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# Response styles in factual items. Personal, contextual, and cultural correlates

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# Response Styles in Factual Items: Personal, Contextual, and Cultural Correlates

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Abstract

This study investigated response styles in factual items and explored their associations with personal, contextual, and cultural factors. Responses on various factual questions, cognitive tests, and interviewers' observational data from a total of 152,514 respondents in 22 countries in the Programme for the International Assessment of Adult Competencies (PIAAC) were analyzed. Indexes of extreme, midpoint, and acquiescent response styles were extracted from Likert-scale and dichotomous responses of factual items. A general response style with a positive loading of extreme response style and negative loadings of midpoint and acquiescent response style was confirmed. This factor showed a similar cross-cultural patterning as another general factor from attitudinal and self-evaluative items of Likert scales in a previous study, which indicated the pervasiveness of response styles irrespective of types of survey items. In a multilevel analysis, the individual-level general response style was found to be negatively related to being male, educational level, and literacy competency, and positively related to third person presence and background noise, and at country level negatively associated with socioeconomic development. Cross-level interactions were also found. Implications on the pervasiveness and nature of response styles are discussed.

*Key words*: response styles, general factor, factual items, nomological network

Response Styles in Factual Items: Personal, Contextual, and Cultural Correlates

Response styles refer to the systematic tendency to respond to questions on some basis other than the target construct (Cronbach, 1950). In cross-cultural contexts, response styles are often investigated in Likert scales of self-evaluative constructs, such as personality and values , and attitude measurements, such as purchasing intentions and political views (e.g., van Herk, Poortinga, & Verhallen, 2004). The presence of response styles in these instruments may be due to inherent ambiguities in item content and response anchors. For example, the difference between "strongly disagree" and "moderately disagree" may not be all that clear and participants could endorse these anchors using their own interpretations, which are susceptible to response styles. However, it is still not clear whether factual items (e.g., "how often do you read a newspaper?") with clearly defined response anchors (e.g., from 1 *never* to 5 *every day*) also elicit response styles, and whether the same cross-cultural patterning is present as found in attitudinal items. Another gap in our knowledge concerns the integration of personal, cultural, and contextual factors that are relevant for response styles. There is ample evidence on the correlates at personal and cultural level (e.g., van Vaerenbergh & Thomas, 2013), yet the role of potentially relevant contextual factors during survey responding (e.g., presence of third person, background noise) has not been adequately studied. We extend the research of response styles to factual items and their nomological network by an integration of personal, contextual, and cultural factors. Such a study has incremental value in enhancing our understanding of the pervasiveness and the nature of response styles.

**Measurement and Stability of Response Styles**

The most frequently studied response styles that can be extracted from data targeting other substantive constructs include Extreme Response Style (ERS), Midpoint Response Style (MRS), and Acquiescent Response Style (ARS) (Paulhus, 1991). Due to the differential operationalizations of these styles across studies, findings are difficult to compare or generalize. To create consistency, He and van de Vijver (2013) integrated various styles from mainly self-evaluative and attitudinal items

into a General Response Style (GRS) factor; this factor has ERS as positive indicator and MRS and ARS as negative indicators, and it is interpreted as a communication filter that reflects a continuum of response moderation to response amplification. This continuum embedded in GRS has been successfully replicated with data from various large-scale surveys both at individual level and country level, and it brought studies of different response styles under a coherent theoretical roof and helped creating consistency in findings (e.g., He, van de Vijver, Domínguez, & Mui, 2014; He & van de Vijver, 2015a).

Response styles in factual items are seldom researched, yet empirical data supporting the stability of response styles may lend some indirect insight into whether they also occur in these items. Weijters, Geuens, and Schillewaert (2010a) used both secondary and primary data to model ERS and ARS across different sets of items and found that that these styles were largely consistent over the course of a questionnaire. Using longitudinal data, He and van de Vijver (2015b) and Weijters, Geuens, and Schillewaert (2010b) confirmed that response styles were stable across time, and could in part be explained by demographics. This evidence speaks to the trait-like nature of response styles; therefore they may exhibit themselves in all types of items as an indicator of self-presentation styles. In addition, systematic associations of response styles obtained from Likert-scales and forced-choice format personality traits have been found, suggesting that response styles were stable irrespective of response formats and could be found on forced-choice instruments, usually designed to minimize response styles (He, Bartram, Inceoglu, & van de Vijver, 2014).

