

**The resilient type:  
'Simply the best' or merely an artifact of social desirability?**

MARCUS ROTH<sup>1</sup> & PHILIPP YORCK HERZBERG<sup>2</sup>

**Abstract**

Several findings within typological research give rise to the suspicion that Big-Five based prototypes are highly influenced by social desirability. In particular concerning the resilient type, these findings tend to suggest, that this personality type is actually nothing more than an *artifact* of a socially desirable response bias. To test this assumption, the degree of SD influence on the NEO-types was compared with the degree of influence on the NEO-dimensions in two studies ( $N_1 = 326$ ;  $N_2 = 119$ ). We found that the Big-Five types, in particular the resilient type, were strongly influenced by social desirability - but not to a greater degree than the NEO-dimensions upon which the types are based. So, the SD-affectation of types merely reflects the SD-affectation of the dimensions upon which the types are based. Future implications for typological prototype-research are discussed in light of these results.

Key words: typology, big five, social desirability, resilientness

---

<sup>1</sup> PD Dr. Marcus Roth, Universität Leipzig, Institut für Psychologie II, Seeburgstraße 14-20, 04103 Leipzig; Tel.: 0341/ 9735918, Fax: 0341 / 9735909; email: mroth@uni-leipzig.de

<sup>2</sup> Dr. Philipp Yorck Herzberg, Universitätsklinikum Leipzig AöR, Abteilung für Medizinische Psychologie und Medizinische Soziologie, Philipp-Rosenthal-Straße 55, 04103 Leipzig, Tel.: 0341/9718818, Fax: 0341/9718809, email: herzberg@medizin.uni-leipzig.de

## 1. Introduction

The direction of current research on personality types has been influenced by the pioneering work of Block (1971), who, through Q-factor analyses of the California Q-Set (Block & Block, 1980), found three personality types which were highly stable over time. With regard to their scores in the two dimensions of the California Q-Set, ego-resiliency and ego-control, Block labeled these types as Resilients, Overcontrollers and Undercontrollers. Numerous subsequent studies replicated these three prototypes (e.g., Robins, John, Caspi, Moffitt, & Stouthamer-Loeber, 1996; Pulkinnen, 1996). Asendorpf, Borkenau, Ostendorf, and van Aken (2001) were the first to replicate the three types based on the dimensions of the Five-Factor (or Big Five) Model (FFM). This variable-centred model proposes five basic personality dimensions that can be distinguished at the broadest level of the individual's personality description: neuroticism, extraversion, openness to experience (or culture or intellect), agreeableness and conscientiousness (see John & Srivastava, 1999; De Raad, 2000). Asendorpf et al. (2001) used cluster analyses to derive the types. So, people were grouped into relatively homogenous clusters according to the similarity of their profiles in the Big-Five dimensions. In their study three replicable prototypes were found and named after the labels proposed by Block and Block (1980) as resilients, overcontrollers and undercontrollers. Resilients showed a generally well-adjusted profile with below average Neuroticism and above average or intermediate scores on the remaining four dimensions. Overcontrollers scored high in Neuroticism and low in Extraversion, whereas Undercontrollers had low scores in Conscientiousness and Agreeableness.

During the last five years, various studies aimed to replicate the personality types based on the FFM (e.g., Schnabel, Asendorpf, & Ostendorf, 2002; Boehm, Asendorpf, & Avia, 2002; Ekehammar & Akrami, 2003; Rammstedt, Riemann, Angleitner, & Borkenau, 2004; Avedeyeva & Church, 2005; Hart, Burock, London, Atkins, & Bonilla-Santiago, 2005; Roth, 2006). Most of the studies have identified three personality types, with resilient, overcontrolled, and undercontrolled types being most common. However, as demonstrated by Herzberg and Roth (2006) on the basis of a systematic overview, there is a notable variability of the profiles within the three prototypes across the studies measuring the Big Five via self-reports, mostly applying the NEO-PI-R (Costa & McCrae, 1992). Only Neuroticism for Resilients and Overcontrollers shows a consistency across different studies, whereas the other dimensions showed substantial fluctuations. So, the homogeneity concerning the three ARC-clusters in previous research seems to be rather fabricated by labelling them identically.

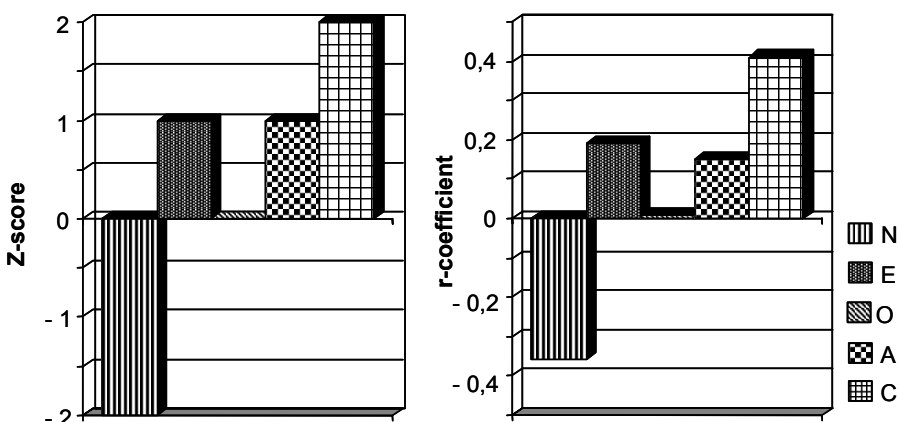
Because of the heterogeneity within the published three-cluster solution, Herzberg and Roth (2006) examined the number of clusters of Big-Five based prototypes utilizing a variety of criteria that meet the current standards in cluster research (see Milligan & Cooper, 1985). Their results, based on a general population sample of 1908 German adults, clearly indicate the *five*-cluster solution as a matter of choice. In their study, the *resilient* prototype was characterized by low scores on Neuroticism and high scores on Extraversion, Agreeableness, and Conscientiousness and moderately positive scores on Openness to Experience. *Overcontrollers* (res. *Non-desirables*) had pronounced scores on Neuroticism, low scores on Extraversion and medium to low scores on the other scales. *Undercontrollers* were characterized by high scores on Neuroticism, moderate scores on Extraversion and Openness, and low scores on Agreeableness and Conscientiousness. The cluster labeled as *confident*, had

moderately high scores on Extraversion and Openness, and medium scores on the other scales. Finally, the *reserved* type tended to have low scores on Neuroticism, Extraversion, and Openness, and moderately positive scores on Agreeableness and Conscientiousness. Recently, Roth and von Collani (2007) could replicate the five-cluster solution, which excels this partition as stable.

