Bayesian Exploratory Factor Analysis*
WEB APPENDIX

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A1 Theorem on the Inverse-Wishart Distribution

Preliminary Result: Inversion of a Partitioned Matrix. Let $\boldsymbol{\Omega}$ be a $k \times k$ symmetric matrix partitioned as:

$$\boldsymbol{\Omega} = \begin{pmatrix} \boldsymbol{\Omega}_{11} & \boldsymbol{\Omega}_{12} \\ \boldsymbol{\Omega}_{21} & \boldsymbol{\Omega}_{22} \end{pmatrix},$$

then its inverse $\boldsymbol{\Omega}^{-1}$ can be expressed as:

$$\boldsymbol{\Omega}^{-1} = \begin{pmatrix} \boldsymbol{\Omega}^{11} & \boldsymbol{\Omega}^{12} \\ \boldsymbol{\Omega}^{21} & \boldsymbol{\Omega}^{22} \end{pmatrix} = \begin{pmatrix} \boldsymbol{\Omega}_{11\cdot 2}^{-1} & -\boldsymbol{\Omega}_{11}^{-1}\boldsymbol{\Omega}_{12}\boldsymbol{\Omega}_{22\cdot 1}^{-1} \\ -\boldsymbol{\Omega}_{22\cdot 1}^{-1}\boldsymbol{\Omega}_{21}\boldsymbol{\Omega}_{11}^{-1} & \boldsymbol{\Omega}_{22\cdot 1}^{-1} \end{pmatrix},$$

where $\boldsymbol{\Omega}_{11\cdot 2} = \boldsymbol{\Omega}_{11} - \boldsymbol{\Omega}_{12}\boldsymbol{\Omega}_{22}^{-1}\boldsymbol{\Omega}_{21}$ is the Schur complement of the block $\boldsymbol{\Omega}_{22}$ in $\boldsymbol{\Omega}$, and $\boldsymbol{\Omega}_{22\cdot 1} = \boldsymbol{\Omega}_{22} - \boldsymbol{\Omega}_{21}\boldsymbol{\Omega}_{11}^{-1}\boldsymbol{\Omega}_{12}$, assuming that $\boldsymbol{\Omega}_{11}^{-1}$, $\boldsymbol{\Omega}_{22}^{-1}$, $\boldsymbol{\Omega}_{11\cdot 2}^{-1}$ and $\boldsymbol{\Omega}_{22\cdot 1}^{-1}$ exist. (See Gupta and Nagar, 2000, Theorem 1.2.3.)

Theorem A1 (**Marginal and Conditional Distributions of the Inverse-Wishart Distribution**). *Let $\boldsymbol{\Omega}$ be a symmetric matrix of size $k \times k$ and assume that $\boldsymbol{\Omega} \sim \mathcal{W}_k^{-1}(\nu;\, \boldsymbol{S})$, an inverse-Wishart distribution with k degrees of freedom and scale matrix $\boldsymbol{S}$. The probability density function of the inverse-Wishart is parameterized as*

$$f(\boldsymbol{\Omega} \mid \nu, \boldsymbol{S}) = \frac{|\boldsymbol{S}|^{\frac{\nu}{2}}|\boldsymbol{\Omega}|^{-\frac{\nu+k+1}{2}}}{2^{\frac{\nu k}{2}}\Gamma_k\left(\frac{\nu}{2}\right)} \exp\left\{-\frac{1}{2}\operatorname{tr}(\boldsymbol{S}\boldsymbol{\Omega}^{-1})\right\}, \tag{A1.1}$$

where $\Gamma_k(\cdot)$ denotes the multivariate Gamma function and $\operatorname{tr}(\cdot)$ is the trace operator.

Partition $\boldsymbol{\Omega}$ and $\boldsymbol{S}$ as

$$\boldsymbol{\Omega} = \begin{pmatrix} \boldsymbol{\Omega}_{11} & \boldsymbol{\Omega}_{12} \\ \boldsymbol{\Omega}_{21} & \boldsymbol{\Omega}_{22} \end{pmatrix}, \qquad \boldsymbol{S} = \begin{pmatrix} \boldsymbol{S}_{11} & \boldsymbol{S}_{12} \\ \boldsymbol{S}_{21} & \boldsymbol{S}_{22} \end{pmatrix}, \qquad \text{of sizes } \begin{pmatrix} k_1 \times k_1 & k_1 \times k_2 \\ k_2 \times k_1 & k_2 \times k_2 \end{pmatrix},$$

and let $\boldsymbol{\Omega}_{22\cdot 1} = \boldsymbol{\Omega}_{22} - \boldsymbol{\Omega}_{21}\boldsymbol{\Omega}_{11}^{-1}\boldsymbol{\Omega}_{12}$ and $\boldsymbol{S}_{22\cdot 1} = \boldsymbol{S}_{22} - \boldsymbol{S}_{21}\boldsymbol{S}_{11}^{-1}\boldsymbol{S}_{12}$ denote the Schur complements of the blocks $\boldsymbol{\Omega}_{11}$ and $\boldsymbol{S}_{11}$ in $\boldsymbol{\Omega}$ and $\boldsymbol{S}$, respectively. Then:

(i) $\boldsymbol{\Omega}_{11}$ *and* $(\boldsymbol{\Omega}_{11}^{-1}\boldsymbol{\Omega}_{12}, \boldsymbol{\Omega}_{22\cdot 1})$ *are independent,*

(ii) $\boldsymbol{\Omega}_{11} \sim \mathcal{W}_{k_1}^{-1}(\nu - k_2;\, \boldsymbol{S}_{11})$,

(iii) $\boldsymbol{\Omega}_{22\cdot 1} \sim \mathcal{W}_{k_2}^{-1}(\nu;\, \boldsymbol{S}_{22\cdot 1})$,

(iv) $\boldsymbol{\Omega}_{11}^{-1}\boldsymbol{\Omega}_{12} \mid \boldsymbol{\Omega}_{22\cdot 1} \sim \mathcal{N}_{k_1 \times k_2}\big(\boldsymbol{S}_{11}^{-1}\boldsymbol{S}_{12};\, \boldsymbol{S}_{11}^{-1} \otimes \boldsymbol{\Omega}_{22\cdot 1}\big)$.

Proof of Theorem A1. Given that

$$f(\boldsymbol{\Omega}_{11}, \boldsymbol{\Omega}_{11}^{-1}\boldsymbol{\Omega}_{12}, \boldsymbol{\Omega}_{22\cdot 1}) = f(\boldsymbol{\Omega}_{11}, \boldsymbol{\Omega}_{12}, \boldsymbol{\Omega}_{22})\mathcal{J}(\boldsymbol{\Omega}_{12} \to \boldsymbol{\Omega}_{11}^{-1}\boldsymbol{\Omega}_{12})\mathcal{J}(\boldsymbol{\Omega}_{22} \to \boldsymbol{\Omega}_{22\cdot 1}),$$

where $\mathcal{J}(X \to Y)$ denotes the Jacobian of the transformation from X to Y, the theorem can be proven by working out the kernel of the inverse-Wishart distribution in equation (A1.1), using the results on the inversion of a partitioned matrix.

First, note that

$$
\begin{aligned}
\operatorname{tr}(\boldsymbol{S}\boldsymbol{\Omega}^{-1}) &= \operatorname{tr}(\boldsymbol{S}_{11}\boldsymbol{\Omega}^{11} + \boldsymbol{S}_{12}\boldsymbol{\Omega}^{21}) + \operatorname{tr}(\boldsymbol{S}_{21}\boldsymbol{\Omega}^{12} + \boldsymbol{S}_{22}\boldsymbol{\Omega}^{22}),\\
&= \operatorname{tr}(\boldsymbol{S}_{11}\boldsymbol{\Omega}_{11\cdot 2}^{-1} - \boldsymbol{S}_{12}\boldsymbol{\Omega}_{22\cdot 1}^{-1}\boldsymbol{\Omega}_{21}\boldsymbol{\Omega}_{11}^{-1}) + \operatorname{tr}(\boldsymbol{S}_{22}\boldsymbol{\Omega}_{22\cdot 1}^{-1} - \boldsymbol{S}_{21}\boldsymbol{\Omega}_{11}^{-1}\boldsymbol{\Omega}_{12}\boldsymbol{\Omega}_{22\cdot 1}^{-1}),\\
&= \operatorname{tr}(\boldsymbol{S}_{11}(\boldsymbol{\Omega}_{11} - \boldsymbol{\Omega}_{12}\boldsymbol{\Omega}_{22}^{-1}\boldsymbol{\Omega}_{21})^{-1} - \boldsymbol{S}_{12}\boldsymbol{\Omega}_{22\cdot 1}^{-1}\boldsymbol{\Omega}_{21}\boldsymbol{\Omega}_{11}^{-1})\\
&\quad + \operatorname{tr}(\boldsymbol{S}_{22}\boldsymbol{\Omega}_{22\cdot 1}^{-1} - \boldsymbol{S}_{21}\boldsymbol{S}_{11}^{-1}\boldsymbol{S}_{12}\boldsymbol{\Omega}_{22\cdot 1}^{-1} + \boldsymbol{S}_{21}\boldsymbol{S}_{11}^{-1}\boldsymbol{S}_{12}\boldsymbol{\Omega}_{22\cdot 1}^{-1} - \boldsymbol{S}_{21}\boldsymbol{\Omega}_{11}^{-1}\boldsymbol{\Omega}_{12}\boldsymbol{\Omega}_{22\cdot 1}^{-1}),\\
&= \operatorname{tr}(\boldsymbol{S}_{11}(\boldsymbol{\Omega}_{11}^{-1} + \boldsymbol{\Omega}_{11}^{-1}\boldsymbol{\Omega}_{12}(\underbrace{\boldsymbol{\Omega}_{22} - \boldsymbol{\Omega}_{21}\boldsymbol{\Omega}_{11}^{-1}\boldsymbol{\Omega}_{12}}_{\boldsymbol{\Omega}_{22\cdot 1}})^{-1}\boldsymbol{\Omega}_{21}\boldsymbol{\Omega}_{11}^{-1}) - \boldsymbol{S}_{12}\boldsymbol{\Omega}_{22\cdot 1}^{-1}\boldsymbol{\Omega}_{21}\boldsymbol{\Omega}_{11}^{-1})\\
&\quad + \operatorname{tr}((\underbrace{\boldsymbol{S}_{22} - \boldsymbol{S}_{21}\boldsymbol{S}_{11}^{-1}\boldsymbol{S}_{12}}_{\boldsymbol{S}_{22\cdot 1}})\boldsymbol{\Omega}_{22\cdot 1}^{-1} + \boldsymbol{S}_{21}\boldsymbol{S}_{11}^{-1}\boldsymbol{S}_{12}\boldsymbol{\Omega}_{22\cdot 1}^{-1} - \boldsymbol{S}_{21}\boldsymbol{\Omega}_{11}^{-1}\boldsymbol{\Omega}_{12}\boldsymbol{\Omega}_{22\cdot 1}^{-1}),
\end{aligned}
$$

where the transformation in the first trace is obtained by the application of the Woodbury identity, and the terms in the second trace are rearranged after having added and substracted $\boldsymbol{S}_{21}\boldsymbol{S}_{11}^{-1}\boldsymbol{S}_{12}\boldsymbol{\Omega}_{22\cdot 1}^{-1}$. Then, it follows that

$$
\begin{aligned}
\operatorname{tr}(\boldsymbol{S}\boldsymbol{\Omega}^{-1}) &= \operatorname{tr}(\boldsymbol{S}_{11}\boldsymbol{\Omega}_{11}^{-1}) + \operatorname{tr}(\boldsymbol{S}_{11}\boldsymbol{\Omega}_{11}^{-1}\boldsymbol{\Omega}_{12}\boldsymbol{\Omega}_{22\cdot 1}^{-1}\boldsymbol{\Omega}_{21}\boldsymbol{\Omega}_{11}^{-1} - \boldsymbol{S}_{12}\boldsymbol{\Omega}_{22\cdot 1}^{-1}\boldsymbol{\Omega}_{21}\boldsymbol{\Omega}_{11}^{-1})\\
&\quad + \operatorname{tr}(\boldsymbol{S}_{22\cdot 1}\boldsymbol{\Omega}_{22\cdot 1}^{-1}) + \operatorname{tr}(\boldsymbol{S}_{21}\boldsymbol{S}_{11}^{-1}\boldsymbol{S}_{12}\boldsymbol{\Omega}_{22\cdot 1}^{-1} - \boldsymbol{S}_{21}\boldsymbol{\Omega}_{11}^{-1}\boldsymbol{\Omega}_{12}\boldsymbol{\Omega}_{22\cdot 1}^{-1}),\\
&= \operatorname{tr}(\boldsymbol{S}_{11}\boldsymbol{\Omega}_{11}^{-1}) + \operatorname{tr}(\boldsymbol{S}_{22\cdot 1}\boldsymbol{\Omega}_{22\cdot 1}^{-1})\\
&\quad + \operatorname{tr}(\boldsymbol{S}_{11}(\boldsymbol{\Omega}_{11}^{-1}\boldsymbol{\Omega}_{12} - \boldsymbol{S}_{11}^{-1}\boldsymbol{S}_{12})\boldsymbol{\Omega}_{22\cdot 1}^{-1}(\boldsymbol{\Omega}_{21}\boldsymbol{\Omega}_{11}^{-1} - \boldsymbol{S}_{21}\boldsymbol{S}_{11}^{-1})),
\end{aligned}
$$

where the expression in the last trace is obtained by factorizing the remaining elements and using the property of the trace operator that $\operatorname{tr}(AB) = \operatorname{tr}(BA)$ for two matrices A and B of compatible dimensions.

Using the above result, as well as the property of the determinant of a partitioned matrix that $|\boldsymbol{\Omega}| = |\boldsymbol{\Omega}_{11}||\boldsymbol{\Omega}_{22\cdot 1}|$ and the expressions of the Jacobians $\mathcal{J}(\boldsymbol{\Omega}_{12} \to \boldsymbol{\Omega}_{11}^{-1}\boldsymbol{\Omega}_{12}) = |\boldsymbol{\Omega}_{11}|^{k_2}$ and $\mathcal{J}(\boldsymbol{\Omega}_{22} \to \boldsymbol{\Omega}_{22\cdot 1}) = 1$, it can be shown that

$$
\begin{aligned}
&f(\boldsymbol{\Omega}_{11}, \boldsymbol{\Omega}_{11}^{-1}\boldsymbol{\Omega}_{12}, \boldsymbol{\Omega}_{22\cdot 1})\\
&\quad = f(\boldsymbol{\Omega}_{11}, \boldsymbol{\Omega}_{12}, \boldsymbol{\Omega}_{22})\mathcal{J}(\boldsymbol{\Omega}_{12} \to \boldsymbol{\Omega}_{11}^{-1}\boldsymbol{\Omega}_{12})\mathcal{J}(\boldsymbol{\Omega}_{22} \to \boldsymbol{\Omega}_{22\cdot 1}),\\
&\quad \propto |\boldsymbol{\Omega}|^{-\frac{\nu+k+1}{2}} \exp\left\{-\frac{1}{2}\operatorname{tr}(\boldsymbol{S}\boldsymbol{\Omega}^{-1})\right\} \times |\boldsymbol{\Omega}_{11}|^{k_2} \times 1,\\
&\quad \propto |\boldsymbol{\Omega}_{11}|^{-\frac{\nu-k_2+k_1+1}{2}} \exp\left\{-\frac{1}{2}\operatorname{tr}(\boldsymbol{S}_{11}\boldsymbol{\Omega}_{11}^{-1})\right\} + |\boldsymbol{\Omega}_{22\cdot 1}|^{-\frac{\nu+k_2+1}{2}} \exp\left\{-\frac{1}{2}\operatorname{tr}(\boldsymbol{S}_{22\cdot 1}\boldsymbol{\Omega}_{22\cdot 1}^{-1})\right\}\\
&\qquad + |\boldsymbol{\Omega}_{22\cdot 1}|^{-\frac{k_1}{2}} \exp\left\{-\frac{1}{2}\operatorname{tr}(\boldsymbol{S}_{11}(\boldsymbol{\Omega}_{11}^{-1}\boldsymbol{\Omega}_{12} - \boldsymbol{S}_{11}^{-1}\boldsymbol{S}_{12})\boldsymbol{\Omega}_{22\cdot 1}^{-1}(\boldsymbol{\Omega}_{21}\boldsymbol{\Omega}_{11}^{-1} - \boldsymbol{S}_{21}\boldsymbol{S}_{11}^{-1}))\right\}.
\end{aligned}
$$

The first term appears to be the kernel of an inverse-Wishart distribution with $\nu - k_2$ degrees of freedom and scale matrix $\boldsymbol{S}_{11}$, providing the result in (ii), the second term is the kernel of an inverse-Wishart distribution with ν degrees of freedom and scale matrix $\boldsymbol{S}_{22\cdot 1}^{-1}$, providing the result in (iii), and the last term is the kernel of a matrix normal distribution with location matrix $\boldsymbol{S}_{21}\boldsymbol{S}_{11}^{-1}$ and scale matrices $\boldsymbol{S}_{11}^{-1}$ and $\boldsymbol{\Omega}_{22\cdot 1}$, providing the result in (iv). The independence of the matrices stated in (i) directly comes from the fact that

$$
f(\boldsymbol{\Omega}_{11}, \boldsymbol{\Omega}_{11}^{-1}\boldsymbol{\Omega}_{12}, \boldsymbol{\Omega}_{22\cdot 1}) = f(\boldsymbol{\Omega}_{11})f(\boldsymbol{\Omega}_{11}^{-1}\boldsymbol{\Omega}_{12}, \boldsymbol{\Omega}_{22\cdot 1}), = f(\boldsymbol{\Omega}_{11})f(\boldsymbol{\Omega}_{11}^{-1}\boldsymbol{\Omega}_{12} \mid \boldsymbol{\Omega}_{22\cdot 1})f(\boldsymbol{\Omega}_{22\cdot 1}).
$$

□

A2 Monte Carlo Study

A2.1 Data Generation

To investigate the performance of our algorithm, we generate models based on the following baseline factor model (see paper, Section 2.1):

$$\underset{(M\times 1)}{Y_i} = \underset{(M\times K)}{\boldsymbol{\alpha}}\underset{(K\times 1)}{\theta_i} + \underset{(M\times 1)}{\varepsilon_i}, \qquad \theta_i \sim \mathcal{N}(0;\, \boldsymbol{R}), \qquad \varepsilon_i \sim \mathcal{N}(0;\, \boldsymbol{\Sigma}),$$

where $\boldsymbol{\Sigma} = \text{diag}(\sigma_1^2, \dots, \sigma_M^2)$ and $\boldsymbol{\alpha}$ is the matrix of factor loadings that contains at most one non-zero element in each row $m = 1, \dots, M$, denoted $\alpha_m^{\boldsymbol{\Delta}}$. The non-zero loadings are indicated by a matrix $\boldsymbol{\Delta}$ of binary indicators of dimensions $(M \times K)$. Since the focus of the experiments is on the factor selection process, no covariates are specified in the model to keep the specification as simple as possible. We denote a single model by $\mathcal{M}(M, K_0, D, D_0)$, where the different parameters are defined in Table A2.1.

Table A2.1: Monte Carlo Study: Model Definition for Data Generation

Parameter	Definition
M	Total number of measurements
K_0	Number of latent factors
D	Number of measurements loading on each factor
D_0	Number of uncorrelated measurements

Models parameters are sampled as explained in Table A2.2 and independently across Monte Carlo replications. Two different distributions are used to sample the factor loadings and idiosyncratic variances, so as to generate models with two different levels of noise. The first one (type I) is very noisy, with a signal-to-noise ratio that is similar to what we observe in our empirical application, whereas the second one (type II) has little noise. In models with measurements that are uncorrelated with the other measurements, these extra measurements are sampled independently from a standard normal distribution $\mathcal{N}(0;\, 1)$.

A2.2 Prior Specification

Table A2.3 summarizes the prior distributions assumed on model parameters (see Section 2.3 of the paper), and Table A2.4 displays the values of the parameters used as baseline prior. The prior on the correlation matrix of the factors is specified such that the individual correlations between the factors are uniformly distributed on $[-1; 1]$, for both the inverse-Wishart prior and the Huang-Wand prior.[1] For the indicator matrix, the probability of a zero row in the factor loading matrix is specified as measurement-specific. Conditional on the inclusion of the measurements into the model, the Dirichlet distribution on $\tau^\star$ is then specified differently for each model size M, to generate plausible prior probabilities for the number of factors.

[1]Note that with this parameterization of the Huang-Wand prior, $E(s_k) = \nu^\star A_k^2 = 1$.

Table A2.2: Monte Carlo Study: Data Generation with Two Levels of Noise.

Definition	Notation	Simulation	
		Type I	Type II
Indicator matrix	$\boldsymbol{\Delta} = \begin{bmatrix} \boldsymbol{I}_{K_0} \otimes \iota_D \\ \boldsymbol{0}_{(D_0 \times K_0)} \end{bmatrix}$		
Correlated measurements ($m = 1, \ldots, K_0 D$):			
Factor loadings	$\alpha_m^{\boldsymbol{\Delta}}$	$\alpha_m^{\boldsymbol{\Delta}} = (-1)^{\phi_m} \sqrt{a_m}$	
		$\phi_m \sim \mathcal{B}er\,(0.5)$	
		$a_m \sim \mathcal{U}\big(\underline{a_m};\, \overline{a_m}\big)$	
		$\underline{a_m} = 0.04$	$\underline{a_m} = 0.49$
		$\overline{a_m} = 0.64$	$\overline{a_m} = 1.00$
Idiosyncratic variances	σ_m^2	$\mathcal{U}(0.2;\, 0.8)$	$\mathcal{U}(0.1;\, 0.3)$
Proportion of noise		[24% – 95%]	[8% – 38%]
Uncorrelated measurements ($m = K_0 D + 1, \ldots, M$):			
Idiosyncratic variances	σ_m^2	1	
Factor loadings	$\alpha_m^{\boldsymbol{\Delta}}$	0	
Factor correlation matrix	$\boldsymbol{R} = \boldsymbol{\Lambda}^{-\frac{1}{2}}\, \boldsymbol{\Omega}\, \boldsymbol{\Lambda}^{-\frac{1}{2}}$	$\boldsymbol{\Omega} \sim \mathcal{W}_{K_0}^{-1}(K_0 + 5;\, \boldsymbol{I}_{K_0})$	
	$\boldsymbol{\Lambda} = \text{diag}(\boldsymbol{\Omega})$	no correlation larger than 0.85	

Notes.— K_0 is the true number of latent factors, D is the number of measurements dedicated to each factor. $\mathcal{U}(\cdot;\, \cdot)$ denotes the uniform distribution and $\mathcal{W}_{K_0}^{-1}(\cdot;\, \cdot)$ the inverse-Wishart distribution of dimension K_0.

A2.3 Summary Statistics used to Evaluate the Results

To assess the performance of our algorithm, we study its ability to recover the true number of latent factors (K_1), the true structure of the factor loading matrix ($\boldsymbol{\Delta}$), as well as the true number of uncorrelated measurements (D_0, i.e., the number of zero rows in the factor loading matrix). For this purpose, and to summarize the Monte Carlo results in an interpertrable way, several statistics are reported. The first set of statistics is based on the hit rates (i.e., the proportion of Monte Carlo replications where the statistic is equal to the true value) for the number of factors K_1 and the number of zero rows in the factor loading matrix D_0 based on the posterior modes ($\widetilde{K}_1$ and $\widetilde{D}_0$), on the values in the highest probability model (K_1^{H} and D_0^{H} in HPM).[2] Hit rates for the full indicator matrix $\boldsymbol{\Delta}$ in HPM ($\boldsymbol{\Delta}^{\text{H}}$) are also computed. Finally, averages of the different statistics across Monte Carlo replications for K_1 and D_0 are also displayed. This allows to detect if there is an over-/underfitting of the model.

It is also interesting to look at the average M-H acceptance rate to see if the sampler manages to make relevant proposal that are accepted, or if it gets stuck in some area of the parameter space and only generates nonidentified models that are automatically rejected.