The communication and cognitive processes in responding to factual questions suggests that they are susceptible to response styles, although compared with attitudinal questions, the semantic and pragmatic meaning of factual questions using frequency-based anchors is easier to understand. Respondents still need to make use of estimation strategies and can employ a fragmented “recall and count” strategy especially when the detailed episodic representation of the fact being asked is not readily available in memory (Ji, Schwarz, & Nisbett, 2000; Schwarz, Oyserman, & Peytcheva, 2010).

The specific retrieval cues used to trigger recall, and the attempt to fill in partial memory through inference in responding to factual items not only affect the accuracy and completeness of the self-report (Jobe, Tourangeau, & Smith, 1993; Tourangeau, Rips, & Rasinski, 2000), but also give the opportunity for response styles to manifest themselves.

Drawing on the compelling evidence on the stability of response styles and the malleability in responses to factual questions, we hypothesize that response styles are present in factual items (Hypothesis 1a), which, in operational terms, means that multiple indexes of one style would all load on one factor, and a GRS could be extracted from these three styles. We also expect that response styles in factual items have the same cross-cultural patterning as in self-evaluative and attitudinal items (Hypothesis 1b), which would suggest that (1) the intercorrelations among these styles are similar to these from attitudinal and self-evaluative items, (2) this GRS derived from factual items shows similar correlations with background variables (e.g., age, education) to correlations derived from attitudinal and self-evaluative items, and (3) aggregated at country level, the cross-cultural patterning of this GRS converged with those from previous studies using other response style indexes.

**Nomological Network of Response Styles**

Beside instrument characteristics, response styles are found to be related to respondent, cultural, and contextual factors as well as their interactions (van Vaerenbergh & Thomas, 2013). As a correlate of respondent characteristics, response amplification (e.g., ERS) versus response moderation (e.g., MRS and ARS) was found to be positively related to age and negatively related to educational level (He, Bartram, et al., 2014). Krosnick (1991) suggested that respondents' cognitive sophistication, conceptualized as the ability to retrieve information from memory and integrate that information into verbally expressed judgment, is negatively related to response styles; this cognitive sophistication is usually assessed by vocabulary knowledge or educational performance (Bobo & Licari, 1989). At cultural level, response styles were repeatedly found to be negatively associated

with country affluence and individualism (Smith, 2004). We expect to replicate these findings using response styles in factual items.

From an anthropological perspective, survey responding is a process of social interaction shaped by the survey respondent, the administrator, other persons present, and the contexts where the survey is taking place (e.g., Maddox, 2014). Thus, contextual factors may play a non-negligible role in response styles. Boeije (2004) reported that as a result of third person presence, interviewees tended to change their self-presentation styles in order to make a certain impression on the interviewer and the third person. In situations where a high level of cognitive burden or distraction is activated (e.g., background noise), respondents are more likely to resort to response styles (e.g., Knowles & Condon, 1999; Krosnick, 1991). We expect third person presence and background noise during the assessment to be positively related to GRS (Hypothesis 2).

As cultural impact on respondents' cognitive and communicative styles may depend on the specific combination of cultural and personal characteristics (Schwarz et al., 2010; Uskul, Oyserman, & Schwarz, 2010), we also explore the interaction of cultural- and individual-level correlates on response styles.

## Method

We focus on three response styles (i.e., ERS, MRS, and ARS) from responses of factual items with clearly defined response anchors across countries in the Survey of Adult Skills from the OECD Programme for the International Assessment of Adult Competencies (PIAAC), and link these styles to nomological network variables at both individual and culture level.

