

## RESEARCH ARTICLE

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# Integration and Domain Specificity of Response Styles: Towards a Better Understanding of a General Response Style

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### Abstract

We examined the meaning of a general response style that integrates acquiescent, extreme, midpoint, and socially desirable responding. A total of 5,457 Dutch residents (mainstreamers and Western and non-Western immigrant) were sampled. Self-report measures of the four response styles, values, personality, self-regulation, cognition, positive life outcomes, and political views were administered. Conventional, indirect measures of acquiescent, extreme, and midpoint responding were calculated. A multigroup confirmatory factor analysis supported a general response style factor with positive loadings of extreme and socially desirable responding, and negative loadings of acquiescent and midpoint responding with both self-report and indirect measures. This factor was most strongly associated with personality and cognition, and least with political views. The correction of the general response style factor had differential effects on the correlations between scales, with the most impact in more personally relevant domains. We advise against correcting for response styles in self-report psychological measures.

### Keywords

response styles, general factor, domain specificity, score correction

Response styles are defined as the systematic tendency to use certain categories of an answering scale on some basis other than the target construct (Cronbach, 1950). It is imperative to understand the underlying mechanism of response styles, thus appropriate measures can be taken to address their effects in self-reports. The most frequently studied response styles include acquiescent response style (ARS), extreme response style (ERS), midpoint response style (MRS), and socially desirable response style (SDR) (Paulhus, 1991). Although usually treated as distinct, these four response styles

are related. It has been found that a General Response Style (GRS) can be extracted with ERS and SDR as positive indicators, and ARS and MRS as negative indicators; GRS is strongly associated with desirable personality traits and can be interpreted as a communication filter (i.e., response amplification to moderation) (He & Van de Vijver, 2013). However, associations of GRS with presumably relevant constructs (e.g., values and self-regulation) have not been adequately researched, nor has its impact on these psychological measures been explored. In the present study we first address the

replicability of GRS with a representative national sample. We then discuss novel topics, including the nomological network of response styles and the effects of their correction.

### **Nomological Network of Response Styles**

Response styles are associated with various psychological measures, notably personality. ERS and SDR were positively related to extroversion and conscientiousness (Eid & Rauber, 2000; Meiser & Machunsky, 2008). ARS and the impression management dimension of SDR were related to agreeableness (Messick & Jackson, 1961; Pauls & Stemmler, 2003). Regarding values, the impression management dimension of SDR was positively associated with collectivism and the self-deceptive enhancement dimension with individualism (Lalwani, Shrum, & Chiu, 2009). Regarding self-regulation, ERS was positively related to promotion regulation focus and MRS to prevention regulation (Cabooter, 2010). In the cognition domain, ERS was positively associated with intolerance of ambiguity (Naemi, Beal, & Payne, 2009), suggesting that respondents' need to evaluate enhances the use of ERS. Krosnick (1991) argued that respondents avoiding cognitive efforts in survey responding tend to utilize ARS as a satisficing strategy. Positive life outcomes, such as subjective well-being and self-esteem, were positively related to SDR and ERS (e.g., Bachman & O'Malley, 1984). These correlations can be extended to GRS, based on the loadings of these specific response styles on GRS.

### **Domain Specificity of Response Styles**

Topic involvement boosts response styles (Diamantopoulos, Raeynolds, & Simintiras, 2006). ERS was found to be higher in surveys dealing with personal domains than public domains (van Dijk, Datema, Pigten, Welten, & van de Vijver, 2009). It seems that in self-evaluation respondents' need for

controllability is higher and the motivation to self-enhance or self-protect is more salient. We expect these findings to extend to GRS. The correlations of GRS with other self-report constructs may differ according to the level of self-involvement, as domains of higher self-involvement (e.g., personality) may share more variance with GRS, compared with domains of lower self-involvement (e.g., political views).

