

Jürgen Deller (Ed.)

Research Contributions to

Personality at Work

Rainer Hampp Verlag



Jürgen Deller:

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Leuphana University of Lüneburg and the University of Minnesota hosted the international symposium on “Personality at Work” in Lüneburg. This symposium was co-organized by Deniz S. Ones (University of Minnesota, USA) and Jürgen Deller (Leuphana University of Lüneburg, Germany). The symposium generated ideas that the organizers felt should be developed and disseminated further. Thus, selected papers were invited for refereed peer review for publication in this edited book.

Personality continues to be a valued topic in a variety of settings. To some degree this is based on meta-analytic findings that have demonstrated the criterion-related validity of personality tests for predicting a variety of valued outcomes. This book focuses on personality in workplace settings. This volume is organized around five themes:

- Personality and criterion related validity
- Construct validity investigations in personality
- Personality in career choice and organizational attraction
- Personality and leadership
- Personality and informational capabilities

Key words: Career choice, informational capabilities, leadership, organizational attraction, personality, validity

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Foreword

Employers are interested in finding out what personal characteristics job applicants possess. There is scientific merit to the idea that there are vast individual differences in terms of work behaviors. For example, a large body of research has documented large differences among people who hold the same job in terms of productivity. For low complexity jobs, individuals who are one standard deviation above the mean level of productivity produce 19% more than the average, while for high complexity jobs the corresponding value is 48%. How much do employees vary in their behaviors at work? The answer is “a lot”, even by the most conservative estimates. This is why employers have aimed to screen and select workers through a variety of means. Much work has been devoted to examining the role of cognitive ability, job knowledge, and skills as predictors and determinants of job performance. Research on personality determinants of work behaviors, however, had lagged behind between 1960 and 1990. Heavy influence of situationally based views of personality, and low values assumed for their criterion related validity were at the root of personality falling out of favor for over three decades.

Personality refers to a spectrum of enduring dispositions or individual differences attributes that consistently distinguish people from one another in terms of their basic tendencies to think, feel, and act in certain ways. The enduring nature and consistency of personality characteristics are manifested in predictable tendencies of individuals to behave in similar ways across situations and settings.

Thankfully, during the 1990s, a confluence of three developments highlighted the influences of personality variables in work settings. First, the emergence of the Big Five taxonomy of personality variables has enabled psychometrically informed groupings of personality variables in research syntheses. Second, better understanding of criterion domains in work settings has taught us that different personality factors (dimensions) or facets (sub-dimensions) predict different criteria differentially. Third, an enhanced understanding of the effects of statistical and measurement artifacts on study findings has enabled objective, robust and psychometrically sophisticated meta-analyses documenting the effects of personality variables at work. Since 1990 alone, over 12,000 new articles have provided empirical evidence for influences of personality variables on every conceivable individual behavior in organizations. In addition, dozens of meta-analyses have documented relationships with key criteria such as job performance, job satisfaction, counterproductive work behaviors, leadership, and motivation among others.

The study of personality influences in work settings is a vibrant field with great importance for human resources applications. This volume brings together a sampling of papers that were presented at the International Symposium on Personality at Work that was held in Lüneburg, Germany. A field that rests on the laurels of its past accomplishments is doomed to stagnate and atrophy. Thoughtful primary studies and meta-analyses are needed to advance knowledge and keep it relevant for the organi-

zations of the future. Professor Deller has successfully edited a volume that provides fresh fodder for the future of personality variables at work.

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This book only became possible because many individuals went the extra mile. First of all I would like to thank all participants of the Lüneburg symposium on Personality at Work for sharing their ideas in presentations and discussions. I would especially like to thank Deniz S. Ones, University of Minnesota, USA, for her excellent cooperation in planning and organizing the symposium where cutting edge research on personality at work was presented in Lüneburg, as well as for her continuous support in identifying publication and dissemination strategies for the outstanding papers from the symposium. This was excellently supported by Stephan Dilchert, University of Minnesota, USA. The organizing committee in Lüneburg, especially Anne-Grit Albrecht and Stefanie Kern, as well as more than 20 students of business psychology, gave the entire symposium a personal touch and guaranteed organizational efficiency. The final preparation of this book was supported by two student assistants: Maike Oertel passed the project on to Heike Geldon. Both of them did a marvellous job. The same is true for the proof readers Ciara Catchpole and Hannah L. Jackson Foldes.

