

Complex Relationships Among Personality Traits, Job Characteristics, and Work Behaviors

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The aim of the study was to investigate the additive, mediating, and moderating effects of personality traits and job characteristics on work behaviors. Job applicants ($N = 161$) completed personality questionnaires measuring extraversion, neuroticism, achievement motivation, and experience seeking. One and a half years later, supervisors rated the applicants' job performance, and the job incumbents completed questionnaires about skill variety, autonomy, and feedback, work stress, job satisfaction, work self-efficacy, and propensity to leave. LISREL was used to test 15 hypotheses. Perceived feedback mediated the relationship between achievement motivation and job performance. Extraversion predicted work self-efficacy and job satisfaction. Work stress mediated the relationship between neuroticism and job satisfaction. Job satisfaction and experience seeking were related to propensity to leave. Autonomy, skill variety, and feedback were related to job satisfaction.

Introduction

The relationships between personality traits and work behaviors, and between job characteristics and work behaviors have often been studied. Whereas most studies have focused on simple, direct relationships of personality traits and job characteristics with work behaviors, we investigated the more complex interrelationships among personality traits, job characteristics, and work behaviors. By using personality traits and job characteristics as predictors, the present study contributes to the integration of two practices: personnel selection and job redesign.

Personality and Work Behaviors

Meta-analyses have shown that personality traits are related to various occupational criteria including job performance, training proficiency, and job satisfaction (Barrick and Mount, 1991; Connolly and Viswesvaran, 2000; Salgado, 1997; Tett, Jackson, and Rothstein, 1991). Barrick and Mount (1991) found that conscientiousness, extraversion, and openness to experience are related to performance criteria across occupational groups, that

extraversion is related to job performance of salesmen and managers but not to job performance of professionals, policemen, and skilled workers, and that openness to experience is related to training proficiency. Matthews and Deary (1998) compared and summarized the meta-analyses conducted by Barrick and Mount (1991) and Tett et al. (1991), and concluded that conscientiousness is the most consistent predictor of job proficiency. Hough (1992) divided conscientiousness into narrower traits of achievement and dependability, and found that achievement showed the stronger associations with job proficiency, training success, and educational success. Salgado (1997) reviewed studies with samples from the European Community and found that conscientiousness and emotional stability are valid predictors across job criteria and occupational groups. Judge, Higgins, Thoresen, and Barrick (1999) found that extrinsic career success, operationalized by income and occupational status, was negatively related to neuroticism and was positively related to extraversion and conscientiousness. According to Matthews and Deary (1998, p. 241), the negative association between neuroticism and performance may vary with environmental stress and the cognitive complexity of the work performed.

Personality is not only related to job performance criteria, but is also a determinant of attitudinal or affective job outcomes such as job satisfaction. For example, Connolly and Viswesvaran's (2000) meta-analysis showed

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that positive affectivity, negative affectivity, and affective disposition are related to job satisfaction. At this point, it should be noted that the affective dispositions of negative and positive affectivity can be best compared to neuroticism and extraversion, respectively (Judge, Bono, and Locke, 2000; Watson and Clark, 1997). Staw, Bell, and Clausen (1986) reanalyzed several longitudinal studies and showed that, over a time span of nearly fifty years, job satisfaction was related to an affective dimension which was described by such terms as cheerful, warm, and satisfied with self. Also, Spector and O'Connell (1994) found that high levels of negative affectivity were predictive of low levels of job satisfaction and of high levels of work anxiety. In the last study, job conditions could not affect personality because the personality questionnaires were administered before the subjects started working. More recently, Judge et al. (1999) compared personality and mental ability to intrinsic and extrinsic career success and found that the Big Five personality traits measured in childhood predicted job satisfaction in late adulthood even after controlling for general mental ability. More specifically, Judge et al. (1999) found a negative relationship between neuroticism and intrinsic career success, i.e. job satisfaction. This relationship, however, disappeared in a regression analysis when other Big Five traits were entered into the regression equation. In this analysis, only conscientiousness remained a significant predictor. Contrary to the prediction, extraversion was unrelated to job satisfaction.

The results of the predictive studies by Staw et al. (1986) and Spector and O'Connell (1994) are in line with those of several cross-sectional studies. Levin and Stokes (1989) found that in a group of professional workers, the trait of negative affectivity correlated with two measures of job satisfaction ($r = -.31$ and $-.29$). After partialling out the effects of job characteristics, the correlations declined but remained significant. Judge and Hulin (1993) found that subjective well-being mediated the relationship between affective disposition and job satisfaction. However, their results suggest that there are reciprocal effects between job satisfaction and well-being. Finally, Judge et al. (2000) found that 'core self-evaluations', i.e. a composite measure of self-esteem, generalized self-efficacy, locus of control and neuroticism, were related to job satisfaction.

Job Characteristics and Work Behaviors

The most well known model in job design is Hackman and Oldham's (1976) Job Characteristics Model. According to this model, five core job characteristics, namely, skill variety, autonomy, feedback, task identity, and task significance affect three psychological states that, in turn, affect work outcomes such as intrinsic work motivation, job satisfaction, absenteeism, turnover, and work quality. These relationships would be moderated by the growth need strength of the individual. Most parts of the model

have been confirmed in meta-analytical studies by Fried and Ferris (1987) and by Loher, Noe, Moeller, and Fitzgerald (1985) showing that job characteristics are related to several work outcomes. The moderating effect of growth need strength has also been confirmed, but the results have been less supportive of the mediating role of the psychological states. Roberts and Glick (1981) criticized these studies because of their cross-sectional design, and argued that relationships between job characteristics and job attitudes could be explained by cognitive consistency within the person. However, a review of ten experimental studies (Thomas and Griffin, 1983) showed that objective task changes do affect an individual's perception of the job.

