

Confirming Five-Factor model and JobMatchTalents predictability of job performance and behavior

Klaus Olsen 2013

Abstract

Instruments used to measure personality in recruitment situations need to be able to predict work related performance. In the present study, we investigate the relationship between the JobMatchTalent test (Olsen, 2013), predictors of job performance e.g., productive behavior, quality and structure, and cooperation skills), and one of the most common instruments to operationalize the Big-Five model of personality: the NEO Personality Inventory-Revised (NEO PI-R). JobMatchTalent is an instrument developed to measure individuals' work-related characteristics. It consists of three areas that provide a broad picture of the individual's characteristics: Stability Patterns, Action Patterns, and Relation Patterns. These areas are divided into 10 scales that provide a deeper picture of the employee; such as the way she/he structures work, stress sensitivity, energy, goal-directedness, and cooperativeness etc. Each of the 10 scales is divided into 3 subordinate scales giving a more detailed picture of the main scale.

This report describes two independent validity studies carried out on the JobMatchTalent test: (1) a supervisor rating study (Jansson, 2012), in which supervisors rated productive behavior, quality and structure, and cooperation skills of workers who had been recruited through the JobMatchTalent test; (2) a correlation study (Garcia, Nima & archer, 2013), in which the convergent and discriminant validity between the JobMatchTalent test and the NEO PI-R was investigated. By comparing the result of these two studies, the aim of the report is to illustrate the overlap between the supervisor rating study in relation to the results from the scientific literature showing the personality dimensions measured by the Big-Five model as a predictors of job performance.

Background: The two studies under review

A supervisor rating study (Construct validity study of the JobMatchTalent) was carried out in Sweden 2012. A total of 668 Executives were asked to rate their own employees, who had completed the JobMatchTalent test between 6-24 months earlier, by answering to 11 different statements (Likert scale 1 = totally disagree, 7 = totally agree) related to their work performance and work behavior. The final sample comprised 104 executives (16% of the original sample) who answered to the statements corresponding to 258 employees. A correlation between the grading of the 11 statements and the JobMatchTalent scales was calculated using Pearson correlation between the 11 statements and the JobMatchTalent's scales (Jansson 2012). The ratings are organized into three main categories: Productive behavior, Quality and structure, Cooperation ability. The results from this first study showed that the JobMatchTalent test has good predictive validity on those three domain areas of work performance and behavior.

The second study reviewed here, was a correlation study between the JobMatchTalent test and the NEO PI-R. Participants ($N = 390$) were recruited from the professional network LinkedIn and asked to complete online versions of the instruments. Using correlation analysis to investigate convergent and discriminant validity between both instruments these researchers identified and analyzed the definitions behind all significant scales with coefficients no lower than $\pm .30$ (i.e., convergent validity) and those with nonsignificant correlations (i.e., discriminant validity). Regression analyses were used to investigate the variance of the NEO PI-R dimensions that could be explained by the

JobMatchTalent test. Both correlation and regression analysis were conducted in two steps, the JobMatchTalent main scales vs. NEO PI-R dimensions and the JobMatchTalent subscales vs. NEO PI-R dimensions. The researchers suggested that there is a strong indication of significant convergent and discriminant validity between the JobMatchTalent test and the NEO PI-R and that 4 of the 5 NEO PI-R dimensions can be discerned in a logical categorization along the JobMatchTalent characteristics: (1) Order and Thoughtfulness, (2) Energy and Extraversion, (3) Social Adaptation and Interest, and (4) Emotion Control. Moreover, all 5 NEO PI-R dimensions overlapped with the JobMatchTalent subscales. Suggesting substantial overlap between the instruments, but also that the two instruments cannot be considered as equivalent to assess individual differences in recruitment situations.

The present report

This report relates the results found in the supervisor rating study (Jansson, 2012) and the correlation study between JobMatchTalent and NEO PI-R (Garcia et al., 2013) in the context of job performance.

