction questionnaires.

Unfortunately, the estimates used for the corrections were not reported. Furthermore, Tsabari et al. (2005) fail to report a table of study results with uncorrected or corrected congruence-satisfaction correlations.

Tsabari et al. (2005) replication and extension is based on 36 studies reported between 1988 and 2003 with a total of 4, 958 participants. Compared to Tranberg et al. (1993) occupational satisfaction-congruence correlation of .20, 95% CI [-.06, .45], Tsabari, Tziner, and Meir (2005, p. 225, Table 2) found a notably lower corrected mean correlation between congruence and satisfaction of .14, 95% CI [-.03, .30]. To study "culture," Tsabari et al. (2005) compared congruence findings between United States and Israel. The congruence results showed that the mean corrected correlation for Israel samples (k = 9) was significant .23, 95% CI [.01, .44] compared to the nonsignificant correlation for the US samples (k = 29) of .13, 95% CI [-.02, .28].

Although unpublished, a meta-analysis by Morris (2003) is important to discuss because he reported a significant interest congruence job satisfaction relation. Morris' meta-analysis corrected for sampling error and unreliability of both interests and job satisfaction. The previous meta-analyses included high school and college samples that have an environment very different from other employed adults. In response, Morris used only employed adult samples. Morris (2003) analyzed 76 studies with employed adult participants (N = 40, 436) and reported a corrected correlation of .24, 95% CI [.02, .45].

Despite these findings, Morris' (2003) analysis is not without its own limitations. Whenever a study reported more than one method of congruence, Morris (2003) selected the "best" congruence method for the effect size, losing information and possibly biasing the results. A second issue involves the number of studies (k = 76). Studies (k = 9) that had results reported

separately for men and women were identified as separate studies, again, biasing the results. Furthermore, Alley's (1978) military sample of 18, 000 participants had an enormous influence on the 95% confidence interval. Once the sample is removed from the meta-analysis the confidence interval (95% CI [-.05, .52]) showed the congruence job satisfaction relation to be nonsignificant.

Reaction to Meta-Analyses

Despite the meta-analytic evidence and Tinsley's (2000a, 2000b, 2005) reiteration of this evidence, literature widely used by researchers and career counselors (e.g., Hansen 2013; Holland, 1997) has yet to accept the finding that interest congruence is not related to job satisfaction. Spokane, Meir, and Catalano (2000)'s narrative-review of congruence, concluded that "If appropriate procedures are used…correlations between congruence and satisfaction or other well-being variables substantially exceed the .25 or even .30 correlational plateau and reach correlations of .40." Occasionally, researchers have misrepresented the meta-analytic findings. For example, Nauta (2010, p. 15) reviewing the current status of Holland's theory stated that "Meta-analyses have confirmed that greater person–environment congruence with respect to the RIASEC types is associated with favorable outcomes, including job satisfaction (Assouline & Meir, 1987; Spokane et al., 2000; Tsabari et al., 2005)..." More recently, Hansen's (2013, p. 395) review of nature, importance, and assessment of interests, reported that the relation between interest congruence and satisfaction is "about .25 and .30 (Hansen, in press)," much higher than the effect sizes reported in the three previous meta-analyses. These reviews, not acknowledging the tenuousness of the congruence assumption, may have come about because of how deeply embedded the idea of person-environment fit is in the field of vocational

psychology (Su, Murdock, & Rounds, 2014). Person-environment fit refers to an amount of compatibility between an individual and a work environment (Kristof-Brown et al., 2005).

Popular writing on career development usually lags research findings and the self-help literature has yet to embrace the idea that interest congruence is unrelated to job satisfaction. Career and self-help writer, Bolles, in his 2014 edition of *What Color is Your Parachute?* describes "people-environments" as capable of making a job delightful or ruining one's year, adding emphasis to the belief in the link between interest congruence and satisfaction. Similarly, Shatkin (2012) wrote in his *50 Best Jobs for Your Personality*, "Many psychological theorists and practicing career counselors believe that you will be most satisfied and productive in a career if it suits your personality" (p.19). He then discussed the importance of knowledge of "things you like to do and subjects that interest you" and environmental fit (Shatkin, 2012, p. 19). None of the authors in the popular literature raise questions or caution readers about the interest satisfaction link.

The meta-analytic findings on interests and satisfaction have theoretical and practical implications. If, in fact, interest congruence and satisfaction are *not* related as the previous meta-analyses have suggested, substantial modifications should be made to career counseling practices. Career counselors should employ alternative methods to guide clients toward satisfying careers without a sole focus on interest congruence. In other words, career counselors should be advised to adopt an entirely new foundation from which to work upon, rejecting the traditional assumption that high interest congruence will lead to satisfaction.

A possible reason not to accept previous meta-analytic results is that many researchers have criticized how the meta-analytic studies were conducted, citing multiple methodological problems (e.g., Rounds, McKenna, Hubert, & Day, 2000; Spokane et al., 2000). Methodological

issues with the three aforementioned meta-analyses may have affected the results, potentially attenuating the relation between interest congruence and satisfaction. The present meta-analysis revisits the studies on the relations of interest congruence and job satisfaction to address these methodological issues in order to clarify the association between interest congruence and satisfaction.

Purpose

The purpose of the present paper is to revisit studies examining the relations of interest congruence and job satisfaction. Specifically, there is a need to address various methodological issues in previous literature to clarify these relations. The present analysis will address several methodological issues presented in the three previously published meta-analyses.

Hypotheses

Despite the lack of significant results linking interests and satisfaction in the literature, I first hypothesize that interest congruence (measured either by matched scale score or by congruence index) will have a positive, significant correlation with job satisfaction. I also hypothesize that interest congruence and facets of satisfaction such as satisfaction with the work itself and intrinsic satisfaction should be significantly correlated. Within the context of the workplace, interests are defined by having a liking for work activities; thus, it logically follows that facets of satisfaction that are similar to the work itself should be more highly correlated.