[2]The highest probability model (HPM) corresponds to the model with indicator matrix $\boldsymbol{\Delta}$ that is most often visited by the algorithm.

Table A2.3: Monte Carlo Study: Prior Distributions of Model Parameters.

Parameter	Notation	Prior specification
Indicator matrix	$\boldsymbol{\Delta} = (\Delta_1, \ldots, \Delta_M)'$	$\Pr(\Delta_m = e_k \mid \tau_k) = \tau_k$ $\tau = (\tau_0, (1-\tau_0)\tau^\star)'$ $\tau_0 \sim \mathcal{B}eta(\kappa_0; \xi_0)$ $\tau^\star \sim \mathcal{D}ir(\kappa, \ldots, \kappa)$
Idiosyncratic variances	$\boldsymbol{\Sigma} = \mathrm{diag}(\sigma_1^2, \ldots, \sigma_M^2)$	$\sigma_m^2 \sim \mathcal{G}^{-1}(c_0; C_m^0)$
Factor loadings	$\boldsymbol{\alpha} = \left[\alpha_m^{\boldsymbol{\Delta}}\right]_{m=1}^M$	$\alpha_m^{\boldsymbol{\Delta}} \mid \sigma_m^2 \sim \mathcal{N}(a_m^0; A_m^0 \sigma_m^2)$
Factor correlation matrix	$\boldsymbol{R}$	$\boldsymbol{R} = \boldsymbol{\Lambda}^{-\frac{1}{2}} \boldsymbol{\Omega} \boldsymbol{\Lambda}^{-\frac{1}{2}}$ $\boldsymbol{\Omega} \mid s_1, \ldots, s_K \sim \mathcal{W}_K^{-1}(\nu; \boldsymbol{S})$ $\boldsymbol{\Lambda} = \mathrm{diag}(\boldsymbol{\Omega})$ $\boldsymbol{S} = \mathrm{diag}(s_1, \ldots, s_K)$
		Inverse-Wishart prior: $\boldsymbol{S} = \boldsymbol{I}_K$
		Huang-Wand prior: $\nu^\star = \nu^\star + K - 1$ $s_k \sim \mathcal{G}(1/2; 1/(2\nu^\star A_k^2))$, $k = 1, \ldots, K$

Notes.— M is the number of measurements and K is the maximum number of latent factors specified by the user.

Table A2.4: Monte Carlo Study: Baseline Prior Specification

Parameters	Values
Indicator matrix	$\kappa_0 = \xi_0 = 0.1$ and $\kappa = 0.5/0.8/1.0/3.0$ (depending on M)
Idiosyncratic variances	$c_0 = 2.5$ and C_m^0 specified as in equation (17) of the paper
Factor loadings	$a_m^0 = 0$ and $A_m^0 = 3.0$
Factor correlation matrix	$\nu = K + 1$ and $\boldsymbol{S} = \boldsymbol{I}_K$ for the inverse-Wishart prior
	$\nu^\star = 2$ and $A_k^2 = 1/2$ for the Huang-Wand prior

A2.4 Monte Carlo Experiment I: MCMC Tuning

This first Monte Carlo experiment investigates the tuning of the MCMC algorithm, in terms of length of the Markov chain. Particularly, we look at (i) the role played by the pre-MCMC phase used to generate sensible values for the indicator matrix, (ii) the importance of the length of the Markov chain—and how many iterations to discard as burn-in—to allow convergence.

A2.4.1 Setup of the experiment

For each Monte Carlo replication, the MCMC sampler is run for a total of $T_0 + T$ iterations, where only the last T iterations are saved for posterior inference, after a burn-in period of T_0 iterations. For the factor search, the number of $2S$ intermediate steps is randomly chosen by specifying $S = 1 + \phi$ with $\phi \sim \mathcal{P}oisson\,(4)$, resulting in an average number of 10 steps in expanded models. The impact of the number of intermediate steps will be investigated in Section A2.5. The starting values of the parameters are selected at random, except for the indicator matrix $\boldsymbol{\Delta}$, which can be specified after a pre-MCMC analysis. This preliminary analysis is performed by running the unrestricted sampler (algorithm 1 in paper) for T_{pre} iterations, starting either with the maximum number of potential factors (with a random structure that meets the identification condition) or with a single factor. The value of $\boldsymbol{\Delta}$ from the last iteration is then saved and used as a starting value, where only the identified factors (those with at least three dedicated measurements) are kept as active factors. The remaining measurements, those that are dedicated to non-identified factors, are considered as extra measurements.

We simulate 100 data sets from models $\mathcal{M}(39, 6, 6, 3)$ and $\mathcal{M}(76, 9, 8, 4)$, each with the two different levels of noise. We run our algorithm on these data sets using different MCMC tuning.

A2.4.2 Monte Carlo results

Tables A2.5 and A2.6 display the results. Convergence appears to be very good in these examples. In the cases with noisy data, more MCMC iterations are necessary to reach stationarity, and longer burn-in are therefore required. Using a pre-MCMC stage to generate sensible starting values for the indicator matrix helps and allows to reduce the burn-in period.

Table A2.5: Monte Carlo experiments for MCMC tuning, model $\mathcal{M}(39, 6, 6, 3)$ of type I (noisy data) with 500 observations, 100 Monte Carlo replications.

MCMC Tuning			K^{start}	Hit Rates					Monte Carlo Averages				p^{H}	acc	$\Pr(acc > .7)$
T_{pre}	T_0	T		$\widetilde{K}_1$	K_1^{H}	$\boldsymbol{\Delta}^{\text{H}}$	$\widetilde{D}_0$	D_0^{H}	$\widetilde{K}_1$	K_1^{H}	$\widetilde{D}_0$	D_0^{H}			
50000	20000	20000	1	0.98	0.98	0.91	0.96	0.97	6.02	6.02	2.98	2.99	0.76	0.93	0.97
50000	40000	20000	1	0.97	0.98	0.90	0.96	0.97	6.03	6.02	2.98	2.99	0.77	0.94	0.98
—	20000	20000	1	1.00	0.99	0.92	0.96	0.97	6.00	6.01	2.98	2.99	0.77	0.94	0.99
—	40000	20000	1	1.00	1.00	0.92	0.96	0.97	6.00	6.00	2.98	2.99	0.77	0.94	0.99
—	60000	20000	1	1.00	1.00	0.92	0.96	0.97	6.00	6.00	2.98	2.99	0.77	0.94	0.98
50000	20000	20000	max.	0.98	0.98	0.90	0.96	0.97	6.02	6.02	2.98	2.99	0.76	0.94	0.97
50000	40000	20000	max.	0.99	0.98	0.91	0.96	0.97	6.01	6.02	2.98	2.99	0.76	0.93	0.98
—	20000	20000	max.	1.00	1.00	0.92	0.96	0.97	6.00	6.00	2.98	2.99	0.77	0.94	0.95
—	40000	20000	max.	1.00	1.00	0.92	0.96	0.97	6.00	6.00	2.98	2.99	0.77	0.94	0.96
—	60000	20000	max.	0.99	0.99	0.91	0.96	0.97	6.01	6.01	2.98	2.99	0.77	0.94	0.95

Notes.— T_{pre} is the number of iterations for the pre-MCMC phase, T_0 for the burn-in period, and T for the sample saved for posterior inference. K^{start} indicates the number of factors the algorithm starts with. Hit rates: Number of active factors K_1 based on posterior mode $\widetilde{K}_1$, on the number of nonzero columns K_1^{H} in highest probability model (HPM); hit rate of full 0/1 pattern of the indicators $\boldsymbol{\Delta}$ based on $\boldsymbol{\Delta}_M^{\text{H}}$ corresponding to the HPM; number of discarded measurements based on posterior mode $\widetilde{D}_0$, based on the number D_0^{H} corresponding to the HPM, as well as their corresponding Monte Carlo averages. Average posterior frequency p^{H} for the HPM and average acceptance rate acc of the factor search procedure are also reported. The proportion of Monte Carlo replications with $acc > .7$ is shown in the last column, and the other statistics are computed for these cases only.

Table A2.6: Monte Carlo experiments for MCMC tuning, model $\mathcal{M}(39, 6, 6, 3)$ of type II (little noise) with 500 observations, 100 Monte Carlo replications.

MCMC Tuning			K^{start}	Hit Rates					Monte Carlo Averages				p^{H}	acc	$\Pr(acc > .7)$
T_{pre}	T_0	T		$\widetilde{K}_1$	K_1^{H}	$\boldsymbol{\Delta}^{\text{H}}$	$\widetilde{D}_0$	D_0^{H}	$\widetilde{K}_1$	K_1^{H}	$\widetilde{D}_0$	D_0^{H}			
50000	20000	20000	1	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	0.84	0.98	1.00
50000	40000	20000	1	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	0.84	0.98	1.00
—	20000	20000	1	0.99	0.99	0.99	1.00	1.00	5.99	5.99	3.00	3.00	0.84	0.98	1.00
—	40000	20000	1	0.99	0.99	0.99	1.00	1.00	5.99	5.99	3.00	3.00	0.84	0.98	1.00
—	60000	20000	1	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	0.84	0.98	1.00
50000	20000	20000	max.	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	0.84	0.98	1.00
50000	40000	20000	max.	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	0.84	0.98	1.00
—	20000	20000	max.	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	0.84	0.98	1.00
—	40000	20000	max.	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	0.84	0.98	1.00
—	60000	20000	max.	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	0.84	0.98	1.00

Notes.— T_{pre} is the number of iterations for the pre-MCMC phase, T_0 for the burn-in period, and T for the sample saved for posterior inference. K^{start} indicates the number of factors the algorithm starts with. Hit rates: Number of active factors K_1 based on posterior mode $\widetilde{K}_1$, on the number of nonzero columns K_1^{H} in highest probability model (HPM); hit rate of full 0/1 pattern of the indicators $\boldsymbol{\Delta}$ based on $\boldsymbol{\Delta}_M^{\text{H}}$ corresponding to the HPM; number of discarded measurements based on posterior mode $\widetilde{D}_0$, based on the number D_0^{H} corresponding to the HPM, as well as their corresponding Monte Carlo averages. Average posterior frequency p^{H} for the HPM and average acceptance rate acc of the factor search procedure are also reported. The proportion of Monte Carlo replications with $acc > .7$ is shown in the last column, and the other statistics are computed for these cases only.

Table A2.7: Monte Carlo experiments for MCMC tuning, model $\mathcal{M}(76, 9, 8, 4)$ of type I (noisy data) with 500 observations, 100 Monte Carlo replications.

MCMC Tuning			K^{start}	Hit Rates					Monte Carlo Averages				p^{H}	acc	$\Pr(acc > .7)$
T_{pre}	T_0	T		$\widetilde{K}_1$	K_1^{H}	$\boldsymbol{\Delta}^{\text{H}}$	$\widetilde{D}_0$	D_0^{H}	$\widetilde{K}_1$	K_1^{H}	$\widetilde{D}_0$	D_0^{H}			
50000	20000	20000	1	0.98	0.98	0.81	0.92	0.95	8.98	8.98	3.94	3.99	0.64	0.95	0.98
50000	40000	20000	1	0.99	1.00	0.83	0.92	0.95	9.01	9.00	3.94	3.99	0.65	0.95	0.98
—	20000	20000	1	0.90	0.90	0.75	0.92	0.95	8.90	8.90	3.94	3.99	0.65	0.95	1.00
—	40000	20000	1	0.96	0.97	0.81	0.92	0.95	8.98	8.97	3.94	3.99	0.65	0.95	0.99
—	60000	20000	1	0.96	0.96	0.80	0.92	0.95	9.00	9.00	3.94	3.99	0.65	0.95	1.00
50000	20000	20000	max.	0.99	1.00	0.84	0.92	0.95	9.01	9.00	3.94	3.99	0.65	0.95	0.99
50000	40000	20000	max.	1.00	1.00	0.83	0.92	0.95	9.00	9.00	3.94	3.99	0.65	0.95	0.99
—	20000	20000	max.	0.95	0.95	0.79	0.92	0.95	8.99	8.99	3.94	3.99	0.64	0.95	1.00
—	40000	20000	max.	0.98	0.98	0.82	0.92	0.95	9.02	9.02	3.94	3.99	0.65	0.95	1.00
—	60000	20000	max.	0.98	0.98	0.82	0.92	0.95	9.02	9.02	3.94	3.99	0.65	0.95	0.99

Notes.— T_{pre} is the number of iterations for the pre-MCMC phase, T_0 for the burn-in period, and T for the sample saved for posterior inference. K^{start} indicates the number of factors the algorithm starts with. Hit rates: Number of active factors K_1 based on posterior mode $\widetilde{K}_1$, on the number of nonzero columns K_1^{H} in highest probability model (HPM); hit rate of full 0/1 pattern of the indicators $\boldsymbol{\Delta}$ based on $\boldsymbol{\Delta}_M^{\text{H}}$ corresponding to the HPM; number of discarded measurements based on posterior mode $\widetilde{D}_0$, based on the number D_0^{H} corresponding to the HPM, as well as their corresponding Monte Carlo averages. Average posterior frequency p^{H} for the HPM and average acceptance rate acc of the factor search procedure are also reported. The proportion of Monte Carlo replications with $acc > .7$ is shown in the last column, and the other statistics are computed for these cases only.

Table A2.8: Monte Carlo experiments for MCMC tuning, model $\mathcal{M}(76, 9, 8, 4)$ of type II (little noise) with 500 observations, 100 Monte Carlo replications.

MCMC Tuning			K^{start}	Hit Rates					Monte Carlo Averages				p^{H}	acc	Pr($acc > .7$)
T_{pre}	T_0	T		$\widetilde{K}_1$	K_1^{H}	$\boldsymbol{\Delta}^{\text{H}}$	$\widetilde{D}_0$	D_0^{H}	$\widetilde{K}_1$	K_1^{H}	$\widetilde{D}_0$	D_0^{H}			
50000	20000	20000	1	0.89	0.89	0.86	0.94	0.97	8.89	8.89	3.94	3.97	0.75	0.99	1.00
50000	40000	20000	1	0.92	0.92	0.89	0.94	0.97	8.92	8.92	3.94	3.97	0.76	0.99	1.00
—	20000	20000	1	0.91	0.91	0.88	0.94	0.97	8.91	8.91	3.94	3.97	0.76	0.99	1.00
—	40000	20000	1	0.93	0.93	0.90	0.94	0.97	8.93	8.93	3.94	3.97	0.76	0.99	1.00
—	60000	20000	1	0.96	0.96	0.93	0.94	0.97	8.96	8.96	3.94	3.97	0.76	0.99	1.00
50000	20000	20000	max.	0.98	0.98	0.95	0.94	0.97	8.98	8.98	3.94	3.97	0.76	0.99	1.00
50000	40000	20000	max.	0.99	0.99	0.96	0.94	0.97	8.99	8.99	3.94	3.97	0.76	0.99	1.00
—	20000	20000	max.	0.97	0.97	0.94	0.94	0.97	8.97	8.97	3.94	3.97	0.76	0.99	1.00
—	40000	20000	max.	0.99	0.99	0.96	0.94	0.97	8.99	8.99	3.94	3.97	0.76	0.99	1.00
—	60000	20000	max.	1.00	1.00	0.97	0.94	0.97	9.00	9.00	3.94	3.97	0.76	0.99	1.00

Notes.— T_{pre} is the number of iterations for the pre-MCMC phase, T_0 for the burn-in period, and T for the sample saved for posterior inference. K^{start} indicates the number of factors the algorithm starts with. Hit rates: Number of active factors K_1 based on posterior mode $\widetilde{K}_1$, on the number of nonzero columns K_1^{H} in highest probability model (HPM); hit rate of full 0/1 pattern of the indicators $\boldsymbol{\Delta}$ based on $\boldsymbol{\Delta}_M^{\text{H}}$ corresponding to the HPM; number of discarded measurements based on posterior mode $\widetilde{D}_0$, based on the number D_0^{H} corresponding to the HPM, as well as their corresponding Monte Carlo averages. Average posterior frequency p^{H} for the HPM and average acceptance rate acc of the factor search procedure are also reported. The proportion of Monte Carlo replications with $acc > .7$ is shown in the last column, and the other statistics are computed for these cases only.

A2.5 Monte Carlo Experiment II: Prior Sensitivity Analysis

A2.5.1 Setup

This experiment is run on 200 data sets generated from model $\mathcal{M}(39, 6, 6, 3)$ with the two levels of noise and with 500 observations. Table A2.9 shows the different prior specifications used. In each case, only one set of parameters is specified differently from the baseline prior in the first row, and these parameters are indicated by a grey cell.

Note that the baseline prior with $\kappa = 1.0$ implies between 5 and 7 factors a priori, while the alternative prior with $\kappa = 0.1$ implies between 2 and 3 factors, and the one with $\kappa = 3.0$ between 7 and 9 factors.

The baseline tuning used in Section A2.4 (Tuning 1) is used in this experiment.

A2.5.2 Results

Monte Carlo results for this experiment are presented in Tables A2.10 and A2.11. The results appear pretty robust across prior specifications, both in models with noisy and less noisy data. One striking result worth mentioning is about the prior specification of the indicators' probabilities. Specifying τ_0 separately for each measurement helps in recovering the number of uncorrelated measurements. When τ_0 is the same for all measurements, the number of zero rows in the factor loading matrix is underestimated (see statistics for D_0 corresponding to Prior 2).

Table A2.9: Monte Carlo Study: Parameter Specification for Prior Sensitivity Analysis.

Model	Prior Specification												
	Indicators				Idiosyncratic Variances		Factor Loadings		Factor Correlation Matrix				Inter. Steps
									Huang-Wand		Inverse-Wishart		
	$\tau_{0(m)}$	κ_0	ξ_0	κ	c_0	C_m^0	a_m^0	A_m^0	$\nu^\star$	A_k^2	ν	$\boldsymbol{S}$	S
Prior 1 (baseline)	τ_{0m}	0.1	0.1	1.0	2.5	H	0.0	3.0	2	1/2			$r(4)$
Prior 2	τ_0	0.1	0.1	1.0	2.5	H	0.0	3.0	2	1/2			$r(4)$
Prior 3	τ_{0m}	0.5	0.05	1.0	2.5	H	0.0	3.0	2	1/2			$r(4)$
Prior 4	τ_{0m}	0.1	0.1	0.1	2.5	H	0.0	3.0	2	1/2			$r(4)$
Prior 5	τ_{0m}	0.1	0.1	3.0	2.5	H	0.0	3.0	2	1/2			$r(4)$
Prior 6	τ_{0m}	0.1	0.1	1.0	1.0	0.2	0.0	3.0	2	1/2			$r(4)$
Prior 7	τ_{0m}	0.1	0.1	1.0	1.1	0.05	0.0	3.0	2	1/2			$r(4)$
Prior 8	τ_{0m}	0.1	0.1	1.0	2.5	H	0.0	1.0	2	1/2			$r(4)$
Prior 9	τ_{0m}	0.1	0.1	1.0	2.5	H	0.0	10.0	2	1/2			$r(4)$
Prior 10	τ_{0m}	0.1	0.1	1.0	2.5	H	0.0	3.0	4	1/4			$r(4)$
Prior 11	τ_{0m}	0.1	0.1	1.0	2.5	H	0.0	3.0	6	1/6			$r(4)$
Prior 12	τ_{0m}	0.1	0.1	1.0	2.5	H	0.0	3.0	2	1			$r(4)$
Prior 13	τ_{0m}	0.1	0.1	1.0	2.5	H	0.0	3.0	2	10			$r(4)$
Prior 14	τ_{0m}	0.1	0.1	1.0	2.5	H	0.0	3.0			$K+1$	$\boldsymbol{I}_K$	$r(4)$
Prior 15	τ_{0m}	0.1	0.1	1.0	2.5	H	0.0	3.0			$K+3$	$\boldsymbol{I}_K$	$r(4)$
Prior 16	τ_{0m}	0.1	0.1	1.0	2.5	H	0.0	3.0			$K+5$	$\boldsymbol{I}_K$	$r(4)$
Prior 17	τ_{0m}	0.1	0.1	1.0	2.5	H	0.0	3.0			$K+1$	$10\boldsymbol{I}_K$	$r(4)$
Prior 18	τ_{0m}	0.1	0.1	1.0	2.5	H	0.0	3.0	2	1/2			$r(2)$
Prior 19	τ_{0m}	0.1	0.1	1.0	2.5	H	0.0	3.0	2	1/2			$r(6)$
Prior 20	τ_{0m}	0.1	0.1	1.0	2.5	H	0.0	3.0	2	1/2			2
Prior 21	τ_{0m}	0.1	0.1	1.0	2.5	H	0.0	3.0	2	1/2			4
Prior 22	τ_{0m}	0.1	0.1	1.0	2.5	H	0.0	3.0	2	1/2			6

Notes.— Parameters different from baseline specification highlighted in grey. The second column, $\tau_{0(m)}$, indicates if the parameters τ_0 are specified individually for each measurement (τ_{0m}) or common for all the measurements (τ_0). $C_m^0 = H$ means that the parameter is specified as in equation (17) of the paper. The last columns shows the number of intermediate steps in expanded models, where $r(S)$ denotes a random number of steps with an average of $2(S+1)$, and single numbers in the last rows denote a fixed number of steps (see paper).

Table A2.10: Monte Carlo experiments for prior sensitivity analysis of model $\mathcal{M}(39,6,6,3)$ of type I (noisy data), 100 Monte Carlo replications.

Prior	Hit Rates					Monte Carlo Averages				Inefficiency Factors			p^{H}	acc	Pr($acc > .7$)
	$\widetilde{K}_1$	K_1^{H}	$\boldsymbol{\Delta}^{\mathrm{H}}$	$\widetilde{D}_0$	D_0^{H}	$\widetilde{K}_1$	K_1^{H}	$\widetilde{D}_0$	D_0^{H}	$\boldsymbol{R}$	$\boldsymbol{\alpha}^{\mathrm{lead}}$	$\boldsymbol{\Sigma}$			
Prior 1	0.98	0.98	0.90	0.96	0.97	6.02	6.02	2.98	2.99	1.15	1.13	1.13	0.76	0.94	0.97
Prior 2	0.97	0.97	0.47	0.00	0.51	6.03	6.03	0.00	1.62	1.61	1.62	1.60	0.05	0.76	0.79
Prior 3	1.00	0.99	0.88	0.93	0.93	6.00	6.01	3.07	3.07	1.12	1.09	1.09	0.88	0.96	0.98
Prior 4	1.00	1.00	0.91	0.96	0.97	6.00	6.00	2.98	2.99	1.04	1.02	1.02	0.77	0.99	0.99
Prior 5	0.92	0.92	0.85	0.96	0.97	6.08	6.08	2.98	2.99	1.25	1.22	1.22	0.76	0.89	0.91
Prior 6	1.00	0.99	0.92	0.96	0.97	6.00	6.01	2.98	2.99	1.15	1.12	1.13	0.77	0.94	0.97
Prior 7	0.99	0.98	0.92	0.96	0.97	6.01	6.02	2.98	2.99	1.15	1.12	1.13	0.76	0.94	0.97
Prior 8	1.00	1.00	0.91	0.96	0.96	6.00	6.00	2.98	2.98	1.17	1.15	1.15	0.69	0.93	0.97
Prior 9	0.98	0.97	0.92	0.97	0.99	6.02	6.03	2.99	3.01	1.15	1.13	1.13	0.81	0.94	0.98
Prior 10	0.99	0.99	0.91	0.96	0.97	5.99	5.99	2.98	2.99	1.12	1.10	1.10	0.77	0.95	0.98
Prior 11	0.98	0.97	0.90	0.96	0.97	6.00	6.01	2.98	2.99	1.11	1.09	1.10	0.78	0.96	0.98
Prior 12	0.98	0.98	0.90	0.96	0.97	6.02	6.02	2.98	2.99	1.15	1.13	1.13	0.76	0.94	0.97
Prior 13	0.98	0.98	0.90	0.96	0.97	6.02	6.02	2.98	2.99	1.15	1.13	1.13	0.76	0.94	0.97
Prior 14	0.98	0.97	0.90	0.96	0.97	6.02	6.03	2.98	2.99	1.15	1.13	1.13	0.76	0.94	0.98
Prior 15	0.99	0.98	0.91	0.96	0.97	6.01	6.02	2.98	2.99	1.12	1.10	1.11	0.77	0.95	0.98
Prior 16	0.96	0.96	0.89	0.96	0.97	6.00	6.00	2.98	2.99	1.11	1.09	1.09	0.77	0.96	0.98
Prior 17	0.98	0.97	0.90	0.96	0.97	6.02	6.03	2.98	2.99	1.15	1.13	1.13	0.76	0.94	0.98
Prior 18	1.00	1.00	0.92	0.96	0.97	6.00	6.00	2.98	2.99	1.18	1.12	1.13	0.77	0.95	0.97
Prior 19	0.99	0.99	0.92	0.96	0.97	6.01	6.01	2.98	2.99	1.14	1.14	1.13	0.77	0.93	0.96
Prior 20	1.00	1.00	0.92	0.96	0.97	6.00	6.00	2.98	2.99	1.18	1.11	1.11	0.77	0.96	0.98
Prior 21	1.00	0.99	0.92	0.96	0.97	6.00	6.01	2.98	2.99	1.13	1.12	1.12	0.77	0.94	0.96
Prior 22	0.99	0.99	0.92	0.96	0.97	6.01	6.01	2.98	2.99	1.14	1.13	1.13	0.76	0.93	0.97

Notes.— Hit rates: Number of active factors K_1 based on posterior mode $\widetilde{K}_1$, on the number of nonzero columns K_1^{H} in highest probability model (HPM); hit rate of full 0/1 pattern of the indicators $\boldsymbol{\Delta}$ based on $\boldsymbol{\Delta}_M^{\mathrm{H}}$ corresponding to the HPM; number of discarded measurements based on posterior mode $\widetilde{D}_0$, based on the number D_0^{H} corresponding to the HPM, as well as their corresponding Monte Carlo averages. Average posterior frequency p^{H} for the HPM and average acceptance rate acc of the factor search procedure are also reported. The proportion of Monte Carlo replications with $acc > .7$ is shown in the last column, and the other statistics are computed for these cases only. Inefficiency factors are computed as Monte Carlo averages of the median values of each set of parameters: the correlations of the factors ($\boldsymbol{R}$), the leading elements of the factor loading matrix ($\boldsymbol{\alpha}^{\mathrm{lead}}$) and the idiosyncratic variances ($\boldsymbol{\Sigma}$).