Invaluable to the project was the support of two institutions: Leuphana University of Lüneburg, which provided necessary meeting rooms for the symposium, and the Lucas Graduate School of Business, San José State University, San José, CA, USA, which hosted me as a Lucas Global Visiting Scholar during the final stages of book preparation.

I am also deeply indebted to the sponsors of the symposium “Personality at Work”. Without the generous support of Volkswagen Foundation the symposium would not have been possible. A special acknowledgement goes to Klaus Sängler, ifp Institut für Personal- und Unternehmensberatung, Cologne, Germany, for a substantial grant that made the printing of this book possible.

This project has only been possible because of all of you! Thank you!

Lüneburg, Germany, and San José, CA, USA, July 2008

Jürgen Deller

Editorial

In May 2005, Leuphana University of Lüneburg and the University of Minnesota, with major funding from Volkswagen Foundation as well as other sponsors (Deller & Ones, 2008), hosted the international symposium on “Personality at Work” at Leuphana University of Lüneburg. It was my special privilege to co-organize this international two and a half day symposium with my colleague Prof. Dr. Deniz S. Ones (University of Minnesota, USA). Our symposium on “Personality at Work” focused on the role of personality traits in everyday work settings. Invited experts from academia and industry from around the world represented diverse backgrounds in the applied sciences, industrial and organizational psychology, business administration, and economics. In Lüneburg, these experts presented and discussed current research findings on personality traits in work settings, as well as on the state-of-the-art practices reflected in this edited book. The unique character of the symposium as a platform to exchange expert knowledge and experience was also shaped by the strong presence of research-oriented practising behavioral scientists who contributed by sharing their experiences from the field.

The symposium on “Personality at Work” generated ideas that the organizers felt should be developed and disseminated further. Thus, selected papers were invited for refereed peer review for potential publication in special issues/sections of scientific journals and for consideration to be published in the edited book you hold in your hands. Between 2006 and 2008, thematically related papers were published as special issues or in special sections of leading journals: in the *International Journal of Selection and Assessment* (for an overview see Deller, Ones, & Viswesvaran, 2007; Viswesvaran, Deller, & Ones, 2007), *Psychology Science* (Ones, Viswesvaran, Dilchert, & Deller, 2006), and *Zeitschrift für Personalpsychologie* (Deller & Ones, 2008). Other papers were invited for publication in this volume and underwent multiple reviews by external ad hoc reviewers. Remaining papers from the symposium will be published by Hampp in a book titled *Readings in Applied Organizational Behavior from the Lüneburg Symposium*.

Personality continues to be a valued topic in a variety of settings. To some degree this is based on meta-analytic findings that have demonstrated the criterion-related validity of personality tests for predicting a variety of valued outcomes. This book focuses on personality in workplace settings. This volume is organized around five themes:

The *first part* offers two papers with research results on personality and criterion related validity:

Using meta-analysis, *Alexander Alonso, Chockalingam Viswesvaran and Juan I. Sanchez* compared the validity of personality and cognitive ability for predicting task and contextual performance. They tested the hypotheses that (1) personality predicts contextual performance better than cognitive ability, and (2) cognitive ability predicts task performance better than personality variables. Across a large data set, cognitive ability did predict task performance better than personality variables. However, there

were no significant differences between cognitive ability and personality variables for predicting contextual performance.

This is followed by a closer look by *Deniz S. Ones and Chockalingam Viswesvaran* at personality based customer service scales used in employee selection. They present three studies on criterion-related, construct, and incremental validity evidence of customer service scales used in pre-employment testing. Amongst other results, they report that personnel selection systems can benefit from including a customer service scale along with measures of cognitive ability, integrity, and the Big Five personality dimensions, in terms of predicting overall job performance and counter-productive work behaviors.

In the *second part* of the book three papers report empirical research results concentrated on the measurement and construct validity investigations in personality:

Stefan Höft and Peter M. Muck analyze construct overlap of personality and assessment center constructs. In their research, the empirical overlap of the construct-oriented personality test approach and the simulation-oriented assessment center approach was investigated, in order to infer valid strategies for the combination of these sources for diagnostic purposes.

