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Inquiry	Vol. 01	NO. 1	Hal. 1-74	Jakarta Agustus 2008	ISSN 1979-7273
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Diterbitkan oleh Program Studi Psikologi Universitas Paramadina

NARROW MEASUREMENT OF PERSONALITY CONSTRUCT

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Abstract

This study aims at highlighting the importance of choosing the narrow measurement or unidimensionality of the personality construct. The narrow measure can predict the predictor and criterion relationship. Personality may be a useful predictor of effort and performance when one has developed a careful theoretical rationale for expecting a given personality construct to be more meaningful associated with a given criterion. More specification on both the predictor and criterion relationship may lead to a more optimistic assessment of the usefulness of personality constructs in predicting effort and performance on the job.

The focus on the measurement problem is important for the quality of research result. The measurement error can have dangerous influence on the empirical result such the mistake of taking conclusion. The measurement error tends to attenuate the observed relationship in two variables of statistical analysis. The measurement error also threatens the validity of research result. The measurement is the fundamental activity in social science. The measurement procedure is important especially when a researchers define the construct and content validity. This is important because by giving attention to the measurement validity, the systematic error can be eliminated.

The construct measurement can be divided into broad measurement or multidimensional and narrow measurement or unidimensionality. This study aims at highlighting the importance of choosing the narrow measurement or unidimensionality of the construct measurement. The inaccuracy in choosing the measurement will mislead the researcher to take the final conclusion of the research. In addition, the result will show insignificant relationship between two variables or the variance is less shared.

This study starts from the opinion of Ones and Viswesvaran (in Ashton, 1998) argue that -broader measure of personality will have higher predictive validity and fidelity. Big Five traits of personality-extraversion, emotional stability, agreeableness, conscientiousness and openness to experience are assumed to have higher reliabilities than the narrower measure. However, Ashton (1998) emphasizes that the broad composite scale should not always become the effective predictors for the criterion variable. The aggregated variables do not always provide gain in validity.

A. Overview of the Study

Ones and Viswesvaran (in Ashton, 1998) have maintained that broader, more multidimensional personality measured are to be preferred in personnel selection research when a complex criterion such as job performance is used. Ones and Viswesvaran's arguments are as follows.

- 1) A predictor and criterion variable can only correlate highly if their underlying dimensionalities are equivalent.
- 2) Empirical data show that increasing criterion correlations accrue with increasing predictor dimensionality.
- 3) An example from factor analysis is a mathematical proof that multidimensional variables must correlate highly with other multidimensional variables than with unidimensional variables.
- 4) Certain broad personality factor measures have higher reliabilities than do any of the narrow personality traits measures of which the factor composites are composed.
- 5) Past empirical studies in the area of integrity assessment support the use of multidimensional personality measures in personnel selection.
- 6) Broad multidimensional variables are more useful for behavior explanation than are narrow unidimensional variables.

It is summarized that the result of several metaanalysis of the relationship between personality and job performance was significant. It showed the superiority of broad traits. They also argued that the integrity test based on the Big Five dimensions was positively correlated to the criterion variable. The integrity test had much higher validities with respect to job performance criteria than narrower measure dimensions.

This result was considered by Ones and Viswesvaran as additional support for their argument that broader traits of personality become more valid predictor of job performance. Furthermore, they pointed out that most job performance is factorially complex. Therefore, it requires factorially complex predictors in order that maximum validity will be achieved.

Unfortunately, the research result of Ones and Viswesvaran (in Ashton, 1998) does not support their own opinion of the broad personality measure. The integrity test of personality scale measuring conscientiousness, extraversion, agreeableness, emotional stability and openness to experience does not emerge. Principal component analysis was performed to analysis the measure scale. An employer can use these two factors to predict workplace delinquency. In other type of jobs, especially non-entry level jobs, performance non-delinquency will likely be predicted by other personality traits. Analysis of a given job should be correlated to the particular personality variables.

According to Kerlinger and Lee (2000), the measurement of personality trait is the most complex problem of psychological measurement. The underlying reason is obvious. The personality of human is complex. For the purpose of measurement, personality is viewed as the organization of individual trait. The major problem in personality is validity. To measure personality traits requires knowledge of what the traits are and how they interact one another. Furthermore, in the organizational behavior field, scholars have debated the primacy of personality in the determination of people's outlook and behavior (Robertson in Buchanan & Huczynski, 1997). The debate concerns the lack of a clear consensus concerning the nature of the major personality dimension.