Recently, many problems have been discussed with respect to research on Big-Five prototypes, primarily concerning the consistency of prototypes across studies and their utility in predicting personality (for summary see Herzberg & Roth, 2006). Interestingly, the problem of a potential influence of social desirability on the Big-Five-types has thus far not constituted a concern for researchers. As formulated by Stöber (2001), “social desirability” (SD) is a readiness to give biased, distorted self-descriptions that portray oneself in a manner that can make a favourable impression on others. The influence of social desirability remains the weakest point in measuring personality by means of self-reports (for an overview see Kubinger, 2002a). The fact that this crucial aspect has as of yet not been reflected in research on Big-Five-types is astonishing given that several studies have revealed a considerable effect of SD on the NEO-scales, upon which the typologies are mostly based.

A detailed inspection of findings within typological research gives rise to the suspicion that Big-Five (or NEO-)based prototypes are greatly affected by social desirability. In particular concerning the resilient type, two findings tend to suggest, that this personality type is actually nothing more than an *artifact* of a socially desirable response bias.

The first suspicious finding pertains to the observed correspondence of the resilient-profile with the correlation pattern between NEO scales and measures of socially desirability, as shown in Figure 1. The left panel of the figure shows the mean z-standardized profile of the resilient type (averaged across the profile-scores reported by Asendorpf et al., 2001; Barbaranelli, 2002; Boehm et al., 2002; Costa et al., 2002; Ekehammar & Akrami, 2003; Rammstedt et al, 2004; Van Leeuwen et al., 2004). The right panel shows the degrees of



**Figure 1:**

Left panel: Typical Big-Five pattern of the resilient type (mean z-scores), right panel: correlations (*r*) between Big-Five dimensions and social desirability (Kanning & Holling, 2001). N, Neuroticism; E, Extraversion; O, Openness; A, Agreeableness; C, Conscientiousness.

correlation coefficients, as reported by Kanning and Holling (2001), between a measure of social desirability and the NEO Big-Five-dimensions. As can be seen, the social desirability profile of the NEO-dimensions is reflected almost exactly in the profile of the resilient type. This gives rise to the assumption that the derivation of the resilient type may well be nothing more than a grouping of participants with an SD response-style. The second suspicious finding concerns the observation that resilient individuals not only differ from remaining personality types on the respective NEO-variables, but also on almost *all* external self-report variables included in previous research. Previous studies have, for example, shown that in comparison to other personality types, resilient individuals can be characterized as having the highest level of self-esteem, life satisfaction, well-being, perceived social support, and psychosocial hardiness - and, for example, as having the lowest level of psychosocial stress, generalized prejudice, authoritarianism, and social dominance orientation (Herzberg & Roth, 2006; Petermann & Roth, 2005; Roth & von Collani, 2007).

In sum, these two findings give reason to question whether the resilient type, as measured by means of self-report using Big-Five instruments, is indeed “simply the best” (i.e. highly psychosocially adapted) or whether the derivation of this type rather represents the mere formation of a group of individuals who tend to respond to items in a socially desirable manner. Given that the latter proves true, then resilient individuals would not constitute a personality type in the true sense, but rather a response-style type.

### *Aim of the present studies*

The following studies aimed to test the influence of social desirability on Big-Five personality types in two ways: by analysing concurrent relationships between types and measures of social desirability (Study I), and by measuring the sensitivity of these types to instructional variations, according to which participants were lead to answer in a socially desirable manner (Study II). Thereby, it's appropriate to distinguish two components of social desirability: *Self-deceptive enhancement* that refers to an unconscious positive bias in item response with the aim of protecting positive self esteem, and *impression management* that refers to the conscious dissimulation of item responses with the aim of making a favourable impression on others. Since two NEO-typologies currently co-exist, analyses were conducted using the “classical” three-type solution predominantly used in previous studies, as well as for the five-cluster-solution proposed by Herzberg and Roth (2006) and Roth and von Collani (2007).

However, the fact that the personality types in an absolute sense are affected by social desirability is a statistical truism, given that the NEO-dimensions upon which the types are based are highly affected. For this reason, the degree of SD influence on the NEO-types was *compared* with of the degree of influence on the NEO-dimensions. If the hypothesis that the resilient type is nothing more than a pooling of individuals with a SD-response-style holds true, then the influence of SD on the types should go *beyond* the influence of SD on the NEO-dimensions. In this case, resilientness, i.e. the extent to which an individual can be classified as belonging to the resilient-prototype (see below), would represent nothing more than a SD-measure, resulting from a “filtering out” of all SD-information from the five NEO-dimensions.

## 2. Study I

In the first study, the hypothesis that SD will more greatly influence NEO-types than NEO-dimensions was tested in a cross-sectional design by analysing the relation of types and traits to measures of social desirability. Because types (persons) and dimensions (variables) can not directly be compared, two strategies of comparison were selected: a *person-centred approach*, in which the dimensions were personalized (grouping of individuals with respect to their scores on the NEO-dimensions) and a *variable-centred approach*, in which the type-information was transformed into continuous parameters of typeness.

### 2.1 Method

#### 2.1.1 Participants and procedure

Data were collected via a web-site designed “to validate several methods of assessing an individual’s personality”. The study was hosted on the web-site of the Department of Social Psychology at the University of Leipzig. Participants were requested to respond to the items by rating the extent of agreement on a five-point Likert scale (ranging from “strongly disagree” to “strongly agree”). Participants were assured of data confidentiality and anonymity and were requested to answer the items truthfully. They received no benefits from their participation. The items of the three questionnaires described in the following were presented in a mixed order. A total of  $N = 326$  participants exhaustively completed all items. Of these, 70.3% were women and 29.7% men. Mean age was 31.3 years ( $SD = 10.9$ ; range 16 to 64 years).

#### 2.1.2 Measures

*NEO Five Factor Inventory (NEO-FFI)*. The Big-Five Dimensions (Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness) were assessed using the NEO-FFI by Costa and McCrae (1992). The NEO-FFI consists of 60 items. Each scale comprises 12 items. We used the German version of the NEO-FFI by Borkenau and Ostendorf (1993), who reported a satisfactory level of internal consistency. The reliability in the present study ranges from  $\alpha = .71$  for Agreeableness to  $\alpha = .90$  for Neuroticism.

*The Social Desirability Scale-17 (SDS-17)*. The SDS-17 (Stöber, 2001) is a measure of social desirability constructed in the style of the Marlowe-Crowne scale (Crowne & Marlowe, 1960) but including new items with formulations and contents that are more up to date and correspond more closely to today’s beliefs about socially desirable behaviours. The SDS-17 consists of 17 statements (e.g., “Sometimes I just throw my rubbish on the street”, “I always eat a healthy diet”), whereby 7 items were worded negatively. In this study a reliability of  $\alpha = .75$  was obtained.