In a second paper, *Peter M. Muck, Benedikt Hell, and Stefan Höft* apply the principles of Behaviorally Anchored Rating Scales to assess the Big Five personality constructs at work. The objective of the study was to integrate the goal of brevity and the joint goals of content and construct validity by developing a new Big Five scale using a format adapted from performance appraisal systems: Behaviorally Anchored Rating Scales (BARS) constructed from two different Big Five measures. Benefits and problems of this new approach are discussed.

The third paper, by *Lauren J. Ramsay, Nicola Taylor, Gideon P. De Bruin, and Deon Meiring*, offers a South African perspective on the five personality factors at work. South African labor legislation requires that tests used in workplace selection are both valid and reliable. As South Africa's language groups also represent linguistic as well as cultural differences, such validation is critical if these measures are to be used in a selection context. Analyses indicated that the Basic Traits Inventory demonstrated a practical level of measurement invariance across the Nguni, Sotho, and Pedi language groups.

In the *third part* of this book, four teams of authors take a closer look at the role of personality in career choice and organizational attraction:

In the first paper of this section, *Rosina M. Gasteiger, Jürgen Kaschube, and Jon P. Briscoe* link protean career orientation (PCO), personality attributes, and motivation, and come up with implications for the workplace. Consistent with previous findings, PCO was found to be strongly related to proactive personality and learning goal orientation. When protean graduates were asked to describe an ideal employer, organizations which were characterized by dynamism and employee initiative were pre-

ferred. In contrast, organizations associated with control and steep hierarchy were viewed less favorably.

This is followed by an examination of the attraction element of Attraction-Selection-Attrition (ASA) theory in a field sample by *Gregory A. Vinson, Deniz S. Ones, and Brian S. Connelly*. The authors used the California Psychological Inventory to examine how organizations and occupations tend to attract applicants with certain personality traits. Substantial personality differences amongst applicants for managerial posts in different organizations were observed, offering further evidence for the robustness of organizational attraction effects based on personality characteristics.

In the third paper of this part, *Thomas Rigotti and Alexander Pabst* take a closer look at the sense of coherence and occupational self-efficacy as antecedents and moderators of psychological contract formation. The aim of their cross-sectional questionnaire study was to explore the role of personality traits as antecedents of psychological contracts. Using a multi-facet measure of the psychological contract, study participants were asked about their expectations regarding their future employment relationships. Empirical evidence suggested that personality traits may moderate the effects of psychological contracts on commitment.

The final paper of this part, by *Klaus Moser and Nathalie Galais*, raises the question as to whether and how both individuals and organizations can benefit from impression management. The aim of this chapter is to reconcile two seemingly contradictory views on self-monitoring. Results are consistent with the assumption that – at least under certain conditions – self-monitoring contributes to career success.

In the *fourth part* of this book, two papers from Europe and North America focus on different aspects of personality and leadership:

The impact of followers' and leaders' personalities, and their perceived similarity, on followers' perceptions of transformational leadership and leader acceptance is analysed in the first paper by *Jörg Felfe and Kathrin Heinitz*. Emphasizing the follower-centered point of view, an experimental study was conducted to examine the influence of followers' personal characteristics on their perception and acceptance of leadership. Results indicated that followers' extraversion and the perception of leaders' personality influence perceptions and acceptance of leadership. It is argued that similarities between leaders and followers seem to be an explanation for this bias.

In the second paper of this part, *Cynthia A. Hedricks* takes a closer exploratory look at the personality qualities of women in corporate leadership positions. Personality trait scores of both female and male corporate leaders suggested that they would demonstrate a transformational style of leadership. Female leaders showed a trend towards higher assertiveness and lower external structure, suggesting a slight tendency for women leaders to engage in more of a transformational leadership style. The results suggest that organizations can use personality assessment to identify and develop their next generation of leaders. This practice could result in more gender equality with respect to corporate leadership.

The *fifth and final part* of this book consists of two papers that present research and concepts on personality and informational capabilities:

Lothar Bildat and Sabine Remdisch empirically examine the relationship between computer and internet literacy and work-related behavior including the role variables such as work persistence and self-confidence in using the computer play. In addition, a model used for the prediction of internet knowledge was tested.

The final paper of this book, by *Andreas Lohff and Achim Preuss*, aims to introduce the concept of informational competence into occupational assessment, in order to predict a person's potential to work successfully under modern working conditions. Informational competence is explored using measures of personality, ability and working style. The criterion-related validation studies reported herein showed that the efficient assessment of informational competence needs dedicated instruments. To explore the relationship between informational competence and personality, the results have been compared with the results of a self-report instrument especially designed for occupational assessment purposes.