In the studies cited above, the relationships among personality traits, job characteristics, and work behaviors have been investigated independently of one another. Some studies have included their combined effects. Williams, Gavin, and Williams (1996) studied the relationships between negative affectivity, job complexity and job satisfaction. The aim of their study was to investigate the biasing effects of negative affectivity on the relationships between job characteristics and job attitudes. Two structural-equations-modeling approaches suggested that although negative affectivity is related to predictors and criteria, it does not bias the relationships between them. Munz, Hulseman, Konold, and McKinney (1996) studied the relationship of both negative and positive affectivity with job characteristics and job outcomes as measured by Hackman and Oldham's (1975) Job Diagnostic Survey. The relationships between job characteristics and job outcomes were not associated with negative affectivity, but positive affectivity showed a weak association with these relationships. Spector, Fox, and Van Katwyk (1999) rejected the bias hypothesis, stating that negative affectivity relates only to job characteristics as rated by incumbents. On the contrary, negative affectivity correlated with job characteristics rated by supervisors and job analysts, but not with job characteristics rated by job incumbents.

Growth need strength (GNS) is a moderator variable in Hackman and Oldham's Job Characteristics Model but GNS is not a widely accepted personality trait. It has been operationalized as the need to be satisfied by the core job characteristics. To state that individuals high on this trait are more satisfied by the job characteristics than individuals low on this trait is more or less tautological. In the present study, well-established personality traits were used and combined in several ways with job characteristics. More dependent variables were used than in most studies and they were measured using different sources: supervisors and job incumbents.

The Present Study

The aim of the present study was to investigate more complex relationships among personality traits, job

characteristics, and work behaviors in addition to simple, direct relationships. First, personality traits and job characteristics can have additive or non-additive effects on work behaviors. The effect of a second independent variable on a dependent variable is additive, with regard to another independent variable, if it explains significant variance in the dependent variable above and beyond that explained by the first independent variable. Second, personality traits and job characteristics can have indirect effects on work behaviors via intervening variables. In this case, the first variable is related to the intervening variable and it is in turn related to a third variable, forming a causal chain. Third, personality traits can have moderating effects on the relationships between job characteristics and work behaviors, and vice versa.

To investigate additive and indirect effects we constructed a path-analytic based on the research literature (see Figure 1). Because personality traits are more or less stable (Judge et al., 1999; Matthews and Deary, 1998) we assumed that the paths from these traits go to other variables used in this study. Of course, other variables and other paths could be included in the model. Therefore, it should be considered as a first attempt to construct such a model, which can be improved in future studies. The model illustrates how personal and environmental variables can be integrated. To facilitate the comparison with other studies, we used well-established personality traits and job characteristics: the Big Five personality dimensions or facets, and Hackman and Oldham's (1976) core job characteristics respectively.

Achievement motivation and job performance. Referring to the upper part of Figure 1, one of the most important findings with respect to the predictive validity of

personality traits is that conscientiousness is related to job performance across occupational groups. Evidence from the literature was already given in the previous section. Vinchur, Schippmann, Switzer, and Roth (1998) showed in their meta-analytic review that the achievement component of conscientiousness is a good predictor of job performance for salespeople, and Piedmont and Weinstein (1994) have shown that the NEO-PI conscientiousness facet scale of Achievement Striving is the best predictor of supervisor ratings in a wide range of occupations. Finally, Stewart (1999) found that the achievement component of conscientiousness correlated more strongly with job performance in the maintenance stage, whereas the order component of conscientiousness correlated more strongly in the transition stage. Therefore, we assumed that achievement motivation predicts job performance two years later (*hypothesis 1*). However, because it will be argued below that this relationship is mediated by feedback the path from achievement motivation to job performance in Figure 1 is indicated with 0.

Feedback as mediator between achievement motivation and job performance. It is not completely clear why there is a relationship between conscientiousness and job performance. Barrick, Mount, and Strauss (1993) suggested that it is because of the mediating effect of goal setting. We propose that people high on the achievement component of conscientiousness seek more feedback than people low on this component and that by using this feedback they will perform better. The mediating effect of feedback on the relationship between achievement motivation and job performance is in accordance with Locke and Latham's (1994) goal-setting theory, following which feedback can lead to setting of high goals, thereby affecting performance.

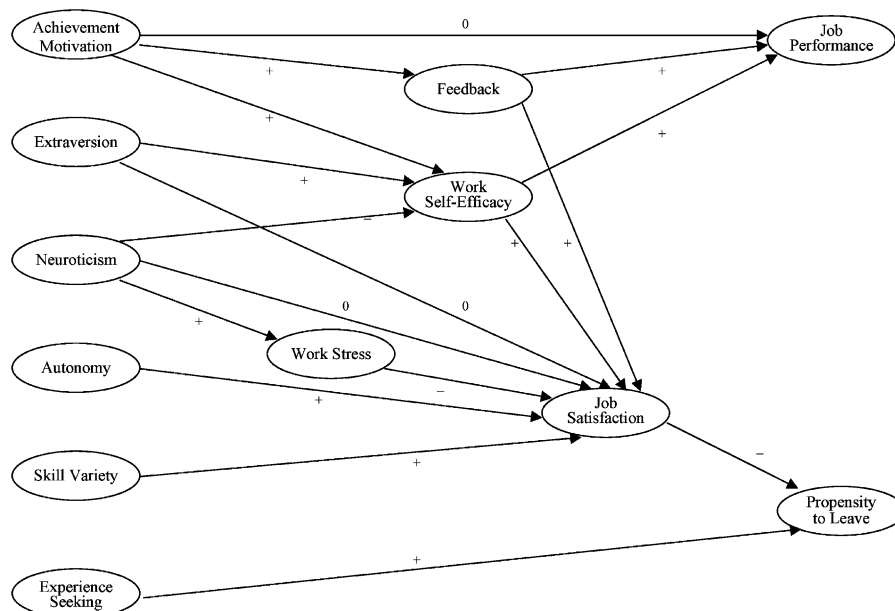


Figure 1. Hypothesized model relating personality traits, job characteristics, and work behaviors. + = significant positive relationship, - = significant negative relationship, and 0 = non-significant relationship

This is supported by findings that achievement needs are related to feedback seeking behavior (Klich and Feldman, 1992) and that job feedback is the job characteristic most strongly related to job performance (corrected $r = .22$) (Fried and Ferris, 1987). Therefore, we hypothesized that job feedback mediates the relationship between achievement motivation and job performance (*hypothesis 2*).