Table A2.11: Monte Carlo experiments for prior sensitivity analysis of model $\mathcal{M}(39, 6, 6, 3)$ of type II (little noise), 100 Monte Carlo replications.

Prior	Hit Rates					Monte Carlo Averages				Inefficiency Factors			p^{H}	acc	$\Pr(acc > .7)$
	$\widetilde{K}_1$	K_1^{H}	$\boldsymbol{\Delta}^{\mathrm{H}}$	$\widetilde{D}_0$	D_0^{H}	$\widetilde{K}_1$	K_1^{H}	$\widetilde{D}_0$	D_0^{H}	$\boldsymbol{R}$	$\boldsymbol{\alpha}^{\mathrm{lead}}$	$\boldsymbol{\Sigma}$			
Prior 1	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	1.03	1.03	1.04	0.84	0.98	1.00
Prior 2	1.00	1.00	0.56	0.00	0.56	6.00	6.00	0.00	1.77	1.54	1.55	1.53	0.06	0.79	0.98
Prior 3	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	1.00	1.00	1.00	0.98	1.00	1.00
Prior 4	1.00	1.00	1.00	0.99	1.00	6.00	6.00	2.99	3.00	1.00	1.00	1.00	0.83	1.00	1.00
Prior 5	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	1.08	1.07	1.08	0.85	0.96	1.00
Prior 6	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	1.03	1.03	1.04	0.84	0.98	1.00
Prior 7	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	1.03	1.03	1.04	0.84	0.98	1.00
Prior 8	1.00	1.00	0.99	0.95	0.99	6.00	6.00	2.95	2.99	1.05	1.05	1.06	0.75	0.97	1.00
Prior 9	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	1.01	1.01	1.02	0.90	0.99	1.00
Prior 10	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	1.03	1.03	1.04	0.84	0.98	1.00
Prior 11	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	1.04	1.04	1.04	0.84	0.98	1.00
Prior 12	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	1.03	1.03	1.04	0.84	0.98	1.00
Prior 13	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	1.03	1.03	1.04	0.84	0.98	1.00
Prior 14	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	1.03	1.03	1.04	0.84	0.98	1.00
Prior 15	0.99	0.99	0.99	1.00	1.00	6.01	6.01	3.00	3.00	1.03	1.03	1.04	0.84	0.98	1.00
Prior 16	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	1.03	1.03	1.04	0.84	0.98	1.00
Prior 17	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	1.03	1.03	1.04	0.84	0.98	1.00
Prior 18	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	1.03	1.03	1.06	0.84	0.98	1.00
Prior 19	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	1.03	1.03	1.03	0.84	0.98	1.00
Prior 20	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	1.03	1.03	1.05	0.84	0.98	1.00
Prior 21	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	1.03	1.03	1.03	0.84	0.98	1.00
Prior 22	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	1.03	1.03	1.03	0.84	0.98	1.00

Notes.— Hit rates: Number of active factors K_1 based on posterior mode $\widetilde{K}_1$, on the number of nonzero columns K_1^{H} in highest probability model (HPM); hit rate of full 0/1 pattern of the indicators $\boldsymbol{\Delta}$ based on $\boldsymbol{\Delta}_M^{\mathrm{H}}$ corresponding to the HPM; number of discarded measurements based on posterior mode $\widetilde{D}_0$, based on the number D_0^{H} corresponding to the HPM, as well as their corresponding Monte Carlo averages. Average posterior frequency p^{H} for the HPM and average acceptance rate acc of the factor search procedure are also reported. The proportion of Monte Carlo replications with $acc > .7$ is shown in the last column, and the other statistics are computed for these cases only. Inefficiency factors are computed as Monte Carlo averages of the median values of each set of parameters: the correlations of the factors ($\boldsymbol{R}$), the leading elements of the factor loading matrix ($\boldsymbol{\alpha}^{\mathrm{lead}}$) and the idiosyncratic variances ($\boldsymbol{\Sigma}$).

Table A2.12: Monte Carlo experiments for prior sensitivity analysis of model $\mathcal{M}(76, 9, 8, 4)$ of type I (noisy data), 100 Monte Carlo replications.

Prior	Hit Rates					Monte Carlo Averages				Inefficiency Factors			p^{H}	acc	$\Pr(acc > .7)$
	$\widetilde{K}_1$	K_1^{H}	$\boldsymbol{\Delta}^{\mathrm{H}}$	$\widetilde{D}_0$	D_0^{H}	$\widetilde{K}_1$	K_1^{H}	$\widetilde{D}_0$	D_0^{H}	$\boldsymbol{R}$	$\boldsymbol{\alpha}^{\mathrm{lead}}$	$\boldsymbol{\Sigma}$			
Prior 1	0.99	1.00	0.84	0.92	0.95	9.01	9.00	3.94	3.99	1.10	1.09	1.10	0.65	0.95	0.99
Prior 2	0.96	0.91	0.28	0.00	0.33	9.00	9.05	0.00	1.68	—	—	—	0.01	0.83	0.93
Prior 3	0.99	0.99	0.78	0.90	0.88	8.99	8.99	4.09	4.11	1.10	1.08	1.08	0.81	0.96	1.00
Prior 4	0.99	0.99	0.82	0.92	0.95	8.99	8.99	3.94	3.99	1.02	1.01	1.01	0.65	0.99	1.00
Prior 5	0.97	0.99	0.85	0.92	0.94	9.03	9.01	3.94	3.99	1.20	1.19	1.19	0.65	0.91	0.89
Prior 6	0.97	0.99	0.82	0.92	0.95	9.03	9.01	3.94	3.99	1.11	1.10	1.10	0.64	0.95	1.00
Prior 7	0.98	0.99	0.82	0.92	0.95	9.02	9.01	3.94	3.99	1.11	1.10	1.10	0.64	0.95	1.00
Prior 8	1.00	1.00	0.81	0.86	0.93	9.00	9.00	3.86	3.95	1.12	1.11	1.11	0.56	0.95	0.99
Prior 9	0.99	0.99	0.82	0.96	0.93	9.01	9.01	4.00	4.05	1.10	1.09	1.09	0.72	0.96	0.99
Prior 10	0.98	0.98	0.81	0.92	0.95	9.02	9.02	3.94	3.99	1.10	1.09	1.09	0.65	0.96	0.99
Prior 11	0.96	0.97	0.83	0.92	0.96	8.98	8.97	3.94	3.98	1.09	1.07	1.08	0.66	0.96	0.99
Prior 12	0.99	1.00	0.84	0.92	0.95	9.01	9.00	3.94	3.99	1.10	1.09	1.10	0.65	0.95	0.99
Prior 13	0.99	1.00	0.84	0.92	0.95	9.01	9.00	3.94	3.99	1.10	1.09	1.10	0.65	0.95	0.99
Prior 14	0.99	0.99	0.83	0.92	0.95	9.01	9.01	3.94	3.99	1.11	1.10	1.10	0.65	0.95	0.98
Prior 15	1.00	1.00	0.83	0.92	0.95	9.00	9.00	3.94	3.99	1.10	1.09	1.09	0.66	0.96	1.00
Prior 16	0.94	0.94	0.81	0.92	0.95	9.00	9.00	3.94	3.99	1.09	1.08	1.08	0.66	0.96	0.99
Prior 17	0.99	0.99	0.83	0.92	0.95	9.01	9.01	3.94	3.99	1.11	1.10	1.10	0.65	0.95	0.98
Prior 18	1.00	1.00	0.83	0.92	0.95	9.00	9.00	3.94	3.99	1.12	1.09	1.09	0.65	0.96	0.99
Prior 19	0.99	0.99	0.83	0.92	0.95	9.01	9.01	3.94	3.99	1.11	1.11	1.11	0.65	0.95	0.98
Prior 20	0.99	0.99	0.82	0.92	0.95	9.01	9.01	3.94	3.99	1.12	1.08	1.08	0.65	0.96	1.00
Prior 21	1.00	1.00	0.83	0.92	0.95	9.00	9.00	3.94	3.99	1.10	1.09	1.09	0.65	0.96	1.00
Prior 22	1.00	1.00	0.84	0.92	0.95	9.00	9.00	3.94	3.99	1.10	1.10	1.10	0.65	0.95	0.98

Notes.— Hit rates: Number of active factors K_1 based on posterior mode $\widetilde{K}_1$, on the number of nonzero columns K_1^{H} in highest probability model (HPM); hit rate of full 0/1 pattern of the indicators $\boldsymbol{\Delta}$ based on $\boldsymbol{\Delta}_M^{\mathrm{H}}$ corresponding to the HPM; number of discarded measurements based on posterior mode $\widetilde{D}_0$, based on the number D_0^{H} corresponding to the HPM, as well as their corresponding Monte Carlo averages. Average posterior frequency p^{H} for the HPM and average acceptance rate acc of the factor search procedure are also reported. The proportion of Monte Carlo replications with $acc > .7$ is shown in the last column, and the other statistics are computed for these cases only. Inefficiency factors are computed as Monte Carlo averages of the median values of each set of parameters: the correlations of the factors ($\boldsymbol{R}$), the leading elements of the factor loading matrix ($\boldsymbol{\alpha}^{\mathrm{lead}}$) and the idiosyncratic variances ($\boldsymbol{\Sigma}$).

Table A2.13: Monte Carlo experiments for prior sensitivity analysis of model $\mathcal{M}(76, 9, 8, 4)$ of type II (little noise), 100 Monte Carlo replications.

Prior	Hit Rates					Monte Carlo Averages				Inefficiency Factors			p^{H}	acc	$\Pr(acc > .7)$
	$\widetilde{K}_1$	K_1^{H}	$\boldsymbol{\Delta}^{\mathrm{H}}$	$\widetilde{D}_0$	D_0^{H}	$\widetilde{K}_1$	K_1^{H}	$\widetilde{D}_0$	D_0^{H}	$\boldsymbol{R}$	$\boldsymbol{\alpha}^{\mathrm{lead}}$	$\boldsymbol{\Sigma}$			
Prior 1	0.98	0.98	0.95	0.94	0.97	8.98	8.98	3.94	3.97	1.02	1.02	1.02	0.76	0.99	1.00
Prior 2	1.00	1.00	0.39	0.00	0.39	9.00	9.00	0.00	1.86	1.19	1.20	1.18	0.01	0.86	1.00
Prior 3	0.99	0.99	0.98	0.99	0.99	8.99	8.99	3.99	3.99	1.00	1.00	1.00	0.96	1.00	1.00
Prior 4	0.99	0.99	0.96	0.94	0.97	8.99	8.99	3.94	3.97	1.00	1.00	1.00	0.75	1.00	1.00
Prior 5	0.98	0.98	0.95	0.94	0.97	9.00	9.00	3.94	3.97	1.07	1.07	1.08	0.77	0.97	1.00
Prior 6	0.99	0.99	0.96	0.94	0.97	8.99	8.99	3.94	3.97	1.02	1.02	1.02	0.76	0.99	1.00
Prior 7	0.99	0.99	0.96	0.94	0.97	8.99	8.99	3.94	3.97	1.02	1.02	1.02	0.76	0.99	1.00
Prior 8	1.00	1.00	0.94	0.89	0.94	9.00	9.00	3.89	3.94	1.03	1.03	1.04	0.65	0.98	1.00
Prior 9	1.00	1.00	0.99	0.98	0.99	9.00	9.00	3.98	3.99	1.01	1.01	1.01	0.85	0.99	1.00
Prior 10	0.98	0.98	0.95	0.94	0.97	8.98	8.98	3.94	3.97	1.02	1.02	1.02	0.76	0.99	1.00
Prior 11	0.97	0.97	0.94	0.94	0.97	8.97	8.97	3.94	3.97	1.02	1.02	1.02	0.76	0.99	1.00
Prior 12	0.98	0.98	0.95	0.94	0.97	8.98	8.98	3.94	3.97	1.02	1.02	1.02	0.76	0.99	1.00
Prior 13	0.98	0.98	0.95	0.94	0.97	8.98	8.98	3.94	3.97	1.02	1.02	1.02	0.76	0.99	1.00
Prior 14	0.99	0.99	0.96	0.94	0.97	8.99	8.99	3.94	3.97	1.02	1.02	1.02	0.76	0.99	1.00
Prior 15	0.98	0.98	0.95	0.94	0.97	8.98	8.98	3.94	3.97	1.02	1.02	1.02	0.76	0.99	1.00
Prior 16	0.96	0.96	0.93	0.94	0.97	8.98	8.98	3.94	3.97	1.02	1.02	1.02	0.76	0.99	1.00
Prior 17	0.99	0.99	0.96	0.94	0.97	8.99	8.99	3.94	3.97	1.02	1.02	1.02	0.76	0.99	1.00
Prior 18	0.99	0.99	0.96	0.94	0.97	8.99	8.99	3.94	3.97	1.02	1.02	1.04	0.76	0.99	1.00
Prior 19	1.00	1.00	0.97	0.94	0.97	9.00	9.00	3.94	3.97	1.02	1.02	1.02	0.76	0.99	1.00
Prior 20	0.97	0.97	0.94	0.94	0.97	8.97	8.97	3.94	3.97	1.01	1.02	1.03	0.76	0.99	1.00
Prior 21	0.98	0.98	0.95	0.94	0.97	8.98	8.98	3.94	3.97	1.02	1.02	1.02	0.76	0.99	1.00
Prior 22	1.00	1.00	0.97	0.94	0.97	9.00	9.00	3.94	3.97	1.02	1.02	1.02	0.76	0.99	1.00

Notes.— Hit rates: Number of active factors K_1 based on posterior mode $\widetilde{K}_1$, on the number of nonzero columns K_1^{H} in highest probability model (HPM); hit rate of full 0/1 pattern of the indicators $\boldsymbol{\Delta}$ based on $\boldsymbol{\Delta}_M^{\mathrm{H}}$ corresponding to the HPM; number of discarded measurements based on posterior mode $\widetilde{D}_0$, based on the number D_0^{H} corresponding to the HPM, as well as their corresponding Monte Carlo averages. Average posterior frequency p^{H} for the HPM and average acceptance rate acc of the factor search procedure are also reported. The proportion of Monte Carlo replications with $acc > .7$ is shown in the last column, and the other statistics are computed for these cases only. Inefficiency factors are computed as Monte Carlo averages of the median values of each set of parameters: the correlations of the factors ($\boldsymbol{R}$), the leading elements of the factor loading matrix ($\boldsymbol{\alpha}^{\mathrm{lead}}$) and the idiosyncratic variances ($\boldsymbol{\Sigma}$).

A2.6 Monte Carlo Experiment III: Factor Search

A2.6.1 Setup

In this experiment, we are interested in the performance of our algorithm in recovering the true latent structure of models of different dimensions, and with different numbers of uncorrelated measurements. We simulate the eight following models:

$$\begin{array}{llll}\mathcal{M}(15,3,5,0), & \mathcal{M}(36,6,6,0), & \mathcal{M}(72,9,8,0), & \mathcal{M}(120,12,10,0),\\ \mathcal{M}(17,3,5,2), & \mathcal{M}(39,6,6,3), & \mathcal{M}(76,9,8,4), & \mathcal{M}(125,12,10,5).\end{array}$$

Each of these model configurations is used to simulate data sets with $N = 500$ and $1,000$ observations, and 100 Monte Carlo replications are used for each of them. Therefore, this Monte Carlo experiment relies on 8 (model sizes) $\times$ 2 (levels of noise) $\times$ 2 (sample sizes) $\times$ 100 (Monte Carlo replications) $= 3,200$ independent data sets.

The baseline prior specification is slightly different for each model, because of the different number of measurements, as shown in Table A2.14. For the prior on the indicators, we use values that provide realistic prior distributions on the number of latent factors. Table 2 in paper shows these prior probabilities for the first four models under investigation. These probabilities were simulated using a simple accept-reject sampling scheme, and the low acceptance rates in the last column reflect the difficulty to sample models that meet the identifying restrictions when drawing only from unrestricted models.

The baseline tuning used in Section A2.4 (50,000/20,000/20,000 for $T_{pre}/T_0/T$ and K^{start} specified as the maximum number of factors) is used in this experiment.

A2.6.2 Results

Monte Carlo results for this experiment are presented in Tables A2.15 and A2.16. These results show that our algorithm succeeds in recovering the true structure of the latent part of the model, even in large models and in noisy data. However, it is also important to point out that factor search becomes harder in these more complicated cases, and longer Markov chains may be required to ensure convergence.

Table A2.14: Monte Carlo Study: Prior Parameter Specification.

Model		Prior Parameters								
		Indicators			Idiosyncratic Variances		Factor Loadings		Correlation Matrix	
	K	κ_0	ξ_0	κ	c_0	C_m^0	a_m^0	A_m^0	$\nu^\star$	A_k^2
$\mathcal{M}(M, K_0, D, D_0)$	K	0.1	0.1	—	2.5	H	0.0	3.0	2	1/2
$\mathcal{M}(15, 3, 5, 0)$	5	0.1	0.1	1.0	2.5	H	0.0	3.0	2	1/2
$\mathcal{M}(17, 3, 5, 2)$	5	0.1	0.1	1.0	2.5	H	0.0	3.0	2	1/2
$\mathcal{M}(36, 6, 6, 0)$	9	0.1	0.1	1.0	2.5	H	0.0	3.0	2	1/2
$\mathcal{M}(39, 6, 6, 3)$	9	0.1	0.1	1.0	2.5	H	0.0	3.0	2	1/2
$\mathcal{M}(72, 9, 8, 0)$	12	0.1	0.1	0.8	2.5	H	0.0	3.0	2	1/2
$\mathcal{M}(76, 9, 8, 4)$	12	0.1	0.1	0.8	2.5	H	0.0	3.0	2	1/2
$\mathcal{M}(120, 12, 10, 0)$	18	0.1	0.1	0.5	2.5	H	0.0	3.0	2	1/2
$\mathcal{M}(125, 12, 10, 5)$	18	0.1	0.1	0.5	2.5	H	0.0	3.0	2	1/2

Notes.— Prior parameters defined in Table A2.3. The first row gives the general prior specification used. The remaining rows give the corresponding values of the prior parameters, as well as the values of model-specific parameter κ. K_0 is the true number of factors and K is the maximum number of factors specified by the user. $C_m^0 = H$ means that the parameter is specified as in equation (17) of the paper).

Table A2.15: Monte Carlo experiments for factor search, models $\mathcal{M}(M, K_0, D, D_0)$ of type I (noisy data), with baseline prior and MCMC tuning, 100 Monte Carlo replications.

Model	N	K	Hit Rates					Monte Carlo Averages				p^{H}	acc	$\Pr(acc > .7)$
			$\widetilde{K}_1$	K_1^{H}	$\boldsymbol{\Delta}^{\text{H}}$	$\widetilde{D}_0$	D_0^{H}	$\widetilde{K}_1$	K_1^{H}	$\widetilde{D}_0$	D_0^{H}			
$\mathcal{M}(15,3,5,0)$	500	5	1.00	1.00	0.97	1.00	1.00	3.00	3.00	0.00	0.00	0.97	0.96	1.00
	1000	5	1.00	1.00	1.00	1.00	1.00	3.00	3.00	0.00	0.00	1.00	0.99	1.00
$\mathcal{M}(36,6,6,0)$	500	9	0.98	0.98	0.95	1.00	1.00	6.02	6.02	0.00	0.00	0.90	0.95	0.97
	1000	9	0.99	1.00	1.00	1.00	1.00	6.01	6.00	0.00	0.00	0.99	0.99	1.00
$\mathcal{M}(72,9,8,0)$	500	12	0.99	0.99	0.93	0.97	0.96	9.01	9.01	0.03	0.04	0.92	0.98	0.99
	1000	12	0.96	0.96	0.96	1.00	1.00	8.96	8.96	0.00	0.00	0.98	1.00	1.00
$\mathcal{M}(120,12,10,0)$	500	18	0.97	0.98	0.81	0.98	0.98	11.99	11.98	0.02	0.02	0.82	0.96	1.00
	1000	18	0.92	0.92	0.89	1.00	1.00	11.94	11.94	0.00	0.00	0.97	0.99	0.99
$\mathcal{M}(17,3,5,2)$	500	5	1.00	1.00	0.91	0.93	0.94	3.00	3.00	1.97	1.98	0.85	0.94	1.00
	1000	5	1.00	1.00	0.99	0.99	0.99	3.00	3.00	1.99	1.99	0.90	0.97	0.99
$\mathcal{M}(39,6,6,3)$	500	9	0.98	0.98	0.90	0.96	0.97	6.02	6.02	2.98	2.99	0.76	0.94	0.97
	1000	9	0.99	0.99	0.98	0.98	0.99	6.01	6.01	2.98	2.99	0.84	0.97	0.99
$\mathcal{M}(76,9,8,4)$	500	12	0.99	1.00	0.84	0.92	0.95	9.01	9.00	3.94	3.99	0.65	0.95	0.99
	1000	12	0.94	0.95	0.90	0.96	0.96	9.02	9.01	3.96	3.96	0.81	0.99	1.00
$\mathcal{M}(125,12,10,5)$	500	18	0.97	0.97	0.76	0.90	0.91	11.99	11.99	5.00	5.03	0.57	0.95	1.00
	1000	18	0.95	0.95	0.93	0.96	0.98	11.95	11.95	4.96	4.98	0.77	0.99	1.00

Notes.— Hit rates: Number of active factors K_1 based on posterior mode $\widetilde{K}_1$, on the number of nonzero columns K_1^{H} in highest probability model (HPM); hit rate of full 0/1 pattern of the indicators $\boldsymbol{\Delta}$ based on $\boldsymbol{\Delta}_M^{\text{H}}$ corresponding to the HPM; number of discarded measurements based on posterior mode $\widetilde{D}_0$, based on the number D_0^{H} corresponding to the HPM, as well as their corresponding Monte Carlo averages. Average posterior frequency p^{H} for the HPM and average acceptance rate *acc* of the factor search procedure are also reported. The proportion of Monte Carlo replications with $acc > .7$ is shown in the last column, and the other statistics are computed for these cases only.