The divergence between the findings of previous meta-analyses and my hypothesis operates because methodological issues within the previous meta-analyses have attenuated the relationship, affecting the authors' results. More importantly, each of the previous meta-analyses has been piecemeal slice of the literature. The present meta-analysis includes a larger number of studies that broadly cover the interest domain. Most specifically, I hypothesize that of all the

facets of satisfaction, the work itself will have the strongest relation with interest congruence because this facet is the most specific to the task or job at hand in comparison to other facets.

Hypothesis 1: Interest congruence (measured either by matched scale score or by congruence index) will have a positive, significant correlation with job satisfaction.

Hypothesis 1a: Interest congruence and facets of satisfaction such as satisfaction with the work itself and intrinsic satisfaction will be significantly correlated.

Hypothesis 1b: Out of all the facets of satisfaction, the work itself will have the strongest relationship with interest congruence.

Second, I predict that satisfaction measures that specifically capture intrinsic aspects of the job will have a stronger relation with interest congruence than extrinsic-oriented satisfaction measures. More precisely, in terms of overall satisfaction, I hypothesize there will be a small correlation (r= 0.2 to 0.3); however, when analyzing facets of satisfaction related to the work itself or intrinsic satisfaction, I predict slightly higher correlations between .25 and .30. I predict an increased correlation for satisfaction facets related to the work itself or intrinsic satisfaction because it may better capture Hulin and Judge's (2003) definition of job satisfactions as "multidimensional psychological responses to one's job" (p. 255). Facets of the work itself or intrinsic satisfaction may be more likely to focus on one's job or occupational task rather than other extraneous or idiosyncratic influences in the workplace.

Hypothesis 2: Satisfaction measures of intrinsic aspects of the job will have a stronger relationship with interest congruence than extrinsic-oriented satisfaction measures. I expect the relationship to be between r= .25 and .30.

Hypothesis 2a: The relationship between interest congruence and satisfaction will

produce a correlation between r= 0.2 and 0.3.

My third hypothesis is related to the way in which studies organize their occupational information. I hypothesize that within-occupational studies (examining a single occupation) will have a stronger relation between interest congruence and satisfaction than studies that examine the relationship across multiple occupations. Examining the interest congruence and satisfaction relationship across multiple occupations poses the potential of introducing more error. For example, a study may be comprised of one large group of teachers, electricians, salesmen and other employed individuals with unspecified job titles. Levels and patterns of congruence and satisfaction may vary by occupation. If so, the resulting effect sizes (correlations) may be attenuated.

In such a case, each occupation has an interest code that would be expected to either match well or poorly with the environmental code at hand. Studies which examine across occupations may be unable to provide information about whether a lower correlation is due to teachers with interest code S and salesmen with interest code E feeling dissatisfied with an environmental code of R, while a smaller number of electricians in the sample with interest code R were quite satisfied. Similarly, my next hypotheses also concern the methodology of the studies. In particular, I hypothesize is that studies that assess both congruence and satisfaction simultaneously will have a stronger relationship between interest congruence and satisfaction than longitudinal studies or studies that assess interests and satisfaction at differing time points due to the typical decrease in validity over time between data collection points (Alvares & Hulin, 1973).

Hypothesis 3: Within-occupational studies will have a stronger relationship between

interest congruence and satisfaction than studies that examine the relationship across multiple occupations.

> *Hypothesis 3a:* Studies, which examine congruence and satisfaction simultaneously, will have a stronger relationship between interest congruence and satisfaction than studies that assess interests and satisfaction at differing time points.

Finally, I predict that studies which use basic interest scales or empirically keyed occupational scales [e.g., Strong Interest Inventory (SII), Strong Vocational Interest Blank (SVIB), or Strong Campbell Interest Inventory (SCII)] will have stronger relationships with satisfaction than studies that use Holland-based scales (e.g., SDS or Vocational Preference Inventory (VPI)). This hypothesis is consistent with literature examining measures of congruence, specifically citing a lack of support for Holland's model (Rounds, Tracey, & Hubert, 1992; Tinsley et al., 2000). Examinations of interest, satisfaction, and congruence measures are included to bring to light factors which may have affected the previously reported nonsignificant results between interest congruence and satisfaction. The present paper extends previous meta-analyses, paying particular attention to methodological issues in order to addresses the relation between interest congruence and satisfaction in a more focused manner.

> *Hypothesis 4:* Studies which use basic interest scales, empirically keyed occupational scales, or the aforementioned scales in conjunction with Holland-based scales will have stronger relationships with satisfaction than studies that use solely Holland-based scales.

Method

Literature Search

A full literature search was conducted to obtain studies for the present meta-analysis. The first search aimed to identify studies from the three existing meta-analyses: Assouline and Meir (1987); Tranberg et al., (1993), and Tsabari et al., (2005). Next, a search was conducted to obtain studies used by Morris in his 2003 unpublished meta-analysis. Studies were eliminated from the present analysis if they violated inclusion and exclusion rules. The University of Illinois library website was used to locate additional published and unpublished studies for inclusion. Search engines included: PsychInfo, ERIC, ProQuest, Academic Search Premier PLUS (Ebsco), Scopus, Primo Articles, Web of Science (Social Sci, Sciences, Medicine, Humanities, Engineering), and the Dissertations and Theses version of ProQuest. The broader search engine of GoogleScholar.com was also used to identify articles. Finally, databases of Ebooks such as Springer Ebooks, Elsevier Ebooks, Wiley Ebooks, Google Books, and Hathi Trust Ebooks were consulted to obtain further resources for analysis.