*Balanced Inventory of Desirable Responding (BIDR)*. The BIDR (Paulhus, 1998) is a two-factor inventory for the measurement of socially desirable responding. The inventory measures two distinguishable components of social desirability: *Self-deceptive enhancement (SDE)* refers to an unconscious positive bias in item response with the aim of protecting positive self esteem. In contrast, *impression management (IM)* refers to the conscious dissimulation of item responses with the aim of making a favourable impression on others. We used the German version of the BIDR developed by Musch et al. (2002), that consists of two

scales (SDE and IM) with 10 items each. The reliabilities in the present study were  $\alpha = .70$  (SDE) and  $\alpha = .68$  (IM).

### 2.1.3 Assignment of individuals to Big-Five-based prototypes

In the present study, we do *not* use the conventional sample-based cluster approach (Ward's method followed by *k*-means clustering) described by Blashfield and Aldenderfer (1988). Since this procedure is very sensitive to sample size and composition, sample-specific profiles are compiled for each data set that varies extremely across different samples. Rather than creating new classification criteria for each sample, Herzberg and Roth (2006) proposed an alternative approach in assigning individuals to prototypes, using discriminant function algorithms as "general" classification criteria, which are inferred from cluster results based on a representative population-based sample. An advantage of this population-based (or algorithm-based) approach lies in the fact that it permits a circumvention of the heterogeneity of personality types in different samples. The rationale of the population-based approach is similar to the common handling of questionnaires and tests in research and practice. Rather than re-computing the item-scale assignment for each sample under investigation, a general item-scale assignment algorithm is employed based on the factorial structure established in representative samples. In adopting this rationale in assigning individuals to prototypes, the population-based approach allows results from different samples to be compared. Furthermore, applying a nomological validation framework derived from Moffitt's theory (Moffitt, 1993) to a sample of male offenders, Herzberg and Roth (2006) were also able to show that the population-based approach reproduces personality types more validly than a sample-inherent derivation.

In the present study, individuals were thus assigned prototype membership by applying discriminant functions inferred from the cluster results of a German representative population-based sample ( $N = 1692$ , 18 to 96 years; see Herzberg & Roth, 2006) to their Big-Five values. Individual profiles were assigned to the best-fitting cluster centre of the representative sample (for the three and five-cluster solutions respectively) according to their Euclidean distance. Figure 2 presents the Big-Five mean z-scores for the two type-solutions in the present sample most sufficiently resembling the prototype pattern which emerged in the representative sample. Type-frequencies in the present sample differed from those in the representative sample. With respect to the three-cluster solution, more participants were assigned to the Undercontrollers and less to the Overcontrollers ( $\chi^2_{(2)} = 80.43$ ,  $p \leq .001$ )<sup>3</sup>. According to the five-cluster solution, less resilient, undercontrolled, and reserved participants were observed in the present sample, whereas the frequencies of the non-desirable and confident were higher than in the general German population ( $\chi^2_{(4)} = 183.08$ ,  $p \leq .001$ )<sup>4</sup>.

---

<sup>3</sup> Frequency distribution of the three personality types in the representative population-based sample: Resilient = 25.7%, Undercontrolled = 33.5%, Overcontrolled = 40.8%.

<sup>4</sup> Frequency distribution of the five personality types in the representative population-based sample: Resilient = 16.8, Non-desirable = 12.0, Undercontrolled = 24.0, Confident = 22.1, Reserved = 25.4.

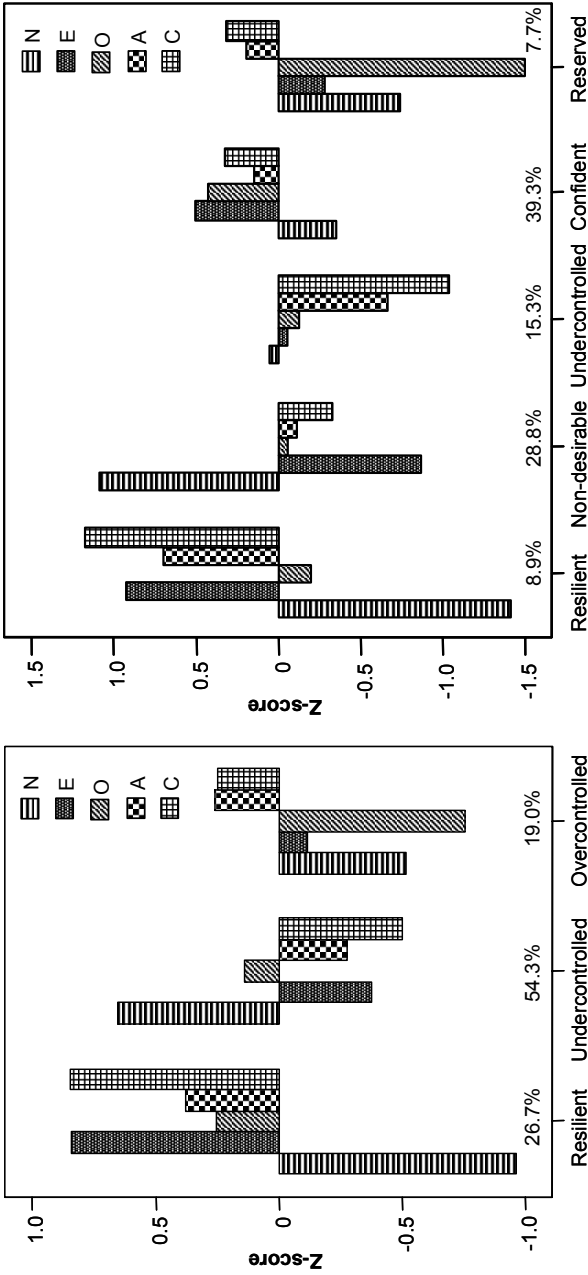


Figure 2:

Personality prototypes (based on population-based cluster-assignment) characterized by their Big-Five z-score pattern by different cluster solutions ( $N = 326$ ): Left panel, three cluster solution; right panel, five cluster solution. N, Neuroticism; E, Extraversion; O, Openness; A, Agreeableness; C, Conscientiousness.

2.2 Results

2.2.1 Influence of social desirability on types and traits: A person-centred perspective

In order to explore the extent to which the types are influenced by social desirability, differences in the psychometric scales assessing SD were tested using multivariate analyses of variance with cluster groups as independent variables. For the purpose of determining the meaning of the differences, effect sizes (partial eta<sup>2</sup>) were also calculated. All SD-scales included revealed significant differences between the personality types based on the three-cluster solution (see Table 1) as well as the five-cluster solution (see Table 2). More specifically, as indicated by Scheffé post-hoc tests, Resilients in the three-cluster solution showed, as expected, the highest and Undercontrollers the lowest degree of social desirability. Results based on the five personality clusters as independent variable were almost identical, with Resilients showing the highest level of social desirability.