Table A2.16: Monte Carlo experiments for factor search, models $\mathcal{M}(M, K_0, D, D_0)$ of type II (little noise), with baseline prior and MCMC tuning, 100 Monte Carlo replications.

Model	N	K	Hit Rates					Monte Carlo Averages				p^{H}	acc	$\Pr(acc > .7)$
			$\widetilde{K}_1$	K_1^{H}	$\boldsymbol{\Delta}^{\mathrm{H}}$	$\widetilde{D}_0$	D_0^{H}	$\widetilde{K}_1$	K_1^{H}	$\widetilde{D}_0$	D_0^{H}			
$\mathcal{M}(15, 3, 5, 0)$	500	5	1.00	1.00	1.00	1.00	1.00	3.00	3.00	0.00	0.00	1.00	1.00	1.00
	1000	5	1.00	1.00	1.00	1.00	1.00	3.00	3.00	0.00	0.00	1.00	1.00	1.00
$\mathcal{M}(36, 6, 6, 0)$	500	9	1.00	1.00	1.00	1.00	1.00	6.00	6.00	0.00	0.00	1.00	1.00	1.00
	1000	9	0.99	0.99	0.99	1.00	1.00	6.01	6.01	0.00	0.00	1.00	1.00	1.00
$\mathcal{M}(72, 9, 8, 0)$	500	12	0.98	0.98	0.98	1.00	1.00	8.98	8.98	0.00	0.00	1.00	1.00	1.00
	1000	12	0.99	0.99	0.99	1.00	1.00	9.01	9.01	0.00	0.00	0.99	1.00	1.00
$\mathcal{M}(120, 12, 10, 0)$	500	18	1.00	1.00	1.00	1.00	1.00	12.00	12.00	0.00	0.00	1.00	1.00	1.00
	1000	18	0.98	0.98	0.98	1.00	1.00	12.00	12.00	0.00	0.00	0.99	1.00	1.00
$\mathcal{M}(17, 3, 5, 2)$	500	5	1.00	1.00	0.96	0.96	0.96	3.00	3.00	1.96	1.96	0.88	0.98	1.00
	1000	5	1.00	1.00	1.00	0.99	1.00	3.00	3.00	1.99	2.00	0.91	0.98	1.00
$\mathcal{M}(39, 6, 6, 3)$	500	9	1.00	1.00	1.00	1.00	1.00	6.00	6.00	3.00	3.00	0.84	0.98	1.00
	1000	9	1.00	1.00	0.99	0.99	0.99	6.00	6.00	2.99	2.99	0.86	0.98	1.00
$\mathcal{M}(76, 9, 8, 4)$	500	12	0.98	0.98	0.95	0.94	0.97	8.98	8.98	3.94	3.97	0.76	0.99	1.00
	1000	12	0.97	0.97	0.93	0.96	0.96	8.97	8.97	3.96	3.96	0.84	0.99	1.00
$\mathcal{M}(125, 12, 10, 5)$	500	18	1.00	1.00	0.98	0.96	0.98	12.00	12.00	4.96	4.98	0.72	0.99	1.00
	1000	18	0.97	0.97	0.95	0.95	0.98	11.97	11.97	4.95	4.98	0.78	0.99	1.00

Notes.— Hit rates: Number of active factors K_1 based on posterior mode $\widetilde{K}_1$, on the number of nonzero columns K_1^{H} in highest probability model (HPM); hit rate of full 0/1 pattern of the indicators $\boldsymbol{\Delta}$ based on $\boldsymbol{\Delta}_M^{\mathrm{H}}$ corresponding to the HPM; number of discarded measurements based on posterior mode $\widetilde{D}_0$, based on the number D_0^{H} corresponding to the HPM, as well as their corresponding Monte Carlo averages. Average posterior frequency p^{H} for the HPM and average acceptance rate acc of the factor search procedure are also reported. The proportion of Monte Carlo replications with $acc > .7$ is shown in the last column, and the other statistics are computed for these cases only.

A2.7 Classical Methods for Selecting the Number of Components and Factors

This section present a brief description of the classical methods routinely used in the psychometric and econometric literature to select the number of components/factors which have been applied to the simulated data (see Table 5 in Section 5 of the paper), using each of the eight model configurations presented in Section A2.6.

One of the most popular approaches for selecting the number of components/factors is the scree plot introduced by Cattell (1966). This graphical method consists of retaining the number of components/factors where an elbow appears on the curve plotting the eigenvalues valued in decreasing order - or alternatively, to retain the number of components/factors which fall above the straight line which can be traced along the plotted eigenvalues after the elbow. The complications inherent in this approach are clear, as the actual decision on the number of components/factors to retain has to be made by the researcher, on the basis of visual inspection of the plot - decision which is not simple in case there is no clear break, or more than one break, in the line. Indeed, Zwick and Velicer (1982) found that Cattell's method is more accurate in case of large samples and strongly defined components. The scree plots of the eigenvalues from the simulated data are reported in Figures A2.17-A2.24: Figures A2.17-A2.20 present the eigenvalues of the raw correlation matrix, and A2.21-A2.24 present those of the reduced one.

Two formalizations of the scree plot have recently been proposed. The first one, the Optimal Coordinates by Raîche et al. (2006), is based on a comparison between the observed eigenvalue and the projected eigenvalue estimated on the basis of the two preceding ones:

$$n_{OC} = \sum \mathbf{1}\left(\lambda \geq \hat{\lambda}\right)$$

The number of components/factors to retain then corresponds to the last observed eigenvalue (respectively, of the raw and of the reduced correlation matrix) which is greater than or equal to the predicted one.

The second formalization of the scree plot is a method recently developed by Onatski (2009) in the context of the study of high-dimensional time series that have the generalized dynamic factor structure. He also developed an important special case when the factors are not dynamic, which is the one we apply here. Onatski (2009) develops a test of the null of k_0 factors against the alternative that the number of factors is larger than k_0 but no larger than $k_1 > k_0$, where k_0 and k_1 are specified a priori by the researcher. The test statistic can be computed as :

$$R \equiv \max_{k_0 < i \leq k_1} \frac{\lambda_i - \lambda_{i+1}}{\lambda_{i+1} - \lambda_{i+2}}$$

where λ_i is the i^{th} largest eigenvalue of the matrix $\frac{2}{T}\sum_{j=1}^{T/2} \hat{X}_j \hat{X}_j'$, where $\hat{X}_j$ is a transformation of the original data obtained by splitting the sample into two subsamples of equal size ($T/2$), multiplying the second half by the imaginary unit $\sqrt{-1}$, and adding to the first half, that is $\hat{X}_j = X_j + \sqrt{-1}X_{j+T/2}$. Onatski (2009) proves that the test statistic is asymptotically pivotal under the null hypothesis, while it explodes under the alternative; and that its asymptotic distribution is a function of the Tracy-Widom distribution.[3] The Onatski (2009) method requires the researcher to specify k_0 and k_1, supposing it is known a priori that $k_0 \leq k \leq k_1$. Notice Onatski (2009) points out that, in a situation with few strong and many weak factors, the test will work as the true number of factors were equal to the number of dominant ones.

Another commonly used method, relying on matrices of partial correlations, was developed by Velicer (1976): he proposed that the number of components n to be extracted when performing principal component analysis should be that at which the average of the squared partial correlations of the measurements, after having partialled out each of the n principal components, would be at a minimum; this happens when the residual matrix resembles an identity matrix. The method has been shown to perform better than Kaiser's rule (Zwick and Velicer, 1982), and to be the most reliable together with parallel analysis (Zwick and Velicer, 1986).

One other widely used method is the Kaiser (1960) rule, which – in its most well-known formulation – suggests to retain a number of components until the related eigenvalue of the raw correlation matrix of the measurements falls below one.[4] When applied to the reduced correlation matrix, then the rule followed is to retain the number of factors at which $\lambda > \bar{\lambda}$, where $\bar{\lambda}$ is the average eigenvalue. Gorsuch (1983) and Kaiser (1960) found that the number of constructs to be retained tends to be between one third and one sixth of the indicators. This relation between the number of measurements available to the researcher and the number of components/factors to retain is indeed problematic, as in cases - like ours - where the correlation matrix of the measurements is high-dimensional, might lead to overextraction (as found, among others, in Horn, 1965, and Zwick and Velicer, 1982).

Finally, after having performed factor analysis by the method of maximum likelihood, we compute the Akaike Information Criterion (Akaike, 1974) and the Bayesian Information Criterion (Schwarz, 1978) as follows:

$$AIC = -2 \times \ln(likelihood) + 2 \times k$$

$$BIC = -2 \times \ln(likelihood) + \ln(N) \times k$$

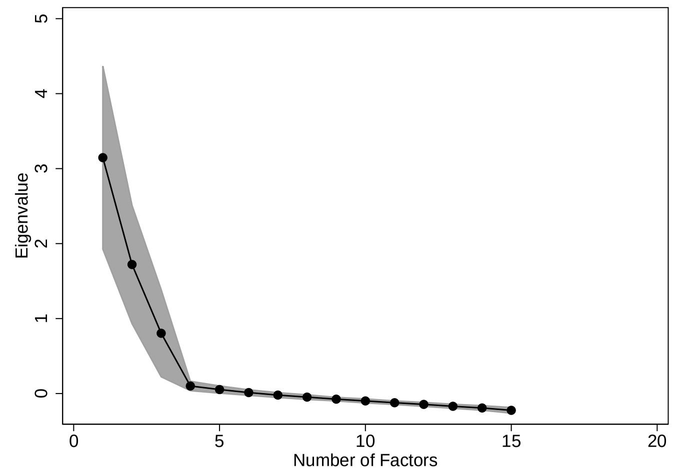
where k is the number of parameters estimated, and N is the sample size. Given models estimated assuming different number of factors, the model with the smaller value of the information criterion is considered to have a better fit.

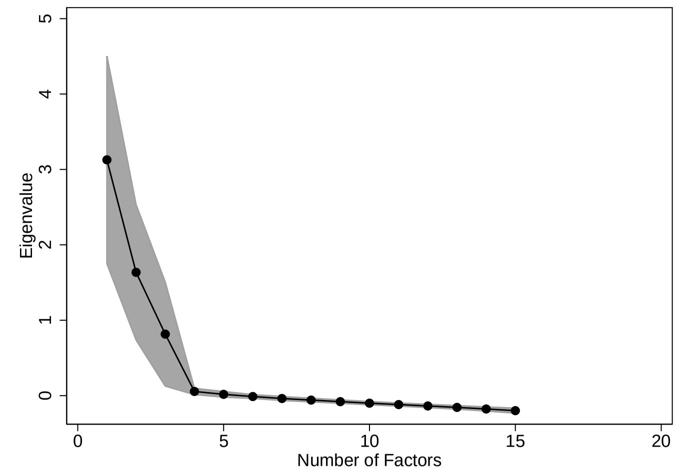
[3]The Tracy-Widom distribution (Tracy and Widom, 1994) is the probability distribution of the largest eigenvalue of an Hermitian random matrix as its dimensionality tends to infinity.

[4]Kaiser developed this method on the basis of Guttman (1954) work on the number of components in image analysis, so this is also known as the Kaiser-Guttman rule. The reason for this cutoff is that the variance of each principal component is equal to the eigenvalue, so a component with an eigenvalue of one accounts for as much variance just as a single standardized indicator.

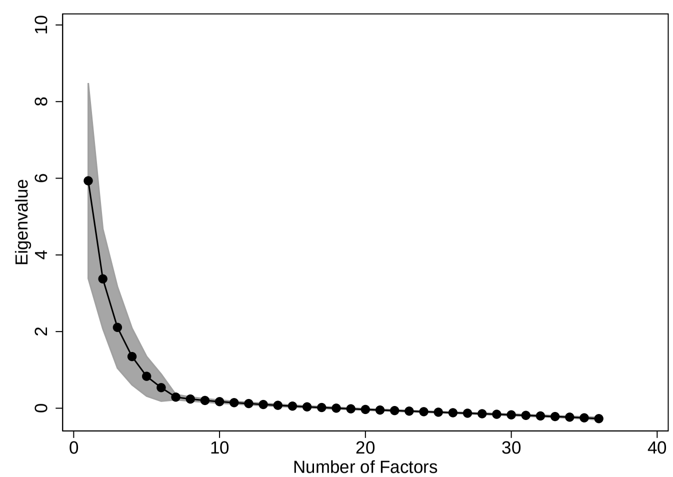
Table A2.17: Scree Plots, eigenvalues from the raw correlation matrix of the simulated data for models $\mathcal{M}(M, K_0, D, D_0)$ with N=500 (left column) and 1000 (right column). 100 Monte Carlo replications.

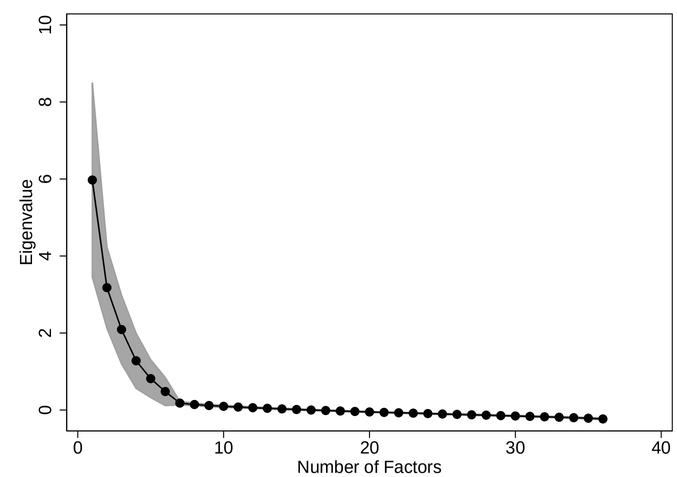
$\mathcal{M}(15, 3, 5, 0)$





$\mathcal{M}(36, 6, 6, 0)$

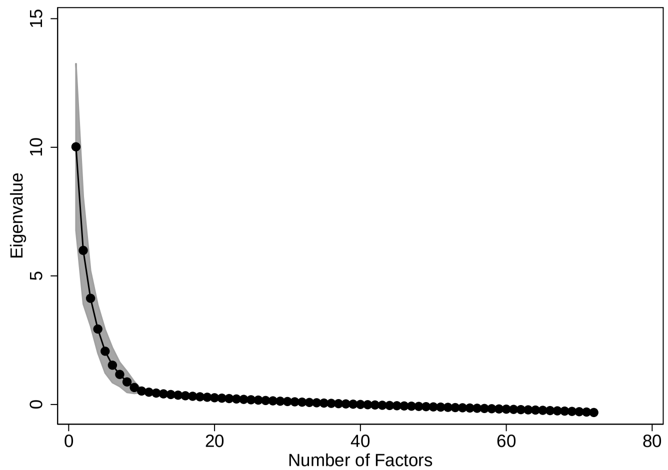


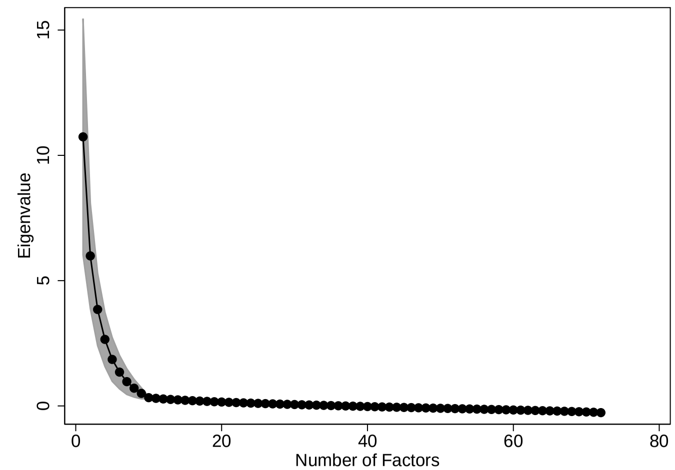


Note: M is the total number of measurements, K_0 the true number of latent factors, D the number of measurements dedicated to each factor, D_0 the number of uncorrelated measurements, and N the sample size. Black dots are averages over the 100 Monte Carlo replications; the grey shaded areas around each line represent standard deviations (two standard deviations above and below).

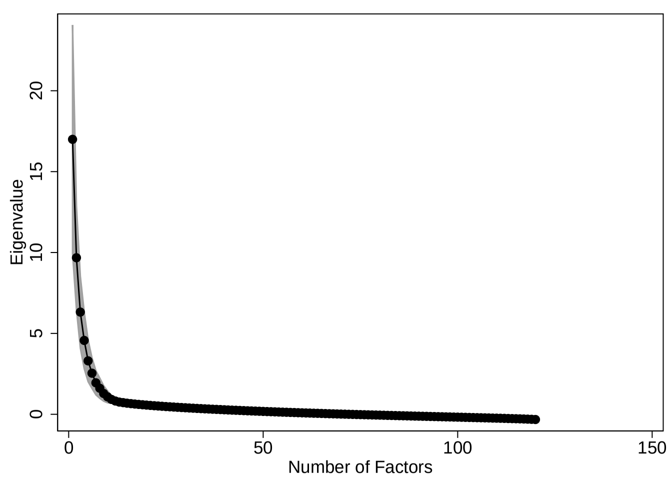
Table A2.18: Scree Plots, eigenvalues from the raw correlation matrix of the simulated data for models $\mathcal{M}(M, K_0, D, D_0)$ with N=500 (left column) and 1000 (right column). 100 Monte Carlo replications. (ctd.)

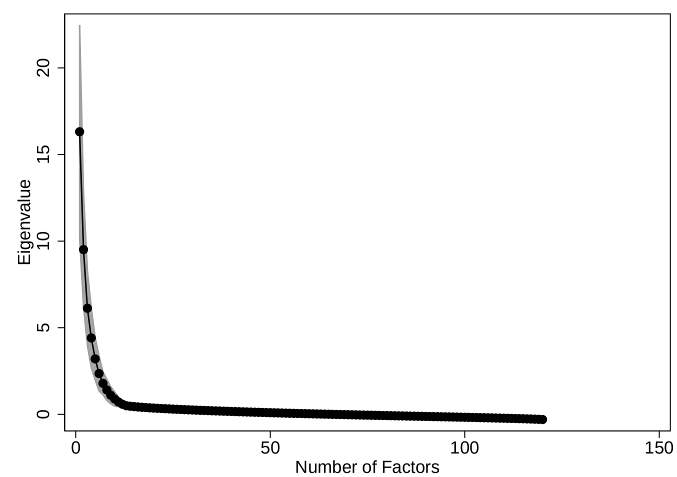
$\mathcal{M}(72, 9, 8, 0)$





$\mathcal{M}(120, 12, 10, 0)$

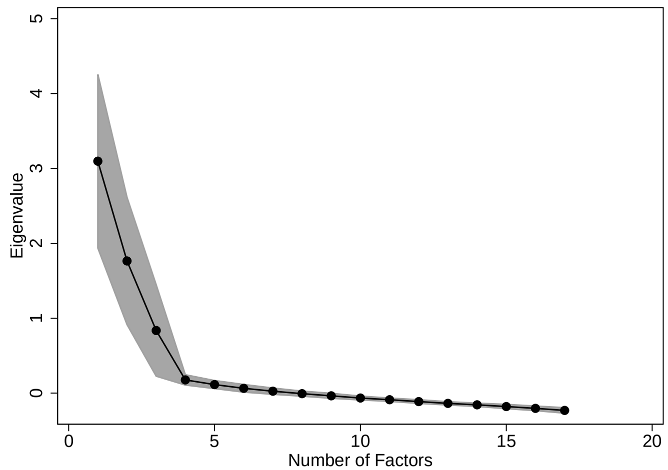


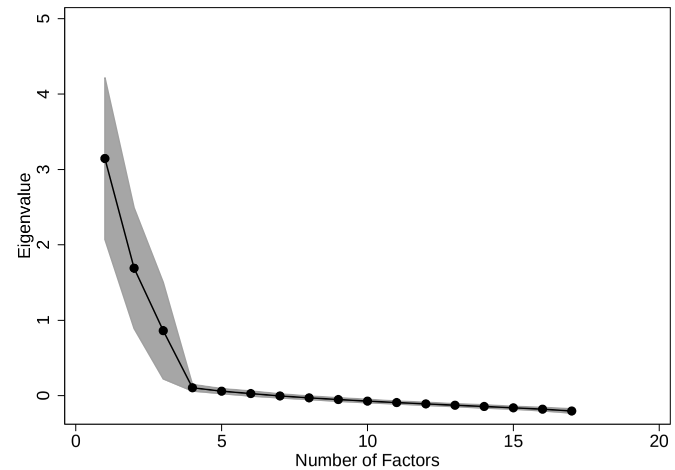


Note: M is the total number of measurements, K_0 the true number of latent factors, D the number of measurements dedicated to each factor, D_0 the number of uncorrelated measurements, and N the sample size. Black dots are averages over the 100 Monte Carlo replications; the grey shaded areas around each line represent standard deviations (two standard deviations above and below).

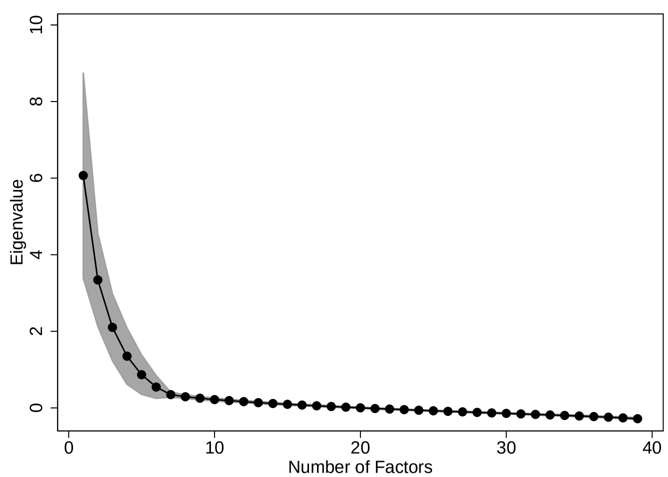
Table A2.19: Scree Plots, eigenvalues from the raw correlation matrix of the simulated data for models $\mathcal{M}(M, K_0, D, D_0)$ with N=500 (left column) and 1000 (right column). 100 Monte Carlo replications. (ctd.)