Altogether, the variety of paper topics included in this volume reflect the wealth of research conducted internationally on personality at work. The symposium could underline the potential that derives from the use of personality in organizational settings and across cultures. Organizations, given the results of the Lüneburg symposium, are well advised to realize the utility gains that personality scales offer.

References

- Deller, J., & Ones, D. S. (2008). „Personality at Work“ in Lüneburg – Rückblick und Ausblick [“Personality at Work” in Lüneburg - Retrospect and prospects]. *Zeitschrift für Personalpsychologie*, 7, 24-26.
- Deller, J., Ones, D. S., & Viswesvaran, C. (2007). Introduction to the Special Issue Section: Personality in personnel selection and assessment. *International Journal of Selection and Assessment*, 15, 82.
- Ones, D. S., Viswesvaran, C., Dilchert, S., & Deller, J. (Eds.) (2006). Special Issue: Considering response distortion in personality measurement for industrial, work and organizational psychology research and practice. *Psychology Science*, 48.
- Viswesvaran, C., Deller, J., & Ones, D.S. (2007). Personality measures in personnel selection: Some new contributions. *International Journal of Selection and Assessment*, 15, 354-358.

1. Personality and Criterion Related Validity

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Deniz S. Ones and Chockalingam Viswesvaran

Comparing the Validity of Personality and Cognitive Ability for Predicting Task and Contextual Performance: A Meta-Analysis

Alexander Alonso, Chockalingam Viswesvaran, and Juan I. Sanchez

Abstract

Meta-analytically tested the hypotheses that (1) personality predicts contextual performance better than cognitive ability, and (2) cognitive ability predicts task performance better than personality variables. Across 507 correlations and 213,460 datapoints, cognitive ability did predict task performance better than personality variables. However, there were no significant differences between cognitive ability and personality variables for predicting contextual performance.

1. Job Performance as a Multidimensional Construct

The study of job performance is a key part of research in human resources management (Austin & Villanova, 1992). In recent years, researchers have expanded the conceptualization of job performance to include subdimensions that purport to reflect the multidimensional structure of performance (Borman & Motowidlo, 1993, 1997; Campbell & Bray, 1993). Of the different facets or subdimensions (cf. Viswesvaran & Ones, 2000, for a summary), the distinction between task and contextual performance first advocated by Borman and Motowidlo (1993; 1997) has been stressed repeatedly. Task performance refers to the performance on the core tasks for which the employee was hired, whereas contextual performance refers to performance on tasks that maintain the social structure of the organization. This distinction can also be related to the distinction between the social and technical systems suggested by the socio-technical systems view of organizations (Von Bertalanffy, 1960).

It has been suggested that these two facets of performance, namely task and contextual, are best predicted by different sets of variables (Guion, 1998). Specifically, there seems to be an emerging consensus about the fact that personality variables predict contextual performance better than cognitive ability, and that cognitive ability predicts task performance better than personality variables (Borman & Motowidlo, 1997). Although Borman and Motowidlo present a more nuanced view of these relationships, the essential idea that personality best predicts contextual performance and that cognitive ability best predicts task performance remains.

In a set of studies conducted by Borman and Motowidlo (1993) and Motowidlo and Van Scotter (1996), this model of task and contextual performance was put to the test. Furthermore, Conway (1999) conducted a meta-analytic review of the model. Moderate support was found for the model. Conway, as well as Van Scotter and Motowidlo, made the argument that only when the predictors are refined will there be a better understanding of the relationships between these predictors and the multidimensional criteria of job performance.

2. Need for Alternate Models

Although it is important to refine the predictors, it is necessary to consider the possibility that the limited support found by Conway (1999) and Motowidlo and Van Scotter (1996) indicates support for alternate models. For example, the predictive validity of emotional stability for task and contextual performance is not explained even by the nuanced model of Motowidlo et al (1997), which admitted predictive links between cognitive ability and conscientiousness for both task and contextual performance. Also, researchers such as Borman and Motowidlo (1997), Motowidlo and Van Scotter (1994), and Conway (1999), have sought better theoretical understanding of the relationship between task and contextual performance. The purpose of the proposed meta-analysis is to test a variety of models involving predictors such as cogni-

tive ability and personality (i.e., the Big 5 factor structure) and the criteria of contextual and task performance.