Within the online databases mentioned above, my search was narrowed by using combinations of the following keywords: interests, vocational interest, congruence, interest congruence, satisfaction, job satisfaction, occupational satisfaction, RIASEC, Holland codes, Person-Environment fit. Books published by prominent authors in the field of vocational psychology such as Holland, Strong, Campbell, etc. were also searched for relevant studies. Other authors and studies were included through the process of reviewing the reference sections and citations of the three major meta-analyses previously published on interests and satisfaction. Searches on the major satisfaction and vocational interest manuals were conducted to find any relevant citations, authors, or publications that could be useful for inclusion in the meta-analysis. Additionally, relevant citations were garnered from reference sections of articles previously identified for inclusion in the present analysis.

Inclusion and Exclusion Rules

To be included in the present meta-analysis, the studies must have empirically investigated the relation between interest congruence and occupational satisfaction. Both published and unpublished papers were included. Examples of legitimate unpublished resources include military studies or dissertations pertaining to interests and satisfaction in the workplace. Studies did not necessarily need to include Holland codes. Special attention was paid to studies which included relationships between congruence and various facets of satisfaction. Studies reporting on the predictive validity of interest measures with job satisfaction as a criterion variable were included. Studies not assessing congruence but reporting correlations between individual occupational and interest scales with job satisfaction were also considered viable targets. Additionally, studies reporting F-values and regressions instead of correlations were converted into effect sizes for this meta-analysis.

Excluded from analysis were studies in which only a tetrachoric correlation could be calculated between congruence and satisfaction. According to Schmidt and Hunter (2015), tetrachoric correlations, a kind of non-Pearson correlation coefficient, have larger standard errors than Pearson r's. With larger standard errors, the amount of sampling error variance in the correlations is underestimated by the formula for sampling error variance of the Pearson correlation. According to Schmidt et al. (1993), "deleting non-Pearson r's increased the average percentage of variance accounted for by sampling error by almost five percent points." (Schmidt & Hunter, 2015, p. 235). In sum, studies in which only a tetrachoric correlation could be calculated between congruence and satisfaction were excluded to avoid the underestimation of sampling error variance in the correlations, thus obtaining more accurate results.

Studies which measured satisfaction solely through academic or other externally driven means (e.g., pay, promotion, supervision, etc.) were also excluded. Although satisfaction is measured in many ways, the literature had to have an occupational element of satisfaction in order to be considered a legitimate candidate for inclusion. It is acceptable for inclusion for the element of occupational satisfaction to be embedded within a broader measure. Additionally, studies were excluded which had participant pools under the age of eighteen due to the research aim of investigating an adult, working population. Likewise, studies which used college major as a measure of interest were excluded as choice of major may differ greatly from occupational interests expressed in the workforce. Only studies conducted within the United States of America were included due to questionable validity of international interest measures. Moreover, studies selected from within the United States best apply to the hypothesized implications of career counseling within the context of the American ideal of vocational psychology.

Coding

Studies that have been deemed acceptable for inclusion in the meta-analysis were coded into an excel file. Information that was coded include the following: author; publication year; publication form; means, standard deviations, scales, and measure of reliability for both interest inventories and satisfaction scales; sample description; N; male N, female N, single occupational title, occupational titles for studies across various occupations; RIASEC person code (one column for each: R, I, A, S, E, C); note on determining occupation and code; congruence used; congruence measure; congruence classification; congruence scale; number of letters used to calculate congruence; mean interest congruence; longitudinal or cross-sectional; tenure and effect size. Additionally, studies which did not specify an interest type for the given sample were

given a “job code” based on the first letter of an occupational interest code as listed on the O*net ("O*net online," 2010).

Corrections

Following the statistical methods suggested by Hunter, Schmidt, and Le (2006), statistical corrections were made for sampling error and correlations were corrected for unreliability in the criterion (satisfaction), unreliability in the predictor (interest scores for matched scores) and indirect range restriction. The decision to correct for indirect range restriction rather than direct range restriction was based upon suggestions made by Hunter, Schmidt, and Le (2006) for accurate validity estimates. Because the issue of restriction of range is based upon a non-predictor variable, corrections for indirect range restriction were most appropriate. The employee was selected into the occupation by employers according to specific criteria; however, employment of employee was also determined by a certain amount of self-selection into the occupation.

Despite the element of self-selection, range restriction is not caused by participants’ interest scores, but by several factors involving both employer and employee. In other words, range restriction is not caused by interest scores, per se, but there may be an indirect relationship (Hunter et al., 2006). A recent meta-analysis by Nye, Su, Rounds, & Drasgow (2012) also followed the statistical suggestions of Hunter et al. (2006). With similar concerns involving employment and self-selection, the meta-analysis investigated interests and performance implementing Hunter et al.’s (2006) statistical decision to use indirect range restriction as opposed to direct range restriction.

Restricted standard deviations reported in primary studies were used. If primary studies did not provide this information, corrections were made for indirect range restriction for interest

match scores using population standard deviations obtained from the technical manuals. If both the authors of the primary studies and technical manuals did not report restricted standard deviations, an average standard deviation ratio across studies was used. For example, in a study comprised of participants with conventional interests, a conventional scale was used when examining occupational satisfaction. In such a case, the correlation would be corrected for range restriction by using the average standard deviation ratio across all studies that matched first-letter code of the environment to the conventional interest scale (Nye, et al., 2012).

For corrections of unreliability of interest match scores and satisfaction, a similar method was used. Reliabilities reported in original papers were used. If the authors did not report interest or satisfaction reliability, reliabilities were selected from technical manuals. If information about reliability could not be obtained from either the original papers or the technical manuals, an average reliability calculated across all studies was used for the corrections. Unlike interest match scores and satisfaction measures, congruence indices were not corrected for restriction of range because estimates have not been made in norming samples of unrestricted standard deviations (Hunter et al., 2006).