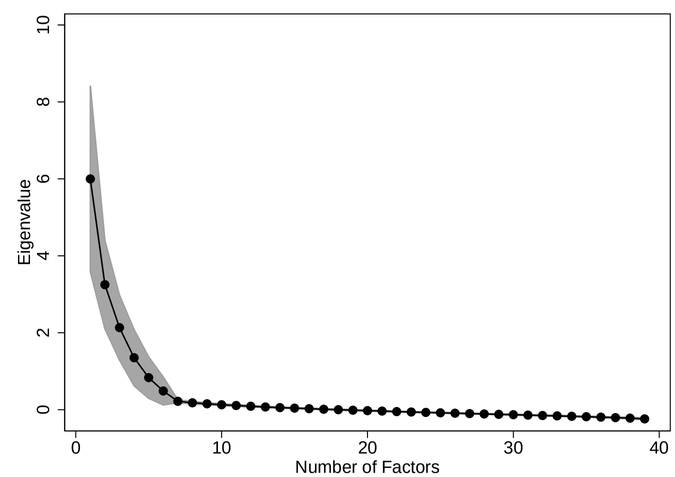
$\mathcal{M}(17, 3, 5, 2)$





$\mathcal{M}(39, 6, 6, 3)$

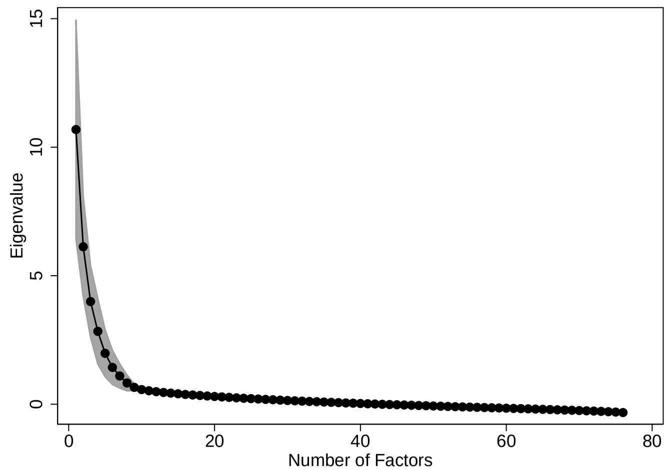


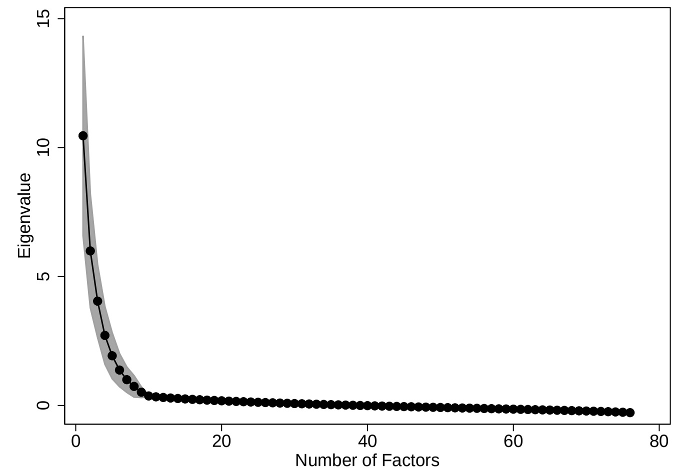


Note: M is the total number of measurements, K_0 the true number of latent factors, D the number of measurements dedicated to each factor, D_0 the number of uncorrelated measurements, and N the sample size. Black dots are averages over the 100 Monte Carlo replications; the grey shaded areas around each line represent standard deviations (two standard deviations above and below).

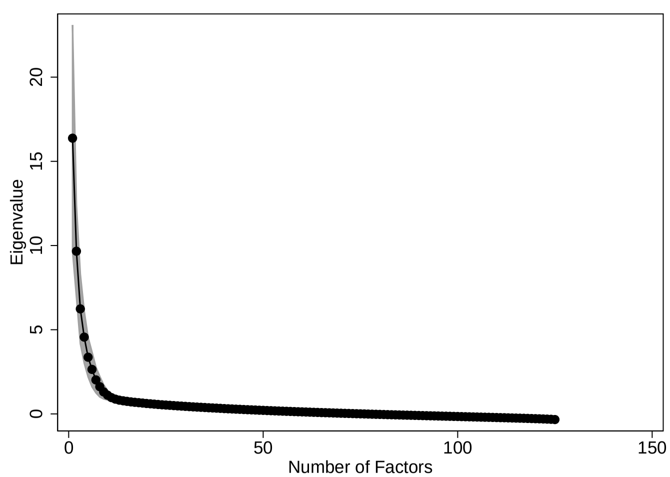
Table A2.20: Scree Plots, eigenvalues from the raw correlation matrix of the simulated data for models $\mathcal{M}(M, K_0, D, D_0)$ with N=500 (left column) and 1000 (right column). 100 Monte Carlo replications. (ctd.)

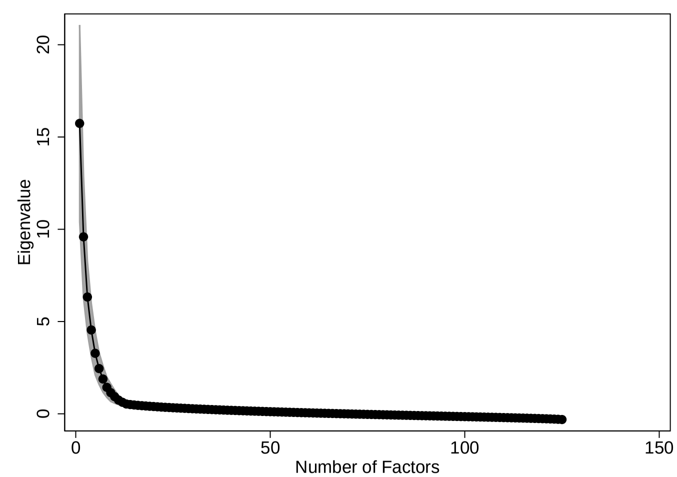
$\mathcal{M}(76, 9, 8, 4)$





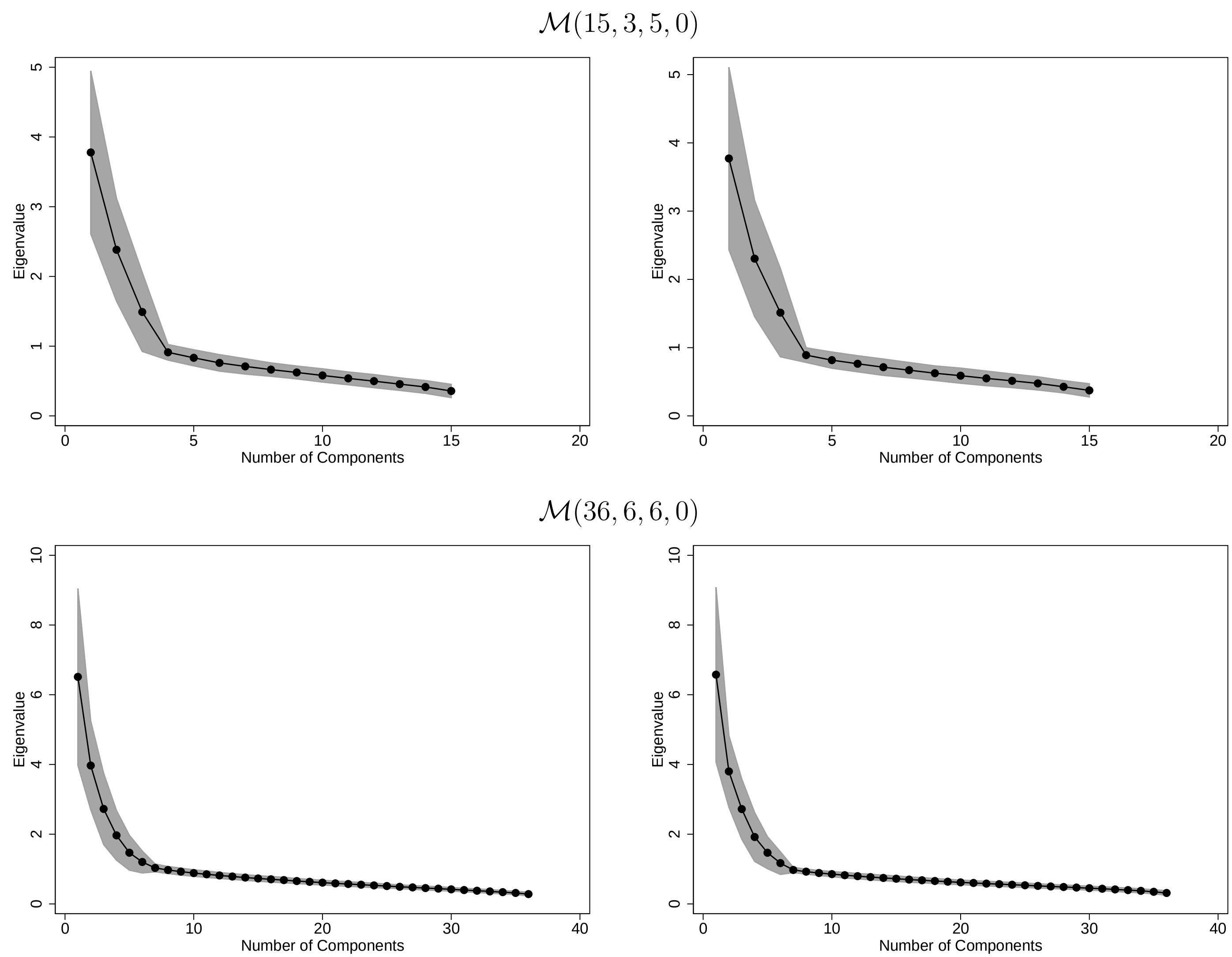
$\mathcal{M}(125, 12, 10, 5)$





Note: M is the total number of measurements, K_0 the true number of latent factors, D the number of measurements dedicated to each factor, D_0 the number of uncorrelated measurements, and N the sample size. Black dots are averages over the 100 Monte Carlo replications; the grey shaded areas around each line represent standard deviations (two standard deviations above and below).

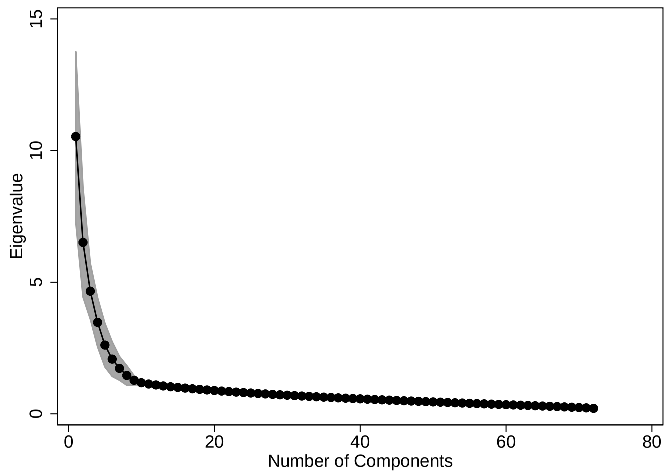
Table A2.21: Scree Plots, eigenvalues from the reduced correlation matrix of the simulated data for models $\mathcal{M}(M, K_0, D, D_0)$ with N=500 (left column) and 1000 (right column). 100 Monte Carlo replications.

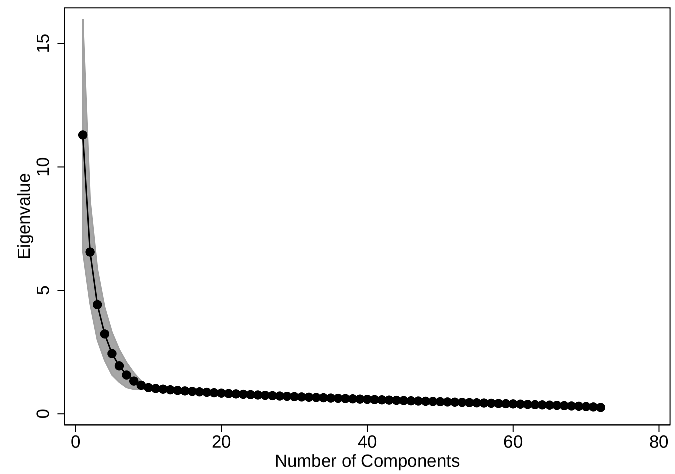


Note: M is the total number of measurements, K_0 the true number of latent factors, D the number of measurements dedicated to each factor, D_0 the number of uncorrelated measurements, and N the sample size. Black dots are averages over the 100 Monte Carlo replications; the grey shaded areas around each line represent standard deviations (two standard deviations above and below).

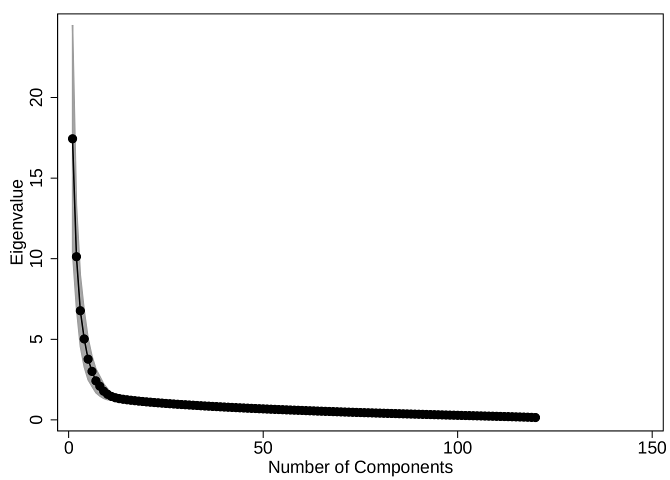
Table A2.22: Scree Plots, eigenvalues from the reduced correlation matrix of the simulated data for models $\mathcal{M}(M, K_0, D, D_0)$ with N=500 (left column) and 1000 (right column). 100 Monte Carlo replications. (ctd.)

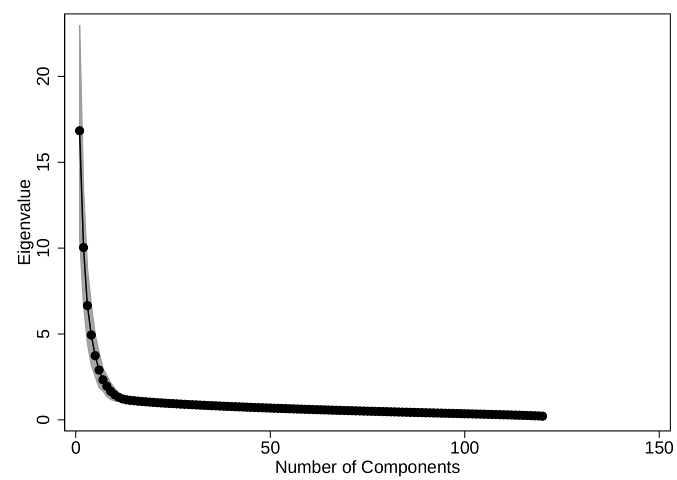
$\mathcal{M}(72, 9, 8, 0)$





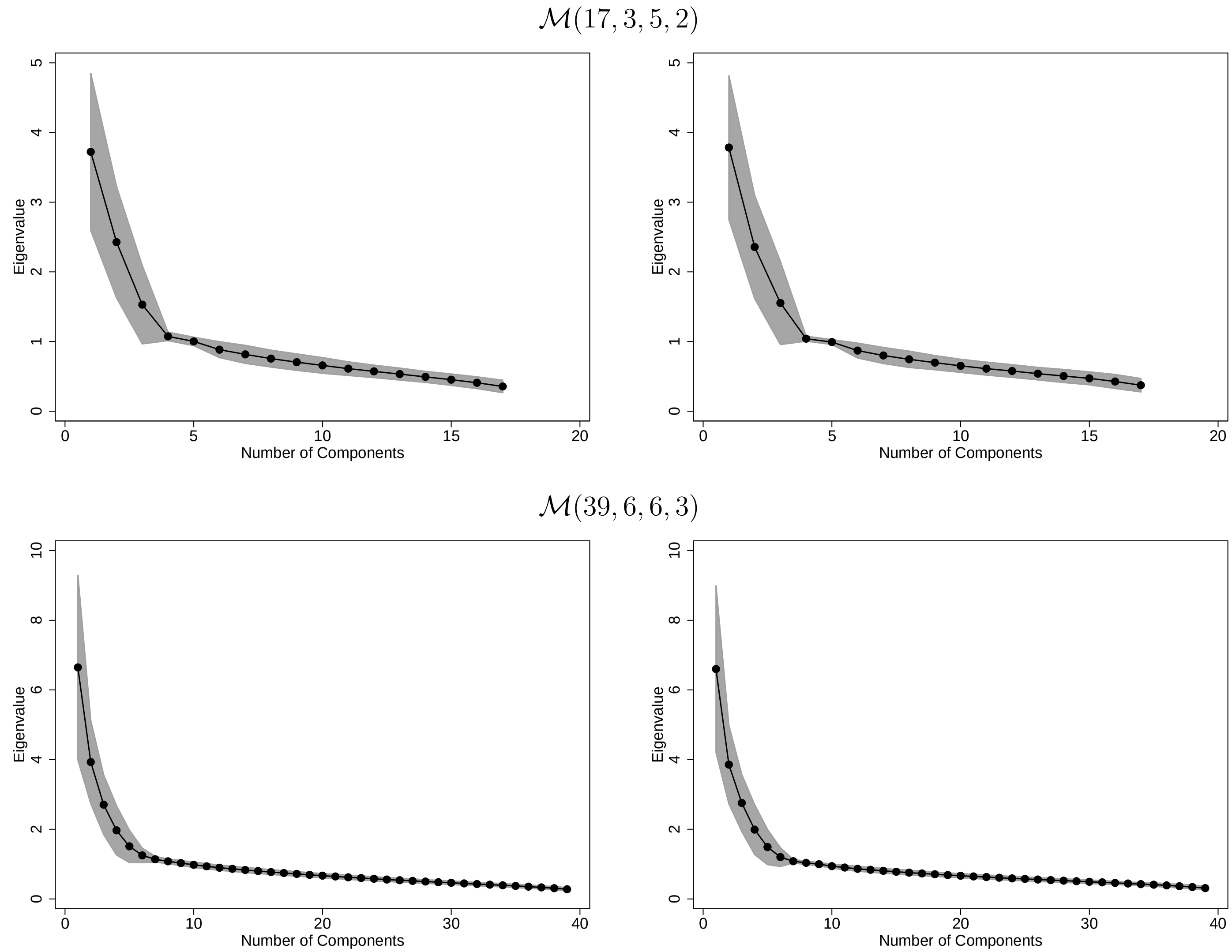
$\mathcal{M}(120, 12, 10, 0)$





Note: M is the total number of measurements, K_0 the true number of latent factors, D the number of measurements dedicated to each factor, D_0 the number of uncorrelated measurements, and N the sample size. Black dots are averages over the 100 Monte Carlo replications; the grey shaded areas around each line represent standard deviations (two standard deviations above and below).

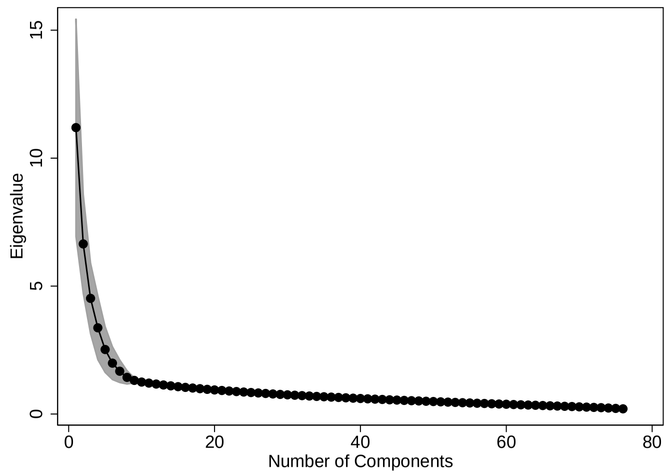
Table A2.23: Scree Plots, eigenvalues from the reduced correlation matrix of the simulated data for models $\mathcal{M}(M, K_0, D, D_0)$ with N=500 (left column) and 1000 (right column). 100 Monte Carlo replications. (ctd.)

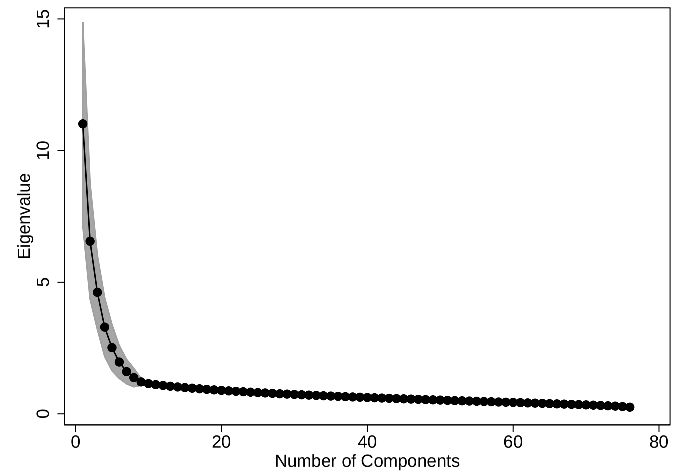


Note: M is the total number of measurements, K_0 the true number of latent factors, D the number of measurements dedicated to each factor, D_0 the number of uncorrelated measurements, and N the sample size. Black dots are averages over the 100 Monte Carlo replications; the grey shaded areas around each line represent standard deviations (two standard deviations above and below).

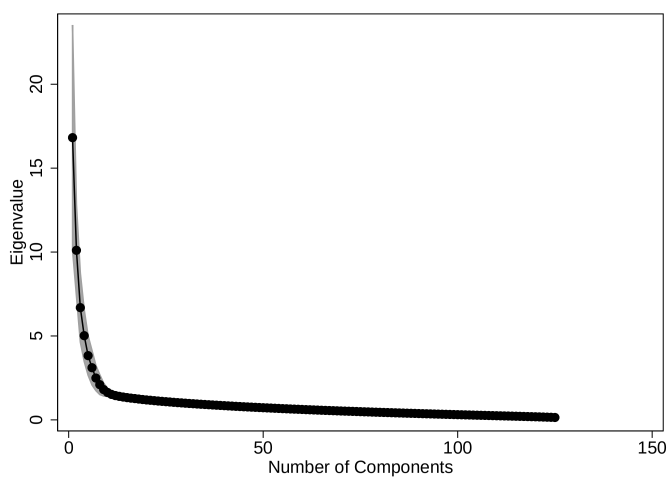
Table A2.24: Scree Plots, eigenvalues from the reduced correlation matrix of the simulated data for models $\mathcal{M}(M, K_0, D, D_0)$ with N=500 (left column) and 1000 (right column). 100 Monte Carlo replications. (ctd.)

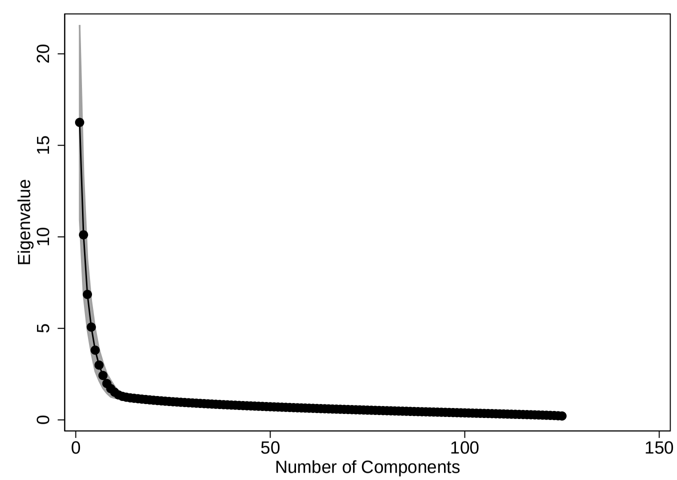
$\mathcal{M}(76, 9, 8, 4)$





$\mathcal{M}(125, 12, 10, 5)$





Note: M is the total number of measurements, K_0 the true number of latent factors, D the number of measurements dedicated to each factor, D_0 the number of uncorrelated measurements, and N the sample size. Black dots are averages over the 100 Monte Carlo replications; the grey shaded areas around each line represent standard deviations (two standard deviations above and below).

A3 Empirical Application

This section of the Web Appendix presents additional results on the empirical analysis of BCS data, which is reported in Section 4.2 of the paper. It is composed of two subsections. The first subsection presents additional results on the BEFA analysis of the BCS data, and the second subsection presents the full estimation results from the classical methods to estimate the number of components/factors.

A3.1 Additional Results on the BEFA analysis

Table A3.1 presents details on the factor loadings and on the idiosyncratic variances (see Figure 2 in the paper). Table A3.2 provides the exact wording for each measurement associated with each factor. Table A3.3 compares side-by-side the allocation to different factors of items with the same wording. Table A3.4. Table A3.4 shows the posterior correlation matrix of the latent factors (see Figure 3 in the paper). Finally, Table A3.5 shows the proportion of the total variance of the measurements due to signal and noise (see Figure 4 in the paper).