### **Correcting for Response Styles**

Response styles can influence both scale means and relationships with other variables (van de Vijver & Leung, 1997). The conventional interpretation of response styles as nuisance factors suggests that score corrections will increase scale validity; yet, the effectiveness of response style correction is not a foregone conclusion. It was argued that ERS and MRS could both hide and exaggerate cross-national differences, yet their correction effects are inconsistent (Diamantopoulos et al., 2006). Dudley et al. (2005) reported that correcting for SDR did not affect the validity of a personality test in different racial groups. Inconsistencies in findings may be due to differences in response styles across stimulus formats, life domains, and operationalizations of response styles. Part of the inconsistencies could presumably be accommodated by integrating specific response styles to a GRS. We explore effects of GRS correction on the patterning of correlations of variables from different domains. If GRS indeed serves as a communication filter that is equally reflected in all self-report measures, GRS correction on any self-report measure would result in consistently lower intercorrelations among these variables. If GRS influences self-report measures of various domains differentially, changes vary across domains. Finally, we explore how the correction of GRS could impact the size of cross-group differences on target measures.

## **Method**

### **Participants and Procedure**

In this paper use is made of data of the LISS (Longitudinal Internet Studies for the Social

Sciences) panel administered by CentERdata (Tilburg University, The Netherlands). The LISS panel is a representative sample of Dutch individuals who participate in monthly Internet surveys. The panel is based on a true probability sample of households drawn from the population register by Statistics Netherlands. Households that could not otherwise participate are provided with a computer and Internet connection. In the present study, respondents of three cultural groups were sampled: Dutch mainstreamers ( $n = 4,812$ ; mean age = 50.63 years; male 46%), Western immigrants from other European countries and North America ( $n = 395$ , Mean age = 52.48 years; male 46%), and Non-Western immigrants from Turkey, Morocco, Suriname and other Eastern countries ( $n = 250$ ; Mean age = 39.96 years; male 44%).

## Measures

### Indirect measures of ARS, ERS, and MRS.

We constructed ARS, ERS, and MRS indexes using non-overlapping sets of items to avoid data dependency (the items used and the syntax to construct these response style indexes are available from the first author upon request).

An ARS index was constructed from eight bi-directional scales (i.e., scales with positively and negatively worded items). These scales covered various life domains (e.g., optimism, attitude to public drug policy). All scales had 5- or 7-point response options with anchors from *strongly disagree* to *strongly agree*. We averaged the proportions of the agreeing categories (e.g., scores of 4 in the 5-point scales, and scores of 5 and 6 in the 7-point scales) from the positively worded items and the negatively worded items for the ARS index. The endorsement of *strongly agree* was not taken as a part of ARS, to avoid confounding with ERS. The value of Cronbach's alpha from the 77 items (recoded as 1 for ARS endorsement and 0 for Non-ARS endorsement, respectively) was .71.

An ERS index was extracted from sets of 4-, 5-, and 7-point scales in the Likert-scale item pool with various item contents. We randomly selected 15 items from each response format (i.e., 4-, 5-, and 7- point

response options), recoded the responses as ERS endorsement (e.g., scores of 1 and 4 of the 4-point items as 1) and Non-ERS endorsement (e.g., scores of 2 and 3 of the 4-point items as 0), and averaged the ERS endorsement from the 45 items as an indicator of global ERS ( $\alpha = .88$ ).

Similar to the ERS index, an MRS index was constructed from sets of 5- and 7-point Likert-scale items. Fifteen items were randomly chosen from each response format and the proportion of the mid-point endorsement (e.g., scores of 4 of the 7-point items) was taken as the global MRS index ( $\alpha = .64$ ).

**Self-report measures of ARS, ERS, MRS, and SDR.** Self-reported measures of ARS, ERS, and MRS have been developed and validated in He and van de Vijver (2013), and the same measures were used in the present study. For each style, a 10-item scale comprised questions with half positively and half negatively phrased items, and each item had a 7-point response option with anchors varying from item to item.

Principal component analysis revealed a one-factor structure for ARS (explained variance of 38%); a sample item of the scale read "Do you sometimes say "Yes" even though you do not actually agree?" ( $\alpha = .81$ ).

The 10 ERS items loaded on two factors; the first factor was about expressiveness and preference of ERS, whereas the second factor was more about the functional aspects of utilizing ERS. Items on the first factor were taken (explained variance of 30%). A sample item from the 5-item ERS scale read "Do you like to be viewed as a person with strong opinions?" ( $\alpha = .72$ ).