### The PIAAC Survey

The PIAAC survey was designed to provide insights into the availability of key skills in society and how they are used at work and at home among working adults aged between 16 and 65 years (OECD, 2013a). According to the technical report (OECD, 2013b), this survey has two main parts: a cognitive part and a background questionnaire. The cognitive part assesses literacy,

numeracy, and problem solving competencies. The background questionnaire targets questions on how these skills are distributed, why they are important, and what factors are related to skill acquisition and decline. Items in this part are mainly factual and responses are either on Likert scales or dichotomous scales (i.e., *Yes* or *No*). In addition to respondents' responses, auxiliary data (e.g., interviewer observations) were collected and processed to support instrument validation, analysis, and report. Twenty-four countries participated in the PIAAC survey; data were collected in their national languages using both computer and paper-and-pencil administration modes in 2011 and 2012. A version of the international database for public use was provided in 2013.

**Participants**

We based our analysis on responses available from the public data file (http://vs-web-fs-1.oecd.org/piaac/puf-data/SPSS/). A total of 152,514 respondents in 22 countries were included. The demographics of these respondents are presented in Table 1.

**Measures**

**Measures of ERS, MRS, and ARS.** We used independent assessments of each target response style with heterogeneous items from the background questionnaire. These factual items include various skills used at work and in everyday life, cultural engagement, and educational and work activities. Item codes and content for each style are presented in Appendix 1.

Specifically, three ERS parcels were constructed from 15 randomly selected factual items with responses ranging from *Never* to *Everyday* (each parcel from 5 items). The average proportion of choosing 1 and 5 in five items was taken as one ERS parcel. The three parcels were summed to indicate ERS. Similarly, three MRS parcels were computed as the average proportion of choosing 3 in another 15 5-point factual items with responses ranging from *Never* to *Everyday*, the sum of the parcels was taken as MRS score.

It has been recommended in the literature to extract ARS from dichotomous responses of Yes versus No in order to avoid confounding with other response style indexes, especially with ERS (He

et al., 2014). ARS in a conventional procedure to take "agree" and "strongly agree" in a 5-point scale would suffer from partial overlap of operationalization with ERS, whereas an ARS index from various dichotomous items reflects the agreeing tendency ("Yay-saying"). In this study, three ARS parcels were extracted from 12 items with dichotomous responses of *Yes* versus *No*, where the proportion of choosing *Yes* from four items was taken as an ARS parcel. Subsequently, the sum of the parcels was used as ARS score.

**Respondent characteristics.** *Age* was measured as age group in 5-year intervals from 1 (*aged 16-19*) to 10 (*aged 60 to 65*). *Gender* was dummy coded with 1 as male and 0 as female. *Educational level* ranged from 1 (*Lower secondary or less*) to 5 (*Tertiary - bachelor/master/research degree*).

Respondents' *literacy, numeracy, and problem-solving competency,* measured in the cognitive part of the survey, were considered proxies of cognitive sophistication. Each respondent was administered a subset of items from the total item pool, thus in this planned missing value design, plausible values on these skills based on item response theory were produced. For each respondent, ten plausible values for each competency were drawn from the estimated distribution of the respondent's competency. As a consequence, analyses involving these competencies need to be performed with each and every of these plausible values to derive unbiased estimates (Rutkowski, Gonzalez, Joncas, & von Davier, 2010).

**Cultural characteristics.** *Socioeconomic development* was measured by the Human Development Index (HDI), which is a composite index for average achievement in key dimensions of human development: a long and healthy life, being knowledgeable (educational history), and having a decent standard of living (United Nations, 2012). The country scores of *Individualism* were taken from Hofstede (2009).

**Survey contextual factors.** Two contextual factors concerning interview situations were examined: *third person presence* and *background noise* during the assessment. These data were from

interviewer observations; they are dummy recoded with 1 as presence and 0 as absence of the factor. Observational data were available for all countries except Italy.

## Results

We describe the results in two parts: the validation of response styles in factual items and their nomological network in a multilevel framework.

### The Validation of Response Styles

Prior to the use the ERS, MRS, and ARS indexes for further analysis, each index was firstly validated from using the parcels. The three parcels of ERS were subjected to a principal component analysis; a one-factor solution was obtained, explaining 50% of the variance, and the loadings ranging from .54 to .78. Similarly, the three parcels of MRS loaded on one factor explaining 42% of the variance, with loadings from .63 to .67. For ARS, the parcels loaded on one factor explaining 48% of variance, with loadings ranging from .63 to .74. The coherence in different parcels of these styles demonstrated that these systematic tendencies to use response anchors can well be captured in various factual items.