Work self-efficacy as mediator between personality and job performance. Another explanation for the relationship between achievement motivation and job performance is that employees high on achievement motivation make more use of their competencies than employees low on achievement motivation, and therefore increase their self-efficacy, which leads to better performance. This reasoning was based on Bandura's (1986) social-cognitive theory following which self-efficacy is of fundamental importance to performance, and it is supported by research findings. Schwarzer (1994) reported that the personality traits of achievement motivation, extraversion, and neuroticism correlated with self-efficacy. Also, Thoms, Moore, and Scott (1996) found significant correlations between achievement motivation, neuroticism, and extraversion and self-efficacy for participating in self-managed groups. More recently, Judge et al. (2000) found that neuroticism was strongly related to generalized self-efficacy ($r = -.60$). They showed that neuroticism and self-efficacy belong to the core self-evaluations, but can be considered as different constructs. In turn, following Sadri and Robertson's (1993) meta-analysis, self-efficacy is related to job performance (mean corrected $r = .37$). Also, Judge and Bono's (2001) meta-analysis showed that these variables are related (mean corrected $r = .23$). Therefore, we hypothesized that work self-efficacy mediates the relationship between achievement motivation and job performance (*hypothesis 3*). Extraversion and neuroticism are related to self-efficacy (see above), and neuroticism is related to job performance (Salgado, 1997). Therefore, we hypothesized that extraversion would predict work self-efficacy (*hypothesis 4*), and that work self-efficacy would mediate the relationship between neuroticism and job performance (*hypothesis 5*).

Personality and job satisfaction. Several studies showed that job satisfaction is related to personality. Judge et al. (1999) found that childhood neuroticism predicted job satisfaction in late adulthood ($r = -.22$). Judge and Bono (2001) reported in their meta-analysis a corrected mean correlation between emotional stability and job satisfaction of .24. Accordingly, Lucas and Fujita's (2000) meta-analysis showed that extraversion is related to pleasant affect. This finding is highly relevant because job satisfaction is defined as a pleasurable or positive emotional state resulting from an appraisal of one's job (Locke, 1969). Lucas and Diener (2001) explained this relationship by the fact that extraversion represents sensitivity to rewards and the tendency to experience pleasant affect. Accordingly, Judge, Heller, and Mount (2002) showed in their meta-analysis that from the Big Five personality traits only

neuroticism and extraversion are related to job satisfaction across studies. Connolly and Viswesvaran (2000) showed in their meta-analysis that negative affectivity and positive affectivity are related to job satisfaction (mean corrected r 's were $-.33$ and $.49$ respectively). Watson and Slack (1993) found that negative affectivity and positive affectivity predicted job satisfaction levels two years later. Watson and Clark (1984) explained these relationships by general appraisal tendencies, namely, individuals high on negative affectivity would tend to have negative experiences and individuals high on positive affectivity would tend to have positive experiences. Clark and Watson (1991) described these traits as lenses through which the environment is interpreted. On the basis of these studies, we hypothesized that neuroticism is negatively related to job satisfaction and that extraversion is positively related to job satisfaction (*hypotheses 6 and 7*).

Work self-efficacy as mediator between personality and job satisfaction. An alternative explanation of the relationships between neuroticism and extraversion and job satisfaction is that these traits affect work self-efficacy, which in turn affects job satisfaction. This explanation is in accordance with the fact that neuroticism and extraversion are related to self-efficacy (see before). In addition, Judge and Bono (2001) showed in their meta-analysis that generalized self-efficacy is related to job satisfaction (mean corrected $r = .45$). They explained this relationship as follows, "Because individuals with high self-efficacy deal more effectively with difficulties and persist in the face of failure, they are more likely to attain valued outcomes and thus derive satisfaction from their jobs." (p. 81) Therefore, we hypothesized that generalized self-efficacy mediates the relationships between neuroticism and job satisfaction, and between extraversion and job satisfaction (*hypotheses 8 and 9*).

Work stress as mediator between neuroticism and job satisfaction. Also, the level of occupational stress can explain the relationship between neuroticism and job satisfaction. Hemenover and Dienstbier (1996) found that the general appraisal tendencies related to neuroticism predicted appraisals of stressors. In turn, work stress is likely to result in job dissatisfaction. A positive relationship between neuroticism and stress has consistently been reported (see Walsh, Wilding, Eysenck, and Valentine, 1997). Spector and O'Connell (1994) found that negative affectivity predicted job strain one year later. Also, Deary et al. (1996) reported significant relationships between neuroticism and job-related stress. In turn, according to Peiro and Gonzalez's (1991) causal model, role stress is an antecedent of job satisfaction. On the basis of these findings, we predicted that work stress mediates the relationship between neuroticism and job satisfaction (*hypothesis 10*). Hypotheses 8, 9, and 10 are in accordance with the general notion in this field that extraversion is more related to positive evaluations and that neuroticism is more related to negative evaluations. However, Munz et al.

(1996) found that negative and positive affectivity had substantive relationships with the job characteristics and affective outcome scales. Therefore, we assumed that extraversion and neuroticism are related to the bipolar construct of job satisfaction but with reversed signs.

Job satisfaction, experience seeking, and propensity to leave. According to path-analytical studies by Bedeian and Armenakis (1981), Klenke and Mathieu (1990), and Peiro and Gonzalez (1991), job satisfaction affects propensity to leave. Furthermore, in a meta-analytical study by Tett and Meyer (1993) the mean correlation between job satisfaction and intent to leave was $-.58$. Therefore, we hypothesized that job satisfaction is negatively related to propensity to leave (*hypothesis 11*). Following the model in Figure 1, neuroticism and extraversion have indirect effects on propensity to leave. This is in accordance with a study by Day, Bedeian, and Conte (1998) who found that the relationships between personality traits and propensity to leave were fully mediated by role stress and job satisfaction. Some studies showed that propensity to leave is also related to sensation seeking (Lee and Mowday, 1987; Taris, Heesink, Feij, Van der Velde, and Van Gastel, 1991). This is in accordance with Zuckerman's (1994) theory, which holds that sensation seekers look for stimulation to increase their level of arousal. A new job can provide experiences that sensation seekers are looking for. Especially the sensation-seeking dimension of experience seeking seems to be related to propensity to leave. Therefore, we supposed that experience seeking predicts propensity to leave (*hypothesis 12*).