All the MRS items loaded on one factor (explained variance of 28%), and a sample item in the MRS scale read "Do you prefer neutral opinions to strong opinions?" ( $\alpha = .69$ ).

Seventeen items from the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960) and the Balanced Inventory of Desirable Responding (Paulhus, 1991) were administered to tap into impression management (IM) (e.g., "I help others in trouble") and Self-Deceptive Enhancement (SDE) (e.g., "I am confident about my

judgment"). All the SDR items were rated on a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Principal component analysis supported the two-factor solution, with explained variances of 24% and 10% ( $\alpha = .73$  for IM;  $\alpha = .63$  for SDE).

We ensured the equivalence of all the self-report response style measures across the three cultural groups with multigroup confirmatory factor analysis. For each self-report response style scale, a model testing invariance of measurement weights and intercepts showed an acceptable fit, which indicated that the scale means can be compared directly.

**Nomological network measures.** We used data of personality, values, self-regulation, cognition, positive life outcomes, and political views administered to the same participants in the panel.

**Personality.** Fifty items of the International Personality Item Pool (Goldberg et al., 2006) were applied to assess the Big Five personality factors. Response options ranged from 1 (very inaccurate) to 5 (very accurate). The "Big One" personality factor was also calculated as the factor score of the five traits in a principal component analysis, in which all the five traits loaded positively on the factor (Musek, 2007). The values of Cronbach's alpha for the five traits were .81, .79, .87, .77, and .88, respectively.

**Values.** *Horizontal Individualism* (sample item: "I'd rather depend on my own strength than being dependent on others"), *Vertical Individualism* ("Winning is everything"), *Horizontal Collectivism* ("If an acquaintance gets a prize, I would feel proud"), and *Vertical Collectivism* ("It is important to me that I respect the decisions made by my groups") were assessed with an 8-item scale from Triandis and Gelfand (1998). The horizontal-vertical dimension distinguishes the preferences of equality versus hierarchy. The response options ranged from 1 (*totally not applicable*) to 7 (*totally applicable*). The values of Cronbach's alpha were .76, .76, .57, and .61, respectively.

**Self-regulation.** Two emotion regulation strategies were assessed with the 10-item scale from Gross and John (2003) with response options ranging from 1 (*strongly disagree*) to

7 (*strongly agree*): *Reappraisal* (i.e., tendency to change an emotional response by reinterpreting the meaning of the emotional stimulus) ( $\alpha = .81$ ) and *Suppression* (i.e., tendency to inhibit ongoing emotion-expressive behavior) ( $\alpha = .78$ ).

Two regulation focus measures, *Prevention Focus* (i.e., focus on the avoidance of failure) ( $\alpha = .85$ ) and *Promotion Focus* (i.e., focus on the pursuit of success) ( $\alpha = .90$ ), were taken from the scale from Lockwood, Jordan, and Kunda (2002); response options ranged from 1 (*totally not applicable*) to 7 (*totally applicable*).

**Cognition.** *Need to Evaluate*, defined as the extent to which people spontaneously evaluate objects or experiences as either good or bad, was measured by the 16-item scale by Jarvis and Petty (1996). The response options ranged from 1 (*extremely uncharacteristic of me*) to 5 (*extremely characteristic of me*). The 16 items loaded on two factors and only the 10 items that loaded on the first factor were used to calculate the scale score ( $\alpha = .85$ ).

*Need for Cognition*, representing the extent to which people engage in and enjoy a wide variety of effortful cognitive activities, was measured by the 18-item scale by Cacioppo and Petty (1982). The response options ranged from 1 (*strongly disagree*) to 7 (*strongly agree*) ( $\alpha = .89$ ).

**Positive outcomes.** *Satisfaction with Life* was measured by the 5-item scale from Diener, Emmons, Larsen, and Griffin (1985). The response options ranged from 1 (*totally disagree*) to 7 (*totally agree*) ( $\alpha = .90$ ). *Self-esteem* was measured by the 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1965), with response options ranging from 1 (*totally disagree*) to 7 (*totally agree*) ( $\alpha = .90$ ).