One argues that there are two fundamental dimensions of personality: emotional stability and extraversion. Others add that there are three other key dimensions to the personality lexicon: conscientiousness, agreeableness and openness to experience (Costa & McCrae, 1985). Together with extraversion and emotional stability, these factors make up the so-called Big Five personality characteristic. The characteristics of the Big Five Factors are a) extraversion e.g. sociable, talkative, and assertive; b) agreeableness e.g. good-natured, cooperative and trusting; c) conscientiousness e.g. responsible, dependable, persistent and achievement oriented; d) emotional stability from the negative pole e.g. insecure, tense and nervous; e) openness to experience e.g. imaginative, sensitive and intellectual (Barrick & Mount, 1993).

The evidence has shown that the five factors have been obtained in different culture with different languages including English, Dutch, German, and Japanese, using different instruments and with different theoretical framework. They have also been shown to be stable over time (Mount & Barrick, 1998). The Big Five model of personality is useful because it provides an organizing framework in which personality research can be conducted.

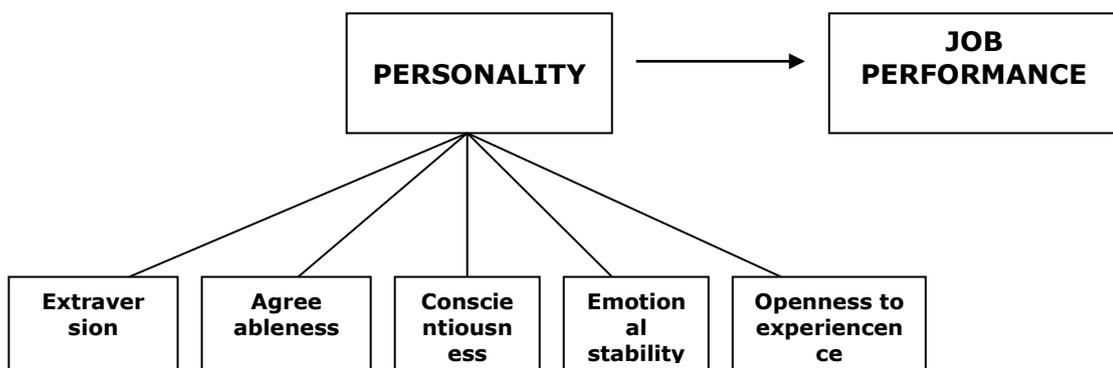


Figure A. Broad Measure of Personality Scale

B. Narrow Measure of Personality Dimensions

The utility of multidimensional construct has triggered a debate in the organizational behavior literature. Some argue that multidimensional constructs provide a holistic representation of complex phenomena, allow researchers to match broad predictors with broad outcome and increase explained variance (Ones and Viswesvaran, 1996).

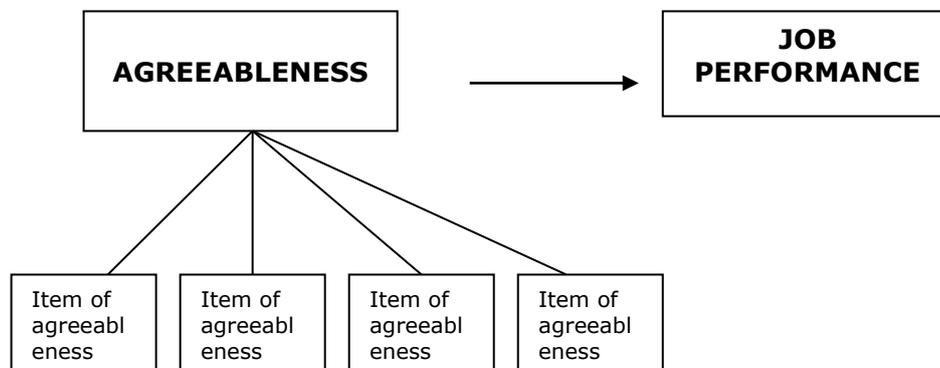


Figure B. Narrow Measure of Personality Scale

However, there is strong argument from the narrow measure supporters. The Big Five model is considered as the broad of personality measurement. The problem is whether to measure a broad trait or several narrow traits or not. This problem is called bandwidth-fidelity problem (Ones & Viswesvaran, 1996). The fidelity argument suggests that long-broad scales will be more reliable than short specific scales. The bandwidth argument suggests that measuring many different narrower traits produces better information than just measuring a few broad traits. Since both of these arguments are theoretically correct and yet mutually exclusive, this presents a problem.