A principal component analysis was carried out with the indexes of the three styles, and a one-factor solution was supported, explaining 51% of the variance. ERS loaded positively (.81), whereas MRS (-.78) and ARS (-.60) loaded negatively. The GRS was confirmed, although it should be acknowledged that the GRS captures about half of the variance of the specific styles, leaving considerable room for uniqueness in each style. Hypothesis 1a was supported.

Response styles in factual items were further validated in three steps by testing: (1) whether the three styles in this dataset showed expected correlations as found in self-evaluative and attitudinal items; that is, whether ERS is negatively correlated with MRS and ARS; (2) whether a GRS could be extracted from these three styles and had expected correlations with individual background variables (i.e., age, education), and (3) aggregated at country level, whether the cross-

cultural patterning of this GRS converged with those from previous studies using other response style indexes.

To obtain unbiased estimates from complex large-scale international surveys such as PIAAC, we carried out a correlational analysis with the IDB analyzer (IDB, 2009), which can deal with specific data features of the data set such as sampling weights and the use of plausible values (OECD, 2013b; Rutkowski et al., 2010).[1] As expected, the international average correlation between ERS and MRS at individual level was negative and significant ($r$ = -.36, $SE$ = .00); in each country, this correlation ranged from -.41($SE$ = .02) in the Netherlands to -.28 (SE = .02) in the Slovak Republic. The same was found for the international average correlation between ERS and ARS ($r$ = -.15, $SE$ = .01); the country-specific correlations ranged from -.24 ($SE$ = .02) in Belgium to -.10 ($SE$ = .02) in United States, with the exception of the correlation in Russian Federation, which was not significant (.03, $SE$ = .07). ARS and MRS were positively correlated ($r$ = .10, $SE$ = .02); the country-specific correlations ranged from .04 ($SE$ = .02) in United States to .19 ($SE$ = .02) in Belgium.

This GRS (i.e., factor score from the principal component analysis) at individual level showed a nonsignificant correlation with age group ($r$ = .01, $SE$ = .01) and a negative, significant correlation with educational level ($r$ = -.27, $SE$ = .00), which replicated previous studies (e.g., He, Bartram, et al., 2014).

Country mean scores on the GRS and each specific style were produced with the IDB analyzer. The country scores of specific response styles were correlated with country scores of response styles from the International Social Survey Programme (mainly attitudinal items) in the He, Bartram et al. (2014) study. With 21 overlapping countries, the correlation of the two ERS measures was .51 ($p$ < .05), of MRS .38 ($p$ = .09), and of ARS .32 ($p$ = .16), suggesting convergence across

[1] The analysis module of the IDB analyzer provides procedures for the computation of means, percentages, correlations, regressions, benchmarks and percentiles for any variable of interest for a country and for specific subgroups within a population in the international dataset. Thus, the computation of means and correlations within the PIAAC dataset in the current study was performed with the IDB analyzer.

databases. Moreover, Table 2 shows the country ranking and the mean scores of GRS across 22 countries. In general, response amplification seemed to be stronger in Mediterranean Europe than in Central and Western Europe, North America, and affluent Eastern Asian counties, whereas Northern Europe had the lowest tendency of response amplification. The patterning among these European countries largely replicated van Herk et al.'s (2004) findings, in which rating scale data of marketing inventories were compared in six countries. To conclude, response styles in factual data are validated and seem to show the same cross-cultural patterning as in self-evaluative and attitudinal data.

**Nomological Network of Response Styles**

The associations of individual-level GRS with personal, cultural, and contextual factors were studied in a multilevel analysis with HLM 6 (Raudenbush, Bryk, & Congdon, 2004). The intra-class coefficient for this GRS was 6%, suggesting sufficient variance at cultural level to conduct multilevel analysis. First, all the nomological network measures were entered in the model in order to examine their relative importance. Individual-level predictors included age, gender, educational level, and literacy competency (given the strong correlations among individuals' literacy, numeracy and problem-solving competences, which were all above .70, only one competence was entered to avoid multicollinearity). In addition, two contextual factors (ambient noise and third-person presence) and two culture-level predictors (Human Development Index and individualism) were used. All variables were standardized to *z* scores. The model applies random intercepts and fixed slopes. Since the literacy competency was measured with 10 plausible values, the multilevel analysis was carried out 10 times (each time with one plausible value, and all the other variables remained the same). Table 3 presents the average regression coefficients in this model and the results when the first plausible value of literacy competency was used.