Analysis

Formulas from Hunter and Schmidt (2004) were used in the present meta-analysis. Several studies within this meta-analysis included more than one effect size (correlation); thus, to avoid violating the rule of independent observations, one effect size per study was included (Hunter & Schmidt, 2004). For the studies that had more than one effect size, an average correlation of the unique effect sizes was reported for each study. Individual effect sizes concerning potential moderators were used in moderator analysis rather than averaged correlations.

Moderation

The interest-satisfaction relationship was examined with particular attention given to occupational and task-related satisfaction measures correlated with interests. Moderators investigated included: the nature of the job satisfaction construct (i.e., promotional opportunities, pay, supervisor, co-workers, etc.), congruence measure, interest inventory, and whether the resource was published or not. When investigating interest measures and congruence indices as moderators, the selection of the VPI, SDS, and Strong interest measures (e.g., Amerikaner, 1988; Bain, 1978; Bass, 2002; Borchers, 2006; Brackney, 1993; Kunce et al., 1976; Obermesik, 1991; Schwebel, 1951) as well as the C, M, and K-P indices (e.g., Bowles, 2008; Dik & Hansen, 2011; Lent & Lopez, 1996; Tokar & Subich, 1997) was determined by the measures' frequent use in the interest congruence literature. Means of measuring congruence were divided into two main categories of "matched scale score" and "congruence indices." This distinction was created to differentiate between congruence index scores (e.g., C, M, or K-P) and interest scores that were correlated with job satisfaction scores. A congruence index involves a fit score that is calculated between interest scores and an occupation. Studies that conceptualized congruence as the direct correlation between interest and satisfaction scores were included in the "matched scale score" category.

Results

Although three previous meta-analyses found no relationship between interest congruence and satisfaction, I hypothesized that interest congruence and satisfaction within the context of the workplace would be significantly correlated. Using a meta-analytic method, 79 studies were included to determine the overall relation between interest congruence and job satisfaction. From the 79 studies for the present meta-analysis, 988 correlations were reported

with a total of 140 samples. As shown in Table 1, the results support the hypothesis that interest congruence and job satisfaction are significantly related. Both methods of fit showed a relationship with satisfaction: match score had a significant ρ of .20, 95% CI [.15, .24] and congruence index had a significant ρ of .08, 95% CI [.04, .12]. When methods of measuring congruence (i.e., matched scale score and congruence index) were combined, a significant relationship between overall interest congruence and satisfaction was found at ρ = .09, 95% CI [.06, .12].

Hypothesis 1a predicted that interest congruence and facets of satisfaction such as satisfaction with the work itself and intrinsic satisfaction would be significantly correlated. Table 1 shows meta-analytic corrected correlations for congruence and facets of satisfaction. My results were partially consistent with this hypothesis, with significant correlations reported for facets such as the work itself, intrinsic satisfaction, and global satisfaction for congruence measured by matched scale score and by congruence index. For congruence measured by matched scale score, the relationship between extrinsic satisfaction and interest congruence was not significantly correlated. Additionally, for congruence measured via congruence indices, satisfaction with promotional opportunities, pay, supervisor, and co-workers were not significant. See Table 1 for corrected correlations and confidence intervals.

Hypothesis 1b predicted that of all the facets of satisfaction, the work itself would have the strongest relationship with interest congruence. My hypothesis was not supported. Although satisfaction with the work itself and congruence index produced a significant corrected correlation (ρ) of .10, 95% CI [.04, .16], no significant difference was found because all other facets of satisfaction had overlapping confidence intervals; for studies measuring interest congruence using matched scale scores, my hypothesis was also not supported. Overlapping

confidence intervals showed no differences among interest congruence and satisfaction with the work itself with ρ of .08, 95% CI [.01, .15], correlations between interest congruence and the facets of intrinsic satisfaction (ρ = .20, 95% CI [.15, .24]), and global satisfaction (ρ= .20, 95% CI [.16, .24]).

Hypothesis 2a predicted that overall satisfaction would have a small correlation (ρ = 0.2 to 0.3) with interest congruence. My hypothesis was supported for studies using matched scale scores with ρ = .20, 95% CI [.15, .24]). Conversely, my hypothesis did not hold up for studies using congruence indices with ρ= .08, 95% CI [.04, .11]. I also predicted that analyzing facets of satisfaction related to intrinsic satisfaction or the work itself would produce slightly higher correlations between .25 and .30. My hypothesis was not supported by the results as evidenced by intrinsic satisfaction correlating with matched scale score congruence at ρ= .20, 95% CI [.16, .24] and with congruence indices at ρ= .07, 95% CI [.02, .12]. Corrected correlations for the relationship between the work itself and interest congruence (noted above) also did not exceed my predicted value of .25.

Also in Hypothesis 2, I predicted that satisfaction measures that specifically capture intrinsic aspects of the job would have a stronger relationship with interest congruence than satisfaction measures assessing extrinsic aspects of the job. My hypothesis was not supported as overlapping confidence intervals indicated no significant difference between measures of satisfaction using intrinsic aspects of the job and measures using extrinsic aspects of satisfaction. The relationship between intrinsic measures of satisfaction and congruence measured by matched scale score was significant with ρ = .20, 95% CI [.16, .24]. . Similarly, when interest congruence was measured by congruence index, the correlations for both intrinsic and extrinsic measures of satisfaction showed no distinction between the two with significant correlations and

overlapping confidence intervals, ρ = .07, 95% CI [.02, .12] and ρ = .08, 95% CI [.04, .13], respectively. Hypothesis 3 predicted that within-occupational studies (examining a single occupation) would have a stronger relationship between interest congruence and satisfaction than studies that examined the relationship across multiple occupations. Results were not consistent with my hypothesis showing overlapping confidence intervals with a significant corrected correlation of .13, 95% CI [.08, .18] for within-occupational studies versus studies examining relationships across multiple occupations with ρ= .08, 95% CI [.04, .12].