Supervisor rating of criterion measure: employees productive behavior

The JobMatchTalent scales that correlate with the measure of productive behavior are: Inner Drive ($r = .20, p < .01$), Activity ($r = .36, p < .01$), Drive ($r = .37, p < .01$), Acting ($r = .42, p < .01$), Communication ($r = .38, p < .01$) (Jansson, 2012). The Convergent and discriminant validity study between JobMatchTalent and NEO PI-R (Garcia et al., 2013) shows that Extraversion has significant correlation with Inner Drive ($r = .51, p < .001$), Activity ($r = .60, p < .001$), Drive ($r = .37, p < .001$), Acting ($r = .49, p < .01$), and Communication ($r = .54, p < .001$). In other words, the JobMatchTalent scales predicting high ratings in the productive behavior measure are the same scales that are related to the Extroversion personality dimension measured by the NEO PI-R. See table 1.

The scientific literature suggests that Extraversion is a good predictor of work performance, especially for sales people and executives and leader effectiveness (Kok-Yee Ng and Soon Ang Nanyang Technological University, 2008). and Extraversion and Conscientiousness are the two best predictors of job performance in various occupations (Barrick & Mount, 1991; Tokar & Subich, 1997; De Fruyt & Mervielde, 1999; Schneider, 1999). Extraversion includes traits such as sociability, assertiveness, activity and talkativeness. Extraverts are energetic and optimistic. Introverts are reserved rather than unfriendly, independent rather than followers, even-paced rather than sluggish. Extraversion is characterized by positive feelings and experiences and is therefore related to positive affect (Clark & Watson, 1991). Extraversion is a valid predictor of performance in jobs characterized by social interaction, such as sales personnel and managers (Barrick & Mount, 1991; Bing & Lounsbury, 2000; Lowery & Krilowicz, 1994; Vinchur et al., 1998). Johnson (1997) found a positive relationship between extraversion and job performance of police personnel, and explained this relationship in terms of the high level of interaction in the police service. Hence, in coherence with the literature, the Inner Drive, Activity, Drive, Acting, and Communication scales in the JobMatchTalent test not only are good constructs of Extraversion but also as expected are predictors of productive behavior (see Figure 1). The scientific literature describes Extraversion as a more significant predictor for executives job performance than non executives. The supervisor rating study of the JobMatchTalent finds a similar coherence between productive behavior amongst executive

and non executives, suggesting that the JobMatchTalent are able to differentiate between job performance predictors of executives and non executives, and suggest that this also shows an additional anchorages of that the supervisor rating study to the scientific literature.

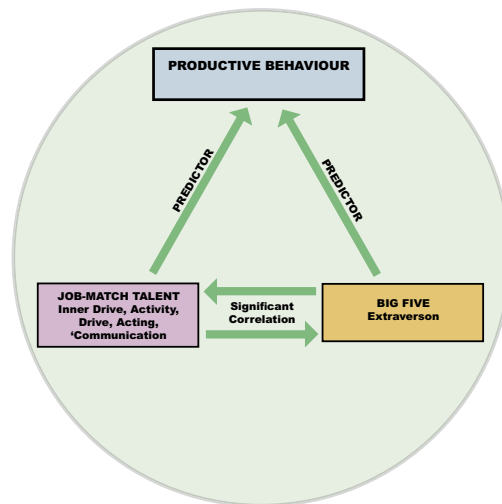


Figure 1: The relationship between JobMatchTalent’s Inner Drive, Activity, Drive, Acting, Communication and NEO PR-I’s Extraversion and their function as predictors of productive behavior.

Supervisor rating of criterion measure: employees quality and structure

The JobMatchTalent scales that correlate with the measure of quality and structure is: Work Structure ($r = .49, p < .01$), Decision Characteristics ($r = .24, p < .01$).

The Convergent and discriminant validity study between JobMatchTalent and NEO PI-R (D. Garcia, A. Al Nima, T. Archer, 2013) shows that Conscientiousness has significant correlation with Work Structure ($r = .50, p < .001$) and Decision Characteristics ($r = .49, p < .001$). See table 1.

Comparing the criterion measure of quality and structure with the convergent and discriminant validity between JobMatchTalent and NEO PI-R, shows that the JobMatchTalent scales predicting the criterion measure of quality and structure are the same scales correlating with the Five Factor models domain scale of Conscientiousness.