Interestingly, according to Cohen's (1988) definition of the magnitude of effect sizes, these differences only proved large for the total measure of SD (SDS-17) and for the sub-scale Self Deception Enhancement (SDE) of the BIDR, on which the largest group differences emerged. In contrast, Impression Management (IM), which actually constitutes the main facet of SD, namely the conscious deception, did not differ greatly across cluster

**Table 1:**

Comparisons of social desirability measures for the three personality prototypes: means, standard deviations, and results of the analysis of variance (ANOVA)

Measures	Resilient		Undercontrolled		Overcontrolled		ANOVA		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>F</i> <sup>a</sup>	η <sup>2</sup>	Scheffé
SDS-17	3.7	0.4	3.3	0.4	3.4	0.4	27.4	.14	UN<OV<RE
BIDR-SDE	3.5	0.5	2.8	0.5	3.2	0.4	57.9	.26	UN<OV<RE
BIDR-IM	2.9	0.6	2.6	0.5	2.9	0.5	8.1	.05	UN<OV,RE

Note: *N* = 326. SDS-17 = Social Desirability Scale-17, BIDR = Balanced Inventory of Desirable Responding, SDS = Self-Deceptive Enhancement, IM = Impression Management

<sup>a</sup> *p*'s < .001.

**Table 2:**

Comparisons of social desirability measures for the five personality prototypes: means, standard deviations, and results of the analysis of variance (ANOVA)

Measures	RS		ND		UN		CO		RE		ANOVA		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>F</i> <sup>a</sup>	η <sup>2</sup>	Scheffé
SDS-17	3.9	0.4	3.3	0.4	3.1	0.4	3.5	0.4	3.4	0.4	19.0	.19	UN<RE, CO<RS
BIDR-SDE	3.9	0.3	2.7	0.5	3.0	0.5	3.1	0.4	3.3	0.3	42.4	.35	ND<UN,CO,RE<RS
BIDR-IM	3.1	0.7	2.7	0.5	2.5	0.4	2.8	0.5	3.0	0.5	6.5	.07	UN<RE <RS

Note: *N* = 326. Personality types: RS = resilient, ND = non-desirable, UN = undercontrolled, CO = confident, RE = reserved. SDS-17 = Social Desirability Scale-17, BIDR = Balanced Inventory of Desirable Responding, SDS = Self-Deceptive Enhancement, IM = Impression Management.

<sup>a</sup> *p*'s < .001.



groups. Effect sizes for SES-17 and BIDR-SDE proved to be large, indicating that personality types were affected by SD to a high extent. In order to answer the question as to whether the influence of SD on types was *higher* than the influence on dimensions, individuals were grouped according to their scores on the five NEO-dimensions (Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness). Each variable was graded 3-fold and 5-fold by percentiles (3-fold graduation: 33<sup>rd</sup> and 67<sup>th</sup> percentile; 5-fold graduation: 20<sup>th</sup>, 40<sup>th</sup>, 60<sup>th</sup>, and 80<sup>th</sup> percentile), so as to allow a direct comparison with results of the three- and five-cluster solutions. Again, analyses of variance were conducted, this time with dimension-groups as independent variables. ANOVA results are summarized as F-values and effect-sizes in Table 3. In line with the type-results, the largest group differences were found for SDE, whereas differences in IM were markedly lower. SDE clearly had the greatest influence on Neuroticism. Comparing the effect-sizes of SDE-differences between Neuroticism-groups with those between cluster groups (Tables 1-2), it can be summarized that, from a person-centred perspective, the dimension Neuroticism in itself explains more variance in social-desirability measures than the types based on all five dimensions.

**Table 3:**

Results of the analyses of variance of the social desirability-scores (SDS-17, BIRD-SDE, and BIDR-IM) by different levels of Big-Five-scores

Source	SDS-17			BIDR-SDE			BIDR-IM		
	<i>F</i>	<i>p</i>	$\eta^2$	<i>F</i>	<i>p</i>	$\eta^2$	<i>F</i>	<i>p</i>	$\eta^2$
Neuroticism (3-fold)	9.49	<.001	.06	95.69	<.001	.37	1.89	ns	-
Extraversion (3-fold)	2.51	ns	-	10.00	<.001	.06	0.17	ns	-
Openness (3-fold)	0.02	ns	-	1.13	ns	-	1.31	ns	-
Agreeableness (3-fold)	28.86	<.001	.15	3.24	.041	.02	17.57	<.001	.10
Conscientiousness (3-fold)	25.53	<.001	.14	27.27	<.001	.14	9.30	<.001	.05
Neuroticism (5-fold)	5.91	<.001	.07	55.67	<.001	.41	1.95	ns	-
Extraversion (5-fold)	2.43	.047	.03	5.71	<.001	.07	1.66	ns	-
Openness (5-fold)	0.56	ns	-	1.56	ns	-	2.17	ns	-
Agreeableness (5-fold)	23.34	<.001	.23	3.10	.016	.04	11.10	<.001	.12
Conscientiousness (5-fold)	15.91	<.001	.17	16.87	<.001	.17	4.94	.001	.06

Note: *N* = 326. SDS-17 = Social Desirability Scale-17, BIDR = Balanced Inventory of Desirable Responding, SDS = Self-Deceptive Enhancement, IM = Impression Management.

### 2.2.2 Influence of social desirability on types and traits: A variable-centred perspective

In order to analyze the influence of SD on types using a variable-centred approach, individual personality profiles were characterized by continuous parameters of typeness, i.e. by their similarity to the cluster centres of all types. These similarities were measured using the Euclidean distances of an individual profile from the three (or five) cluster centres based on the representative sample (see above). Euclidean distance coefficients were multiplied by (-1), so that higher scores expressed a higher degree of similarity (the maximal value is 0, representing no difference between an individual profile and a cluster centre). This procedure resulted in scores on three continuous typeness-variables for each individual based on the three-cluster solution (namely resilientness, undercontrolledness, and overcontrolledness)

and five typeness-variables (resilientness, undercontrolledness, non-desirableness, confidentness, and reservedness) based on the five-cluster-solution. Each individual naturally has the highest score in the variable representing the prototype to which s/he belongs.

Table 4 presents the correlations of SD-measures with NEO-dimensions and the continuous typeness-parameters of the NEO-type profiles. Generally, high correlations were observed between SD-measures and NEO-variables (typeness-variables as well as dimension-variables). As expected in light of the results described above, the highest correlations were found between resilientness and SDE. However, the correlation between neuroticism and SDE again proved higher than the correlation between SDE and both typeness-variables of the resilient-profile.