Job characteristics and job satisfaction. The hypotheses concerning the relationships between job characteristics and job satisfaction were derived from Hackman and Oldham's (1976) model. The meta-analyses by Fried and Ferris (1987) and by Loher et al. (1985) showed that skill variety, autonomy, and feedback are the job characteristics most strongly related to job satisfaction. It should be noted that some discussion is possible about the number of discernable job dimensions in the factor-structure of the Job Diagnostic Survey (see Renn, Swiercz, and Icenogle, 1993). However, we based our selection of variety, autonomy, and feedback, as the dimensions of most interest, on the existence of well-established theoretical positions for each of these dimensions. For example, Dodd and Ganster (1996) demonstrated in an experimental study, that manipulations and perceptions of skill variety and autonomy predicted satisfaction. Therefore, we followed suit and assumed that skill variety, autonomy, and feedback are related to job satisfaction (*hypotheses 13, 14, and 15*). Hackman and Oldham assumed that the job characteristics also affect job performance, but very low correlations with this criterion were reported in the meta-analyses mentioned above.

Moderating effects. Following Hackman and Oldham's (1976) model, GNS moderates the relationships between job characteristics and work behaviors. Growth need

strength is defined as "the strength of the respondent's desire to obtain 'growth' satisfaction from his or her work" (Hackman and Oldham, 1975, p. 163). In the present study, we investigated the moderating effects of several more established personality traits on the relationships between job characteristics and work behaviors. Such a personality trait is experience seeking which is defined as "the seeking of arousal through the mind and senses through a nonconforming lifestyle." (Zuckerman, 1979, p. 102) According to McCrae (1990), this construct parallels the Big Five personality dimension of openness to experience. De Jong, Van der Velde, and Jansen (2001) found that, as with GNS, openness to experience moderated the relationships between job characteristics and job satisfaction.

Time lag. The present study is uniquely suited to test the model presented in Figure 1 and the interactions described above because the personality traits were measured one and a half years before the work behaviors. This time lag is firstly important because personality factors would predict performance more in the long run (Ferguson, 1960). Accordingly, Tett et al. (1991) showed that personality measures predict performance better when samples are composed of longer tenured employees. Secondly, this procedure also controls for several biases because it excludes response consistency between the personality questionnaires and the follow-up questionnaires, and because it reduces the possible effects of the job on the incumbent's personality. Thirdly, the research design is congruent with the procedure in personnel selection in which personal traits are used to predict work behaviors.

Method

Participants and Procedure

The data were collected from a medium-sized, private consulting company that screens applicants for its corporate clients. A total of 441 applicants in various jobs participated in the first phase of the study, during which tests were administered and selection interviews were held. The personality questionnaires were administered to the applicants as part of the standard selection procedure. A large range of jobs was included to obtain sufficient variance in the job characteristics. Table 1 lists the jobs for which the applicants in our sample applied. As a standard procedure of the consulting company, 18 months after hire evaluation forms were sent to client organizations with the request to rate the employees, but not to show the ratings to the employees. This was done to reduce leniency in the ratings. Ninety-one percent of the evaluation forms were returned to the company. Eighteen months after the initial interview, follow-up questionnaires were also sent to the home addresses of the 411 applicants, including those rejected. Although the consulting organization primarily used other characteristics, such as abilities and job

Table 1. Number of Applicants per Job Category

Job category	<i>n</i>
Manager	31
Engineer	15
Labor analyst	10
Technical commercial jobs	14
Commercial jobs	21
Bookkeeper	20
Medical social jobs	11
Personnel manager	20
Accountant	14
Fiscal jobs	14
Social worker	11
	181

knowledge, for selecting applicants, some restriction of range might occur because of the intercorrelations with personality measures. The means and standard deviations of the personality scales of the unrestricted sample are 68.8 and 14.3, respectively, for Extraversion, 23.9 and 10.9, respectively, for Neuroticism, 31.1 and 5.6, respectively, for Achievement Motivation, and 43.7 and 9.5, respectively, for Experience Seeking. Comparison with the means and standard deviations in the restricted sample (see Table 2) indicates a small effect of restriction of range. This means that the correlations between the personality traits and the follow-up data were underestimates of the correlations in the unrestricted sample. One hundred and eighty-one completed questionnaires were returned, yielding a response rate of 44%. The percentage of females in the original sample was 38.5% and in the final sample this figure was 23.9%. The selection ratio of the original sample was .60 and in the final sample it was .89. The average age in both samples was 32 (*SD* = 7).

Measures

Neuroticism. The Neuroticism scale of the Amsterdam Biographic Questionnaire (Wilde, 1971), which is a Dutch modification of the Eysenck Personality Questionnaire (Eysenck and Eysenck, 1975), was used to measure neuroticism. Wilde (1971) reported that this scale consisting of 30 items had a split-half reliability of .86. A sample item is: "Do you often fret about the past?" The answer categories are *yes*, *?*, and *no*. Hoekstra, Ormel, and De Fruyt (1996) found that this scale correlated .75 with the total Neuroticism scale of the Dutch Big Five personality questionnaire, the NEO-PI-R. In the present study, the Cronbach alpha was .82.

Extraversion. Extraversion was measured with the Extraversion scale of the Amsterdam Biographic Questionnaire (Wilde, 1971). The scale consisting of 21 items had a split-half reliability of .80 (Wilde, 1971). A sample

Table 2. Intercorrelations Among Main Variables, Means, and Standard Deviations (N = 161)

Variable	2	3	4	5	6	7	8	9	10	11	12	<i>M</i>	<i>SD</i>
1. Extraversion	-.19*	.29**	.18*	.13	.11	.08	.21**	.00	-.03	.32**	-.00	68.8	14.2
2. Neuroticism		-.07	.13	-.01	.01	-.00	-.18*	.25**	.23**	-.16*	.00	23.9	10.9
3. Achievement motivation			.03	.05	-.02	.30**	.03	.09	.03	.26**	.18*	31.1	5.6
4. Experience seeking				-.12	-.04	-.02	-.08	.11	.20**	.15	.03	43.7	9.5
5. Skill variety					.36**	.09	.37**	.03	-.19*	.18*	-.07	6.2	1.2
6. Autonomy						.05	.39**	.04	-.24**	-.02	-.05	6.8	1.3
7. Feedback							.17*	.04	-.17*	.13	.21*	5.5	1.8
8. Job satisfaction								-.30**	-.62**	.14	.04	90.6	12.5
9. Work stress									.40**	.00	-.07	16.2	5.9
10. Propensity to leave										.01	-.08	6.2	4.5
11. Work self-efficacy											.08	62.8	6.8
12. Job performance												12.8	2.5

p* < .05, *p* < .01.

item is: "Do you think you are a talkative person?" The answer categories are *yes*, *?*, and *no*. This scale correlated .78 with the total Extraversion scale of the NEO-PI-R (Hoekstra et al., 1996). We found a Cronbach alpha of .81.