Schneider, Hough, and Dunnette (1996) contend that narrow traits will be more predictive when the personality measure matches the performance measure in terms of the specificity of the two measures. It is argued that the best criterion-related validities will be attained if researchers use a construct oriented approach to match specific traits to those specific job performance dimensions. The researchers should also focus on development theories of job performance those incorporate constructs that are both specific and meaningful. That is when using narrowly defined personality traits; the performance measure should also be narrowly defined. They further suggest that in a validity study, the narrow components of performances that are measured should be determined through a job analysis. This greater specificity would result in a better understanding of the specific elements, which influence good or poor performance.

Critics have questioned the theoretical utility of multidimensional constructs on the grounds. The broad measurement explains less variance and confounds relationship between their dimensions and other constructs (Paunonen, Rothstein & Jackson, 1999). The constructs are also conceptually ambiguous (Edwards, 2001). This ambiguity occurs because variation in a multidimensional constructs may imply variation in any or all of its dimensions. Consequently, theories that explain the relationship between a multidimensional construct and other variables are difficult to develop because different explanations may apply to different dimensions of the construct (Johns, 1998).

Another source of debate concerns the internal consistency of multidimensional construct created by summing dimensions scores (Edwards, 2001). Critics note that the dimensions of a multidimensional construct are not homogenous. They represent different manifestation of the construct. If the heterogeneity of

dimensions is getting to increase, the correlations among the dimensions will decrease. Thus it will reduce the reliability of summed dimension scores.

Critics of multidimensional construct have also defended the construct validity of dimension measures. Schneider et.al. (1996) argue that dimensions specificity should be treated as a measurement error. Specificity is precisely valid. Accordingly, high specificity should be interpreted not as invalid construct variance, but instead as valid dimension variance that is not captured by the multidimensional construct.

Although multidimensional constructs often produced higher criterion related validity than most of their dimensions, they frequently have lower criterion related validity than at least one dimension, (Paunonen, et al., 1999). Critics have further pointed out that the multi dimensions constructs cannot have higher criterion related validity than an optimally weighted linear combination of its dimensions as when the dimensions are used as predictors in multiple regression analysis. Paunonen, Rothstein and Jackson (1999) have provided some reasons concerning the use of multiple unidimensional predictors for job performance. They evaluate of Ones and Viswesvaran's evidence.

The Importance of Narrow Measurement in the Research

There are some supporting arguments of using narrow measurement as follows.

1. On Dimensionality and Predictiveness

It is certain that a multidimensional predictor can correlate highly with a multidimensional criterion. However, it is equally certain that a unidimensional predictor can correlate more highly with a multidimensional criterion than does an aggregate of several such predictors. In Ones and Viswesvaran's article, they listed

meta-analytically derived correlations between Big Five personality factor and five relatively narrow indices of job performance. It was also reported the correlations between the Big Five and a broad composite criterion.

Table 1. Summary Of Ones And Viswesvaran’s Research

Personality variables	Broad		Job Performance Variable		
	1	2	3	4	5
	Uncorrected	Corrected	Average uncorrected	Best uncorrected	Narrow corrected
Emotional stability	0.20	0.25	0.16	0.25	0.32
Extraversion	0.14	0.22	0.12	0.26	0.41
Openness to Experience	0.19	0.29	0.13	0.25	0.38
Agreeableness	0.12	0.16	0.10	0.23	0.32
Conscientiousness	0.22	0.32	0.20	0.37	0.54
Mean	0.17	0.25	0.14	0.27	0.39

The result of the research Ones and Viswesvaran-Personality and Job Performance Correlations (1996)

The broad Big Five factors were able to predict the broad composite criterion (column 1) at level exceeding on average, their ability to predict the narrower performance criteria (column 3). Nevertheless, if each column is carefully examined, *it becomes obvious that each of the Big Factors was more highly predictive of one or the other of the narrow criteria than of the broad composite.* For example, the emotional stability correlates 0.20 with the broad composite criterion (column 1), but it correlates 0.25 with a narrow component of the composite (column 4). The greater predictive disparities are shown by the extraversion and agreeableness. It correlates 0.14 and 0.12 with the composite criterion while it correlates 0.26 and 0.23 with the effort criterion.

Ones and Viswesvaran (in Ashton, 1998) calculated the estimated correlations of perfectly reliable Big Five personality factor measure with the broad composite criterion (column 2); emotional stability $r=0.25$; extraversion $r= 0.22$; openness to

experience $r = 0.29$; agreeableness $r = 0.16$; and conscientiousness $r = 0.32$. The same statistical correction for unreliability is applied to the five best personality-performance correlations. The resultant values (column 5) are emotional stability $r=0.32$; extraversion $r= 0.41$; openness to experience $r = 0.38$; agreeableness $r = 0.32$; and conscientiousness $r = 0.54$. In summary, Paunonen et al. (1999) concluded that the broad measure of personality measure has failed to predict accurately a multidimensional criterion. Each of these estimated personality-performance correlations is with a relatively narrow job criterion and each is much higher than its corresponding correlation with the broader multiple criterion.