There are two additional models that need to be tested. Both are partial-mediation models where (1) contextual performance mediates the relationship between the Big Five personality variables (i.e., conscientiousness, extroversion, agreeableness, emotional stability, and openness to experience) and task performance as well as the relationship between cognitive ability and task performance, and (2) task performance mediates the relationship between the Big Five variables and contextual performance as well as the relationship between cognitive ability and contextual performance. Examining the viability of each of these models will hopefully yield results that enrich our understanding of the manner in which predictors and criteria are linked.

Consider the mediating effects of contextual performance. Here, it is hypothesized that contextual performance will serve as a mediator in the link between predictors and task performance. Thus, an individual is driven to perform prescribed tasks by both personality and cognitive ability, but their performance of contextual activities will mediate their task performance. The performance of contextual activities will affect the amount of time spent on, and the performance in, assigned tasks.

Consider an alternate partial mediation model where task performance mediates the relationship between predictors and contextual performance. Eglee (1995) and Conway (1999) have suggested that new directions in research on task and contextual performance might include looking at how one's task performance affects their ability to perform behaviors that would be considered contextual in nature. In particular, Eglee (1995) looked at differences in contextual performance as attributed to sex and other cultural variables. The practical reasoning behind this is that a person who accomplishes what is required of them better and faster than others will be asked to help others, or teach others how to perform better. These helping and teaching roles would be contextual performance. This model differs from the previous one in that since contextual performance is the outcome variable and task performance is the mediator, it is expected that some of the personality variables (namely extroversion) will not be related to it as closely as others, because of its small correlations with task performance (Conway, 1999).

In summary, the following hypotheses are tested in this paper:

- H1: The relationship between predictors (Big Five factors of personality and cognitive ability) and task performance will be mediated by one's contextual performance.
- H2: The relationship between predictors and contextual performance will be mediated by one's task performance.

3. Method

3.1 Database

The search for studies began with a variety of literature searches to locate all correlations between cognitive ability, personality (i.e., Big Five factors), task performance, and contextual performance. We obtained all published studies listed in Conway's meta-analysis (1999). Furthermore, studies were also found in published library databases such as WebLuis and PsychInfo. Mail or electronic mail was sent to each researcher in this area of study requesting a copy of any unpublished studies. We sent 83 pieces of mail. A total of 36 authors responded, and of the 36 total responses only three studies proved useful to the meta-analysis. In order to prove useful for our purposes, analyses needed to include observed correlations between predictors and task and/or contextual performance. Moreover, it is important to note that for inclusion researchers needed to explicitly mention the use of Borman and Motowidlo's (1993; 1997) definition of task and/or contextual performance. The use of this definition, coupled with the inclusion of only studies with correlations reported for the task and contextual performance relationship, yielded a small but sufficient sample of studies. Taking into account the three conference papers as well as the published works located through library research, a total of 507 correlations were found, and these comprised the meta-analytic database. The total sample size (number of participants) across the 507 correlations was 213,460. The total sample included a variety of jobs including insurance agents, salespersons, military mechanics, accountants, and managers. Of these participants, a large portion (68%) had taken a cognitive ability test as part of the Armed Forces Qualifying Test. As for the performance measures, supervisory ratings were the most commonly used source.

3.2 Analysis

The Hunter and Schmidt (2004) psychometric meta-analytic procedure was used. Artifact distributions were used to correct for unreliabilities in the two measures. Once the meta-analytically derived correlations between the six predictors and the two criteria were obtained, they were used to test the alternate models (Viswesvaran & Ones, 1995). Partial correlations were used to test the hypotheses. Partial mediation was inferred if the zero-order correlation between the predictor and one performance dimension (task or contextual) was reduced by partialing out the other performance dimension. The variance reduction factor was computed to test the partial mediation effect (Chen & Spector, 1991).

Since both task and contextual performance were assessed primarily through ratings, we explored the effects of halo by cumulating the correlation between task and performance ratings in three different ways. First, all correlations were cumulated together. Second, we cumulated only those correlations in which the same rater provided the two performance ratings (intra-rater correlation). Finally, we cumulated the

correlations where task and contextual performance were provided by different raters (inter-rater correlations).