Achievement motivation. To measure achievement motivation we used the Achievement Motivation scale, a Dutch self-report questionnaire constructed by Hermans (1970). The scale consists of 44 items representing several theoretical aspects of the achievement motive, such as achievement behavior, aspiration level, upward mobility and persistence. A sample item is: "For me, performing better than others is ..." with four answer categories ranging from *very important* to *not so important*. Hermans (1976) reported a scale reliability (KR 20) of .86 in a large sample consisting of job applicants and vocational counseling clients. The scale showed sufficient discriminant validity against the criterion of achievement anxiety (Hermans, 1970). In a more recent study, the scale correlated .67 with the total Conscientiousness scale of the NEO-PI-R (Hoekstra et al., 1996).

Experience seeking. Experience seeking was measured with the Sensation Seeking Questionnaire by Van den Berg and Feij (1988). This questionnaire is a modification of Zuckerman's (1979) general Sensation-Seeking Scales for personnel selection. The Experience-Seeking scale has 11 items, one of which is: "I would like to wander for a while." The answer categories range from 1 (*completely disagree*) to 7 (*completely agree*). In our sample of 441 applicants, the Cronbach alpha of the Experience-Seeking scale was .71. McCrae and Costa (in Zuckerman, 1994) reported a correlation of $r(217) = .54$ between the NEO-PI scale of Openness to Experience and Zuckerman's (1979) Experience-Seeking scale, whereas Zuckerman, Kuhlman, Joireman, Teta, and Kraft (1993) found that these scales correlated $r(157) = .43$.

The four personality scales described above were administered to a sample of 665 applicants for various jobs (Van den Berg and Feij, 1993). In a factor analysis on 15 personality measures, these four personality scales loaded highest on each of the four factors found. We see these results as support for the choice of our scales.

Job characteristics. We did not use Hackman and Oldham's (1975) Job Descriptive Survey to measure job characteristics because Taber and Taylor (1990) showed that this instrument has important psychometric limitations. They attributed the low internal consistencies of the scales to the use of items with different formats. They also suggested developing more objective measures by asking more objective and less evaluative questions. To follow this suggestion we developed anchored rating scales. First, we constructed a preliminary instrument for measuring *skill variety*, *autonomy*, and *feedback*. We formulated the following items per scale. Skill Variety: "There is much skill variety in the job" and "The problems to be solved vary strongly"; Autonomy: "There is much opportunity to contribute own ideas", "One should work following the

instructions of superiors", and "One can take independent decisions with respect to own work"; and Feedback: "From the results, I know whether or not I am performing well". The answer format consisted of Likert-type scales ranging from 1 (*completely disagree*) to 5 (*completely agree*). Seven psychologists from the consulting firm, where the data were collected, rated the following ten jobs: management consultant, system analyst, personnel manager, technical commercial employee, job analyst, medical officer, accountant (controller), bookkeeper (in a small company), programmer, and health insurance act reporter. To estimate the scorer reliability we calculated the indexes of within-group interrater agreement of the items, as indicated by James, Demaree, and Wolf (1993). These values ranged from .91 to .71 and showed that the interrater agreements are acceptable. On the basis of the job ratings, we constructed rating scales consisting of vertical bars, similar to Thurstone scales, for each item. The mean scores of eight jobs were used as anchor points to indicate several levels of job characteristics. The standard deviations of the ratings of technical commercial employee and job analyst were too high for this purpose. The answer categories on these items ranged from 1 (bottom) to 9 (top).

The 181 participants in the main study were asked to rate their own job on these items. It was necessary to assess the job characteristics at the same time as the work behaviors because both need to be related to the same position in the company and because job characteristics normally have short-term effects. Therefore, they were measured with the follow-up questionnaire 18 months after the selection procedure. Taylor (1968) showed that rater agreement for anchored scales is higher than for ordinary graphic rating scales, suggesting that the reliabilities of the final items are higher than those of the pilot-study items. The scores on the items measuring skill variety and autonomy were summed to form two scales. The Cronbach alphas of these scales were .72 and .64, respectively. Following another suggestion by Taber and Taylor (1990), we compared the measures with independent assessments of the job. The supervisors of 70 respondents rated the jobs involved on similar items adapted to rate others' jobs. The commensurate correlations were for skill variety $r = .33$ ($p < .05$), for autonomy $r = .31$ ($p < .05$), and for feedback $r = .44$ ($p < .001$). The results show that the ratings by job incumbents and their supervisors were related, although their perceptions differed (cf. Spector et al., 1999).

Work behaviors. Eighteen months after the participating applicants were hired their supervisors rated their *job performance*. The evaluation form consisted of four items: (a) "the intellectual capacities of the person in order to perform his job are ...", (b) "the professional skills of the person are ...", (c) "the amount of work the person achieves is ...", and (d) "the way the person gets on with others in his work environment is ...". These items were applicable to all jobs and made it possible to compare

performance in different jobs on several general aspects. The responses were *very good* (1), *good* (2), *sufficient* (3), *below average* (4), *insufficient* (5), and *bad* (6). Factor analysis showed that the items measured only one dimension. The item scores were reversed and summarized to form a single performance measure. The Cronbach alpha of the scale was .81 ($N = 165$).

A 12-item *work self-efficacy* scale was derived from performance rating scales often used in organizations. The items were selected on the basis of applicability to various jobs and were reformulated in order to represent self-efficacy. Sample items from the questionnaire are: "Resolution: I am able to decide quickly, to make judgements, and to undertake actions" and "Cooperation: I am able to function as a fully-fledged member of a group, even when I am not the leader." The participants were asked to rate themselves in comparison to colleagues on 7-point scales ranging from 1 (*very little*) to 7 (*very much*), and to indicate whether the behavior described in the item was important for performing their job. Cronbach alpha was .81 ($N = 177$). For each subject, the scores on the items indicated as important were summed and corrected for the number of items.