The best individual-level predictors of the GRS were low cognitive sophistication (i.e., literacy competency, low educational level), and being female. Third person presence had a weak, positive effect and age-group had a weak, negative effect. At country level, HDI had a marginal,

negative impact on the individual-level GRS, whereas the effect of individualism was nonsignificant. The weakness of the culture-level predictors may be caused by the limited variation in these variables among the participating countries (most of them are economically developed countries with a fairly high level of individualism).

Next, the cross-level interactions on individual GRS were explored. Given the limited number and variation of countries, in each multilevel model only one individual-level predictor, one culture-level predictor (socioeconomic development and individualism are positively related, thus only socioeconomic development was used), and their interaction were entered. These multilevel models used random slopes and random intercepts. The standardized regression coefficients are presented in Table 4. In most cases, the interaction was significant. The interaction components always have the same sign as the effects at individual level, indicating that socioeconomic development does not change the sign of the regression coefficients of individual-level predictors; instead it systematically amplifies the effects of individual-level predictors, presumably by adding more variation to the data. So, the interactions did not change individual-level associations, but made these a bit stronger. However, all interaction effects were weak, especially for these of survey contextual variables.

## Discussion

We studied response styles in factual items in association with various nomological network measures in a 22-country survey. We confirmed that ERS, MRS, and ARS extracted from factual items converged with these from attitudinal items and had similar intercorrelations. The general response style factor defined by these three specific styles from factual items showed the same cross-cultural patterning as found for attitudinal items, which demonstrates the pervasiveness of the GRS across stimulus domains. Among the personal, cultural, and contextual factors under investigation, the GRS is most strongly related to personal characteristics; in particular educational level and

cognitive sophistication had the strongest negative associations with the GRS. Implications on how to perceive response styles and what is their nature in cross-cultural surveys are discussed.

The straightforwardness of factual questions and frequency-based response options suggests that it is relatively easy for respondents to find an appropriate response stored and readily available in memory, which is less the case when answering attitudinal questions (Schwarz et al., 2010). As a consequence, response styles could be absent or much less salient in factual items. However, we found the same systematic patterning of response styles in factual items as in attitudinal items. We argue that this finding is in line with the view that response styles are a communication filter (He & van de Vijver, 2013). These styles are possibly present in the early stages of comprehending an item and making a judgment. The GRS, as the integration of different specific styles, represents the tendency to amplify versus to moderate responses in all kinds of response scales. It refers to a general impression management strategy that colors presumably all self-reports. So, the main conclusion of this study is that response styles can also be found in factual items. Given that response styles can also be found in responses to forced-choice questions (He, Bartram, et al., 2014), we argue that we should adopt the view that response styles are part and parcel of self-reports.

In cross-cultural surveys, there has been debate on the extent to which response styles are dependent on questions, cultures, survey contexts, and personal dispositions (van Vaerenbergh & Thomas, 2013). Response styles in the present study were much more relevant to personal dispositions than cultural or contextual factors. Specifically, response styles were mostly related to cognitive sophistication: respondents with lower levels of education and cognitive competency tended to amplify their responses more, possibly because they have a higher need for clarity, whereas respondents with a higher educational level and cognitive competency tend to moderate their responses, due to their preference to express themselves with more nuances. Survey contexts had a very weak, yet significant effect; these are factors that can be well controlled for with an adequate design and standardized administration.