4. Results

The artifact distributions used are summarized (means, standard deviations, number of reliability estimates, the total sample size, etc.) in Table 1 for the six predictors as well as for both ratings of task and contextual performance. The reliability estimates summarized were coefficient alphas. The median reliability value was .78; in fact they ranged from .75 to .81.

Table 1. Key Study Variables and Reliabilities

Variables	k	<u>N</u>	Reliability	SD _r	Rel _f ^a	SD _f ^a
1. Task performance	84	54654	.81	.2102	.76	.2474
2. Contextual performance	216	74538	.87	.0619	.86	.0528
3. Cognitive ability	6	18455	.75	.1626	.81	.1094
4. Emotional stability	37	13076	.77	.1015	.76	.1083
5. Agreeableness	40	6529	.76	.1068	.76	.0698
6. Conscientiousness	47	26618	.77	.1040	.78	.0621
7. Openness to experience	37	13072	.77	.0828	.76	.0599
8. Extraversion	40	6518	.80	.0754	.77	.0567

Note. ^a refers to the frequency-weighted reliability estimates.

The first step in the analysis of these relationships was to estimate the meta-analytic true score correlations for each of the thirteen relationships examined. However, when examining the relationship between contextual and task performance, one should account for the use of inter- and intra-rater correlations. The reason behind conducting separate analyses for inter- and intra-rater correlations is that often intra-rater ratings are inflated by halo error, and comparing the two (inter- and intra-rater) types of correlations facilitates an exploration of the extent to which this has occurred in the present data.

Therefore, in Table 2, three relationships between contextual performance and task performance are reported. The first included both inter- and intra-rater correlations. The estimated true score correlation equaled .46, with a sample size weighted mean observed correlation of .38. The second estimate of task-contextual relationship involved inter-rater correlations, and its true score correlation was .39, with a sample size weighted mean observed correlation of .33. This is the correlation when two dif-

ferent raters evaluated task and contextual performance respectively. Finally, the last relationship reported is that between task and contextual performance using intra-rater correlations (i.e., the same rater rated both task and contextual performance). The true score correlation was estimated as .75 and the sample size weighted mean observed correlation was .63. As expected, the intra-rater was much higher than either the total or the inter-rater relationships. This higher magnitude is probably due to the effects of halo.

Table 2. Relationships Between Contextual and Task Performance

Meta-Analysis	k	N	Rbar	SD _{rbar}	ρ	SD _{ρ}	%SE	%Variance
CP-TP	45	22462	.38	.18	.46	.19	.84	.24
CP-TP *	28	16979	.33	.18	.39	.21	.61	.39
CP-TP ^a	17	5483	.63	.10	.75	.13	.34	.19

Note. *Refers to the use of only inter-rater correlations in the meta-analysis. ^a Refers to the use of only intra-rater correlations in the meta-analysis. Rbar refers to the use of mean sample size weighted observed correlations while ρ refers to the use of true score correlation estimates.

Tables 3 and 4 summarize the correlations between the six predictor variables and the two criterion variables. In Table 3, the relationships between task performance and the six predictors are reported. Although all but one of the relationships between the Big Five and task performance were positive, the correlations were small, ranging from .08 for agreeableness to .14 for conscientiousness. Only extraversion was shown to be negatively related to task performance (.03) and a sample size weighted mean observed $r = -.02$. The same pattern did not hold for cognitive ability, however; it had a substantial correlation with task performance.

Table 3. Relationships Between Six Predictors and Task Performance

Meta-Analysis	k	N	Rbar	SD _(rbar)	ρ	SD _{ρ}	%Standard error	%Variance
Agr-TP	10	1640	.05	.0876	.08	.0505	79	81
OE-TP	10	5167	.09	.0333	.12	.0000	171	198
Con-TP	24	9922	.11	.0519	.14	.0000	88	103
ES-TP	10	5169	.09	.0755	.12	.0782	34	38
EX-TP	10	1636	-.02	.0804	-.03	.0232	95	95
g-TP	11	8658	.24	.1486	.32	.1751	5	16

Note. Rbar refers to the use of mean sample size weighted observed correlations while ρ refers to the use of true score correlation estimates.