Hypothesis 3a concerned the timing in which interest and congruence measures were administered. I predicted that studies that assessed interest congruence and satisfaction simultaneously would have a stronger relationship than studies which assessed interests and satisfaction at differing time points. Seventy-five cross-sectional studies and nine longitudinal studies were included in the present analysis. Longitudinal studies varied greatly in duration of time between data collection from as little as two weeks (Breeden, 1993) to 25 years (Jepsen, 2003). Contrary to my hypothesis, no significant differences were found with overlapping confidence intervals resulting for studies which implemented cross-sectional measurement of interests and congruence (ρ= .09, 95% CI [.06, .12]) and studies measuring interests and congruence at differing time points (longitudinal design) (ρ = .16, 95% CI [.04, .28]).

Finally, Hypothesis 4 predicted that studies which used basic interest scales, empirically keyed occupational scales, or the aforementioned scales in conjunction with Holland-based scales (e.g., SII, SVIB, or SCII) would have stronger relationships with satisfaction than studies that used solely Holland-based scales (e.g., SDS or VPI). My hypothesis was not supported as overlapping confidence intervals indicated no significant differences between the "Strong measures" (i.e., SII, SVIB, and SCII) with a significant corrected correlation of .09, 95% CI [.04,

.14], the SDS with ρ= .07, 95% CI [.02, .12], and studies using the VPI with a correlation that was not significant with ρ= .10, 95% CI [.00, .19]. Likewise, the most commonly used congruence indices (i.e., C, M, and K-P indices) showed no distinction among the three with overlapping confidence intervals for the significant corrected correlations ranging between .05 and .08. Confidence intervals also overlapped for "other" measures including "homegrown" methods of assessing congruence resulting in a significant corrected correlation of .07, 95% CI [.02, .13].

TABLES

Table 1. Meta-Analytic Corrected Correlations for Congruence and Facets of Satisfaction

						95% CI		80% CV		% var explained
Moderators	*k*	*N*	Avg *r*	*ρ*	*SDρ*	Lower	Upper	Lower	Upper	
Matched Score	25	7930	0.17	0.20	0.09	0.15	0.24	0.09	0.31	0.42
Intrinsic satisfaction	22	7628	0.17	0.20	0.07	0.16	0.24	0.11	0.29	0.46
Extrinsic satisfaction	3	302	0.20	0.23	0.21	-0.06	0.52	-0.04	0.50	0.32
Satisfaction with work itself	3	422	0.07	0.08	0.07	0.01	0.15	-0.01	0.18	1.00 [a]
Global satisfaction [b]	21	7421	0.18	0.20	0.07	0.16	0.24	0.11	0.29	0.46
Congruence Index	59	11741	0.07	0.08	0.09	0.04	0.11	-0.04	0.20	0.54
Intrinsic satisfaction	33	6134	0.06	0.07	0.13	0.02	0.12	-0.09	0.23	0.34
Extrinsic satisfaction	28	6113	0.08	0.08	0.06	0.04	0.13	0.00	0.16	0.75
Satisfaction with work itself	15	3288	0.09	0.10	0.09	0.04	0.16	-0.01	0.21	0.51
Satisfaction with promotional opportunities	7	1310	0.00	0.00	0.10	-0.10	0.10	-0.12	0.12	0.46
Satisfaction with pay	6	775	-0.03	-0.04	0.02	-0.12	0.05	-0.06	-0.01	0.96
Satisfaction with supervisor	8	1371	0.04	0.04	0.08	-0.05	0.13	-0.07	0.15	0.60
Satisfaction with co-workers	8	1371	0.03	0.03	0.18	-0.11	0.17	-0.20	0.26	0.23
Global satisfaction	36	6463	0.08	0.09	0.13	0.04	0.15	-0.08	0.27	0.35

Note. Above correlations were corrected for sampling error, unreliability in the criterion (satisfaction), unreliability in the predictor (interest scores for matched scores) and indirect range restriction.

[a] Set a 1.00 as original value was reported at 1.38 indicating that the variance of the sampling error exceeded the variance of the residual.

[b] Global satisfaction indicates satisfaction measured by a single item or question.

Table 2. Meta-Analytic Corrected Correlations for Moderator Variables

						95% CI		80% CV		% var explained
Moderators	*k*	*N*	Avg *r*	*ρ*	*SDρ*	Lower	Upper	Lower	Upper	
Number of Occupations										
Single	40	11320	0.11	0.13	0.13	0.08	0.18	-0.03	0.29	0.35
Multiple	43	8473	0.07	0.08	0.08	0.04	0.12	-0.02	0.18	0.62
Design										
Longitudinal	9	1544	0.15	0.16	0.14	0.04	0.28	-0.01	0.34	0.43
Cross-sectional	75	17809	0.08	0.09	0.10	0.06	0.12	-0.03	0.21	0.51
Inventory										
VPI	16	2139	0.09	0.10	0.17	0.00	0.19	-0.12	0.31	0.27
SDS	19	5205	0.06	0.07	0.04	0.02	0.12	0.02	0.13	0.85
Strong [a]	27	4613	0.08	0.09	0.09	0.04	0.14	-0.02	0.20	0.58
Other	23	8601	0.15	0.17	0.16	0.11	0.24	-0.03	0.37	0.13
Congruence Index										
C index	28	5563	0.08	0.08	0.06	0.04	0.13	0.01	0.16	0.78
M index	12	2299	0.08	0.09	0.09	0.02	0.16	-0.03	0.20	0.47
KP index	15	2743	0.05	0.05	0.08	0.00	0.11	-0.05	0.16	0.51
Other	35	6866	0.07	0.07	0.13	0.02	0.13	-0.09	0.24	0.35
Publication Status										
Unpublished	25	3958	0.05	0.05	0.13	-0.01	0.11	-0.12	0.22	0.35
Published	59	15397	0.09	0.10	0.09	0.07	0.13	-0.01	0.21	0.57

Note. Above correlations were corrected for sampling error, unreliability in the criterion (satisfaction), unreliability in the predictor (interest scores for matched scores) and indirect range restriction.