These results show that resilientness was strongly influenced by SD (mainly SDE), though not to a larger degree than neuroticism. In contrast to our hypothesis, the influence of SD on NEO-types thus *does not go beyond* the influence of SD on the dimensions. Therefore, resilientness does not represent an artificial SD-variable, “filtered out” from all SD-information on the five NEO-dimensions – and is therefore not an artifact of SD. In order to directly test this assumption, head-to-head comparisons of the five NEO-dimensions versus three (and five) NEO-typeness-variables as proposed by Costa, Herbst, McCrae, Samuels, and Ozer (2002) were finally performed. Applying this procedure, the criterion variables (here the SD-measures) were predicted using two regression models: In one regression

**Table 4:**

Pearson product moment correlations of the social desirability-measures with the NEO-dimensions (Big-Five) and NEO-typeness-variables

	SDS-17	BIDR-SDE	BIDR-IM
<i>Dimensions (Big Five)</i>			
Neuroticism	-.24***	-.66***	-.13*
Extraversion	.16**	.27***	.02
Openness	-.01	-.11*	-.11*
Agreeableness	.48***	.18***	.36***
Conscientiousness	.42***	.42***	.21***
<i>Typeness-variables (from three-cluster solution)</i>			
Resilientness	.37***	.61***	.27***
Undercontrolledness	-.19***	-.10*	.03
Overcontrolledness	.23***	.44***	.25***
<i>Typeness-variables (from five-cluster solution)</i>			
Resilientness	.38***	.63***	.27***
Non-desirableness	-.13*	-.26***	.07
Undercontrolledness	-.17**	.04	.02
Confidentness	.27***	.45***	.24***
Reservedness	.23***	.46***	.26***

Note:  $N = 326$ . SDS-17 = Social Desirability Scale-17, BIDR = Balanced Inventory of Desirable Responding, SDS = Self-Deceptive Enhancement, IM = Impression Management.

\*  $p \leq .05$ ; \*\*  $p \leq .01$ ; \*\*\*  $p \leq .001$  (two tailed).

analysis, type indicators were entered as a first block of predictors, followed by dimension indicators as a second block. In the second regression analysis, predictor blocks were entered in a reversed sequence. This approach enables an evaluation of the additional (or incremental) influence of the dimensions over the types (and vice versa) on SD.

Multivariate regression analyses were first performed in order to concurrently predict criterion variables (SDS-17, SDE, and IM) by comparing the three typeness-variables and the five dimension-variables. As can be seen in Table 5, entering the NEO-variables first resulted in a highly significant variance contribution (explaining on average 33%), whereas entering the typeness-variables in a second step of the regression analysis only resulted in a low additional contribution (1%) to the explained variance. Entering the three type-variables first resulted in a significant increase in explained variance (23%), but the addition of the Big-Five dimensions leads to a further substantial increase (11% on average). Analyses thus revealed that NEO-dimensions clearly showed more additional influence on SD than the three type-variables, whereas additional influence of the type-variables on SD above and

**Table 5:**

Head-to-head comparison of five NEO-FFI variables and three type variables in the concurrent prediction of social desirability variables by multiple regression models

Criterion variables	Model 1		Model 2	
	Step:1 $R^2$ 5 NEO variables <sup>a</sup>	Step 2: $\Delta R^2$ 3 type variables <sup>b</sup>	Step 1: $R^2$ 3 type variables <sup>b</sup>	Step 2: $\Delta R^2$ 5 NEO variables <sup>a</sup>
SDS-17	.34***	.01	.20***	.15***
BIDR-SDE	.48***	.01	.40***	.09***
BIDR-IM	.16***	.02*	.09***	.09***

Note:  $N = 326$ . SDS-17 = Social Desirability Scale-17, BIDR = Balanced Inventory of Desirable Responding, SDS = Self-Deceptive Enhancement, IM = Impression Management.

<sup>a</sup> Neuroticism, Extraversion, Openness, Agreeableness, Conscientiousness

<sup>b</sup> Resilientness, Undercontrolledness, Overcontrolledness

\*  $p \leq .05$ ; \*\*  $p \leq .01$ ; \*\*\*  $p \leq .001$ .

**Table 6:**

Head-to-head comparison of five NEO-FFI variables and five type variables in the concurrent prediction of social desirability variables by multiple regression models

Criterion variables	Model 1		Model 2	
	Step:1 $R^2$ 5 NEO variables <sup>a</sup>	Step 2: $\Delta R^2$ 5 type variables <sup>b</sup>	Step 1: $R^2$ 5 type variables <sup>b</sup>	Step 2: $\Delta R^2$ 5 NEO variables <sup>a</sup>
SDS-17	.34***	.01	.32***	.04**
BIDR-SDE	.48***	.01	.46***	.03**
BIDR-IM	.16***	.03*	.15***	.04**

Note:  $N = 326$ . SDS-17 = Social Desirability Scale-17, BIDR = Balanced Inventory of Desirable Responding, SDS = Self-Deceptive Enhancement, IM = Impression Management.

<sup>a</sup> Neuroticism, Extraversion, Openness, Agreeableness, Conscientiousness

<sup>b</sup> Resilientness, Non-desirableness, Undercontrolledness, Confidentiousness, Reservedness

\*  $p \leq .05$ ; \*\*  $p \leq .01$ ; \*\*\*  $p \leq .001$ .

beyond the influence of dimensions was virtually equal to zero for each dependent variable. Comparing the five dimensions with the typeness-variables resulting from the five-cluster solution, however, resulted in a change of pattern somewhat in favour of the dimension-variables. As Table 6 indicates, typeness- and NEO-dimension-variables explain almost the same proportion of SD-variance. Furthermore, the additional variance explained by type-variables over dimensions, is almost identical to the additional variance of dimensions over type-variables.

### 3. Study II

The second study aimed to test the influence of SD on types and NEO-dimensions by analysing their sensitivity to changes in questionnaire instructions, from a standard form to a fake-good instruction.

#### 3.1 Method

The sample was drawn from individuals attending various leisure facilities (sport clubs, choral societies). People were invited to take part in a “questionnaire-study dealing with several methods of assessing an individual’s personality”. They were guaranteed that answers would be treated confidentially and anonymously. Participants received no benefits from their participation. 119 subjects completed the questionnaire in the first session containing standard self-description instructions which requested them to respond truthfully. Two months after the first session, participants were administered the same questionnaire for a second time, this time with “fake good” instructions. The fake-good instructions read as follows:

You will now be given a questionnaire which you completed for the first time two months ago. This time, however, we would like you to imagine a situation in which you want to make as good an impression as possible, for example, a job-application situation. Therefore, please answer all questions in such a way as to make as good an impression as possible.