The next set of correlations involves those between contextual performance and the six predictor variables (See Table 4). Here, the true score correlations ranged from .03 for extraversion to .13 for emotional stability. Also, the sample size weighted observed correlations ranged from .02 for extraversion to .10 for agreeableness as well as for emotional stability. In line with the ideas enunciated by others (Borman & Motowidlo, 1993; 1997; Guion, 1998; Van Scotter & Motowidlo, 1996), cognitive ability had a lower validity than personality variables for predicting contextual performance.

Table 4. Relationships Between Contextual Performance and Six Predictors

Meta-Analysis	k	N	Rbar	SD _{rbar}	ρ	SD _{ρ}	%Standard error	% Variance
CP-OE	29	7905	.09	.0677	.11	.0374	79	79
CP-Agr	30	4889	.10	.1088	.12	.0928	51	51
CP-ES	29	7907	.10	.1184	.13	.1241	26	26
CP-EX	30	4882	.02	.0876	.03	.0469	81	81
CP-Con	53	16696	.08	.0699	.10	.0502	64	65
CP-g	13	9797	.04	.0688	.05	.0693	28	28

Note. Rbar refers to the use of mean sample size weighted observed correlations while ρ refers to the use of true score correlation estimates.

In general, cognitive ability had the highest validity for predicting task performance. All other validities were low; in fact, the true score correlations were all less than .15, with observed correlations (i.e., validities) being typically less than .10. As expected, cognitive ability was related to task performance (.32) with a sample size weighted observed correlation of .24.

To shed light on the potential mediation effects, the next set of analyses reports partial correlations and variance reduction ratios computed using true score correlations and inter-rater correlations between task and contextual performance. Mediation analyses with: (1) inter-rater sample size weighted observed correlations, (2) intra-rater true score correlations, and (3) intra-rater sample size weighted observed correlations, can be done by performing the appropriate computations using the results summarized in Tables 3 and 4. The variance reduction ratios for the mediational effects of contextual performance are summarized in the top half of Table 5, and the mediational effects of task performance are summarized in the bottom half of Table 5.

Table 5. Variance Reduction Ratios for Task Performance/Contextual Performance as a Mediator Using Inter-Rater True Score Correlations

Task performance		
Zero-Order correlation	Partialling task/contextual performance	Variance reduction ratio
Agr-CP = .12	.09	44%
Cons-CP = .10	.03	91%
ES-CP = .13	.08	62%
EX-CP = .03	.05	-177%
OE-CP = .11	.06	70%
g-CP = .05	-.13	-576%

Contextual performance		
Zero-Order correlation	Partialling task/contextual performance	Variance reduction ratio
Agr-TP = .08	.02	94%
Cons-TP = .14	.12	27%
ES-TP = .12	.06	75%
EX-TP = -.03	-.05	-177%
OE-TP = .12	.07	66%
g-TP = .32	.34	13%

The variance reduction ratio when contextual performance was partialled out of the predictor-task performance relationship ranged from 13% for cognitive ability to 94% for agreeableness. That is, the validity of agreeableness for predicting task performance was almost fully mediated by one's contextual performance. On the other hand, the validity of cognitive ability for predicting task performance was minimally mediated by contextual performance. Thus Hypotheses 1a and 1b received broad support. Although we stated that mediation effect were minimal for cognitive ability, note that it is still different from zero. The validity of conscientiousness for predicting task performance was reduced by almost one fourth (27%) when contextual performance was controlled. This effect was most pronounced for emotional stability and for openness to experience.

Consider now the mediating effects of task performance on the predictive validity of cognitive ability and of personality variables for predicting contextual performance. The predictive validity of conscientiousness for predicting contextual performance was reduced by 90% when task performance was controlled. The predictive validity of agreeableness was almost halved, as was that of emotional stability. In general, the

results reported in Table 5 suggest substantial mediational effects for both task and contextual performance, and provide broad support for the two hypotheses advanced earlier in this paper.

5. Discussion

Job performance is a central construct in work and organizational psychology (Austin & Villanova, 1992). Virtually all human resource interventions have the ultimate goal of improving job performance. Models have been advanced which identify different sets of dimensions as comprising the construct of job performance (Viswesvaran & Ones, 2000). What are sparse, however, are process models (e.g., McCloy, Campbell, & Cudeck, 1994; Schmidt & Hunter, 1992; Schmidt, Hunter, & Outerbridge, 1986) investigating how the different performance dimensions are related, and how the predictive validities of different predictors are channeled through the different dimensions.