The majority of *job satisfaction* items were borrowed from the Specific Satisfactions scale of the Job Diagnostic Survey (Hackman and Oldham, 1975), which measures intrinsic and extrinsic aspects of job satisfaction. The items were translated into Dutch. In the heading, the subjects were asked to indicate how satisfied they were with aspects of the job described below. Examples are: "The amount of personal growth and development I get in doing my job" and "The amount of challenge in my job." The items had 7-point Likert-type scales ranging from 1 (*extremely dissatisfied*) to 7 (*extremely satisfied*). In the present study, the 15-item scale had a Cronbach alpha of .90 ($N = 180$) and correlated .68 with the single item for global job satisfaction: "All in all, how satisfied are you with your present job?" It should be noted that we conceived job satisfaction as a bipolar dimension running from high dissatisfaction to high satisfaction.

Work stress was measured using the Job-induced Tension scale of the Anxiety-Stress Questionnaire (House and Rizzo, 1972) consisting of seven items. The questionnaire was translated into Dutch. Sample items are: "I work under a great deal of stress," and "Problems associated with my job have kept me awake at night." The respondents were asked to answer the items, using seven-point Likert scales ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). One item was deleted because it correlated poorly with the total score of the other items. In the present study, the Cronbach alpha was .74 ($N = 181$).

A 3-item scale of Intention to Turn Over, from the Michigan Organizational Assessment Questionnaire, was used to measure *propensity to leave*. Seashore, Lawler, Mirvis, and Cammann (1982) reported a Cronbach alpha of .83. This questionnaire was also translated into Dutch

and yielded a Cronbach alpha of .87 ($N = 181$) in the present study. A sample item is: "I will probably look for a new job in the next year." The response categories ranged from 1 (*strongly disagree*) to 7 (*strongly agree*).

Statistical Analysis

The model presented in Figure 1 was tested with structural equation modeling by using LISREL 8. In this model, all latent variables had single observed variables as indicators. We set the variance of each observed variable to 1 minus the reliability to account for the effects of measurement errors. This procedure was preferred above using parcels of the measures because in this way all parts of the instruments contributed equally to the latent variables, while the unreliability was accounted for. The following reliability estimates were used: neuroticism .82, extraversion .81, achievement motivation .86, experience seeking .71, skill variety .72, autonomy .64, feedback .75, job performance .81, work self-efficacy .81, job satisfaction .90, work stress .74, and propensity to leave .87. The reliability of Achievement Motivation was derived from a similar study and was, therefore, assumed to be a good estimate. For the single-item scale of feedback we used the scorer reliability, which seemed to be appropriate because with nonobjective measures the scorer reliability is as relevant as usual types of reliability (Cascio, 1998, p. 92).

The mediator effects were tested using the following rules. A variable functions as a mediator when it meets the following conditions: (a) the path from the independent variable to the presumed mediator is significant, (b) the path from mediator to the dependent variable is significant, and (c) a previously significant relationship between the independent and dependent variables is no longer significant, when the other paths are controlled (Baron and Kenny, 1986, p. 1176). An important advantage of testing mediator effects with structural equation modeling is that the measurement errors can be controlled.

The interaction effects among the personality traits and job characteristics on work behaviors were tested with moderated regression analyses. The personality traits and the job characteristics concerned were entered in the first step and the cross-product of these independent variables was entered in the second step. In order to reduce multicollinearity, the scores of the main independent variables were standardized before the cross-products were computed (see Cohen and Cohen, 1983). Collinearity analyses showed that in none of the regressions the condition index exceeded the critical value of .30.

Results

The correlations between the variables are presented in Table 2. Because some participants did not complete all personality questionnaires, listwise deletion resulted in a

sample of 161 subjects. The correlations among the personality traits were low and were in line with the Big Five personality model. Some correlations among the job characteristics were moderately high, but independence of the job characteristics is not assumed in Hackman and Oldham's (1976) model.

Structural Equations Modeling

The correlation matrix was used to test the path model shown in Figure 1. The result of the chi-square test was: $\chi^2(33, N = 161) = 34.05, p = .42$. This means that the model as a whole did not significantly differ from the data. The root mean square error of approximation (RMSEA) was .014 and, following Hu and Bentler (1999), the RMSEA of a good model is lower than .06. The adjusted goodness-of-fit index (AGFI) was .92 and the non-normed fit index (NNFI) was .99, both of which should be higher than .90. So, all these fit statistics indicated that the model fitted well. Conclusions with respect to the hypotheses were drawn from the resulting path diagram presented in Figure 2 as well as from the zero-order correlations (Table 2).

As shown in Table 2, the correlation between achievement motivation and job performance was significant. This means that hypothesis 1 is confirmed. The paths from achievement motivation to feedback and from feedback to job performance were significant, whereas the relationship between achievement motivation and job performance was no longer significant. These findings confirm hypothesis 2 that feedback mediates the relationship between achievement motivation and job performance. Because the non-significant path from work self-efficacy to job performance

might also affect these results the mediating effect was tested in a separate model with achievement motivation, feedback, and job performance. The results were nearly the same confirming the hypothesis about the mediating effect of feedback.

The path from work self-efficacy to job performance was not significant. This result is not in accordance with hypothesis 3 that work self-efficacy mediates the relationship between achievement motivation and job performance. Because this path was also not significant in a separate model, we concluded that the hypothesis is not confirmed.

The zero-order correlations between extraversion and work self-efficacy, and the path from extraversion to work self-efficacy were significant. This means that hypothesis 4 is confirmed. However, hypothesis 5 that work self-efficacy mediates the relationship between neuroticism and job performance is not confirmed because the correlation between neuroticism and job performance, and the path from neuroticism to work self-efficacy, were not significant. Neuroticism did correlate with work self-efficacy, but it had no additive effect on this variable.