## Limitations and Future Directions

Our study has a few limitations. First, we only had factual items with a single frequency-based Likert scale format for ERS and MRS, and with dichotomized items for ARS. Although the patterning was replicated, future studies should make use of more varied items and response formats in the construction and comparison of response style indexes (Kieruj & Moors, 2013). Second, we did not have enough attitudinal items in this dataset to extract another set of response style indexes, with which we could have compared response styles from both types of items, and test whether more cross-cultural variations would exist in attitudinal items compared with factual items (Schwarz et al., 2010). Thirdly, the variation of countries in key cultural characteristics was not impressive; subsequently the interaction effects were small in size and did not allow a more nuanced outlook on for example how country-level education may interact with individual-level education on the manifestation of response styles. Future efforts should expand the number of countries to adequately study cross-cultural variations on response styles. Nevertheless, our study has demonstrated the pervasiveness and stability of response styles in survey data, and pointed out that response styles are mostly related to individual dispositions, which we believe provides another piece of the puzzle in understanding the psychological meaning of response styles.

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Table 1 *Demographics of Participants in Each Country*

| Country | Sample Size | Mean Age Group in 5-year intervals | Percentage of Male | Mean Educational Level |
|---|---|---|---|---|
| Austria | 5130 | 5.66 | .49 | 2.47 |
| Belgium | 5463 | 5.72 | .49 | 2.66 |
| Canada | 26683 | 5.83 | .47 | 3.05 |
| Czech Republic | 6102 | 5.30 | .45 | 2.43 |
| Denmark | 7328 | 6.37 | .49 | 2.77 |
| Estonia | 7632 | 5.75 | .45 | 2.80 |
| Finland | 5464 | 5.94 | .50 | 2.89 |
| France | 6993 | 5.95 | .49 | 2.53 |
| Germany | 5465 | 5.55 | .49 | 2.72 |
| Ireland | 5983 | 5.67 | .46 | 2.90 |
| Italy | 4621 | 6.08 | .48 | 2.12 |
| Japan | 5278 | 5.94 | .48 | 3.05 |
| Republic of Korea | 6667 | 5.69 | .47 | 2.73 |
| Netherlands | 5170 | 5.93 | .49 | 2.57 |
| Norway | 5128 | 5.55 | .52 | 2.96 |
| Poland | 9366 | 3.85 | .51 | 2.62 |
| Russia | 3892 | 4.82 | .35 | 3.73 |
| Slovak Republic | 5723 | 5.48 | .47 | 2.30 |
| Spain | 6055 | 5.61 | .49 | 2.28 |
| Sweden | 4469 | 5.75 | .50 | 2.80 |
| United Kingdom | 8892 | 5.82 | .42 | 2.73 |
| United States | 5010 | 5.72 | .46 | 3.03 |

Note. Age groups ranged from 1 (*aged 16-19*) to 10 (*aged 60 to 65*); Educational level ranged from 1 (*Lower secondary or less*) to 5 (*Tertiary - bachelor/master/research degree*)

Table 2 *Country Ranking on the General Response Style (GRS)*

| Country | Mean GRS |
|---|---|
| Italy | .54 |
| Russian Federation | .45 |
| Spain | .43 |
| Ireland | .38 |
| Slovak Republic | .35 |
| France | .33 |
| Belgium | .24 |
| Czech Republic | .20 |
| United Kingdom | .17 |
| Canada | .10 |
| Japan | .03 |
| Netherlands | .03 |
| Poland | .03 |
| United States | -.01 |
| Germany | -.05 |
| Austria | -.07 |
| Estonia | -.15 |
| Denmark | -.28 |
| Republic of Korea | -.34 |
| Norway | -.39 |
| Sweden | -.39 |
| Finland | -.55 |

Table 3 *Regression Coefficients in the Multilevel Analysis*

| Predictors | Regression Coefficient Using the First Plausible Value of Literacy Competency (S.E.) | Average Regression Coefficient Across the 10 Analyses with Each of the Plausible Values of Literacy Competency |
|---|---|---|
| Individual Level | | |
| Age Group | -.020** (.005) | -.019** |
| Being Male | -.099** (.004) | -.099** |
| Educational Level | -.212** (.005) | -.212** |
| Literacy Competency | -.264** (.005) | -.264** |
| Third Person Presence | .021** (.004) | .021** |
| Background Noise | .005 (.004) | .004 |
| Cultural Level | | |
| Socioeconomic development | -.140 † (.067) | -.140 † |
| Individualism | .067 (.068) | .067 |

†$p$ =.051. *$p$ < .05. **$p$ < .01.