The results reported in this paper summarize the extant literature on the intercorrelations between predictors and task or contextual performance. We focused on cognitive ability and the Big Five factors of personality, as these are the predictors that have garnered most of the recent research attention (Schmidt & Hunter, 1998; Schmitt & Chan, 1998). We focused on task and contextual performance as these two dimensions have also been extensively studied (cf. Conway, 1999). Our results suggested broad support for the hypotheses that the predictive validity of cognitive ability and personality factors for predicting task performance is mediated by contextual performance and vice versa.

The analyses presented here have several theoretical and practical implications. Theoretically, job performance has been previously conceptualized as a construct to be measured at one point in time. The mediational effects found here suggest that job performance would be better conceptualized in episodic terms. Moreover, it appears that one subdimension (e.g., contextual performance) can have effects on another subdimension (e.g., task performance) in a subsequent time period. The design of performance appraisal systems should capture this dynamic interplay. In fact, the cross-sectional gathering of measures of task and contextual performance, which characterizes the majority of the validation studies included in the present meta-analysis, precludes assertions about causality. Longitudinal designs including more than two points in time may have to be included in future predictive validity studies to confirm the mediation effects suggested by the relationships uncovered here.

The effects of partialing out contextual performance on the validity of extraversion for predicting task performance are noteworthy. Extraversion had a negative effect on task performance, and holding contextual performance constant actually accentuated this effect. This finding is understandable because extraverted individuals are sociable and talkative, and therefore may represent a distraction in the workplace. However, this result may not hold for certain types of jobs where success is highly de-

pendent on social activity and minimally dependent on technical tasks, such as certain sales jobs. Future research should explore the moderating effects of job characteristics when investigating process models of job performance.

Potential moderators of the mediational relationships uncovered here should be explored. Such moderators might include autonomy, type of job, and job satisfaction. For example, although contextual performance is normally operationalized as being "above and beyond" task performance, both raters and performers might see contextual performance as necessary to success on performing certain types of jobs. This perception would, in turn, be in line with some societal views as well as certain organizational cultures (namely that of the military and others with long-held collectivistic traditions). Thus, contextual performance may be a necessary antecedent of prescribed task performance in organizations with long-standing cultures where meeting contextual performance expectations is a *sine qua non* to not only get ahead but even just to stay level. For example, in the military one may be encouraged to help others perform even by going above and beyond the call of duty. If one fails to do so, one might be expelled or discharged. In other words, there are organizational contexts that blur the line separating contextual and task performance, because performing contextual activities becomes a necessity and thereby almost a prescribed task.

The intercorrelation between task and contextual performance in the present study was high, even when the two ratings were provided by two different raters (.52). However, the fact that there was some evidence for mediation suggests that task and contextual performance are certainly not one and the same construct, and, perhaps most importantly for the purpose of our study, that separating these facets increases our understanding of the process through which predictors affect job performance.

Future research could also profit from a more fine-grained division of construct facets; task and contextual performance could be divided into altruism and integrity (Goodman, 1999), and cognitive abilities and Big five factors of personality could be broken down into their respective facets. Such analyses would shed additional light on the specific processes through which various constructs affect job performance. The still limited number of studies available precluded more fine-grained analyses in the present meta-analysis.

A potentially important methodological caveat is the kind of reliabilities used in meta-analytic cumulation. The reliability estimate used is important because of its effects on the meta-analytically obtained correlations and thus, on the variance reduction analyses. Although coefficient alpha was used here, some (Schmidt & Hunter, 1996; Schmidt, Viswesvaran, & Ones, 2000) might argue that for the purposes of this study the ideal would be to use inter-rater reliability. To the extent that true score correlations are underestimated by correcting observed validity coefficients with coefficient alphas rather than inter-rater reliabilities, the validities reported in Tables 3 and 4 are probably conservative estimates.

By meta-analytically cumulating the extant literature and testing for mediational effects, our results provide new insights into the dynamic nature of the relationships among major predictors and job performance. Our findings illustrate that bivariate examinations of predictor effects on specific criteria of the “ $x \rightarrow y$ ” type mask the complex ways in which predictors affect the various facets of performance such as “ $x \rightarrow y_1 \rightarrow y_2$ ” processes. We hope that this study will stimulate personnel selection researchers to carry out new research designs which are capable of disentangling the multivariate relationships amongst predictors, and the various facets of job performance over time.

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