The correlations between neuroticism and extraversion, and job satisfaction were significant (see Table 2) confirming hypotheses 6 and 7. However, hypotheses 8 and 9 (that work self-efficacy mediates the relationships between neuroticism and extraversion) are not confirmed because the path from work self-efficacy to job satisfaction and the zero-order correlations between these variables were not significant.

The paths from neuroticism to work stress and from work stress to job satisfaction were significant. The path from neuroticism to job satisfaction was not significant,

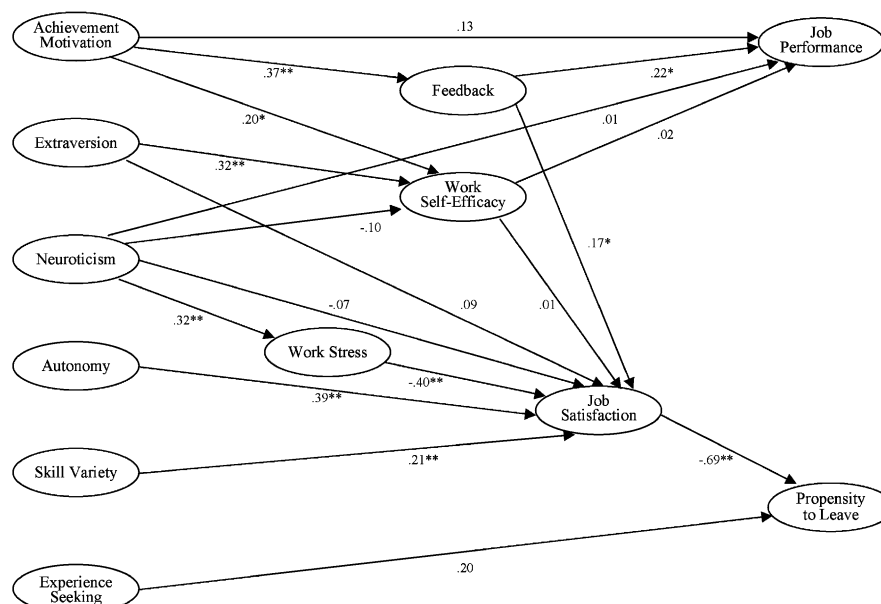


Figure 2. Resulting model relating personality traits, job characteristics, and work behaviors. Latent variables are presented within ovals

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

whereas the zero-order correlation between these variables was significant. These results confirm hypothesis 10 that work stress mediates the relationship between neuroticism and job satisfaction. The mediating effect of work stress was also found in a separate model with these three variables.

The correlation between job satisfaction and propensity to leave and the path between these variables were significant, which results confirm hypothesis 11 concerning this relationship. Also, the path from experience seeking to propensity to leave was significant. This result confirms hypothesis 12 that experience seeking predicts propensity to leave. The modification indices that are part of the output of LISREL suggested that a path from work stress to propensity to leave should be added. This means that in the present sample work stress had a direct effect on propensity to leave, in addition to the indirect effect via job satisfaction. This finding should be replicated in future studies.

The paths from skill variety, autonomy, and feedback to job satisfaction and the zero-order correlations between these variables were significant. These results confirm hypotheses 13, 14, and 15 that these job characteristics are related to job satisfaction.

The model in Figure 2 consists of two independent parts. The dependent variables in the upper part describe performance criteria, whereas those in the lower part describe job attitudes. Performance criteria were related to achievement motivation, extraversion, and feedback, whereas job attitudes were related to neuroticism, experience seeking, autonomy, skill variety, and feedback. These results indicate that these types of work behaviors are unrelated to one another (see Table 2) and are related to mostly different independent variables.

Moderated Regression Analysis

The interactions between the job characteristics and personality traits were tested with moderated regression analyses. Four personality traits, three job characteristics, and five work behaviors yielded 60 possible interactions. From these 60 interactions the following four were significant: the interaction between experience seeking and autonomy on job performance ($\beta = -.23, p < .001$), the interaction between experience seeking and feedback on work stress ($\beta = .17, p < .05$), the interaction between neuroticism and autonomy on job performance ($\beta = .16, p < .05$), and the interaction between achievement motivation and feedback on work stress ($\beta = -.16, p < .05$). Because the number of significant interactions barely exceeded the level of chance the interactions should be replicated however before interpretations are useful.

Discussion

The present study shows that in addition to simple relationships more complex relationships among person-

ality traits, job characteristics, and work behavior exist. The simple, direct relationships are presented in Table 2 and the additive and the mediated relationships are shown in Figure 2. Following the model, achievement motivation and extraversion had additive effects in predicting work self-efficacy. The relationship between extraversion and work self-efficacy can be explained by the high number of subjects holding jobs in which communication is important. From the sample of 161 subjects, 108 had the following jobs: manager, labor analyst, technical commercial jobs, commercial jobs, medical social jobs, personnel manager, or social worker. More studies in more specific groups of jobs are needed to investigate this relationship. Skill variety, autonomy, feedback, and work stress had additive effects on job satisfaction. The results are in accordance with the meta-analyses by Fried and Ferris (1987), and by Loher et al. (1985), who found that autonomy, skill variety, and feedback are the best predictors of job satisfaction. Finally, job satisfaction and experience seeking had additive effects on propensity to leave. This last result suggests that two reasons for leaving the job can be discerned: dissatisfaction with the present job and seeking the experience of a new job. Future studies should take these different reasons for leaving a job into account. Figure 2 also shows that we found two mediating effects: feedback mediates the relationship between achievement motivation and job performance, and work stress mediates the relationship between neuroticism and job satisfaction.

Despite the wide range of jobs used, we found a clear pattern of results. This is in accordance with meta-analyses, such as those conducted by Barrick and Mount (1991), that showed that the predictive validity of personality traits does not differ strongly among job categories, although specific effects could also be expected (see Matthews and Deary, 1998). The model as a whole reveals that two independent patterns of relationships can be discerned: one relating to performance criteria and another relating to job attitudes. Although the personality traits used to test this model were measured nearly two years before the job characteristics and the work behaviors, personality traits explained additive variance of work behaviors.