A total of  $N = 107$  participants completed the questionnaire in the second session. Of these, 59% were women and 40% were men. Mean age was 32.8 years ( $SD = 11.5$ ; range 18 to 60 years).

*Measures.* The following three instruments were administered to the participants in each session: *NEO Five Factor Inventory (NEO-FFI; Borkenau & Ostendorf, 1993)*, *Social Desirability Scale-17 (SDS-17; Stöber, 2001)*, and *Balanced Inventory of Desirable Responding (BIDR; Musch et al., 2002)*. The items of the three questionnaires were presented in a mixed order with a five-point Likert scale format (ranging from “strongly disagree” to “strongly agree”).

*Assignment of individuals to Big-Five based prototypes.* The same population based-approach described in Study I was used to assign the participants prototype membership. First, individual profiles of Big Five mean scores from Session 1 were assigned to the best-fitting cluster centre of the representative sample (see above). Assignments were made for

the three- as well as for the five-cluster solutions and resulted in *types under standard instruction*. This procedure was repeated for the Big-Five scores from Session 2 (again for the three- and five-cluster solutions) resulting in *types under fake-good instruction*.

### 3.2 Results

Tables 7 and 8 present frequency distributions of the types resulting from cluster-assignments under standard<sup>5</sup> and fake-instruction. The convergence between the first and second cluster-assignment, as tested by Cohen's kappa  $\kappa$  was significant ( $p < .001$ ) but low for the three-cluster solutions as well as for the five-cluster solutions ( $\kappa = .23$  and  $.18$ , respectively). Only 46% of participants were assigned to the same type in both sessions when applying the three-cluster-solution. The majority of these were classified as the resilient type. For this type, the rate of consistent classification was 93%, whereas only 21 % of the Undercontrollers and 35% of the Overcontrollers were assigned to the same type under fake-

**Table 7:**

Frequency distributions of the three-cluster assignments under standard and fake instruction

Type classification by standard instruction	n (f %)	Type classification by fake-good instruction					
		RS		UN		OV	
		n	(f %)	n	(f %)	n	(f %)
Resilient (RS)	30 (28.0)	28	(93.3)	0	(0.0)	2	(6.7)
Undercontrolled (UN)	43 (40.2)	28	(65.1)	9	(20.9)	6	(14.0)
Overcontrolled (OV)	34 (31.8)	20	(58.8)	2	(5.9)	12	(35.3)
<i>Total</i>	<i>107 (100.0)</i>	<i>76</i>	<i>(71.0)</i>	<i>11</i>	<i>(10.3)</i>	<i>20</i>	<i>(18.7)</i>

**Table 8:**

Frequency distributions of the five-cluster assignments under standard and fake instruction

Type classification by standard instruction	n (f %)	Type classification by fake-good instruction									
		RS		ND		UN		CO		RE	
		n	(f %)	n	(f %)	n	(f %)	n	(f %)	n	(f %)
Resilient (RS)	12 (11.2)	10	(83.3)	0	(0.0)	0	(0.0)	1	(8.3)	1	(8.3)
Non-desirable (ND)	22 (20.6)	9	(40.9)	2	(9.1)	1	(4.5)	9	(40.9)	1	(4.5)
Undercontrolled (UN)	13 (12.1)	8	(61.5)	1	(7.7)	3	(23.1)	1	(7.7)	0	(0.0)
Confident (CO)	41 (38.3)	25	(61.0)	2	(4.9)	1	(2.4)	13	(31.7)	0	(0.0)
Reserved (RE)	19 (17.8)	5	(26.3)	0	(0.0)	2	(10.5)	4	(21.1)	8	(42.1)
<i>Total</i>	<i>107 (100.0)</i>	<i>57</i>	<i>(53.3)</i>	<i>5</i>	<i>(4.7)</i>	<i>7</i>	<i>(6.5)</i>	<i>28</i>	<i>(26.2)</i>	<i>10</i>	<i>(9.3)</i>

<sup>5</sup> The frequency distribution of the three types under standard instruction didn't differ from the representative frequency distribution ( $\chi^2_{(2)} = 3.96$ ,  $p = ns$ ; see footnote 2). In contrast, a different frequency distribution compared to that of the representative sample was observed with respect to the five-cluster solution ( $\chi^2_{(4)} = 31.19$ ,  $p \leq .001$ ; see footnote 3).

instruction. As expected, the majority of these switched to a resilient-profile under fake-instruction conditions. As shown in Table 7, the pattern of results emerging with respect to the five-cluster solution was almost identical, with only 34% convergence between first and the second cluster-assignments. Thus, the results clearly indicate a high sensitivity of types to faking instructions. As expected, Resilients can unambiguously be characterized as the type whose profile resembles that which results when individuals attempt to make a social desirable impression on others.

Since the aim of the study was further to compare the SD-instruction sensitivity of types with that of dimensions, the variable-centred approach was selected, according to which individual NEO-profiles were transformed into continuous typeness-variables. Therefore, the same procedure, as described in detail in Study I, was carried out for the NEO-profiles emerging in both sessions. In order to test the differences in the NEO-dimensions and typeness-variables between the first (standard) and the second (fake-good) measurement-point, *t*-tests for paired samples were calculated. As shown in Table 9, the effects of instructional variation proved relatively large<sup>6</sup>. Compared to the standard condition, scores in the

**Table 9:**

Differences in NEO-dimensions and typeness-variables between standard instruction and fake-good instruction (*t*-tests for paired samples)

Variable	Standard instruction		Fake-good instruction		<i>t</i> -tests		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	$\eta^2$
<i>Dimensions (Big Five)</i>							
Neuroticism	2.8	0.7	2.2	0.6	8.75	<.001	.42
Extraversion	3.2	0.4	3.7	0.4	-11.67	<.001	.56
Openness	3.5	0.5	3.5	0.5	-1.63	ns	-
Agreeableness	3.6	0.4	3.8	0.4	-6.71	<.001	.30
Conscientiousness	3.7	0.5	4.2	0.6	-9.46	<.001	.46
<i>Typeness-variables (three-cluster solution)</i>							
Resilientness	-1.5	0.6	-1.1	0.5	-6.48	<.001	.28
Undercontrolledness	-1.4	0.4	-2.0	0.6	11.90	<.001	.57
Overcontrolledness	-1.2	0.5	-1.4	0.5	4.53	<.001	.16
<i>Typeness-variables (five-cluster solution)</i>							
Resilientness	-1.7	0.6	-1.2	0.5	-7.77	<.001	.36
Non-desirableness	-1.5	0.5	-2.2	0.6	12.61	<.001	.59
Undercontrolledness	-1.4	0.4	-1.9	0.6	10.87	<.001	.53
Confidentness	-1.1	0.4	-1.2	0.4	1.24	ns	-
Reservedness	-1.3	0.5	-1.5	0.5	3.80	<.001	.12

Note: *N* = 107.