[a]Includes the SCII, SII, and SVIB

Discussion

In this paper, results from a meta-analytic review of interest congruence and satisfaction using 79 studies containing a total of 140 samples and 988 correlations are presented. Contrary to previous meta-analyses (Assouline & Meir, 1987; Tranberg et al., 1993; Tsabari et al., 2005) which did not find any relationship between interest congruence and satisfaction, the present analysis shows a significant relationship; however, the correlation is notably lower than results frequently cited in literature widely used by researchers and career counselors (e.g., Holland, 1997). In sum, the relationship between interest congruence and satisfaction is significant, but not as influential as it has been portrayed in popular writing on career development and career-oriented self-help literature.

This significant meta-analytic result may be the product of re-evaluating the relationship between vocational interest congruence and satisfaction addressing various methodological issues in the previous meta-analyses. First, the present analysis went beyond previous meta-analyses in terms of sampling a broad scope of literature including interest satisfaction relations rather than solely sampling from studies which attend to the traditional "RIASEC" congruence literature. Second, previous meta-analyses included a smaller sample of studies, thus decreasing the power of finding a significant effect size. Third, other methodological problems such as the "file drawer" and "apples and oranges" issues were addressed in this analysis by including both published and unpublished studies as well as strategically organizing measures of satisfaction into numerous, specific categories. Fourth, corrections were made for indirect restriction of range, unreliability and sampling error. Finally, attention was given to potential moderator effects not addressed in previous studies.

Strengths and Limitations

A strength of this study simply lies in the fact that it is a meta-analysis. By re-evaluating the literature and organizing information differently than in previous studies, new knowledge will be gained from the meta-analytic procedure that could not otherwise be garnered from another method of study such as a single experimental study. Although the process of meta-analysis provides a unique way of synthesizing a vast array of scholarly literature, it also has several limitations. Meta-analyses are prone to the "file drawer" issue in which experiments with nonsignificant results are not published. This bias in published information favoring studies yielding significant results can create skewed results within the meta-analysis (Rosenthal, 1995). Partial compensation for this limitation has been provided by including unpublished material as well as published material in the present meta-analysis.

Another major limitation of the meta-analytic process is the "apples and oranges" concept as described by Lipsey and Wilson (2001, pg. 8). Because meta-analyses often combine such a vast number of studies, it can sometimes occur that different constructs are erroneously compared. I argue that this is a large methodological issue within the past three meta-analyses conducted on interests and satisfaction. Because the studies combined academic and job satisfaction, mixing both internal and external satisfaction measures, the results do not accurately report what the researchers sought to investigate in terms of interest congruence and occupational satisfaction.

Instead of measuring satisfaction, researchers have measured a mixture of well-being and a conglomerate of other facets of satisfaction, unrelated to the occupation or task at hand. For example, past meta-analyses included one-item global measures, three-item measures, grades, inventories of educational experience, or even their own versions of satisfaction questionnaires to measure the construct of satisfaction. Another strength of this meta-analysis is that special

care has been taken to analyze the data in more specific sections, separating out the different types of satisfaction in order to create a more accurate representation of the relationship between interests and satisfaction.

Finally, a limitation inherent in vocational psychological research is the concept of restriction of range. The idea of restriction of range is the concept that there is a process of self-selection when an individual enters a particular job. Because individuals cannot ethically be forced into randomized occupations for a given length of time, there exists a narrowed range of people within particular occupations. Restriction of range also leads to a skewed distribution of scores; because people largely self-select (or are selected by superiors with certain criteria) into specific fields of work, a disproportionate amount of people report being satisfied in their current job. To correct for this restriction of range, the statistical procedures outlined by Hunter et al. (2006) were implemented (i.e., corrections were made for indirect range restriction for interest match scores using population standard deviations). Congruence indices were not corrected for restriction of range because estimates have not been made in norming samples of unrestricted standard deviations (Hunter et al., 2006).

Potential Impact on Career Counseling

Within American society, it is a commonly accepted ideal that the work an individual does should align with an individual's interests or passions. Self-help books on the shelves such as *Do What You Love, The Money Will Follow* and *Welcome to the Real World: Finding Your Place, Perfecting Your Work, and Turning Your Job into Your Dream Career* (Sinetar, 1989; Berger, 2014) popularize this American philosophy. Berger (2014) writes, "Don't settle for an *okay* job—go after your dream job" (p. 26). Part of the "American dream" is working hard at a task that brings fulfillment in order to achieve financial stability, success, and happiness. As a

direct result of this mentality, it is a common practice for individuals to take various interest measures throughout the lifetime; interest measures are commonly administered in a school setting. Most students take at least one interest measure during his or her career as a student; in fact, the ACT exam that many high school students take for college admission can include an interest inventory (UNIACT).

The use of interest measures can influence how individuals perceive their likes, dislikes, and potential areas of talent, influencing the way they choose their future occupations. The "American dream" framework for understanding interests also influences the way in which career counselors go about administering career guidance. Currently, there is a gap between the findings in recent meta-analyses and the way in which career counselors practice in terms of the relationship between interest congruence and satisfaction. Career counseling methods in terms of the use of interest measures as a means of predicting job satisfaction should be remodeled to accurately represent the scientific literature.

Future Directions

In light of the results of the present meta-analysis, future research could be conducted to further investigate global satisfaction. As previously mentioned, it is possible that measures of global satisfaction encompass extraneous aspects of constructs related to, but not synonymous with satisfaction. Future research may focus more on the facet of global satisfaction, investigating other constructs that may be involved, potentially contributing to global satisfaction's significant relationship with interest congruence. An additional avenue for future research is the surprising result of studies implementing simultaneous measurement of interests and congruence producing a lower correlation than studies that measured interests and

congruence at differing time points. Potential moderating influences as well as study characteristics (in addition to the large difference in *k*) should be investigated.