In the scientific literature it is suggested that the Five Factor models factor of Conscientiousness is a good general predictor of work performance related to quality and structure. Conscientiousness refers to self-control and the active process of planning, organizing and carrying out tasks (Barrick & Mount, 1993). Conscientiousness is one trait of the five-factor model of personality, and is an aspect of what has traditionally been called character. It is manifested in characteristic behaviors such as being efficient, organized, neat, and systematic. (Thompson, E.R. October 2008).

The model presented in the supervisor rating study shows that the JobMatchTalent scales correlate with conscientiousness is predicting quality and structure.

The model presented in the supervisor rating study shows that the JobMatchTalent scales Work Structure and Decision Characteristics predicting quality of work correlate significantly with NEO PI-Rs Conscientiousness which is also found to be a good predictor of similar subjects.

The significant Big-Five dimension in the prediction of work structure and quality (i.e., Conscientiousness) and the significant JobMatchTalent scales (i.e., Work Structure and Decision Characteristics) predicting this work-related variable are highly intercorrelated (Garcia et al., 2013).



Figure 2: JobMatchTalents Work Structure, Decision Characteristics and NEO PR-Rs Conscientiousness are both predictors of qualities related to work structure and quality and found to have mutual significant correlations.

Supervisor rating of criterion measure: employees cooperation ability

JobMatch scales correlating with the criterion measure of cooperation is: Tolerance ($r = .42, p < .01$), Social Interest ($r = .41, p < .01$), Communication ($r = -.25, p < .01$), Stress Index ($r = .02, p < .01$),

The Convergent and discriminant validity study between JobMatchTalent and NEO PI-R (D. Garcia, A. Al Nima, T. Archer, 2013) shows that Agreeableness has significant correlation with both the Tolerance ($r = .56, p < .001$) and the Social Interest ($r = .49, p < .001$). See table 1.

Comparing the criterion measure of cooperation ability with the convergent and discriminant validity between JobMatchTalent and NEO PI-R, shows that the JobMatchTalent scales two most positively significant scales predicting the criterion measure of cooperation ability are the same scales correlating with the Five Factor models domain scale of Agreeableness. In the scientific literature it is suggested that the Five Factor models factor of Agreeableness is a good general predictor of cooperation skills. "People low in Agreeableness are uncooperative, manipulative, tend not to follow rules, and cheat to get ahead" (Goldberg, 1999). "Agreeableness has been found to predict aspects of job performance that involve interpersonal interactions"(e.g., Ilies, Scott, & Judge, in press; Mount et al., 1998), "but it is not considered a consistent predictor of task performance" (Barrick et al.,2001).

The model presented in the supervisor rating study shows that the JobMatchTalent scales that correlate with Agreeableness is predicting cooperation skills as Agreeableness is found in the literature to predict cooperativeness. The model also shows, in accordance with the literature, that

there are no significant correlation between JobMatchTalents predictors of cooperation skills and JobMatchTalents predictors of work performance in the very same way as it is found in the literature that Agreeableness has no significant prediction of work performance. (Klang 2012), (Murry R. Barrick, Michael K. Mount and Timothy A Judge. 2001)

The Big-Five models predictor of cooperativeness and the JobMatchTalents predictor of cooperativeness has significant correlation between each other as well as both are found not to predict work performance only predicting work behavior of cooperativeness.

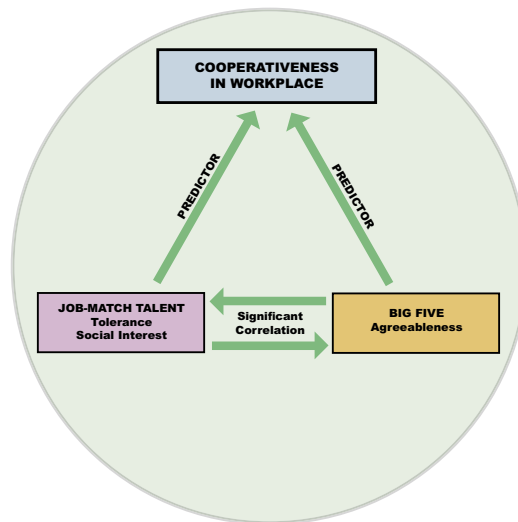


Figure 3: JobMatchTalents Tolerance, Social Interest and NEO PR-Rs Agreeableness are both found to be predictors of qualities related to work structure and quality and found to have mutual significant correlations.