<sup>6</sup> As expected, differences between both sessions were also observed in the SD-measures SDS-17 (standard: *M* = 3.4, *SD* = 0.4; fake-good: *M* = 3.9, *SD* = 0.6;  $T_{(106)} = -9.14$ ,  $p \leq .001$ ,  $\eta^2 = .44$ ), BIDR-SDE (standard: *M* = 3.1, *SD* = 0.5; fake-good: *M* = 3.6, *SD* = 0.5;  $T_{(106)} = -9.40$ ,  $p \leq .001$ ,  $\eta^2 = .46$ ), and BIDR-IM (standard: *M* = 2.9, *SD* = 0.5; fake-good: *M* = 3.4, *SD* = 0.6;  $T_{(106)} = -7.68$ ,  $p \leq .001$ ,  $\eta^2 = .36$ ) of course.

fake-good condition increased for resilientness, and decreased for the remaining typeness-variables, especially for undercontrolledness and non-desirableness (or overcontrolledness). However, these effects were not greater than the effects of instructional variation on NEO-dimensions. This once again indicates that the typeness-variables are indeed highly sensitive to conditions in which a social desirable impression is to be made on others, but that they are no more sensitive than the NEO-dimensions upon which they are based.

#### 4. Discussion

In the present paper, the main aim was to test the influence of social desirability on Big-Five personality types. That aim was rooted in findings within typological research giving rise to the suspicion that Big-Five (or NEO-)based prototypes are greatly affected by social desirability. In particular concerning the resilient type, these findings tend to suggest, that this personality type is actually nothing more than an *artifact* of a socially desirable response bias. To test the assumption, whether the derivation of this type rather represents the mere formation of a group of individuals who tend to respond to items in a socially desirable manner, the degree of SD influence on the NEO-types was compared with the degree of influence on the NEO-dimensions.

In sum, as shown by the results of our studies, these assumptions were not collaborated. Indeed, we found that the Big-Five types, in particular the resilient type, were strongly influenced by social desirability - but not to a greater degree than the NEO-dimensions upon which the types are based. This finding was consistent throughout different approaches of comparison (person-centred vs. variable-centred), different strategies measuring the SD-affectation (cross-sectional correlations with SD-measures vs. analyzing differences between standard and fake-good instructions), and different cluster-solutions (three vs. five cluster) implemented in our analyses. Because the influence of SD on Big-Five types does not go beyond the influence of SD on the NEO-dimensions, we can *not* assume that types are merely an artifact of social desirability. So, the SD-affectation of types merely reflects the SD-affectation of the dimensions upon which the types are based - nothing more (but nothing less; see below). However, the impact of social desirability on the Big Five dimensions and types would be more severe if future studies would show that social desirable responding with regard to the Big Five has an impact on external criteria or important outcome measures, e.g. occupational performance or objective measures of health (see Caspi, 2000).

In the present study, a comparison of results based on various SD-indices measuring different facets of social desirability revealed that the influence of social desirability on types was primarily related to the SDE-subscale of the BIDR. This facet is assumed by Paulhus (1998; see also Musch et al., 2002) to reflect the unconscious component of social desirability. The theoretical rationale underlining the application of the BIDR is deeply grounded in the assumption that people with high scores in SDE *actually believe* in their overly positive self-reports (contrary to individuals scoring high in IM, who consciously dissemble). As defined by Paulhus (1986), SDE is a “less conscious attempt to look good to oneself” (p. 146), a tendency to distort reality in an optimistic manner. According to Paulhus (1986), a certain tendency toward self-deceptive enhancement is characteristic of the mentally healthy individual. Thus, SDE is conceptualized as a personality style rather than as a socially desirable response style. With respect to this conceptualization, it *could* be assumed that Resil-

ients are not actually individuals who tend to intentionally fake questionnaires, but rather individuals with an optimistic self-view - incidentally, this would be in line with the theoretical conception of this type (see Robins, John, & Caspi, 1998).

However, to make it clear from the beginning: This “positive” interpretation of the SDE-component is false! First, as was shown in Study II, the resilient profile clearly emerged more frequently when participants were asked to fake their answers in a socially desirable manner. Second, the SDE-scale proved just as sensitive to intentional faking instructions as the IM scale measuring conscious dissemblance: This was clearly seen in the equally large effect sizes for the differences between standard-manner and fake-good instruction on both the IM as well as the SDE-scale (see *footnote 5*). This result contradicts the construct validity of the BIDR. The results of the present study thus imply that the scale labels “Self-Descriptive Enhancement” and “Impression Management” (together with their theoretical foundations) are rather misleading, in so far as *both* scales measure impression management strategies used in pursuing the aim of intentionally faking responses in a socially desirable manner. Studies carried out by Pauls and Crost (2004) also yielded corresponding findings and the authors concluded “that the categorization of unconscious self-deception on the one hand and conscious other-deception on the other hand seems to be arbitrary” (p. 1149).

There is no doubt that the present results should be primarily traced back to the intentional aim to fake questionnaires - in the sense of a socially desirable response style. As described above, the influence of SD on types is comparable to the influence on NEO-dimensions, which can be considered “good news“. However the fact that types are *no less* affected by SD than dimensions also entails that the influence of SD is in both cases extremely high. This is the “bad news” of the present paper. When solely based on self-reports, the typological approach is thus burdened with the very same problem which the dimensional approach is afflicted with: Since individuals *are able* to fake questionnaires, and there is never any guarantee that they do not do so (see also Seiwald, 2002), alternative strategies are essential when it comes to measuring the individual’s personality. Indeed, as rightly stated by Kubinger (2002b) “there is no definite need to hold on to personality inventories” (p. 15). In our opinion, the typological approach to personality would greatly profit from alternative classification strategies that are not exclusively based on self-reports. In order to ensure that the NEO-types actually represent personality types (and not various types of questionnaire response-styles) it would appear necessary that future research should look to validate personality types using objective personality tests (e.g., Kubinger, 2005).

## References

- Asendorpf, J. B., Borkenau, P., Ostendorf, F., & van Aken, M. A. G. (2001). Carving personality description at its joints: Confirmation of three replicable personality prototypes for both children and adults. *European Journal of Personality, 15*, 169-198.
- Avedeyeva, T. V., & Church, A. T. (2005). The cross-cultural generalizability of personality types: a Philippine study. *European Journal of Personality, 19*, 451-474.
- Barbaranelli, C. (2002). Evaluating cluster analysis solutions: An application to the Italian NEO personality inventory. *European Journal of Personality, 16*, 43-55.