Our model does not include paths from personality traits to job characteristics because this would make the model very complex. However, two studies (Judge et al., 2000; Judge, Locke, Durham, and Kluger, 1998) showed that perceived job characteristics partially mediate the relationship between core self-evaluations and job satisfaction. In their studies, core self-evaluations consisted of neuroticism, self-efficacy, self-esteem, and locus of control. The variable of perceived job characteristics was a summary measure of Hackman and Oldham's (1976) core job characteristics. To test this model in our sample we performed structural equations modeling using LISREL 8. We measured core self-evaluations with neuroticism and work self-efficacy, and perceived job characteristics with autonomy, skill

variety, and feedback. The result of the chi-square test was: $\chi^2(7, N = 161) = 9.49, p = .22$. Other relevant statistics were: RMSEA = .045, AGFI = .94, and NNFI = .92. These results show that the model fits well with the data. However, because the path coefficient from core self-evaluations to perceived job characteristics was not significant ($\beta = .13$) and the path coefficient from core self-evaluations to job satisfaction was significant ($\beta = .31$) no mediating effect was established. In short, with a modified model of Judge, Bono and Locke (2000) we could not confirm that job characteristics mediated the relationship between personality and job satisfaction. However, future studies should take the mediating effects of job characteristics between personality and job satisfaction into account.

The study also investigated interactions between personality traits and job characteristics on work behaviors. The results show that only a few of the interactions were significant and that the effect sizes were small. These findings are in accordance with the literature overview by O'Brien (1986) showing that interaction effects between personality and job characteristics on job satisfaction are seldom significant and explain only 1.35% of the variance. Searching for interactions among these variables seems not to be very promising.

The Big Five taxonomy can be used as a frame of reference for the interpretation of the effects of personality variables on the dependent variables. Neuroticism and extraversion fit well into this taxonomy. It is also clear that achievement striving can be considered to be a basic facet of conscientiousness in Costa and McCrae's Five Factor Model framework (Costa and McCrae, 1998). However, achievement striving and conscientiousness are not isomorphic. As Matthews (1997, p. 478) remarks: "Achievement orientation is normally seen as part of conscientiousness, but it may be desirable to distinguish qualities of being dependable, meticulous, and painstaking from achievement-related qualities such as striving for success, and seeking a high degree of involvement in work". Matthews (1997) further notices that ambition may also relate to extraversion, which Hogan (1986) splits into sociability and ambition factors. Along a similar line the positioning of the work self-efficacy construct in our model can be discussed. Work self-efficacy can be considered a specific operationalization of the more general self-efficacy construct, which is equivalent to the competence facet of conscientiousness (Costa and McCrae, 1998). We found a significant, though moderate relationship between achievement motivation and work self-efficacy, which could be expected if both are facets of the conscientiousness factor. However, unlike achievement motivation, work self-efficacy did not predict job performance ratings. We also found that work self-efficacy was negatively related to neuroticism. This result is in accordance with our prediction and consistent with the idea that neuroticism and generalized self-efficacy are part of the core self-evaluations

(Judge et al., 1998). At last, experience seeking is similar to openness to experience (McCrae (1990)), but it is clear that the construct of experience seeking is narrower than this Big-Five dimension.

The present study has theoretical relevance because the model in Figure 2 can be explained using several theories. First, as noted before, the mediating effect of feedback on the relationship between achievement motivation and job performance is in accordance with Locke and Latham's (1994) goal-setting theory. Second, the relationship between extraversion and self-efficacy is consistent with Watson and Clark's (1997) notion that extraverts have a general tendency to have positive experiences. Following this theory, extraverts also have a positive view on their own abilities and are therefore high on work self-efficacy. The relationships between neuroticism and job satisfaction, and neuroticism and work stress, can be explained by the fact that persons high on neuroticism, an indicator of negative affectivity, have the tendency to appraise their environment negatively and to report more strains (see Watson and Clark, 1984). The path from experience seeking to propensity to leave is in accordance with Zuckerman's (1994) theory on sensation seeking. Following this theory, the relationship can be explained by the fact that experience seekers need high levels of arousal, which can be achieved by the stimulation of changing jobs. Finally, the finding that the effects of job characteristics are not strongly moderated by personality traits suggests that job characteristics fulfill general needs that most people have in common. This is in line with Maslow's (1954) conceptualization of self-actualization needs.

The present study has also some practical implications. It confirms the previous research finding that achievement motivation is related to job performance in a large range of jobs. This means that achievement motivation can be used as a predictor of job performance in many jobs. The relationship between feedback and job performance suggests that improving opportunities to get feedback from the job can also increase job performance. The results presented in Table 2 show that neuroticism and experience seeking can be used to predict propensity to leave. Especially for jobs in which turnover is costly to the organization, it is important to select employees who will stay in the organization for a longer time. The correlations in Table 2 also suggest that designing job in such a way that employees have high levels of skill variety, autonomy, and feedback reduces the propensity that they will leave. The results also suggest that selecting non-neurotic extraverts will increase job satisfaction. With respect to job satisfaction, the results presented in Figure 2 suggest that high levels of skill variety, autonomy, and feedback can compensate for high levels of work stress. In general, combining personality testing and job design may be a fruitful approach in human resource management.

Three limitations of this study need to be acknowledged. First, personality traits, job characteristics, and most work

behaviors with the exception of job performance were measured by self-report. This has been done in many studies on the job characteristics model, but may cause common method variance.

Second, the heterogeneity of the job performance rating scale used in the study is a potential concern. Although the four rating items refer to various and different aspects: intellectual capacity, professional and social skills, and productivity, the items are highly intercorrelated ($\alpha = 0.81$). This might indicate the presence of rater bias, such as halo-effect. However, also in practice supervisors often make generalized performance ratings that are biased and form the basis of many decisions. Our purpose was to predict these generalized performance ratings. Nevertheless, the findings should be replicated with more unbiased performance measures.

Third, the high mean score on the Work Self-Efficacy scale of 62.5 in comparison to the maximum score of 84 and the small standard deviation of this measure suggest that the answers to this scale were affected by social desirability. This might explain the low correlation between work self-efficacy and job performance.

Future studies that combine personality traits and job characteristics should use personality questionnaires that measure the Big Five personality dimensions and their facets. In this way, the research findings can be compared better. Also, the model can be refined because the facets can be related to different work behaviors. For example, within the conscientiousness dimension, the achievement facet can be distinguished from the other facets. Also, longitudinal research designs should be used to test causality.

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