Table 4 *Coefficients of Cross-Level Interactions in the Multilevel Analysis*

| | Individual-Level Predictor (S.E.) | Socioeconomic Development (S.E.) | Cross-Level Interaction (S.E.) |
|---|---|---|---|
| Age Group | .012* (.006) | -.116†(.064) | .008(.006) |
| Being Male | -.094**(.004) | -.116†(.064) | -.012*(.006) |
| Educational Level | -.285**(.005) | -.116†(.064) | -.019**(.006) |
| Literacy Competency (PV1) | -.342**(.005) | -.116†(.064) | -.039**(.006) |
| Third Person Presence | .043**(.005) | -.113†(.061) | .010†(.006) |
| Background Noise | .034**(.005) | -.113†(.061) | .012*(.006) |

†$p < .10$. *$p < .05$. **$p < .01$.

Appendix 1 Data Source for the Construction of Each Response Style

| Item Code | | Item Content |
|---|---|---|
| Extreme Response Style | | |
| Pacel 1 | D_Q13a | Current work - Learning - Learning from co-workers/supervisors |
| | F_Q04b | Skill use work - Negotiating with people |
| | G_Q01g | Skill use work - Literacy - Read financial statements |
| | G_Q05h | Skill use work - ICT - Computer - Real-time discussions |
| | H_Q03f | Skill use everyday life - Numeracy - Prepare charts graphs or tables |
| Pacel 2 | F_Q02b | Skill use work - Teaching people |
| | F_Q05a | Skill use work - Problem solving - Simple problems |
| | G_Q03g | Skill use work - Numeracy - Use simple algebra or formulas |
| | H_Q01g | Skill use everyday life - Literacy - Read financial statements |
| | H_Q05a | Skill use everyday life - ICT - Internet - For mail |
| Pacel 3 | F_Q03b | Skill use work - Planning others activities |
| | F_Q06b | Skill use work - Working physically for long |
| | G_Q05e | Skill use work - ICT - Computer - Spreadsheets |
| | H_Q02b | Skill use everyday life - Literacy - Write articles |
| | H_Q05f | Skill use everyday life - ICT - Computer - Word |
| Midpoint Response Style | | |
| Pacel 1 | D_Q13b | Current work - Learning - Learning-by-doing |
| | F_Q03c | Skill use work - Organizing own time |
| | G_Q01d | Skill use work - Literacy - Read professional journals or publications |
| | G_Q05a | Skill use work - ICT - Internet - For mail |
| | H_Q05d | Skill use everyday life - ICT - Internet - Conduct transactions |
| Pacel 2 | F_Q02c | Skill use work - Presentations |
| | F_Q05b | Skill use work - Problem solving - Complex problems |
| | G_Q02d | Skill use work - Literacy - Fill in forms |
| | H_Q01e | Skill use everyday life - Literacy - Read books |
| | I_Q05f | About yourself - Voluntary work for non-profit organizations |
| Pacel 3 | F_Q02d | Skill use work - Selling |
| | F_Q06c | Skill use work - Using hands or fingers |
| | G_Q03c | Skill use work - Numeracy - Use or calculate fractions or percentages |
| | H_Q03c | Skill use everyday life - Numeracy - Use or calculate fractions or percentages |
| | G_Q05g | Skill use work - ICT - Computer - Programming language |
| Acquiescent Response Style | | |
| Pacel 1 | B_Q02a | Education - Current qualification |
| | B_Q12a | Activities - Last year - Open or distance education |
| | B_Q12g | Activities - Last year - Private lessons |
| | F_Q07b | Skill use work - Need more training |
| Pacel 2 | B_Q03a | Education - Uncompleted qualification |
| | B_Q12c | Activities - Last year - On the job training |
| | B_Q26a | Activities - Last year - Wanted but didn't start |
| | G_Q04 | Skill use work - ICT - Experience with computer in job |

| | | |
|---|---|---|
| Pacel 3 | B_Q04a | Education - Formal qualification |
| | B_Q12e | Activities - Last year - Seminars or workshops |
| | C_Q01a | Current status/work history - Last week - Paid work |
| | F_Q07a | Skill use work - Not challenged enough |

Note. There is no intersection between the variables used to assess individuals' education level and the items used to assess response styles.