- Blashfield, R. K., & Aldenderfer, M. S. (1988). The methods and problems of cluster analysis. In J. R. Nesselroade & R. B. Cattell (Eds.), *Handbook of multivariate experimental psychology* (2 ed., pp. 447-473). New York: Plenum Press.
- Block, J. (1971). *Lives through time*. Berkeley: Bancroft Books.
- Block, J. H., & Block, J. (1980). The role of ego-control and ego-resiliency in the organization of behavior. In W. A. Collins (Ed.), *Minnesota Symposium of Child Psychology* (Vol. 13, pp. 39-101). Hillsdale, NJ: Erlbaum.
- Boehm, B., Asendorpf, J. B., & Avia, M. D. (2002). Replicable types and subtypes of personality: Spanish NEO-PI samples. *European Journal of Personality*, 16, 25-41.
- Borkenau, P., & Ostendorf, F. (1993). *NEO-Fünf-Faktoren Inventar nach Costa und McCrae. Handanweisung [The NEO-Five-Factor Inventory. Manual]*. Göttingen: Hogrefe.
- Caspi, A. (2000). The Child is father of the man: Personality continuities from childhood to adulthood. *Journal of Personality and Social Psychology*, 78, 158-172.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale: Erlbaum.
- Costa, P. T., Herbst, J. H., McCrae, R. R., Samuels, J., & Ozer, D. J. (2002). The replicability and utility of three personality types. *European Journal of Personality*, 16, 73-87.
- Costa, P. T., & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO PI-R) and NEO Five Factor Inventory (NEO-FFI). Professional Manual*. Odessa, FL: Psychological Assessment Resources.
- Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology*, 24, 349-354.
- De Raad, B. (2000). *The big five personality factors: The psycholexical approach to personality*. Seattle: Hogrefe & Huber Publishers.
- Ekehammar, B., & Akrami, N. (2003). The relation between personality and prejudice: a variable- and a person centred approach. *European Journal of Personality*, 17, 449-464.
- Hart, D., Burock, D., London, B., Atkins, R., & Bonilla-Santiago, G. (2005). The relation of personality types to physiological, behavioural and cognitive processes. *European Journal of Personality*, 19, 391-407.
- Herzberg, P. Y., & Roth, M. (2006). Beyond resilient, undercontrollers, and overcontrollers? An Extension of Personality Prototype Research. *European Journal of Personality*, 20, 5-28.
- John, O. P., & Srivastava, S. (1999). The Big Five trait taxonomy. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research*. New York: Guilford.
- Kanning, U. P., & Holling, H. (2001). Struktur, Reliabilität und Validität des NEO-FFI in einer Personalauswahlsituation [Structure, reliability, and validity of the NEO-FFI in a personnel selection process]. *Zeitschrift für Differentielle und Diagnostische Psychologie*, 22, 239-247.
- Kubinger, K.D. (Ed.). (2002a). Personality questionnaires: Some critical points of view. *Psychology Science*, 44, Issue 1.
- Kubinger, K.D. (2002b). On faking personality inventories. *Psychologische Beiträge*, 44, 10-16.
- Kubinger, K.D. (2005). Objektive psychologisch-diagnostische Verfahren [Objective Psychological Assessment]. In H. Weber & T. Rammsayer (Eds.), *Handbuch der Persönlichkeitspsychologie und Differentiellen Psychologie* (pp. 158-165). Göttingen: Hogrefe.
- Milligan, G. W., & Cooper, M. C. (1985). An examination of procedures for determining the number of clusters in a data set. *Psychometrika*, 50, 159-179.
- Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behavior. *Psychological Review*, 100, 674-701.

- Musch, J., Brockhaus, R., & Bröder, A. (2002). Ein Inventar zur Erfassung von zwei Faktoren sozialer Erwünschtheit [An inventory for the assessment of two factors of social desirability]. *Diagnostica, 48*, 121-129.
- Paulhus, D.L. (1986). Self-deception and impression management in test responses. In A. Angleitner & J.S. Wiggins (Eds.), *Personality assessment via questionnaire* (pp. 143-165). New York: Springer.
- Paulhus, D. L. (1998). *The Balanced Inventory of Desirable Responding*. Toronto: Multi-Health Systems.
- Pauls, C. A., & Crost, N. W. (2004). Effects of faking on self-deception and impression management scales. *Personality and Individual Differences, 37*, 1137-1151.
- Petermann, H. & Roth, M. (2005). *Persönlichkeitstypen und produktives Altern [Personality types and successful aging]*. Paper presented at the 8<sup>th</sup> Arbeitstagung der Fachgruppe Differentielle Psychologie, Persönlichkeitspsychologie und Psychologische Diagnostik der Deutschen Gesellschaft für Psychologie, Marburg.
- Pulkinnen, L. (1996). Female and male personality styles: A typological and developmental analysis. *Journal of Personality and Social Psychology, 70*, 1288-1306.
- Rammstedt, B., Riemann, R., Angleitner, A., & Borkenau, P. (2004). Resilients, Overcontrollers, and Undercontrollers: The replicability of the three personality prototypes across informants. *European Journal of Personality, 18*, 1-14.
- Robins, R. W., John, O. P., & Caspi, A. (1998). The typological approach for studying personality. In R. B. Cairns, L. R. Bergman & J. Kagan (Eds.), *Methods and models for studying the individual* (pp. 135-160). Beverly Hills: Sage.
- Robins, R. W., John, O. P., Caspi, A., Moffitt, T. E., & Stouthamer-Loeber, M. (1996). Resilient, overcontrolled, and undercontrolled boys: Three replicable personality types. *Journal of Personality and Social Psychology, 70*, 157-171.
- Roth, M. (2006, submitted). *Moderating effect of personality type on the relationship between sensation seeking and illegal substance use in adolescents*. Paper submitted for publication.
- Roth, M., & von Collani, G. (2007). A head-to-head comparison of Big-Five types and traits in the prediction of social attitudes: Further evidence for a five-cluster typology. *Journal of Individual Differences, 28*, 138-149.
- Seiwald, B.B. (2002). Replicability and generalizability of Kubinger's results: Some more studies on faking personality inventories. *Psychologische Beiträge, 44*, 17-23.
- Schnabel, K., Asendorpf, J. B., & Ostendorf, F. (2002). Replicable types and subtypes of personality: German NEO-PI-R versus NEO-FFI. *European Journal of Personality, 16*, 7-24.
- Stöber, J. (2001). The Social Desirability Scale-17 (SDS-17): Convergent validity, discriminant validity, and relationship with age. *European Journal of Psychological Assessment, 17*, 222-232.
- van Leeuwen, K., De Fruyt, F., & Mervielde, I. (2004). A longitudinal study of the utility of the resilient, overcontrolled, and undercontrolled personality types as predictors of children's and adolescents' problem behavior. *International Journal of Behavioral Development, 28*, 210-220.