Supervisor rating predictors of executives vs. no executives.

The supervisor rating study shows that there are a difference between the level of prediction between the group of executives and non executives. See table 4. To illustrate the difference between predictors of executives and non executives median correlation for both groups are shown below:

Supervisor rating criterion for productive behavior:

Median for executives: $\tilde{x} = .48$

Median for NON executives: $\tilde{x} = .24$

Supervisor rating criterion for quality and structure:

Median for executives: $\tilde{x} = .38$

Median for NON executives: $\tilde{x} = .36$

Supervisor rating criterion for cooperation skills:

Median for executives: $\tilde{x} = .35$

Median for NON executives: $\tilde{x} = .32$

What we see is that the predictors of cooperation skills and quality and structure are very similar between executives and non executives. We see a larger median difference on the criterion of productive behavior. The JobMatchTalent predictors for productive behavior, as described earlier in this study, finds to have significant correlation with BIG-FIVE MODEL s Extraversion. The scientific literature describes Extraversion as a more significant predictor for executives job performance than non executives. The supervisor rating study of the JobMatchTalent finds a similar coherence between productive behavior amongst executive and non executives, as is described in the scientific literature.

BIG-FIVE models Conscientiousness is described in the scientific literature as the general most common predictor of job performance. Extraversion is found to be best predictor within salespeople and executives. Referring to the above median table we finds that the supervisor rating study confirms and/or are coherent to other scientific studies of Extraversion and Conscientiousness.

Conclusions

The JobMatchTalent supervisor rating study (Jansson, 2012) in conjunction with the study addressing the construct validity of the JobMatchTalent test in relation to the Big-Five personality dimensions (Garcia et al., 2013) show clear overlap with findings in the literature suggesting that the Big-Five dimensions that are important in the prediction of productive behavior, quality and work structure and cooperation at the work place are: Conscientiousness, Extraversion and Agreeableness.

The scientific literature describes Extraversion as a more significant predictor for executives job performance than non executives. The supervisor rating study of the JobMatchTalent finds a similar coherence between productive behavior amongst executive and non executives, suggesting that the JobMatchTalent are able to differentiate between job performance predictors of executives and non executives, and suggest that this also shows an additional anchorages of that the supervisor rating study to the scientific literature.

Table 1. Pearson Correlation between the JobMatchTalent main scales and the NEO PI-R dimensions.

		JOBMATCH TALENT									
		Stability Patterns				Action Patterns			Relationship Patterns		
		Work structure	Inner drive	Stress index	Decision Characteristics	Activity	Drive	Acting	Tolerance	Social interest	Communication
NEO PI-R	Openness	-.07	.21**	-.02	-.09	.22**	.21**	.21**	.12*	.17**	.23**
	Conscientiousness	.50**	.32**	.28**	.49**	.12*	.25**	.25**	.01	-.09	.10
	Extraversion	-.10	.51**	.16**	.08	.60**	.37**	.48**	.18**	.18**	.54**
	Agreeableness	.08	.04	.14**	-.22**	-.14**	-.33**	-.20**	.56**	.49**	-.29**
	Neuroticism	-.09	-.57**	-.62**	-.24**	-.02	-.06	-.33**	-.32**	.01	-.03

Note: * p < .05, ** p < .01.



Convergent correlations



Discriminant correlations

Table 2. Pearson Correlation JobMatchTalent and NEO PI-R domain Scales.