Table A3.1: BEFA: Factor Loadings and Idiosyncratic Variances

Measurements	$E\left(\alpha_m^{\boldsymbol{\Delta}}\right)$	$\text{SE}(\alpha_m^{\boldsymbol{\Delta}})$	$\Pr(\boldsymbol{\Delta}_m = 1)$	$E(\sigma^2)$	$\text{SE}(\sigma^2)$
Factor 1: Cognitive Ability (IQ) [C]					
Cog PLCT	0.477	0.020	1.000	0.590	0.019
Cog FMT	0.731	0.017	1.000	0.281	0.011
Cog SERT	0.737	0.017	1.000	0.269	0.011
Cog BASTM	0.598	0.020	1.000	0.545	0.018
Cog BASTRD	0.416	0.021	1.000	0.770	0.025
Cog BASTS	0.580	0.019	1.000	0.497	0.017
Cog BASTWD	0.629	0.019	1.000	0.454	0.016
Locus2	0.187	0.030	1.000	1.000	0.000
Locus3	0.161	0.034	0.997	1.000	0.000
Locus4	0.554	0.041	1.000	1.000	0.000
Locus5	0.449	0.033	1.000	1.000	0.000
Locus6	0.422	0.037	1.000	1.000	0.000
Locus8	0.074	0.043	0.135	1.000	0.000
Locus10	0.369	0.033	1.000	1.000	0.000
Locus11	0.381	0.032	1.000	1.000	0.000
Locus14	0.476	0.039	1.000	1.000	0.000
Locus15	0.639	0.038	1.000	1.000	0.000
Factor 2: Behavioral Problems (BP) [M]					
Rutter1	0.448	0.022	1.000	0.817	0.026
Rutter2	0.490	0.022	1.000	0.797	0.026
Rutter3	0.558	0.023	1.000	0.840	0.027
Rutter4	0.473	0.022	1.000	0.813	0.026
Rutter5	0.349	0.021	1.000	0.790	0.025
Rutter8	0.543	0.021	1.000	0.676	0.022
Rutter9	0.481	0.020	1.000	0.617	0.020
Rutter10	0.516	0.022	1.000	0.768	0.025
Rutter11	0.305	0.023	1.000	1.002	0.031
Rutter12	0.124	0.019	1.000	0.711	0.022
Rutter13	0.201	0.022	1.000	0.909	0.028
Rutter14	0.587	0.021	1.000	0.664	0.022
Rutter18	0.564	0.022	1.000	0.760	0.025
Rutter19	0.497	0.020	1.000	0.645	0.021
Conners1	0.412	0.021	1.000	0.787	0.025
Conners2	0.404	0.020	1.000	0.707	0.022
Conners4	0.493	0.023	1.000	0.853	0.027
Conners5	0.376	0.020	1.000	0.722	0.023
Conners6	0.394	0.021	1.000	0.765	0.024
Conners7	0.484	0.022	1.000	0.804	0.026

Measurements	$E(\alpha_m^{\boldsymbol{\Delta}})$	$\mathrm{SE}(\alpha_m^{\boldsymbol{\Delta}})$	$\Pr(\boldsymbol{\Delta}_m = 1)$	$E(\sigma^2)$	$\mathrm{SE}(\sigma^2)$
Conners8	0.595	0.021	1.000	0.644	0.021
Conners9	0.619	0.021	1.000	0.654	0.022
Conners10	0.581	0.021	1.000	0.659	0.021
Conners11	0.584	0.020	1.000	0.635	0.021
Conners12	0.464	0.020	1.000	0.639	0.021
Conners14	0.459	0.023	1.000	0.924	0.029
Conners15	0.440	0.020	1.000	0.662	0.021
Conners16	0.609	0.020	1.000	0.543	0.018
Conners17	0.628	0.020	1.000	0.592	0.020
Conners18	0.317	0.022	1.000	0.834	0.026
Factor 3: Anxiety (Anx) [M]					
Rutter6	0.642	0.026	1.000	0.539	0.028
Rutter7	0.357	0.026	1.000	0.839	0.028
Rutter16	0.543	0.025	1.000	0.604	0.025
Rutter17	0.411	0.025	1.000	0.732	0.026
Factor 4: Hyperactivity (H) [M]					
Rutter15	0.715	0.021	1.000	0.505	0.019
Conners3	0.717	0.021	1.000	0.492	0.019
Conners13	0.820	0.020	1.000	0.331	0.016
Conners19	0.719	0.020	1.000	0.466	0.018
Factor 5: Attention Problems (AP) [T]					
CDEV1	0.640	0.020	1.000	0.616	0.020
CDEV3	0.609	0.020	1.000	0.617	0.020
CDEV12	0.812	0.019	1.000	0.409	0.014
CDEV13	-0.781	0.018	1.000	0.353	0.012
CDEV26	0.852	0.017	1.000	0.251	0.010
CDEV29	-0.782	0.018	1.000	0.355	0.012
CDEV48	-0.760	0.019	1.000	0.422	0.015
CDEV51	0.791	0.019	1.000	0.409	0.014
Factor 6: Anxiety (Anx) [T]					
CDEV2	0.670	0.019	1.000	0.500	0.017
CDEV19	0.805	0.019	1.000	0.344	0.014
CDEV23	0.839	0.018	1.000	0.281	0.012
CDEV33	0.519	0.021	1.000	0.724	0.024
CDEV52	-0.521	0.022	1.000	0.750	0.025
CDEV53	0.798	0.019	1.000	0.358	0.014
Factor 7: School Phobia (SPh) [T]					
CDEV4	0.651	0.028	1.000	0.653	0.033
CDEV41	0.725	0.030	1.000	0.598	0.037
CDEV46	0.388	0.025	1.000	0.660	0.024

Measurements	$E(\alpha_m^{\boldsymbol{\Delta}})$	$\text{SE}(\alpha_m^{\boldsymbol{\Delta}})$	$\Pr(\boldsymbol{\Delta}_m = 1)$	$E(\sigma^2)$	$\text{SE}(\sigma^2)$
Factor 8: Conduct Problems (CdP) [T]					
CDEV5	0.687	0.020	1.000	0.543	0.018
CDEV8	0.811	0.020	1.000	0.454	0.015
CDEV9	0.802	0.020	1.000	0.509	0.017
CDEV16	0.829	0.019	1.000	0.390	0.014
CDEV21	0.765	0.019	1.000	0.437	0.015
CDEV22	0.696	0.020	1.000	0.570	0.019
CDEV24	0.812	0.020	1.000	0.462	0.016
CDEV25	0.779	0.020	1.000	0.459	0.016
CDEV34	0.798	0.018	1.000	0.332	0.012
CDEV37	0.746	0.021	1.000	0.624	0.021
CDEV38	0.728	0.023	1.000	0.756	0.024
CDEV39	0.695	0.023	1.000	0.812	0.026
CDEV43	0.743	0.020	1.000	0.538	0.018
CDEV44	0.636	0.020	1.000	0.584	0.019
CDEV49	0.713	0.020	1.000	0.582	0.019
Locus13	0.113	0.032	0.783	1.000	0.000
Factor 9: Motor Coordination Problems (MCP) [T]					
CDEV6	0.722	0.022	1.000	0.647	0.022
CDEV7	-0.490	0.022	1.000	0.774	0.025
CDEV10	0.726	0.020	1.000	0.481	0.017
CDEV14	0.578	0.020	1.000	0.547	0.019
CDEV15	-0.356	0.023	1.000	0.919	0.029
CDEV18	0.768	0.021	1.000	0.497	0.018
CDEV27	-0.518	0.021	1.000	0.700	0.023
CDEV28	0.722	0.021	1.000	0.572	0.020
CDEV35	-0.645	0.022	1.000	0.680	0.023
CDEV40	0.632	0.022	1.000	0.675	0.023
CDEV42	0.599	0.023	1.000	0.834	0.027
CDEV45	0.527	0.026	1.000	1.084	0.035
CDEV47	0.503	0.020	1.000	0.631	0.021
CDEV50	-0.537	0.022	1.000	0.725	0.024
Factor 10: Depression (D) [T]					
CDEV11	0.568	0.021	1.000	0.590	0.020
CDEV20	0.592	0.021	1.000	0.592	0.021
CDEV30	0.701	0.019	1.000	0.421	0.016
CDEV31	0.659	0.021	1.000	0.539	0.020
Factor 11: Concentration Problems (CcP) [T]					
CDEV17	0.788	0.018	1.000	0.315	0.013
CDEV32	0.802	0.018	1.000	0.277	0.013

Measurements	$E(\alpha_m^{\boldsymbol{\Delta}})$	SE($\alpha_m^{\boldsymbol{\Delta}}$)	Pr($\boldsymbol{\Delta}_m = 1$)	$E(\sigma^2)$	SE(σ^2)
CDEV36	0.603	0.021	1.000	0.650	0.022
Factor 12: Positive Sense of Self (PSS) [C]					
Lawseq1	0.156	0.035	0.989	1.000	0.000
Lawseq2	0.820	0.074	1.000	1.000	0.000
Lawseq3	0.790	0.053	1.000	1.000	0.000
Lawseq4	0.637	0.046	1.000	1.000	0.000
Lawseq5	0.379	0.038	1.000	1.000	0.000
Lawseq6	0.694	0.053	1.000	1.000	0.000
Lawseq7	0.517	0.041	1.000	1.000	0.000
Lawseq8	0.498	0.043	1.000	1.000	0.000
Lawseq9	0.545	0.051	1.000	1.000	0.000
Lawseq10	0.730	0.051	1.000	1.000	0.000
Lawseq11	0.503	0.068	1.000	1.000	0.000
Lawseq12	0.497	0.042	1.000	1.000	0.000
Locus1	0.588	0.044	1.000	1.000	0.000
Locus7	0.640	0.046	1.000	1.000	0.000
Locus9	0.268	0.035	1.000	1.000	0.000
Locus12	0.120	0.053	0.757	1.000	0.000
Locus16	0.393	0.049	1.000	1.000	0.000
Factor 13: Body Build (BB) [D]					
Height	0.646	0.042	1.000	0.402	0.020
Head	0.453	0.033	1.000	0.685	0.023
Weight	0.798	0.049	1.000	0.193	0.024
Bpsys	0.233	0.027	1.000	0.863	0.027
Bpdias	0.189	0.027	1.000	0.952	0.030

Note: Each row displays for each measurement loading on each factor (specified in column 1): the mean ($E(\alpha_m^{\boldsymbol{\Delta}})$) and the standard error of the factor loadings (SE($\alpha_m^{\boldsymbol{\Delta}}$)), the probability that the indicator is equal to 1 (Pr($\boldsymbol{\Delta}_m = 1$)), and the mean ($E(\sigma^2)$) and the standard error of the idiosyncratic variances (SE(σ^2)). [M] refers to traits extracted from items evaluated by the mother, [T] by the teacher, [C] by the child, [D] by the doctor during the medical visit.

Table A3.2: BEFA: Details on the Measurements loading on each of the factors

θ_1: **Cognitive Ability (IQ) [C]**
Picture Language Comprehension Test [PLCT]
Friendly Math Test [FMT]
Shortened Edinburgh Reading Test [SERT]
British Ability Scales (BAS): Word Definition [WD]
British Ability Scales (BAS): Word Similarities [WS]
British Ability Scales (BAS): Matrices [M]
British Ability Scales (BAS): Recall Digits [RD]
Caraloc 2: Do you feel that wishing can make good things happen?
Caraloc 3: Are people good to you no matter how you act towards them?
Caraloc 4: Do you usually feel that it's almost useless to try in school because most children are cleverer than you?
Caraloc 5: Is a high mark just a matter of "luck" for you?
Caraloc 6: Are tests just a lot of guesswork for you?
Caraloc 8: Are you the kind of person who believes that planning ahead makes things turn out better?
Caraloc 10: When someone is very angry with you, is it impossible to make him your friend again?
Caraloc 11: When nice things happen to you is it only good luck?
Caraloc 14: Are you surprised when your teacher says you've done well?
Caraloc 15: Do you usually get low marks, even when you study hard?
θ_2: **Behavioral Problems (BP) [M]**
Rutter 1: Very restless. Often running or jumping up and down. Hardly ever still.
Rutter 2: Is squirmy or fidgety.
Rutter 9: Often appears miserable, unhappy, tearful or distressed.
Rutter 3: Often destroys own or others' belongings.
Rutter 4: Frequently fights with other children.
Rutter 5: Not much liked by other children.
Rutter 10: Sometimes takes things belonging to others.
Rutter 11: Has twitches, mannerisms or tics of the face or body.
Rutter 12: Frequently sucks thumb or finger.
Rutter 13: Frequently bites nails or fingers.
Rutter 14: Is often disobedient.
Rutter 18: Often tells lies.
Rutter 19: Bullies other children.
Conners 4: Hums or makes other odd noises at inappropriate times.
Conners 5: Has difficulty picking up small objects.
Conners 7: Becomes obsessional about unimportant things.
Conners 9: Shows restless or over-active behavior.
Conners 10: Is impulsive, excitable.
Conners 11: Interferes with the activity of other children.
Conners 14: Given to rhythmic tapping or kicking.
Conners 15: Cries for little cause.
Conners 18: Has difficulty using scissors.
Rutter 8: Irritable. Is quick to 'fly off the handle'.
Conners 8: Requests must be met immediately, easily frustrated.
Conners 12: Is sullen or sulky.
Conners 16: Changes mood quickly and drastically.
Conners 17: Displays outbursts of temper, explosive or unpredictable behavior.

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Conners 1: Is noticeably clumsy. Conners 2: Trips or falls easily or bumps into objects or other children. Conners 6: Drops things which are being carried.
θ_3: Anxiety (Anx) [M]
Rutter 6: Often worried, worries about many things. Rutter 7: Tends to do things on his/her own, rather solitary. Rutter 16: Tends to be fearful or afraid of new things or new situation. Rutter 17: Is fussy or over-particular.
θ_4: Hyperactivity (H) [M]
Rutter 15: Cannot settle to do anything for more than a few moments. Conners 3: Inattentive, easily distracted. Conners 13: Fails to finish things he/she starts, short attention span. Conners 19: Has difficulty concentrating on any particular task though may return to it frequently.
θ_5: Attention Problems (AP) [T]
CDev 1: Child is given to daydreaming. CDev 3: Child cannot concentrate on any particular task, even though the child may return to it frequently. CDev 12: Child becomes bored during class. CDev 13: Child shows perseverance; persists with difficult or routine work. CDev 26: Child is easily distracted. CDev 29: Child pays attention to what is being explained in class. CDev 48: Child completes tasks which are started. CDev 51: Child fails to finish things he starts.
θ_6: Anxiety (Anx) [T]
CDev 2: Child is fearful or afraid of new things or situations. CDev 19: Child behaves 'nervously'. CDev 23: Child is worried and anxious about many things. CDev 33: Child tends to do things on his or her own, is rather solitary. CDev 52: Introvert/Extrovert. CDev 53: Anxious/Unworried.
θ_7: School Phobia (SPh) [T]
CDev 4: Child has problems with wetting pants during class. CDev 41: Child has problems of soiling pants during class. CDev 46: Child truants from school.
θ_8: Conduct Problems (CdP) [T]
CDev 5: Child complains about things. CDev 9: Child teases other children to excess. CDev 16: Child interferes with the activities of other children. CDev 22: Child is excitable, impulsive. CDev 24: Child shows restless or over-active behavior. CDev 25: Child is squirmy and fidgety. CDev 34: Child quarrels with other children. CDev 37: Child destroys own or other children's belongings. CDev 38: Child hums or makes other odd vocal noises at inappropriate times. CDev 39: Child given to rhythmic tapping or rhythmic kicking during class. CDev 43: Child bullies other children.

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CDev 49: Child request must be satisfied immediately - is easily frustrated. Caraloc 13: When you get into an argument is it usually the other person's fault? CDev 8: Child displays outbursts of temper, explosive or unpredictable behaviour. CDev 21: Child changes mood quickly and drastically. CDev 44: Child is sullen or sulky.
θ_9: Motor Coordination Problems (MCP) [T]
CDev 6: Child trips or falls easily or bumps into objects or other children. CDev 7: Child works deftly with his or her hands. CDev 10: Child is noticeably clumsy in formal or informal games. CDev 14: Child finds it difficult to kick a ball forward. CDev 15: Child dresses and undresses competently (e.g. for P.E.). CDev 18: Child shows difficulty when picking up small objects. CDev 27: Child manipulates small objects easily with his/her hands. CDev 28: Child drops things which are being carried. CDev 35: Child can use scissors and similar manipulative equipment competently. CDev 40: Child shows inadequate control when handling a pencil or paint brush. CDev 42: Child experiences classroom or playground accidents. CDev 45: Child has twitches, mannerisms or tics of the face or body. CDev 47: Child fearful in movements, requires much encouragement to move faster. CDev 50: Child holds writing and drawing instruments appropriately.
θ_{10}: Depression (D) [T]
CDev 11: Child cries for little cause. CDev 20: Child is fussy or over-particular. CDev 30: Child in relations with others appears to be miserable, unhappy, tearful or distressed. CDev 31: Child becomes obsessional about unimportant tasks.
θ_{11}: Concentration Problems (CcP) [T]
CDev 17: Child becomes confused or hesitant when given a complex task. CDev 32: Child is forgetful when given a complex task. CDev 36: Child shows lethargic and listless behavior.
θ_{12}: Positive Sense of Self (PSS) [C]
Lawseq 1: Do you think that your parents usually like to hear about your ideas? Lawseq 2: Do you often feel lonely at school? Lawseq 3: Do other children often break friends or fall out with you? Lawseq 4: Do you think that other children often say nasty things about you? Lawseq 5: When you have to say things in front of teachers, do you usually feel shy? Lawseq 6: Do you often feel sad because you have nobody to play with at school? Lawseq 7: Are there lots of things about yourself you would like to change? Lawseq 8: When you have to say things in front of other children, do you usually feel foolish? Lawseq 9: When you want to tell a teacher something, do you usually feel foolish? Lawseq 10: Do you often have to find new friends because your old friends are playing with somebody else? Lawseq 11: Do you usually feel foolish when you talk to your parents? Lawseq 12: Do other people often think that you tell lies? Caraloc 1: Do you feel that most of the time it's not worth trying hard because things never turn out right anyway? Caraloc 7: Are you often blamed for things which just aren't your fault?

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Caraloc 9: When bad things happen to you, is it usually someone else's fault?
Caraloc 12: Do you feel sad when it is time to leave school each day?
Caraloc 16: Do you think studying for tests is a waste of time?
θ_{13}: **Body Build (BB) [D]**
Height
Head Circumference
Weight
Blood Pressure, Systolic
Blood Pressure, Diastolic

Note: T = reported by the teacher; M = reported by the mother; C = reported by the child; D = measured by the doctor during the medical visit.

Table A3.3: BEFA: Allocation of Mother- and Teacher-Reported Items with the Same Wording

Mother-reported *Rutter Scale*	BEFA	Teacher-reported *Child Developmental Scale*	BEFA
1. Very restless. Often running or jumping up and down. Hardly ever still.	θ_2 (Beh.Probl.)	24. Child shows restless or over-active behavior.	θ_8 (Cond.Probl.)
2. Is squirmy or fidgety	θ_2 (Beh.Probl.)	25. Child is squirmy and fidgety.	θ_8 (Cond.Probl.)
3. Often destroys own or others' belongings.	θ_2 (Beh.Probl.)	37. Child destroys own or other children's belongings.	θ_8 (Cond.Probl.)
4. Frequently fights with other children.	θ_2 (Beh.Probl.)	34. Child quarrels with other children.	θ_8 (Cond.Probl.)
5. Not much liked by other children.	θ_2 (Beh.Probl.)	9. Child teases other children to excess.	θ_8 (Cond.Probl.)
6. Often worried, worries about many things.	θ_3 (Anxiety)	23. Child is worried and anxious about many things.	θ_6 (Anxiety)
7. Tends to do things on his/her own, rather solitary.	θ_3 (Anxiety)	33. Child tends to do things on his or her own, is rather solitary.	θ_6 (Anxiety)
9. Often appears miserable, unhappy, tearful or distressed.	θ_2 (Beh.Probl.)	30. Child in relations with others appears to be miserable, unhappy, tearful or distressed	θ_{10} (Depression)
11. Has twitches, mannerisms or tics of the face or body.	θ_2 (Beh.Probl.)	45. Child has twitches, mannerisms or tics of the face or body.	θ_9 (Mot.Coord.P.)
16. Tends to be fearful or afraid of new things or new situation.	θ_3 (Anxiety)	2. Child is fearful or afraid of new things or situations.	θ_6 (Anxiety)
17. Is fussy or over-particular.	θ_3 (Anxiety)	20. Child is fussy or over-particular.	θ_{10} (Depression)
19. Bullies other children.	θ_2 (Beh.Probl.)	43. Child bullies other children.	θ_8 (Cond.Probl.)
Mother-reported *Conners Hyperactivity Scale*	**BEFA**	**Teacher-reported *Child Developmental Scale***	**BEFA**
1. Is noticeably clumsy	θ_2 (Beh.Probl.)	10. Child is noticeably clumsy in formal or informal games.	θ_9 (Mot.Coord.P.)
2. Trips or falls easily or bumps into objects or other children	θ_2 (Beh.Probl.)	6. Child trips or falls easily or bumps into objects or other children.	θ_9 (Mot.Coord.P.)
3. Inattentive, easily distracted	θ_4 (Hyperactivity)	26. Child is easily distracted.	θ_5 (Att.Prob.)
4. Hums or makes other odd noises at inappropriate times	θ_2 (Beh.Probl.)	38. Child hums or makes other odd vocal noises at inappropriate times.	θ_8 (Cond.Probl.)
5. Has difficulty picking up small objects	θ_2 (Beh.Probl.)	18. Child shows difficulty when picking up small objects.	θ_9 (Mot.Coord.P.)
6. Drops things which are being carried	θ_2 (Beh.Probl.)	28. Child drops things which are being carried.	θ_9 (Mot.Coord.P.)
7. Becomes obsessional about unimportant things	θ_2 (Beh.Probl.)	31. Child becomes obsessional about unimportant tasks.	θ_{10} (Depression)
8. Requests must be met immediately, easily frustrated	θ_2 (Beh.Probl.)	49. Child request must be satisfied immediately - is easily frustrated.	θ_8 (Cond.Probl.)
10. Is impulsive, excitable	θ_2 (Beh.Probl.)	22. Child is excitable, impulsive.	θ_8 (Cond.Probl.)
11. Interferes with the activity of other children	θ_2 (Beh.Probl.)	16. Child interferes with the activities of other children.	θ_8 (Cond.Probl.)
12. Is sullen or sulky	θ_2 (Beh.Probl.)	44. Child is sullen or sulky.	θ_8 (Cond.Probl.)
13. Fails to finish things he/she starts, short attention span	θ_4 (Hyperactivity)	51. Child fails to finish things he starts	θ_5 (Att.Prob.)
14. Given to rhythmic tapping or kicking	θ_2 (Beh.Probl.)	39. Child given to rhythmic tapping or rhythmic kicking during class.	θ_8 (Cond.Probl.)
15. Cries for little cause	θ_2 (Beh.Probl.)	11. Child cries for little cause.	θ_{10} (Depression)
16. Changes mood quickly and drastically	θ_2 (Beh.Probl.)	21. Child changes mood quickly and drastically.	θ_8 (Cond.Probl.)
17. Displays outbursts of temper, explosive or unpredictable behaviour	θ_2 (Beh.Probl.)	8. Child displays outbursts of temper, explosive or unpredictable. behaviour.	θ_8 (Cond.Probl.)
18. Has difficulty using scissors	θ_2 (Beh.Probl.)	35. Child can use scissors and similar manipulative equipment competently.	θ_9 (Mot.Coord.P.)
19. Has difficulty concentrating on any particular task	θ_4 (Hyperactivity)	3. Child cannot concentrate on any particular task,	θ_5 (Att.Prob.)
though may return to it frequently	θ_4 (Hyperactivity)	even though the child may return to it frequently	θ_5 (Att.Prob.)

Note.— This table reports the BEFA allocation of the items of the mother- (first column) and teacher- (third column) reported scales which have the same wording, and the factors on which the measurements from each set load (second and fourth columns, respectively). Beh. Probl. = Behavioral Problems; Cond. Prob. = Conduct Problems; Mot. Coord. P. = Motor Coordination Problems; Att. Prob. = Attention Problems.