2. On Statistical Corrections and Dimensionality

Ones and Viswesvaran (in Ashton, 1998) argued that the aggregating personality variables into broader personality predictors would lead to increase in predictor-criterion correlations. They applied the Spearman Brown formula to correct their observed personality predictor validities. The formula is used to estimate the increase or decrease expected in the reliability and validity of a measure. However, when the formula is used there are some assumptions (Nunnally, 1978). First, the mean predictor-predictor (interitem) correlations do not change with the aggregation of new predictors. Second, the mean predictor-criterion correlation remains unchanged.

At table 1, the observed validity for openness to experience (column 1) was 0.19 and the corrected validity (column 2) was 0.29. The latter value is the new validity expected if the predictors were an aggregate of an infinite number of openness to experience measures. Ones and Viswesvaran interpreted that the new validity was caused by the broader measure of openness to experience predictor. As mentioned earlier, the correlation of 0.29 Spearman-Brown corrected validity for openness to

experience is the value that would result if the items added to the longer personality measure do not change 1) the mean interitem correlations and 2) the mean item-criterion correlation. Paunonen et al. (1999) provides two ways to achieve this end.

- 1) One could add items to the unidimensional openness to experience measure that are relatively uncorrelated with the existing items therefore they will increase the composite's dimensionality. The measures are also highly intercorrelated and more mutually redundant among themselves than the existing item therefore they will maintain the level of mean interitem correlation.
- 2) One could add items to the unidimensional openness to experience without changing the aggregate's dimensionality. This method is used by adding new items that are randomly parallel to the existing items. The randomly parallel items have the same correlations with one another. Thus, the mean interitem and mean item criterion correlation of the aggregate measure would not change. Consequently, the dimensionality of the longer measures will be the same as that of the shorter measure.

3. On Factor Structure and Dimensionality

Ones and Viswesvaran (in Ashton, 1998) computed the sum of the cross products of the factor loadings of the multidimensional predictor and multidimensional criterion. The correlation of result was 0.65. They also compare to unidimensional predictor and multidimensional criterion and the correlation of result was 0.24. As the result of it, they contended that factorially complex predictors would increase maximum validity.

However, Paunonen et al. (1999) argue that Ones and Viswesvaran only chose the positive factor loading across five orthogonal factors. They were 0.30, 0.40, 0.20, 0.30 and 0.40. It is suggested that the examples of multidimensional predictor and multidimensional criterion had to be mixed; both negative and positive loadings for the chosen variables. Consider the job of customer service. One of the predictor facets might represent emotional stability (nervous and tense). It is reasonable to expect emotional stability to predict performance of customer service negatively (the less tense or the less insecure, the better an employee serves a consumer). Therefore, the

two variables can define opposite ends of the same factor and have opposite signs in their factor loadings. If we combine the emotional stability and customer service into a predictor composite and a criterion composite would lower any prediction and criterion correlation.

4. On Integrity Assessment, Dimensionality and Predictiveness

Ones and Viswesvaran (1996) argue Big Five Personality test can capture all dimensions of job performance. The integrity test is really needed to achieve high correlations between the predictor and criterion relationship. Broad personality inventory has the bias. Hogan and Hogan (1992) have suggested item responses of any questionnaires concerning job applicant and job performance on personality measures are guided by self presentation of an image that the respondents to convey to the tester.

Furthermore, Paulhus (in Smicht & Ryan, 1993) argued that self-presentation through responses to personality test items has been the focus of social desirability studies. Socially desirable responding can be divided into two dimensions: self-deception and impression management. Self-deception is a response style characterized by an unconscious tendency to see oneself in a favorable light whereas impression management is the conscious presentation of a false fronts such deliberately falsifying test responses to create favorable impression. There are many reasons why the integrity test can correlate higher with job performance (Paunonen, et al., 1999). The responses of questionnaires items of personality tend to inflate.

5. On Dimensionality and Behavior Explanation

Ones and Viswesvaran (1996) maintained the opinion that the broad measure of personality has more explanatory power than the narrow measure. Paunonen et al. (1999) pointed out that the advantage of unidimensionality personality measure for behavior explanation is greater because it consists of psychometrically parallel items,- a total score on the measure is an estimate of a respondent's true score on some latent psychological attribute. The measure is considered to be more predictive of the work behavior aspect. One can understand how the relationship between the psychological needs of workers to their level of job performance in a theoretical network of trait-work behavior. Once again Paunonen et.al (1999) underlines as follows.