		NEO PI-R				
		Openness	Conscientiousness	Extraversion	Agreeableness	Neuroticism
WORK STRUCTURE	Focus on planning	-.14**	.33**	-.26**	.04	.01
	Focus on details	.04	.25**	-.07	.11*	.02
	Focus on order	-.03	.49**	.09	.05	-.20**
PERSONAL DRIVE	Self-motivation	.01	.45**	.42**	-.23**	-.35**
	Optimism	.43**	-.11*	.44**	.07	-.06
	Mood stability	-.02	.34**	.22**	.14**	-.69**
STRESS INDEX	Self-control	-.09	.21**	-.08	.24**	-.47**
	Resilience	.04	.22**	.23**	.07	-.62**
	Concentration ability	.07	.16**	.26**	-.08	-.16**
DECISION CHARACTERISTICS	Thoughtfulness	-.22**	.34**	-.34**	.04	-.04
	Willpower	.10*	.18**	.38**	-.40**	-.06
	Persistence	-.01	.35**	.16**	-.03	-.34**
ACTIVITY	Physical Activity	.15**	.11*	.45**	.05	-.04
	Mental energy	.21**	.31**	.63**	-.13**	-.21**
	Need for speed	.16**	-.07	.40**	-.25**	.19**
DRIVE	Winning instinct	.08	.31**	.35**	-.37**	-.09
	Vision	.32**	.05	.31**	-.23**	.01
	Development motivation	.30**	.10*	.12*	.16**	-.01
ACTING	Sphere of influence	.17**	.23**	.38**	-.07	-.34**
	Power of initiative	.16**	.19**	.43**	-.29**	-.08
	Risk taking	.27**	-.06	.38**	-.26**	-.10
TOLERANCE	Concurring image	-.01	-.11*	-.14**	.48**	-.03
	Tolerant attitude	.14**	.01	.30**	.33**	-.32**
	Trust in others	.17**	.15**	.27**	.53**	-.43**
SOCIAL INTEREST	Displayed consideration	.13*	-.21**	.02	.38**	.14**
	Diplomacy	-.03	-.06	-.10*	.43**	-.06
	Contact creating	.36**	.14**	.72**	.02	-.17**
COMMUNICATION	Force in communication	.17**	.14**	.49**	-.34**	-.06
	Communicativity	.20**	-.01	.43**	-.18**	.10
	Openness	.36**	.15**	.61**	.03	-.33**

Note: * p < .05, ** p < .01.



Convergent correlations



Discriminant correlations

Table 3. Results of the regression analysis, JobMatchTalent subscales in the prediction of the 5 NEO PI-R domain Scales.

Predictor	Outcome	β	t	Adj. R2	F
Winning instinct	Openness	-.17	-2.2*	.27	7.73***
Vision		.28	4.49***		
Development motivation		.22	4.56***		
Contact creating		.16	2.01*		
Force in communication		-.22	-2.11*		
Thoughtfulness	Conscientiousness	.30	5.30***	.39	12.95***
Willpower		.17	2.29*		
Persistence		.15	3.22**		
Mental energy		.23	2.94**		
Winning instinct		.22	3.01**		
Power of initiative		.19	2.63**		
Risk taking		-.30	-5.02***		
Thoughtfulness	Extraversion	-.12	-2.71**	.63	32.06***
Physical activity		.10	2.51*		
Mental energy		.20	3.19**		
Development motivation		-.07	-2.18*		
Power of initiative		-.12	-2.07*		
Tolerant attitude		.11	2.57*		
Contact creating		.45	8.06***		
Openness		.16	3.09**		
Physical activity	Agreeableness	.11	2.31*	.52	20.73***
Winning instinct		-.13	-2.01*		
Development motivation		.15	3.84***		
Risk taking		-.21	-4.06***		
Trust in others		.45	9.78***		
Displayed consideration		.20	3.49**		
Willpower	Neuroticism	-.23	-3.00**	.38	12.34***
Persistence		-.13	-2.75**		
Need for speed		.18	2.61**		
Concurring image		-.31	-2.82**		
Tolerant attitude		-.14	-2.48*		
Trust in others		-.21	-4.06***		
Displayed consideration		.18	2.77**		
Diplomacy		.27	3.03**		
Communicativity		.30	3.62***		
Openness	-.17	-2.65*			

Note: * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4. Results of the regression analysis of the supervisor rating study, JobMatchTalent subscales in the prediction of the 5 NEO PI-R domain Scales.