Table A3.4: BEFA: Posterior Correlation Matrix of the Latent Factors in Highest Probability Model (Active Factors Only).

	θ_1	θ_2	θ_3	θ_4	θ_5	θ_6	θ_7	θ_8	θ_9	θ_{10}	θ_{11}	θ_{12}	θ_{13}
θ_1		[-0.233; -0.142]	[-0.107; 0.010]	[-0.393; -0.304]	[-0.539; -0.465]	[-0.299; -0.207]	[-0.138; -0.023]	[-0.269; -0.179]	[-0.334; -0.243]	[-0.234; -0.131]	[-0.661; -0.594]	[0.324; 0.422]	[0.048; 0.147]
θ_2	-0.188 (0.024)		[0.450; 0.548]	[0.584; 0.652]	[0.160; 0.249]	[0.022; 0.118]	[-0.009; 0.104]	[0.218; 0.304]	[0.059; 0.153]	[0.090; 0.192]	[0.121; 0.217]	[-0.239; -0.134]	[-0.086; 0.015]
θ_3	-0.048 (0.030)	0.497 (0.025)		[0.161; 0.276]	[-0.093; 0.020]	[0.163; 0.274]	[-0.052; 0.084]	[-0.111; 0.001]	[-0.028; 0.086]	[0.067; 0.192]	[-0.032; 0.087]	[-0.165; -0.037]	[-0.074; 0.047]
θ_4	-0.348 (0.023)	0.619 (0.017)	0.218 (0.029)		[0.367; 0.450]	[0.048; 0.147]	[-0.026; 0.089]	[0.240; 0.330]	[0.171; 0.266]	[0.089; 0.195]	[0.305; 0.397]	[-0.280; -0.174]	[-0.052; 0.053]
θ_5	-0.504 (0.019)	0.205 (0.023)	-0.037 (0.029)	0.408 (0.021)		[0.318; 0.401]	[0.088; 0.199]	[0.623; 0.679]	[0.496; 0.566]	[0.404; 0.490]	[0.825; 0.865]	[-0.340; -0.242]	[-0.076; 0.023]
θ_6	-0.253 (0.023)	0.070 (0.024)	0.219 (0.029)	0.096 (0.025)	0.361 (0.021)		[0.101; 0.214]	[0.219; 0.307]	[0.431; 0.509]	[0.732; 0.790]	[0.590; 0.659]	[-0.254; -0.148]	[-0.052; 0.048]
θ_7	-0.081 (0.029)	0.045 (0.029)	0.015 (0.035)	0.031 (0.030)	0.143 (0.028)	0.156 (0.029)		[0.119; 0.231]	[0.272; 0.380]	[0.270; 0.388]	[0.085; 0.202]	[-0.153; -0.025]	[-0.119; -0.001]
θ_8	-0.224 (0.023)	0.260 (0.022)	-0.055 (0.029)	0.287 (0.023)	0.651 (0.014)	0.265 (0.023)	0.176 (0.029)		[0.460; 0.534]	[0.586; 0.655]	[0.441; 0.519]	[-0.302; -0.203]	[-0.075; 0.022]
θ_9	-0.289 (0.023)	0.106 (0.024)	0.028 (0.030)	0.219 (0.024)	0.531 (0.018)	0.471 (0.020)	0.323 (0.028)	0.499 (0.019)		[0.597; 0.669]	[0.579; 0.648]	[-0.250; -0.144]	[0.016; 0.115]
θ_{10}	-0.184 (0.026)	0.141 (0.026)	0.129 (0.032)	0.142 (0.027)	0.447 (0.022)	0.761 (0.015)	0.328 (0.030)	0.620 (0.018)	0.633 (0.018)		[0.513; 0.598]	[-0.353; -0.243]	[-0.081; 0.027]
θ_{11}	-0.628 (0.017)	0.171 (0.024)	0.030 (0.030)	0.352 (0.024)	0.845 (0.010)	0.625 (0.018)	0.144 (0.030)	0.479 (0.020)	0.614 (0.018)	0.558 (0.022)		[-0.316; -0.210]	[-0.043; 0.060]
θ_{12}	0.375 (0.025)	-0.188 (0.027)	-0.103 (0.033)	-0.227 (0.027)	-0.291 (0.025)	-0.202 (0.027)	-0.091 (0.033)	-0.252 (0.026)	-0.196 (0.027)	-0.298 (0.028)	-0.266 (0.027)		[-0.048; 0.065]
θ_{13}	0.096 (0.026)	-0.037 (0.026)	-0.016 (0.031)	0.002 (0.027)	-0.026 (0.025)	-0.004 (0.026)	-0.062 (0.030)	-0.027 (0.025)	0.066 (0.025)	-0.026 (0.028)	0.010 (0.026)	0.006 (0.029)	

Notes.— Lower triangle: Posterior means and standard errors in parenthesis. Upper triangle: 95% highest posterior density intervals of the correlations. Diagonal elements constrained to 1. Latent factors: θ_1: Cognitive Ability [C]. θ_2: Behavioral Problems [M]. θ_3: Anxiety [M]. θ_4: Hyperactivity [M]. θ_5: Attention Problems [T]. θ_6: Anxiety [T]. θ_7: School Phobia [T]. θ_8: Conduct Problems [T]. θ_9: Motor Coordination Problems [T]. θ_{10}: Depression [T]. θ_{11}: Concentration Problems [T]. θ_{12}: Positive Sense of Self [C]. θ_{13}: Body Built [D]. M: reported by the mother; T: reported by the teacher; C: reported by the child; D = measured by the doctor during the medical visit.

Table A3.5: BEFA: Proportion of total variance of measurements due to signal and noise

Items	Signal	Noise	Items	Signal	Noise	Items	Signal	Noise
Cog PLCT	0.278	0.722	Conners19	0.526	0.474	CDEV44	0.409	0.591
Cog FMT	0.654	0.346	CDEV1	0.400	0.600	CDEV45	0.204	0.796
Cog SERT	0.668	0.332	CDEV2	0.472	0.528	CDEV46	0.187	0.813
Cog BASTM	0.396	0.604	CDEV3	0.376	0.624	CDEV47	0.286	0.714
Cog BASTRD	0.184	0.816	CDEV4	0.395	0.605	CDEV48	0.578	0.422
Cog BASTS	0.404	0.596	CDEV5	0.465	0.535	CDEV49	0.467	0.533
Cog BASTWD	0.466	0.534	CDEV6	0.446	0.554	CDEV50	0.284	0.716
Rutter1	0.198	0.802	CDEV7	0.236	0.764	CDEV51	0.605	0.395
Rutter2	0.231	0.769	CDEV8	0.591	0.409	CDEV52	0.265	0.735
Rutter3	0.270	0.730	CDEV9	0.559	0.441	CDEV53	0.639	0.361
Rutter4	0.216	0.784	CDEV10	0.522	0.478	Lawseq1	0.025	0.975
Rutter5	0.134	0.866	CDEV11	0.353	0.647	Lawseq2	0.404	0.596
Rutter6	0.430	0.570	CDEV12	0.617	0.383	Lawseq3	0.384	0.616
Rutter7	0.132	0.868	CDEV13	0.634	0.366	Lawseq4	0.289	0.711
Rutter8	0.303	0.697	CDEV14	0.378	0.622	Lawseq5	0.126	0.874
Rutter9	0.272	0.728	CDEV15	0.122	0.878	Lawseq6	0.326	0.674
Rutter10	0.257	0.743	CDEV16	0.639	0.361	Lawseq7	0.212	0.788
Rutter11	0.085	0.915	CDEV17	0.665	0.335	Lawseq8	0.200	0.800
Rutter12	0.022	0.978	CDEV18	0.542	0.458	Lawseq9	0.230	0.770
Rutter13	0.043	0.957	CDEV19	0.653	0.347	Lawseq10	0.348	0.652
Rutter14	0.341	0.659	CDEV20	0.372	0.628	Lawseq11	0.204	0.796
Rutter15	0.503	0.497	CDEV21	0.573	0.427	Lawseq12	0.199	0.801
Rutter16	0.326	0.674	CDEV22	0.460	0.540	Locus1	0.258	0.742
Rutter17	0.187	0.813	CDEV23	0.715	0.285	Locus2	0.035	0.965
Rutter18	0.294	0.706	CDEV24	0.588	0.412	Locus3	0.026	0.974
Rutter19	0.277	0.723	CDEV25	0.570	0.430	Locus4	0.235	0.765
Conners1	0.178	0.822	CDEV26	0.743	0.257	Locus5	0.168	0.832
Conners2	0.187	0.813	CDEV27	0.276	0.724	Locus6	0.151	0.849
Conners3	0.511	0.489	CDEV28	0.476	0.524	Locus7	0.291	0.709
Conners4	0.221	0.779	CDEV29	0.633	0.367	Locus8	0.006	0.994
Conners5	0.164	0.836	CDEV30	0.539	0.461	Locus9	0.068	0.932
Conners6	0.169	0.831	CDEV31	0.446	0.554	Locus10	0.121	0.879
Conners7	0.225	0.775	CDEV32	0.702	0.298	Locus11	0.127	0.873
Conners8	0.354	0.646	CDEV33	0.271	0.729	Locus12	0.017	0.983
Conners9	0.369	0.631	CDEV34	0.658	0.342	Locus13	0.014	0.986
Conners10	0.338	0.662	CDEV35	0.379	0.621	Locus14	0.185	0.815
Conners11	0.349	0.651	CDEV36	0.358	0.642	Locus15	0.290	0.710
Conners12	0.252	0.748	CDEV37	0.472	0.528	Locus16	0.135	0.865
Conners13	0.669	0.331	CDEV38	0.413	0.587	Height	0.511	0.489
Conners14	0.186	0.814	CDEV39	0.373	0.627	Head	0.232	0.768
Conners15	0.226	0.774	CDEV40	0.371	0.629	Weight	0.771	0.229
Conners16	0.406	0.594	CDEV41	0.471	0.529	Bpsys	0.060	0.940
Conners17	0.399	0.601	CDEV42	0.300	0.700	Bpdias	0.037	0.963
Conners18	0.108	0.892	CDEV43	0.507	0.493			

A3.2 Classical Methods

This subsection gives more details on the classical estimation procedures that we apply in the real data in Section 4 of the paper.

Classical Methods for Selecting the Number of Components/Factors First, the classical methods for selecting the number of components/factors (see Table 6 of the paper) have already been described in Section A2.7. Here we use the Pearson correlation matrix for the residualized measurements, since the variables are all continuous, and the polyserial correlation matrix for the raw measurements, since the variables are both binary and continuous.

The scree plots of the eigenvalues from the raw polyserial correlation matrix of our measurements are reported in Figure A3.1 and Figure A3.3; the ones of the eigenvalues from the reduced polyserial correlation matrix[5] are reported in Figure A3.2 and Figure A3.4. They show how difficult it is in our case to make any conclusion based on this approach, since no clear elbows appear in these graphs.

[5]To construct the reduced polyserial correlation matrix, we use the squared multiple correlations as measures of the communalities.

Figure A3.1: Scree Plot, first 100 eigenvalues from the raw polyserial correlation matrix

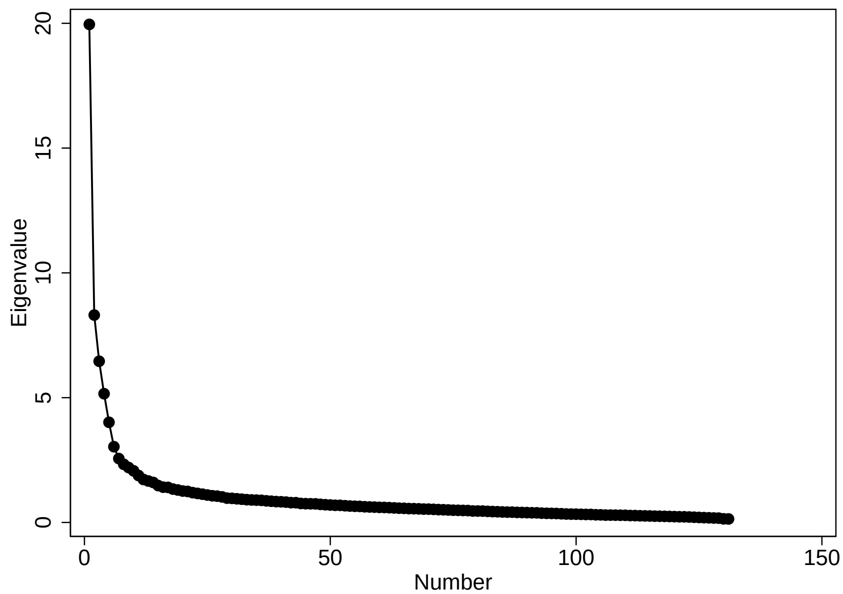


Figure A3.2: Scree Plot, first 100 eigenvalues from the reduced polyserial correlation matrix

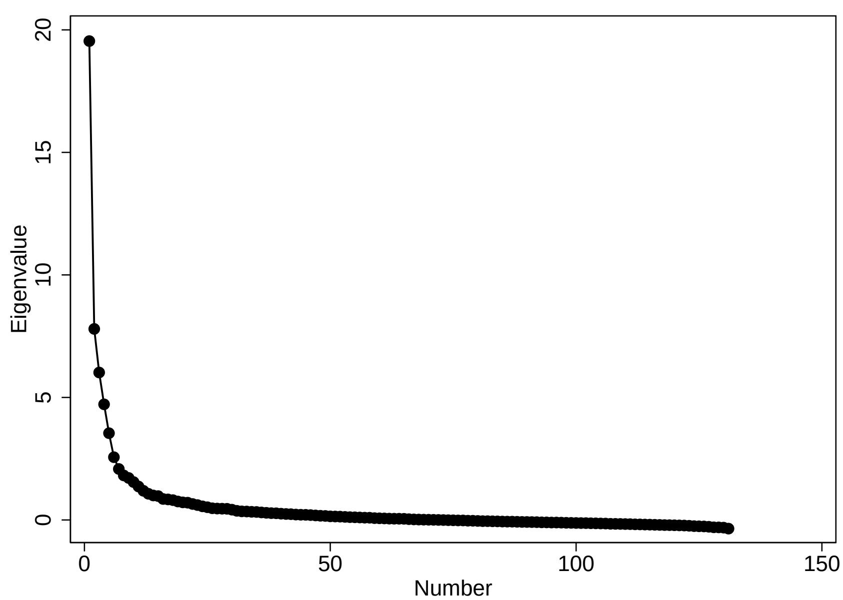


Figure A3.3: Scree Plot, first 30 eigenvalues from the raw polyserial correlation matrix

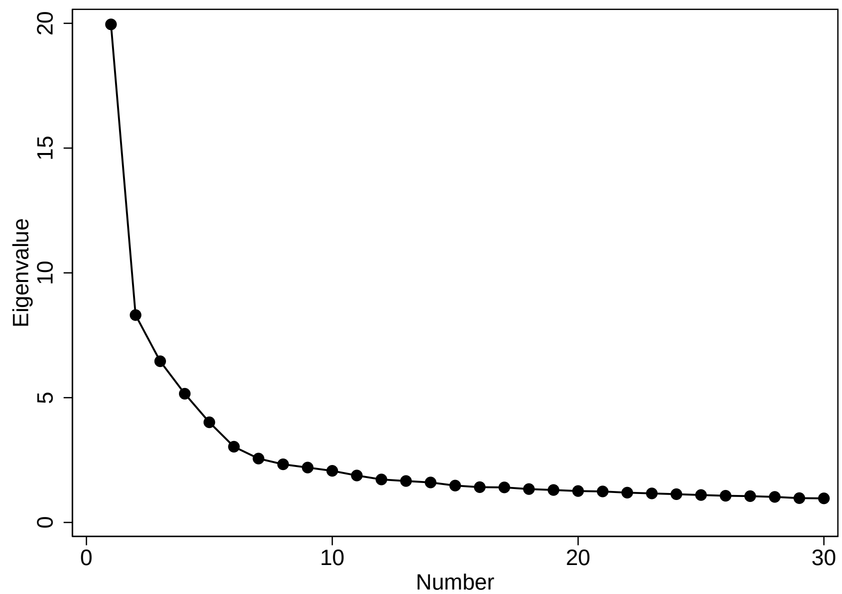
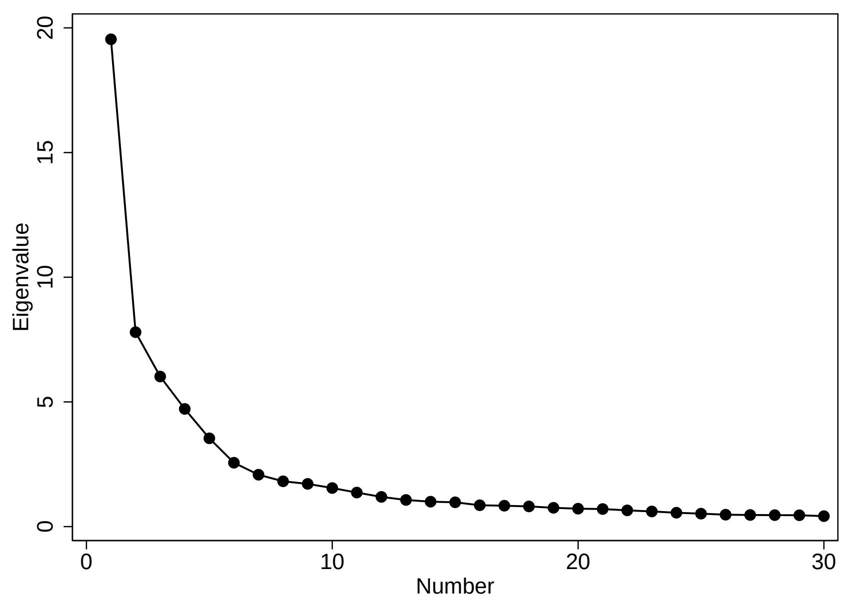


Figure A3.4: Scree Plot, first 30 eigenvalues from the reduced polyserial correlation matrix



Rotation Methods Second, the two oblique rotation methods employed to search for a simpler structure after having extracted the factors using either the method of maximum likelihood, of principal factors, or of principal components, are described.

The first rotation method we apply is the oblique Promax rotation, first developed by Hendrickson and White (1964), which is performed in two stages (see Browne, 2001). First, an orthogonal rotation is performed using the varimax method. The varimax rotation (Kaiser, 1958) is an orthogonal rotation which maximizes the variance of the squared loadings of a factor (column) on all the measurements (rows) in the loadings matrix, i.e. it maximizes the following criterion:

$$V(\boldsymbol{\alpha}) = \sum_{k=1}^{K} \left(\frac{1}{Q} \sum_{q=1}^{Q} \alpha_{q,k}^{4} - \left(\frac{1}{Q} \sum_{q=1}^{Q} \alpha_{q,k}^{2} \right)^{2} \right) \tag{A3.1}$$

where $\boldsymbol{\alpha}$ is the loadings matrix, q indexes the rows, and k indexes the columns. In words, this is simply the sum of the columnwise variances of the squared elements of the loadings matrix. Then, the elements of the rotated matrix are raised to some power.[6] Second, this unrotated factor matrix is rotated to the best least-squares fit to the oblique solution by the Procrustes procedure.

The second rotation method we apply is the Quartimin rotation, first developed by Jennrich and Sampson (1966), and recently applied in Heckman et al. (2013), which belongs to a family of oblique rotations that use the simplicity criteria proposed by Carroll (1953). It is performed computing the rotation matrix which maximizes the following simplicity criterion $c(\boldsymbol{\alpha})$:[7]

$$c(\boldsymbol{\alpha}) = -\left((1-\gamma) \underbrace{\left(\sum_{q=1}^{Q} \sum_{k=1}^{K} \sum_{l \neq k, l=1}^{K} \alpha_{q,k}^{2} \alpha_{q,l}^{2} \right)}_{\text{Row Complexity}} + \gamma \underbrace{\left(\sum_{k=1}^{K} \sum_{q=1}^{Q} \sum_{l \neq q, l=1}^{Q} \alpha_{q,k}^{2} \alpha_{l,k}^{2} \right)}_{\text{Column Complexity}} \right) \tag{A3.2}$$

where $\boldsymbol{\alpha}$ is the loadings matrix and γ is set to zero.[8]

Final Structures Third, all final structures resulting from the application of different dimensionality selection, extraction and rotation methods and one sequential item elimination algorithm to the initial set of 131 measurements (see Table 7 in the paper) are shown in Tables A3.6-A3.29.

[6]The power parameter has to be chosen by the researchers; Tataryn et al. (1999) suggest to use as value 2, 3 or 4, and also show that, for the type of promax rotation that we use, setting the power at 3 minimizes error and bias. Hence, we choose the power of 3, which is commonly used in practice (Watson et al., 1995; Osman et al., 2008; Dien et al., 2007; Iwata et al., 1998; Wolraich et al., 1998; Tiffany and Drobes, 1991).

[7]Most of the rotation criteria are based on the Crawford-Ferguson family (Crawford and Ferguson, 1970) of simplicity measures.

[8]In other words, the quartimin rotation focuses on reducing the weight on row complexity in order to obtain a perfect cluster configuration (Carroll, 1953), by having only one loading per row large, while all the others close to zero (if all others were exactly zero, then row complexity would be zero); if more than one loading per row is large, then the criterion (A3.2) penalizes by producing large row complexity.