**Political views.** *Opinion on Democracy* (sample item: "voters should have direct input in law-making") was measured with 9 items ( $\alpha = .78$ ), *Trust in Politicians* ("elected politicians are the most suitable people to make decisions") was measured with 4 items ( $\alpha = .65$ ), and *Opinion on Immigration* ("the unity of the Netherlands is weakened by the immigrant population") was measured with 10 items ( $\alpha = .88$ ). The response options for the

three scales ranged from 1 (*totally disagree*) to 5 (*totally agree*).

## Results

We report the results in three parts: the fit of the GRS model across cultural groups, the associations of response styles with the nomological network measures, and the impact of GRS correction on the correlation pattern and mean differences.

## The General Response Style Factor Model

We fitted the General Response Style model in a multigroup confirmatory factor analysis in AMOS (Byrne, 2001), in which indirect measures of ARS, ERS, and MRS, and self-report measures of ARS, ERS, MRS, IM, and SDE all loaded on the General Response Style factor; all the indirect and direct measures also loaded on an assessment mode factor with identical loadings per mode (to account for the difference in data collection modes). The measurement residuals model was the most parsimonious model that fitted well (Table 1).

Table 1. *Descriptive Characteristics of Respondents from the Three Cultural Groups*

Cultural Groups	Sample size	Percentage of males	Mean age (standard deviation)	Mean education (standard deviation)
Dutch mainstreamers	4812	46%	50.63 (17.12)	3.48 (1.50)
Western immigrants	395	46%	52.48 (16.61)	3.61 (1.53)
Non-Western immigrants	250	44%	39.96 (14.39)	3.43 (1.66)

Note. Education was scored from 1 (*primary school*) to 6 (*university*).

The standardized solutions are presented in Figure 1. We found support for a General Response Style factor with positive loadings of ERS and SDR, and negative loadings of ARS and MRS. Only the self-report measures loaded significantly on the mode factor, which indicates that the mode factor served to capture the distortion in self-report measures.

We compared the latent means of GRS and the mode factor across ethnic groups, using the measurement intercept model that fitted reasonably well ( $\chi^2(75, N = 5,457) = 700.98, p$

$< .01$ , TLI = .92, CFI = .93, RMSEA = .04). Compared with Dutch mainstreamers (as the reference group), Non-Western immigrants scored lower on GRS ( $M = -.08, SE = .04, p < .05$ ), whereas Western immigrants scored higher ( $M = .06, SE = .03, p < .05$ ). Non-Western immigrants had a higher mean on the mode factor ( $M = .52, SE = .13, p < .01$ ), whereas the Western immigrant group did not differ from the Dutch mainstream group ( $M = .13, SE = .10, p > .05$ ). These differences were in line with He and van de Vijver (2013).