Although the present analysis shows a significant relationship between interest congruence and job satisfaction, the correlation is lower than perhaps any vocational counselor would desire for implementation in practice. Due to this small relationship between interest congruence and satisfaction, future research should be directed toward re-evaluating the importance of the role of interests with satisfaction in general. With a low but significant correlation, what are other factors that may play more of a central role in determining job satisfaction? Predigar and Staples (1996) discuss the distinctions between interests and values, noting that both concepts are related to job satisfaction. Future research could reassess this position of interests and values as separate constructs; for example, researchers may investigate whether interests are actually a value, in of its self. The implementation of a theoretical shift away from the use of interests could increase the importance of understanding other values within career counseling and point toward a more practical method of aiming to obtain high job satisfaction.

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APPENDIX

Author(s)	Interest Measure	Interest Measure Reliability	Satisfaction Measure	Satisfaction Measure Reliability	Congruence Measure	Sample	N	r
Alley, Wilboum & Berberich (1976)	Other	0.98	global	0.825	Other	Insurance, food manufacture, wholesale food	8258	0.18
Amerikaner, Elliot & Swank (1988)	VPI	0.79	JDI	0.88	Ranked comparison congruence scale	Insurance, food manufacture, wholesale food	80	0.18
Aranya, Barak & Amernic (1981)	SDS	0.8	global	0.825	Three-letter congruence index	accountants	761	0.00
Bain (1978)	SVIB	0.85	MSQ	0.9	Correlation with scale score; Ranked comparison congruence scale	Navy recruits; Insurance, food manufacture, wholesale food	72	0.08
Bass (2002)	SDS	0.92	Other	0.77	C Index	Graduated Interns now working	80	0.23
Borchers (2006)	SDS	0.8	Other	0.77	C Index	engineering non-profit employees	53	0.23
Bowles (2008)	SII	0.88	MSQ	0.9	C Index	11 occupations	180	-0.07
Boyd (1981)	SDS	0.8	JDI	0.88	correlation with scale score	Psychologist, Social Worker, Counselor	50	-0.08
Bizot & Goldman (1993)	VPI research version	0.75	global; MSQ	0.825; 0.89	Novel calculation based on 2 highest interests on VPI	employed in multiple occupations	115	0.19
Brackney (1993)	SDS	0.8	JDI	0.88	Iachan's M Index		180	0.39
Brayfield & Marsh (1957)	KPR	0.877	Brayfield-Rothe	0.77	Correlation with scale score	veterans	50	0.02
Breeden (1993)	SCII	0.895	HSB; MSQ	0.93, .90	Interest occupational scales used to determine score	adults participants in vocational counseling clinic	149; 270	0.17

Buchanan (1997)	SDS	0.72	JSB	0.87	Iachan's M index; C index; PICS; BCI	employed	259	0.14
Carson & Mowsesian	SII	0.88	HSB	0.825	Iachan's M index	employed	139	0.18
Carter (1991)	Other	0.95	HSB	0.91	Correlation with	Pharmacists, career and house-	6734	0.03
Clarken (1983)	VPI	0.79	HSB	0.846	Correlation with	Student Teachers	103	-
Coddington (1998)	VPI	0.79	JDI	0.88	C Index	Campus Ministers	50	0.02
Connor (1980)	SCII	0.895	JDI	0.88	Correlation with scale score	medical technologists	207	-0.02
Dik & Hansen (2011)	SII	0.88	Other	0.8	C Index	8 occupations	352	0.18
Dik, Hu & Hansen (2007)	SII	0.88	Other	0.81	C Index	.	239	0.12
Dik, Strife & Hansen (2010)	SII	0.88	Other	0.8	C Index	.	334	0.14
DiMichael (1949)	KPR	0.877	HSB	0.85	.	vocational counselors	146	0.10
Dipboye, Zultowski, Dewhirst & Arvey	SVIB	0.845	MSQ	0.9	.	physicist and engineers	215	0.06
Dockins (2004)	SDS	0.8	JDI	0.85	Wiggins-Moody Compatibility Index	Employed Students	228	0.10
Doty & Betz (1979)	SVIB; SCII	0.845; 0.895	HSB	0.83	Correlation with scale score	employed in multiple occupations	88	0.23
Fricko & Beehr (1992)	SCII	0.895	global	0.825	SCII-GOT- job congruence	employed in multiple occupations	253	0.06
Furnham & Schaeffer (1984)	SDS	0.93	JSB	0.8	Wiggins-Moody Compatibility index	parents of students	82	-0.24
Furnham & Toop (1984)	SDS	0.71	HSB	0.785	Wiggins-Moody Compatibility index	11 occupations	135	0.20
Garfinkle (1979)	VPI	0.79	MSQ	0.9	Correlation with scale score	Physicists and engineers	105	0.12
Geist (1963)	GPII	0.87	HSB	0.85	Correlation with scale score	7 occupations	271	0.11
Gellatly, Paunonen, Meyer & Jackson (1991)	Career Directio	0.79	IOR; HSB	0.89	.	food services management	59	-0.09