Group	Criterion measure	Main scales JMT	Correlations
Correlations between index for criterion measure in supervisor rating study and main scales of JobMatchTalent			
MERGED GROUP (N=258)			
	Productive behavior	EFG J B	.36, .37, .42, .38, .20
	Quality and structure	A D	.49, .24
	Cooperation ability	HIJ C	.42, .41, -.25, .02
	Median value: .37 (p<.001)		
EXECUTIVES (N=120)			
	Productive behavior	EFG J B	.43, .49, .48, .58, .31
	Quality and structure	A D	.48, .28
	Cooperation ability	HIJ C	.55, .51, -.19, -.09
	Median value: .48 (p<.001)		
NON-EXECUTIVES (N=138)			
	Produktivt agerande	EFG J B	.28, .24, .36, .19, .09
	Quality and structure	A D	.49, .22
	Cooperation ability	HIJ C	.31, .33, -.33, .13
	Median value: .28 (p<.001)		

Designations: A=Work Structure, B=Inner Drive, C=Stress index, D=Decision Characteristics, E=Activity, F=Drive, G=Acting, H=Tolerance, I=Social interest, J=Communication.

Table 5: Correlation between supervisor rating criteria and the main scales of the JobMatchTalent (N=258)

Supervisor rating criterions	A	B	C	D	E	F	G	H	I	J
1. The ability to work together with others	.02	.02	-.04	-.12*	-.04	-.20**	-.12*	.35**	.39**	-.11
2. Manage to structure the work well	.39**	.00	.00	.25**	.00	.05	-.04	-.03	-.01	-.04
3. Keeps a high quality on tasks	.39**	-.07	-.01	.14*	-.04	.02	-.13*	-.09	-.05	-.11
4. Is productive and execute high level of production/result	.07	.10	.07	.14*	.18**	.19**	.23**	-.16**	-.19**	.21**
5. Has a tolerant and uncritical attitude to others	-.01	.02	.04	-.13*	-.09	-.19**	-.11	.42**	.34**	-.19*
6. Has the ability to inspire and get others to work	-.05	.23**	-.07	.07	.23**	.20**	.35**	-.02	-.02	.32**
7. Have a good adaptability to routines and roles	.15*	-.01	.04	-.08	-.13*	-.25**	-.21**	.20**	.22**	-.26**
8. Has the ability to be clear in expression and information	-.01	.04	-.14*	.15**	.32**	.21**	.28**	-.26**	-.18**	.46**
9. Is self-propelled and easy to keep one's self motivated	.08	.26**	.14*	.17**	.21**	.30**	.29**	-.10	-.14*	.11
10. Are proactive and take initiative	-.03	.18**	-.05	.07	.32**	.33**	.40**	-.17**	-.18**	.30**
11. Is committed and drive towards defined goals	.05	.16**	-.06	.17**	.24**	.38**	.32**	-.25**	-.23**	.26**

Not. * p<.05; ** p<.01.

References

- Barrick, M.R. & Mount, M.K. (1991). The big five personality dimensions and job performance: A meta-analysis. *Personnel Psychology, 44*, 1-26.
- Barrick, M. R., Mount, M. K., & Judge, T. A. (2001). Personality and performance at the beginning of the new millennium: What do we know and where do we go next? *International Journal of Selection and Assessment, 9*, 9-30.'
- Thompson, E.R. (2008). Development and Validation of an International English Big-Five Mini-Markers. *Personality and Individual Differences, 45*, 542–548.
- Andreas Klang (2012). Stockholm University - Department of Psychology. The Relationship between Personality and Job Performance in Sales.
- Murry R. Barrick, Michael K. Mount and Timothy A Judge. Personality and performance 2001 -Yee Ng and Soon Ang Nanyang Technological University. *Journal of Applied Psychology, 2008, Vol 93, No. 4, 733–743, Personality and Leader Effectiveness.*
- Jansson (2012) Creterion validity JobMatchTalent through supervisor rating study. Updated August 2013.
- Danilo Garcia, Ali Al Nima, Trevor Archer (2013) Convergent and discriminant validity between JobMatchTalent and NEO PI-R.