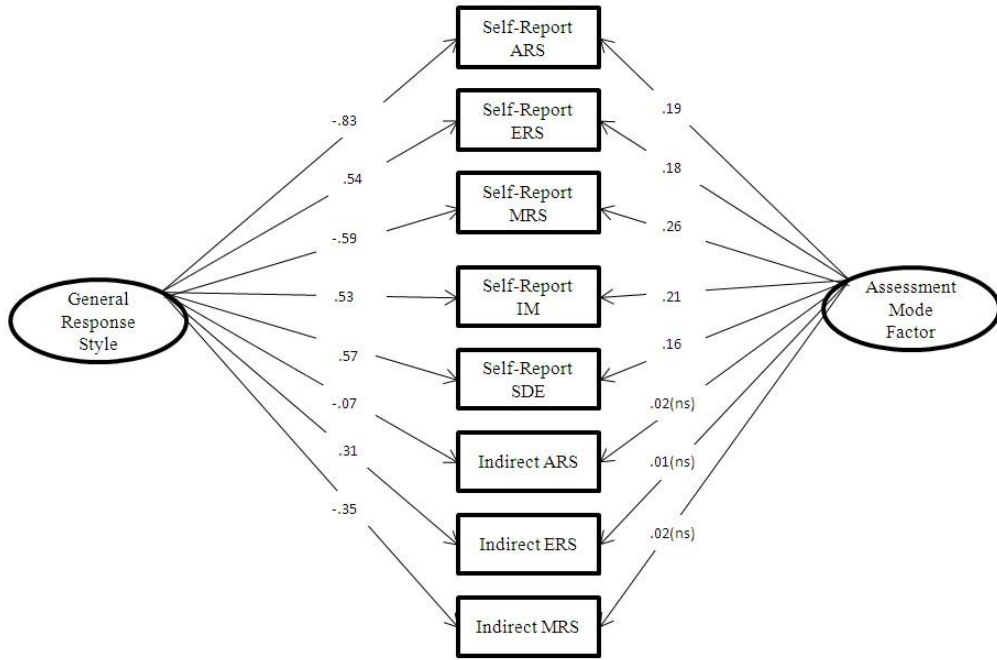


Figure 1. Standardized Solutions of the General Response Style Model from acquiescent response style (ARS), extreme response style (ERS), midpoint response style (MRS), Impression Management (IM), and Self-Deceptive Enhancement (SDE) among the three ethnic groups. All coefficients were significant at  $p < .01$ , except that the loadings of indirect measures on the mode factor were nonsignificant (*ns*).

Note. The values of the constrained loadings on the assessment mode factor were slightly different due to the standardization procedure. There were three correlated error terms not shown in the figure, which were between self-report ERS and IM, indirect ARS and indirect ERS, and indirect ERS and indirect MRS.

### Domain Specificity and Meaning of Response Styles

The correlations of response styles with all the other psychological variables are presented in Table 2. GRS showed moderate to strong positive associations with the desirable personality traits, horizontal individualism, cognition, and self-esteem, and a negative association with prevention self-regulation focus. Political views had very weak associations with GRS. Overall, the correlations with personality and cognition were stronger than with other domains, which implies that measures that were more self-

evaluative triggered more GRS. The domain specificity of GRS was supported.

The specific response styles had similar, yet weaker correlation patterns than GRS. ERS and MRS seemed to be the essential indicators of GRS, as they had a very similar patterning to GRS. There was more differentiated patterning in ARS and the two SDR dimensions. ARS was particularly related to prevention focus and trust in politicians. Both SDE and IM were related to collectivism which stresses interpersonal harmony; SDE was also positively related to vertical individualism.

Table 2. *Measurement Invariance of the Scales: Measurement Weights and Intercept Invariance*

Scale	Invariance	$\chi^2/df$	TLI	CFI	RMSEA
Acquiescent Response Style	MW	9.03**	.91	.92	.04
	Intercepts	8.02**	.92	.92	.04
Extreme Response Style	MW	15.65**	.92	.95	.05
	Intercepts	11.09**	.95	.95	.04
Midpoint Response Style	MW	6.44**	.90	.92	.03
	Intercepts	6.08**	.91	.91	.03
Impression Management	MW	7.55**	.89	.90	.04
	Intercepts	6.86**	.90	.90	.03
Self-Deceptive Enhancement	MW	3.33**	.99	1	.02
	Intercepts	2.91**	.99	.99	.02

Note. TLI = Tucker–Lewis index. CFI = Comparative Fit Index. RMSEA = Root Mean Square Error of Approximation. MW = Measurement Weights. \*\* $p < .01$ .

### Impact of GRS Correction

The scores of each of the other psychological variables were predicted by GRS, and the standardized residuals of each variable were saved as GRS-corrected scores. We compared the intercorrelations among variables using raw scores and GRS-corrected scores. In the personality domain (five traits and the “Big One” personality factor), the absolute positive correlations among them dropped on average by .10 (from .36 in the raw scores to .26 in the corrected scores), indicating that the GRS shared quite some variance with personality traits. The correlation between the two cognition measures dropped by .09 (from .32 to .23), and between the two positive outcome measure by .06 (from .47 to .41). The average change (in absolute values) in the self-regulation domain was .02, that of value domain .01, and that of political views was .00. To summarize, the effects of GRS on the relationship between variables were small, yet meaningfully patterned. Its influence was in line with the personal involvement level of domains: the larger the self-evaluative

component, the larger the correction. In whatever domain, the change of correlation was weak at best.