Gottfredson & Holland (1990)	VPI	0.79	JDI	0.88	Iachan's M index	bank tellers	77	-0.08
Harboe (2003)	SDS	0.92	JDI	0.84	Other	Harboe (2003)	284	-
Harris, Moritzen, Robitschek, Imhoff & Lynch (2001)	VPI	0.79	JDI	0.88	C Index	Publisher, freight-shipping, police, school, medical	40	0.36
Hoeglund & Hansen (1999)	SII	0.88	global	0.77	FL-Flex; K-P index; HCI; Sb index; C index; occupational scale	9 occupations	1473	0.06
Imhoff (1998)	VPI	0.88	JIG	0.93	Iachan's M index	10 occupations	104	0.18
Jackson, D. N., Paunonen, S. V. & Rothstein, M. G. (1987)	JVIS	0.84	7 point scale	0.79	Correlation with scale score	Personnel executives	285	0.24
Jagger (1992)	CAI	0.89	MSQ	0.9	Wiggins-Moody Compatibility Index	Rehabilitated' Individuals with psychiatric & physical disabilities	72	0.26
Jagger& Neukrug (1992)	SDS, SII,	0.84	MSQ	0.9	C index	"successfully rehabilitated clients"	72	0.26
Jepsen & Sheu (2003)	Occupational	0.83	Other	0.77	C Index	Graduated Students	292	-0.07
Kates (1950)	SVIB	0.85	HSB	0.846	Other	Marketing Department Employee	25	0.35
Kittrell (1980)	SCII	0.895	MSQ	0.9	Correlation with scale score	Supervisors attending supervisor classes	212	0.05
Knapp & Tremble (2007)	Other	0.83	VIP	0.87	Correlation with scale score	soldiers	703	0.02
Kunce, Decker, & Eckelman (1976)	SVIB	0.7	5 point scale	0.7	Exact, near hit, or miss	employed in multiple occupations	156	0.26
Lau & Abrahams (1971)	Navy Vocatio	0.74	Other	0.77	Other	Marketing Department Employee	127	0.18
Lent & Lopez (1996)	VPI	0.79	modification of Quinn and Shepard (1974)	0.72	Exact, near hit, or miss; K-P index; C index	7 occupations	166	0.03

Lipsett & Wilson (1954)	KPR	0.79	global	0.825	Suitable or unsuitable	employed in multiple occupations	108	0.41
Lorch (1977)	VPI	0.79	JDI	0.88	Correlation with	Ohio Cooperative Extension	171	0.21
Meir, Melamed & Dinur (1995)	SDS	0.8	JDI	0.81	Vocational, leisure, skill use	lawyers, psychologists, physicians	120	0.29
Mount & Muchinsky (1978)	SDS	0.8	JDI	0.88	Suitable or unsuitable	13 occupations	362	0.22
Muthard & Morris	VPI	0.79	Other	0.88	Other	Marketing Department Employee	55	-
Obermesik (1991)	VPI	0.79	Other	0.88	Other	Marketing Department Employee	301	0.14
Oleski & Subich (1996)	SDS	0.9	global	0.825	K-P index; C index	42 occupations	42	0.33
Oliver (1993)	SII	0.88	global	0.825	C Index	Hawaiian Working College	128	0.21
Pritchard & Peters (1974)	JAPQ	0.58	MSQ	0.9	Correlation with scale score	Enlisted Navy personnel	586	0.30
Pseekos (2009)	SDS	0.8	Other	0.9	Iachan's M Index	.	224	0.14
Reilly & Echternacht (1979)	Novel air force	0.9	JDI	0.741	Correlation with scale score	Employed in multiple occupations	454	0.10
Robertson (1975)	SVIB	0.85	Other	0.77	Correlation with scale score	Security Police; Law Enforcement, Graduated Students	582	0.00
Rounds (1990)	SCII	0.91	HSB	0.825	Correlation with scale score	part and full-time occupations	405	0.29
Schletzer (1966)	SVIB	0.845	HSB; Brayfield-	0.85; 0.77	Correlation with scale score	6 occupations	185	0.08
Schoeny (1997)	SDS	0.8	JDI	0.76	K-P Index	employees from 5 different non-profits	535	0.06
Schwebel (1951)	SVIB	0.7	HSB	0.846	Correlation with scale score	Naval aviators	105	0.21
Sedge (1985)	VPI	0.79	MSQ	0.9	Correlation with scale score	engineers and engineer managers	156	0.24
Shapoorian (1987)	SVIB	0.85	JDI	0.88	correlation with scale score	university workers	61	-0.28
Strong (1955)	SVIB	0.76	global	0.825	Correlation with scale score	Utilities Maintenance and Fire Fighters	655	0.18

Sundell (1999)	VPI	0.79	MSQ	0.9	Correlation with scale score	Navy recruits	125	-0.02
Tokar & Subich (1997)	SDS	0.795	HSB	0.85	K-P index; C index	152 occupations	395	0.03
Toomey (2001)	SDS	0.8	MSQ	0.86	Iachan's M Index; C	school psychologists	225	0.10
Upperman & Church (1995)	VPI	0.79	JDI	0.88	Iachan's M index; K-P index, C index	military positions	154	0.01
Vernick, Reardon & Peterson (2007)	VPI	0.79	JDI	0.90	Iachan's M Index	telecommunications workers	198	0.01
West (1993)	SII	0.88	JDI	0.88	Iachan's M index	8 occupations	111	0.12
Wiener & Klien (1978)	SVIB	0.845	JDI	0.88	SVIB occupational	production, sales, engineering	101	0.14
Wiggins (1976)	VPI	0.79	HSB	0.85	Correlation with scale score	teacher	110	-0.02
Wiggins, Lederer, Salkowe & Rys (1983)	VPI	0.79	HSB	0.87	C index	5 occupations	247	0.57
Wilkins (1967)	SVIB	0.85	HSB	0.846	Correlation with scale score	Naval aviators	95	-0.13
Worthington & Dolliver (1977)	SCII	0.895	"self-reported"	0.77	Correlation with scale score	employed in multiple occupations	141	0.32
Worthington & Dolliver (1977)	SVIB	0.85	Other	0.77	Other	Marketing Department Employee	130	0.31
Young, Tokar & Subich (1998)	SDS	0.795	HSB; global	0.825	Dichotomous self-letter agreement	172 different occupations	483	0.06