We do agree that with a very complex criterion sometimes multidimensionality in the prediction is needed in order to predict with any acceptable degree of accuracy. But the solution is not to measure the separate facets represented by the criterion and then combine those measures into a single predictor, thereby potentially undermining the interpretability of the predictor composite. The solution is to use multiple homogeneous measures of narrow traits separately as distinct variables for prediction.

7. Content Validity

Discussing about the broad versus narrow measures is inseparable from the content validity. Many definitions of content validity are proposed. Content validity is the *degree to which elements* of an assessment instrument are *relevant to and representative of the targeted construct for a particular assessment purpose* (Haynes, Richard, & Kubany, 1995). The term element refers to all the aspects of the measurement process that can affect the obtained data. The degree to which matters to that content validity is a quantitatively based judgment. Particular purpose refers to the fact that indices of relevance and representativeness of an assessment can vary depending on the functions of the assessment. Relevance refers to the appropriateness

of its elements for the targeted construct while representativeness refers to the degree to which its elements are proportional to the facets of the targeted construct.

By adopting this definition, it is relevant to conclude that the Big Five measure has high content validity. The reason is obvious because it offers the representativeness of human personality. However, Ghiselli, Campbell, and Zedeck (1981) argue the *content validity does not always refer to the all dimensions of one construct*. The relative homogeneity of the components of the test is an indication of content validity. It does not deal with the problem of the extent to which the elements of a test cover all aspects and phases of the trait or characteristics. A test that measures only certain aspects of the trait may be more useful and perhaps will give new and fruitful ideas about the nature of human. The content validity can be enhanced by selecting homogenous items only when the definition of the variable specifies that homogeneity is desirable.

Recent meta-analysis has shown that certain personality constructs are valid predictors of job performance criteria for numerous occupations. At least some jobs, special attributes are required to match to certain personality characteristics. The result of this study confirms that extraversion (one of Big Five dimensions) is perceived to be the most important characteristic for the job presenting of the insurance sales agent. Meanwhile, openness to experience is perceived to be important in job reporter.

Mc Adam (1992) proposes *criticisms of the Big Five model as the broad Measure*. The criticism covers the negative aspects of the broad measure including covering the universe; need for prediction and description; the problem of explanation; context, conditionality and the role of middle level units.

1. Covering the universe. The theory involves arbitrary and subjective decisions that go into the choice of items, the choice of factor analytical procedures and rotations and the labeling of factors. The theory is atheoretical and makes the assumptions that languages reflect social reality. The theory does not address the core personality traits.
2. Need for prediction and description. Narrow trait categories are more useful when describing the specifics of personality. The Big Five are seemingly single traits categories rather than five traits.
3. Context, conditionality and the role of middle level units. Operating on a general level, the theory ignores explicitly contextual variables that are necessary for predictions, description and understanding of personality.
4. The problem of explanation. The Big Five does not completely explain the reasons of human behavior.

Paunonen and Ashton (2001) conducted the research to know the relationship Big Five predictors of academic achievement. Results indicated that lower level trait measure did better than its higher-level factor measure in the prediction of course grades. The aggregation of narrow traits measures into broad factor measures can be counter productive from the points of view of both behavior prediction and behavior explanation. This problem is analogous with the correlation of job satisfaction and performance. Fisher (1980) also points out that the aggregation problem causes the lack of consistent findings on the satisfaction and performance relationship. Specific attitudes measures should be related to specific job behavior. The study clearly demonstrates that more specific attitude measures are better predictors of single-act criteria. If one is interested in predicting job performance, then one should measure

the attitude toward the act of performing on the job rather than attitude toward an object.

C. Conclusion

As the reasons of narrow measure have been explored above, it is better to understand that there are some supporting arguments that the narrow measure can predict the predictor and criterion relationship based on dimensionality, statistical correction, factor structure, consistency, and integrity assessment. It is very important to note that an emerging consensus regarding the use of broad measure hardly suggests a universal acceptance. The use of broad measures has not obtained the consistency of the result. Personality may be a useful predictor of effort and performance when one has developed a careful theoretical rationale for expecting a given personality construct to be more meaningful associated with a given criterion. However, more specification on both the predictor and criterion relationship may lead to a more optimistic assessment of the usefulness of personality constructs in predicting effort and performance on the job.

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