A series of MANOVAs were performed with all the other psychological variables (first in raw scores and then with GRS correction) as dependent variables and demographic variables as independent variables; the effect sizes of these analyses were compared (Table 3). Specifically, we compared the partial eta squared values of the differences in 21 dependent variables from both raw and GRS corrected scores across three age groups, between males and females, across the six levels of education, and across the three cultural groups. The effect sizes of group differences were largely identical in the two sets of scores. We examined the change of effect sizes per domain and did not find any significant difference in the sizes. However, it should be noted that even with raw scores, there were very limited cross-cultural mean differences in these variables, which was possibly due to the insufficient heterogeneity in our samples (e.g., the immigrant participants in the panel are well adjusted to the Dutch society).

Table 3. Results of the Multigroup Confirmatory Factor Analyses of the General Response Style Factor

	$\chi^2$	df	$\chi^2/df$	TLI	CFI	RMSEA	$\Delta\chi^2$	$\Delta df$
Unconstrained	651.41	49	13.29**	.88	.93	.05		
Measurement weights	671.65	63	10.66**	.91	.93	.04	20.24	14
Measurement intercepts	729.67	79	9.24**	.92	.92	.04	58.02**	16
Structural covariances	733.95	81	9.06**	.92	.92	.04	4.28	2
Measurement residuals	827.87	103	8.04**	.93	.92	.04	93.91**	22

Note. Most restrictive model with acceptable fit is printed in italics. TLI = Tucker–Lewis index. CFI = Comparative Fit Index. RMSEA = Root Mean Square Error of Approximation. \*\* $p < .01$ .

Table 4. Correlation of Response Styles with Other Variables

	GRS	ARS direct	ARS indirect	ERS direct	ERS indirect	MRS direct	MRS indirect	SDE	IM
Extroversion	.37**	-.29**	-.02	.29**	.20**	-.24**	-.25**	.23**	.11**
Agreeableness	.28**	-.10**	-.04**	.09**	.23**	-.07**	-.32**	.09**	.40**
Conscientiousness	.37**	-.19**	-.06**	.15**	.31**	-.09**	-.32**	.28**	.34**
Emotional Stability	.42**	-.35**	.00	.12**	.28**	-.17**	-.23**	.39**	.29**
Openness	.38**	-.29**	.04*	.32**	.15**	-.28**	-.35**	.19**	.11**
“Big One” Personality	.58**	-.39**	-.03	.32**	.37**	-.28**	-.48**	.37**	.39**
Horizontal Individualism	.32**	-.24**	.00	.25**	.17**	-.14**	-.23**	.21**	.17**
Vertical Individualism	-.01	.01	.12**	.17**	-.12**	-.01	-.01	.09**	-.18**
Horizontal Collectivism	.17**	-.07**	.06**	.12**	.08**	-.02	-.20**	.13**	.21**
Vertical Collectivism	.13**	-.04**	.05**	.09**	.06**	.02	-.15**	.10**	.18**
Reappraisal	.12**	-.07**	.02	.08**	.10**	.02	-.13**	.07**	.11**
Suppression	-.11**	.05**	.04*	-.06**	-.01	.14**	.13**	.01	-.10**
Prevention Focus	-.33**	.30**	.10**	-.04*	-.31**	.20**	.11**	-.24**	-.24**
Promotion Focus	-.02	.07**	.12**	.19**	-.18**	.01	-.09**	.04*	-.14**
Need to Evaluate	.37**	-.30**	.06**	.50**	.17**	-.26**	-.19**	.22**	.01
Need for Cognition	.32**	-.29**	.04*	.29**	.06**	-.29**	-.22**	.18**	.07**
Life Satisfaction	.24**	-.12**	.08**	.05**	.15**	-.06**	-.21**	.30**	.20**
Self-Esteem	.55**	-.41**	-.08**	.23**	.33**	-.23**	-.35**	.47**	.37**
Opinion on Democracy	.06**	-.04*	-.03	.08**	.09**	.05**	.02	.09**	.03
Trust in Politicians	-.04*	.07**	.11**	-.03	-.06**	.07**	-.07**	.04*	.01
Opinion on Immigration	-.05**	.06**	-.05**	.03	.03	.09**	.05**	.02	-.09**

Note. GRS = General Response Style. ARS = Acquiescent Response Style. ERS = Extreme Response Style. MRS = Midpoint Response Style. IM = Impression Management. SDE = Self-Deceptive Enhancement.

\* $p < .05$ . \*\* $p < .01$ .

### Discussion

Our study is, to our knowledge, the first to address the combined meaning of ARS, ERS, MRS, and SDR with multiple measures in a representative national sample. We found a GRS with positive loadings of ERS and SDR and negative loadings of ARS and MRS. This general factor has stronger associations with personality traits, cognition, and positive life

outcomes than with other domains. The impact of GRS on the structure of self-report data was in accordance with a domain dependence model: GRS correction affects domains with high personal involvement more than domains with low personal involvement; yet, even in personal domains, score corrections did not have a strong impact on correlations or gender, age and ethnic differences.

The confirmation of GRS illustrates that specific response styles can be integrated, and the combined meaning represents the general tendency to amplify or to moderate responses. GRS, as well as the specific response styles, is not associated with various self-report measures to the same degree, but vary across domains. It seems that response styles have more influence on responses in domains with more self-involvement (van Dijk et al., 2009). We also observed a near-zero correlation of GRS with vertical individualism, possibly for the same reason. Whereas all the other items within the value domain start with the first-person pronoun “I”, items on vertical individualism are formulated in a less personal, more distant manner (e.g., “winning is everything”; “competition is the law of nature”).

Integrating different response styles in GRS produces more reliable estimates of response styles, as it reconciles various

problems resulting of various operationalizations of response styles, or the domain differences when extracting indirect measures of specific response styles from other self-report measures. Furthermore, our findings suggest reluctance in response style correction. Firstly, we observed differential sizes of correlations between response styles and various psychological measures. These styles share variance notably with personality measures. However, our results indicate that the global impact of score corrections on correlations is modest and there is no evidence for a validity increase after correction (Ones, Viswesvaran, & Reiss, 1996). Secondly, the correction of GRS does not change the structure of self-report measures. All in all, GRS may represent valid individual and cross-cultural differences, and it can be a strong candidate to define an important aspect of culture: a preferred way of self-disclosure in communication (Smith, 2011).

Table 5. Results of MANOVA with Demographic Variables as Independent Variables and All the Nomological Network Variables as Dependent Variables

Group	Type of Scores	Wilks' Lambda	df1	df2	Partial $\eta^2$
Age cohort	Raw Scores	.80**	40	3106	.11
	GRS-corrected	.81**	40	3106	.10
Gender	Raw Scores	.78**	20	1554	.22
	GRS-corrected	.78**	20	1554	.22
Education	Raw Scores	.64**	100	7556	.08
	GRS-corrected	.65**	100	7556	.08
Ethnic group	Raw Scores	.90**	40	3106	.05
	GRS-corrected	.89**	40	3106	.06

Note. Age cohorts include three groups: age below 35, age 35 to 65, and age above 65. Gender was scored as 0 for female and 1 for male. Education was scored from 1 (*primary school*) to 6 (*university*). Cultural Group refers to Dutch Mainstreamers, Western Immigrants, and Non-Western Immigrants. \*\* $p < .01$ .

### Limitations and Future Directions

A few caveats should be mentioned. We did not have external measures that are less susceptible to response styles (e.g., behavior measures) to validate GRS-corrected scores. Besides, due to the lack of mean differences across the cultural groups in the current study, we could not draw conclusion on the effects of GRS on the magnitude of scale means across groups; replicating the study with

heterogeneous cross-cultural samples which presumably have a larger mean difference may shed light on this issue. In conclusion, different response styles can be considered simultaneously with the extraction of GRS. However, our study suggests GRS should be more the topic of future research in stable communication preferences rather than a source of score correction to increase the validity of self-reports.

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