Table A3.6: Maximum Likelihood Factor Analysis with Promax Rotation and $K^S = 6$, Final Structure from the Raw Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6
Rutter8	-0.034	-0.038	0.007	0.037	0.711	0.012
Rutter9	-0.027	0.009	-0.002	0.071	0.511	-0.028
Rutter14	0.116	0.095	-0.04	-0.073	0.522	-0.02
Conners8	-0.028	-0.022	0.006	0.035	0.66	0.034
Conners9	0.122	-0.01	0.012	-0.04	0.523	0.024
Conners10	0.083	0.017	0.034	-0.049	0.542	0.054
Conners12	-0.032	0.05	-0.051	0.032	0.55	-0.048
Conners16	-0.033	-0.011	-0.007	-0.011	0.756	-0.007
Conners17	-0.014	-0.048	0.02	0.018	0.783	-0.006
Caraloc1	-0.078	0.077	0.029	-0.007	-0.038	0.642
Caraloc4	-0.064	-0.052	0.023	0.01	0.014	0.699
Caraloc5	0.047	-0.002	-0.033	0.058	0.03	0.689
Caraloc11	0.019	0.05	-0.033	-0.022	0.046	0.672
Caraloc15	0.058	-0.131	0.008	-0.042	-0.052	0.61
CDEV1	-0.074	0.609	0.049	0.143	-0.041	0.004
CDEV3	0.049	0.565	0.042	0.043	-0.029	0
CDEV5	0.652	-0.008	0.052	0.081	-0.005	0.004
CDEV6	0.25	-0.127	0.624	-0.011	-0.042	-0.024
CDEV8	0.831	-0.095	-0.033	0.025	0.055	-0.04
CDEV9	0.851	-0.002	-0.043	-0.149	-0.003	0.032
CDEV10	0.012	-0.002	0.662	0.121	-0.018	0.003
CDEV13	-0.139	-0.769	0.09	0.029	0.011	0.028
CDEV14	-0.086	-0.083	0.65	0.121	0.034	0.003
CDEV16	0.752	0.216	-0.004	-0.149	-0.02	0.015
CDEV18	0.014	-0.073	0.818	-0.033	-0.003	0.004
CDEV19	-0.108	0.1	0.128	0.724	0.016	-0.014
CDEV20	0.221	-0.144	0.085	0.524	-0.03	0.054
CDEV21	0.718	-0.032	-0.007	0.216	-0.011	-0.02
CDEV22	0.699	-0.038	-0.029	0.097	-0.034	0.083
CDEV23	0.01	-0.002	-0.04	0.909	0.005	-0.003
CDEV24	0.673	0.09	0.003	0.128	-0.036	0.049
CDEV27	0.164	-0.111	-0.577	0.047	-0.038	-0.044
CDEV28	0.149	-0.011	0.641	-0.02	-0.012	-0.016
CDEV29	-0.144	-0.757	0.031	0.047	0.01	0.023
CDEV32	-0.009	0.609	0.1	0.158	0.015	-0.097
CDEV34	0.808	0.066	-0.033	-0.027	0.002	-0.036
CDEV35	0.116	-0.182	-0.596	0.066	-0.023	0
CDEV37	0.615	0.059	0.157	-0.099	0.029	0.005
CDEV38	0.519	0.064	0.213	-0.079	-0.012	0.004
CDEV40	0.005	0.167	0.524	-0.056	0.017	-0.023
CDEV43	0.79	0	-0.006	-0.164	0.009	-0.025
CDEV44	0.567	0.061	-0.007	0.131	0.009	-0.057
CDEV48	-0.022	-0.839	0.013	0.022	0.015	-0.042
CDEV49	0.595	0.063	0.004	0.152	-0.011	-0.026
CDEV51	0.062	0.814	-0.042	0.019	-0.001	0.039
CDEV53	-0.065	0.046	-0.056	0.816	0.031	0.008

Note.— The cells display rotated factor loadings (using oblique promax rotation) obtained from factor analysis of all the raw measurements performed using the extraction method of maximum likelihood. Number of initial factors (K^S): 6 (following Onatski (2009)). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6|\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.7: Maximum Likelihood Factor Analysis with Quartimin Rotation and $K^S = 6$, Final Structure from the Raw Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6
Rutter8	-0.023	0.031	0.004	0.028	0.707	0.015
Rutter9	-0.015	-0.017	0.001	0.063	0.51	-0.016
Rutter14	0.11	-0.095	-0.033	-0.07	0.525	-0.027
Conners8	-0.018	0.017	0.004	0.028	0.656	0.032
Conners9	0.121	0.006	0.014	-0.044	0.522	0.01
Conners10	0.081	-0.02	0.035	-0.053	0.54	0.035
Conners12	-0.024	-0.05	-0.047	0.029	0.55	-0.042
Conners16	-0.025	0.01	-0.009	-0.017	0.752	-0.015
Conners17	-0.006	0.032	0.014	0.011	0.78	-0.001
Caraloc1	-0.086	-0.072	0.035	-0.013	-0.052	0.603
Caraloc4	-0.065	0.056	0.025	-0.008	-0.004	0.655
Caraloc5	0.031	-0.046	-0.025	0.055	0.023	0.747
Caraloc11	0	-0.076	-0.026	-0.018	0.039	0.697
Caraloc14	0.054	0.081	0.012	0.022	0.013	0.657
Caraloc15	0.042	0.1	0.005	-0.05	-0.063	0.624
CDEV2	-0.149	-0.215	0.041	0.602	0.014	-0.066
CDEV5	0.64	-0.004	0.069	0.094	0.008	-0.006
CDEV6	0.255	0.101	0.605	-0.001	-0.037	-0.038
CDEV8	0.809	0.067	-0.017	0.038	0.071	-0.037
CDEV9	0.81	-0.021	-0.025	-0.126	0.016	0.027
CDEV10	0.034	-0.01	0.646	0.132	-0.017	-0.014
CDEV13	-0.122	0.72	0.037	-0.01	-0.007	0.061
CDEV14	-0.06	0.066	0.628	0.126	0.032	0.001
CDEV16	0.716	-0.218	0.026	-0.124	0	-0.005
CDEV18	0.02	0.036	0.786	-0.014	-0.003	-0.004
CDEV19	-0.049	-0.088	0.148	0.717	0.012	-0.02
CDEV20	0.265	0.151	0.099	0.507	-0.031	0.041
CDEV21	0.717	0.023	0.017	0.22	0.002	-0.03
CDEV22	0.691	0.035	-0.001	0.093	-0.022	0.068
CDEV23	0.082	0.016	-0.007	0.877	0	-0.008
CDEV24	0.667	-0.087	0.037	0.129	-0.023	0.028
CDEV27	0.164	0.139	-0.557	0.029	-0.036	-0.039
CDEV28	0.153	-0.014	0.625	-0.003	-0.007	-0.024
CDEV29	-0.124	0.72	-0.018	0.011	-0.007	0.054
CDEV32	-0.005	-0.574	0.135	0.189	0.026	-0.135
CDEV34	0.78	-0.082	-0.009	-0.008	0.021	-0.034
CDEV35	0.121	0.214	-0.582	0.046	-0.024	0.002
CDEV37	0.586	-0.085	0.166	-0.076	0.043	-0.001
CDEV38	0.504	-0.067	0.225	-0.066	0	-0.022
CDEV40	0.001	-0.187	0.514	-0.035	0.02	-0.04
CDEV43	0.748	-0.033	0.006	-0.139	0.026	-0.02
CDEV44	0.56	-0.072	0.012	0.145	0.023	-0.057
CDEV48	-0.001	0.811	-0.037	-0.012	0.001	-0.017
CDEV49	0.587	-0.08	0.028	0.163	0.002	-0.022
CDEV51	0.049	-0.775	0.013	0.046	0.014	0.012
CDEV53	-0.003	-0.038	-0.032	0.799	0.025	0.007

Note.— The cells display rotated factor loadings (using oblique quartimin rotation) obtained from factor analysis of all the raw measurements performed using the extraction method of maximum likelihood. Number of initial factors (K^S): 6 (following Onatski (2009)). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6|\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.8: Principal Axes Factor Analysis with Promax Rotation and $K^S = 6$, Final Structure from the Raw Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6
CogPLCT	-0.015	0.004	0.666	0.068	0.023	-0.027
CogFMT	0.022	-0.005	0.792	-0.058	-0.048	0.035
CogSERT	-0.012	0.004	0.816	-0.051	-0.022	0.01
CogBASTM	-0.013	-0.021	0.668	-0.055	0.006	-0.035
CogBASTS	0.01	0.003	0.748	0.061	0.005	-0.007
CogBASTWD	0	-0.006	0.802	0.079	-0.007	-0.004
Rutter8	-0.024	0.672	-0.003	-0.034	0.026	-0.017
Rutter9	-0.037	0.536	0.015	0.002	0.077	-0.066
Rutter14	0.146	0.517	-0.077	-0.026	-0.074	0.001
Conners7	-0.117	0.504	0.066	0.038	0.061	-0.013
Conners8	-0.027	0.685	0.024	0.013	0.019	0.042
Conners9	0.106	0.565	0.028	0.045	-0.069	0.001
Conners10	0.076	0.575	0.003	0.068	-0.084	0.012
Conners12	-0.02	0.551	-0.049	-0.061	0.048	-0.046
Conners16	-0.02	0.727	-0.016	-0.025	-0.011	0.018
Conners17	-0.003	0.745	-0.007	-0.011	0.014	0.032
Lawseq2	0.067	-0.043	-0.026	-0.032	-0.122	0.599
Lawseq3	-0.121	0.028	0.161	0.013	0.038	0.512
Lawseq4	-0.004	0.012	-0.056	0.039	0.047	0.679
Lawseq6	0.089	0.038	0.028	-0.101	-0.023	0.586
Lawseq12	-0.093	0.026	-0.015	0.066	0.1	0.503
CDEV5	0.643	0.007	0.053	0.066	0.067	-0.037
CDEV6	0.194	-0.03	0.078	0.61	-0.023	-0.041
CDEV8	0.807	0.057	0.061	-0.073	0.033	-0.037
CDEV9	0.846	0.008	0.026	-0.034	-0.174	0.033
CDEV10	0.017	-0.011	0.038	0.63	0.127	-0.038
CDEV16	0.799	-0.006	-0.059	0.063	-0.15	-0.004
CDEV18	0.01	-0.002	0.005	0.71	-0.005	0.017
CDEV19	-0.043	0.004	-0.067	0.153	0.712	0.026
CDEV21	0.735	-0.016	0.042	-0.053	0.229	-0.031
CDEV22	0.724	-0.028	0.081	-0.044	0.078	0.047
CDEV23	0.059	-0.008	-0.002	-0.022	0.842	0.018
CDEV24	0.755	-0.028	0.02	0.02	0.128	0.063
CDEV25	0.649	-0.027	-0.1	0.136	0.057	0.021
CDEV34	0.823	0	-0.034	-0.029	-0.036	-0.056
CDEV35	0.057	-0.011	0.145	-0.579	0.019	-0.042
CDEV37	0.618	0.034	-0.009	0.168	-0.097	-0.011
CDEV43	0.795	0.005	-0.033	-0.021	-0.168	0.042
CDEV44	0.602	-0.008	-0.055	-0.046	0.171	-0.039
CDEV49	0.639	0.002	-0.023	-0.001	0.169	0.039
CDEV53	-0.02	0.013	-0.006	-0.051	0.813	-0.031

Note.— The cells display rotated factor loadings (using oblique promax rotation) obtained from factor analysis of all the raw measurements performed using the extraction method of principal factors. Number of initial factors (K^S): 6 (following Onatski (2009)). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6|\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.9: Principal Axes Factor Analysis with Quartimin Rotation and $K^S = 6$, Final Structure from the Raw Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6
CogPLCT	-0.019	0.001	0.662	0.062	0.022	-0.037
CogFMT	0.008	-0.006	0.79	-0.056	-0.04	0.062
CogSERT	-0.021	0	0.814	-0.052	-0.025	0.016
CogBASTM	-0.019	-0.023	0.662	-0.059	0.016	-0.016
CogBASTS	0.003	0	0.743	0.054	0.007	-0.017
CogBASTWD	-0.009	-0.008	0.798	0.075	-0.006	-0.006
Rutter8	-0.019	0.671	-0.005	-0.031	0.027	-0.015
Rutter9	-0.023	0.528	0.012	-0.002	0.051	-0.12
Rutter14	0.141	0.518	-0.082	-0.021	-0.063	0.008
Conners7	-0.111	0.501	0.066	0.038	0.059	-0.025
Conners8	-0.029	0.683	0.025	0.019	0.025	0.038
Conners9	0.101	0.565	0.022	0.052	-0.07	-0.006
Conners10	0.07	0.577	-0.002	0.077	-0.077	0.023
Conners12	-0.009	0.544	-0.05	-0.065	0.034	-0.082
Conners16	-0.019	0.724	-0.017	-0.022	-0.008	0.009
Conners17	-0.003	0.745	-0.006	-0.006	0.022	0.038
Lawseq2	0.003	-0.029	0.004	-0.003	-0.035	0.687
Lawseq4	-0.057	-0.001	-0.013	0.039	0.075	0.531
Lawseq6	0.031	0.04	0.056	-0.077	0.038	0.589
CDEV2	-0.08	0.004	-0.182	0.067	0.626	0.021
CDEV5	0.636	0.01	0.041	0.072	0.066	-0.082
CDEV6	0.189	-0.019	0.065	0.606	-0.013	-0.052
CDEV8	0.797	0.062	0.046	-0.058	0.033	-0.062
CDEV9	0.818	0.015	0.009	-0.021	-0.144	0.04
CDEV10	0.023	-0.003	0.033	0.617	0.136	-0.074
CDEV16	0.778	0.001	-0.077	0.074	-0.133	-0.015
CDEV18	0.003	0.011	-0.001	0.703	0.021	0.013
CDEV19	-0.018	0.016	-0.047	0.167	0.723	0.025
CDEV21	0.733	-0.007	0.036	-0.029	0.221	-0.047
CDEV22	0.709	-0.015	0.076	-0.007	0.065	0.053
CDEV23	0.09	0.001	0.02	-0.001	0.834	0
CDEV24	0.739	-0.011	0.017	0.06	0.124	0.079
CDEV25	0.635	-0.014	-0.109	0.161	0.063	0.023
CDEV34	0.811	0.007	-0.051	-0.017	-0.027	-0.063
CDEV35	0.061	-0.019	0.146	-0.571	0.002	-0.028
CDEV37	0.602	0.043	-0.025	0.173	-0.072	-0.008
CDEV43	0.77	0.012	-0.048	-0.012	-0.138	0.048
CDEV44	0.604	-0.005	-0.062	-0.039	0.168	-0.07
CDEV49	0.63	0.009	-0.028	0.02	0.167	0.01
CDEV53	0.018	0.018	0.015	-0.039	0.795	-0.065

Note.— The cells display rotated factor loadings (using oblique quartimin rotation) obtained from factor analysis of all the raw measurements performed using the extraction method of principal factors. Number of initial factors (K^S): 6 (following Onatski (2009)). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6|\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.10: Principal Components Factor Analysis with Promax Rotation and $K^S = 6$, Final Structure from the Raw Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6
CogPLCT	-0.01	0.008	0.046	0.729	0.01	-0.025
CogFMT	0.007	0	-0.051	0.813	-0.09	0.042
CogSERT	-0.022	0.001	-0.058	0.831	-0.051	0.025
CogBASTM	-0.021	-0.009	-0.055	0.725	-0.026	-0.044
CogBASTS	0.009	0.005	0.048	0.799	-0.013	-0.004
CogBASTWD	0.006	-0.013	0.045	0.833	-0.028	0.002
Rutter3	0.012	0.539	0.051	-0.034	-0.109	-0.056
Rutter8	-0.033	0.658	-0.047	-0.003	0.076	0.014
Rutter9	-0.082	0.619	-0.009	0.039	0.139	-0.066
Rutter10	0.058	0.511	0.052	-0.037	-0.178	-0.093
Rutter14	0.135	0.6	-0.004	-0.056	-0.094	0.001
Rutter18	0.102	0.547	-0.01	-0.082	-0.143	-0.052
Rutter19	0.038	0.547	0.025	-0.019	-0.138	-0.035
Conners7	-0.135	0.551	0.003	0.085	0.134	0.021
Conners8	-0.024	0.678	-0.039	0.023	0.094	0.095
Conners9	0.131	0.576	0.015	0.041	-0.051	0.042
Conners10	0.095	0.583	0.036	0.013	-0.053	0.062
Conners11	0.111	0.596	0.023	0.009	-0.066	0.002
Conners12	-0.055	0.61	-0.069	-0.041	0.097	-0.037
Conners15	-0.123	0.584	0.059	0.037	0.101	-0.033
Conners16	-0.036	0.741	-0.032	-0.003	0.036	0.041
Conners17	-0.021	0.741	-0.013	0	0.061	0.052
Lawseq2	0.106	-0.032	0.015	-0.028	-0.2	0.68
Lawseq3	-0.093	0.042	0.022	0.168	0.031	0.627
Lawseq4	0.032	0.029	0.054	-0.074	0.04	0.768
Lawseq6	0.116	0.051	-0.081	0.024	-0.047	0.657
Lawseq12	-0.064	0.021	0.048	-0.04	0.151	0.619
Caraloc7	-0.105	-0.013	0.05	0.063	0.067	0.601
CDEV5	0.678	0.008	-0.016	0.043	0.14	-0.022
CDEV6	0.232	-0.051	0.61	0.105	0	-0.033
CDEV8	0.812	0.06	-0.112	0.047	0.072	-0.023
CDEV9	0.864	0.01	-0.082	0.029	-0.142	0.034
CDEV10	0.01	-0.007	0.621	0.057	0.233	-0.028
CDEV16	0.817	0.005	0.033	-0.052	-0.122	0
CDEV18	0.007	-0.028	0.783	0.043	0.047	0.022
CDEV19	-0.034	0.007	0.145	-0.124	0.743	0.057
CDEV20	0.224	-0.022	-0.046	0.101	0.604	0.009
CDEV21	0.739	-0.006	-0.076	0.017	0.262	-0.009
CDEV22	0.772	-0.031	-0.078	0.063	0.048	0.068
CDEV23	0.063	0.004	-0.035	-0.072	0.849	0.05
CDEV24	0.783	-0.022	0.016	0.003	0.088	0.071
CDEV25	0.685	-0.023	0.145	-0.104	0.022	0.023
CDEV27	0.186	-0.03	-0.722	0.051	0.004	-0.072
CDEV28	0.162	-0.021	0.667	0.022	0.011	0.004
CDEV30	0.204	0.022	0.179	0.028	0.512	-0.116
CDEV33	-0.093	0.063	0.131	0.11	0.573	-0.158
CDEV34	0.818	0.01	-0.054	-0.037	0.02	-0.051
CDEV35	0.109	-0.013	-0.754	0.122	0.033	-0.054
CDEV37	0.652	0.037	0.169	0.013	-0.08	-0.021

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Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6
CDEV38	0.595	-0.01	0.265	0.028	-0.128	-0.039
CDEV39	0.567	-0.033	0.257	0.039	-0.101	-0.035
CDEV40	0.036	0.003	0.657	-0.075	-0.025	-0.008
CDEV43	0.804	0.007	-0.045	-0.028	-0.138	0.038
CDEV44	0.589	0.002	-0.054	-0.069	0.243	-0.05
CDEV49	0.673	0.004	-0.045	-0.044	0.205	0.054
CDEV53	-0.036	0.03	-0.051	-0.077	0.836	0.002

Note.— The cells display rotated factor loadings (using oblique promax rotation) obtained from factor analysis of all the raw measurements performed using the extraction method of principal components. Number of initial components (K^S): 6 (following the Scree plot). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6|\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.11: Principal Components Factor Analysis with Quartimin Rotation and $K^S = 6$, Final Structure from the Raw Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6
CogPLCT	-0.013	0.004	0.046	0.727	0.031	-0.022
CogFMT	-0.004	-0.007	-0.051	0.808	-0.078	0.051
CogSERT	-0.03	-0.006	-0.056	0.829	-0.044	0.033
CogBASTM	-0.028	-0.014	-0.056	0.719	-0.004	-0.033
CogBASTS	0.004	0	0.048	0.795	0.005	0.001
CogBASTWD	0	-0.018	0.046	0.831	-0.005	0.006
Rutter3	0.013	0.538	0.044	-0.052	-0.099	-0.053
Rutter8	-0.025	0.653	-0.036	-0.001	0.058	0
Rutter9	-0.065	0.616	0.005	0.045	0.112	-0.081
Rutter10	0.054	0.513	0.041	-0.063	-0.164	-0.084
Rutter14	0.131	0.599	-0.003	-0.075	-0.096	-0.001
Rutter18	0.099	0.547	-0.015	-0.105	-0.142	-0.046
Rutter19	0.035	0.546	0.019	-0.037	-0.134	-0.032
Conners7	-0.121	0.545	0.01	0.095	0.124	0.007
Conners8	-0.016	0.67	-0.028	0.029	0.08	0.077
Conners9	0.129	0.574	0.021	0.033	-0.051	0.031
Conners10	0.094	0.581	0.041	0.007	-0.054	0.05
Conners11	0.11	0.595	0.024	-0.005	-0.062	-0.004
Conners12	-0.043	0.606	-0.057	-0.039	0.072	-0.048
Conners15	-0.108	0.58	0.064	0.039	0.086	-0.044
Conners16	-0.029	0.735	-0.024	-0.005	0.019	0.029
Conners17	-0.012	0.736	-0.003	-0.001	0.04	0.038
Lawseq2	0.079	-0.049	-0.006	-0.032	-0.177	0.683
Lawseq3	-0.102	0.022	0.009	0.182	0.04	0.621
Lawseq4	0.021	0.008	0.042	-0.058	0.041	0.755
Lawseq6	0.096	0.033	-0.091	0.028	-0.043	0.655
Lawseq12	-0.064	0.003	0.043	-0.016	0.146	0.602
Caraloc7	-0.109	-0.031	0.041	0.083	0.063	0.589
CDEV2	-0.079	0.002	0.069	-0.228	0.685	0.047
CDEV5	0.668	0.019	0.018	0.039	0.136	-0.043
CDEV6	0.243	-0.037	0.609	0.097	0.015	-0.053
CDEV8	0.794	0.072	-0.074	0.035	0.059	-0.04
CDEV9	0.831	0.022	-0.055	0.004	-0.132	0.027
CDEV10	0.041	0.003	0.622	0.066	0.229	-0.055
CDEV16	0.79	0.02	0.057	-0.075	-0.11	-0.012
CDEV18	0.03	-0.016	0.771	0.038	0.051	0.002
CDEV19	0.009	0.005	0.163	-0.081	0.742	0.018
CDEV20	0.25	-0.021	-0.01	0.141	0.592	-0.03
CDEV21	0.733	0.004	-0.034	0.021	0.25	-0.037
CDEV22	0.751	-0.021	-0.045	0.063	0.06	0.043
CDEV23	0.105	0	-0.003	-0.021	0.842	0.007
CDEV24	0.767	-0.011	0.047	0	0.098	0.044
CDEV25	0.672	-0.01	0.165	-0.114	0.041	0.002
CDEV27	0.162	-0.037	-0.701	0.056	0.001	-0.059
CDEV28	0.177	-0.008	0.66	0.012	0.021	-0.015
CDEV33	-0.048	0.065	0.158	0.141	0.525	-0.185
CDEV34	0.8	0.024	-0.019	-0.053	0.009	-0.066
CDEV35	0.087	-0.023	-0.734	0.127	0.026	-0.037
CDEV37	0.637	0.051	0.186	-0.011	-0.08	-0.029

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... table A3.11 continued

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6
CDEV38	0.58	0.005	0.275	0.006	-0.109	-0.051
CDEV39	0.555	-0.019	0.268	0.019	-0.086	-0.046
CDEV40	0.053	0.014	0.644	-0.086	-0.018	-0.022
CDEV43	0.774	0.019	-0.02	-0.052	-0.136	0.03
CDEV44	0.59	0.011	-0.017	-0.071	0.204	-0.068
CDEV49	0.665	0.012	-0.01	-0.04	0.204	0.027
CDEV53	0.01	0.025	-0.022	-0.027	0.816	-0.036

Note.— The cells display rotated factor loadings (using oblique quartimin rotation) obtained from factor analysis of all the raw measurements performed using the extraction method of principal components. Number of initial components (K^S): 6 (following the Scree plot). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6|\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.12: Maximum Likelihood Factor Analysis with Promax Rotation and $K^S = 13$, Final Structure from the Raw Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10
CogPLCT	0.077	-0.056	0.019	0.682	0.02	0.018	0.027	-0.041	-0.005	-0.003
CogFMT	-0.126	0.044	-0.009	0.74	0.013	-0.045	-0.022	0.057	0.026	-0.003
CogSERT	-0.083	-0.001	-0.02	0.794	-0.009	-0.03	-0.035	0.014	0.029	0.001
CogBASTM	-0.066	-0.005	-0.031	0.675	-0.078	0.009	-0.031	0.021	0.001	0.004
CogBASTS	0.061	-0.02	0.029	0.744	0.048	-0.004	0.005	-0.02	0.008	0.007
CogBASTWD	0.056	-0.039	0.036	0.783	0.068	-0.009	0.028	-0.027	-0.01	-0.019
Rutter8	-0.015	0.006	0.014	-0.009	0.046	0.01	-0.022	-0.054	0.732	-0.055
Rutter15	-0.058	0.014	0.02	-0.067	0.038	0.012	0.703	-0.002	0.035	-0.012
Conners1	0.024	-0.031	0.019	0.032	0.008	-0.018	0.004	-0.006	-0.03	0.846
Conners2	-0.013	-0.003	0.001	-0.04	0.042	-0.01	-0.033	-0.015	0.005	0.813
Conners3	0.159	0.045	-0.039	-0.025	-0.036	-0.057	0.586	-0.006	0.022	0.061
Conners6	-0.031	-0.012	-0.002	-0.01	-0.03	0.021	0.04	0.025	0.003	0.586
Conners8	-0.028	0.012	-0.009	0.022	0.003	0.038	0.114	0.021	0.545	0.025
Conners12	0.072	0.012	-0.071	-0.015	-0.012	0.009	-0.044	-0.058	0.504	0.109
Conners13	0	-0.038	0.023	0.017	0.017	0.041	0.861	-0.014	0.009	-0.034
Conners16	0.004	0.005	-0.016	0.028	-0.02	-0.022	0.069	0.021	0.726	0.034
Conners17	-0.013	0.035	0.035	0.023	-0.01	-0.005	-0.019	0.034	0.848	-0.042
Conners19	0.015	-0.004	-0.008	-0.003	-0.009	0.011	0.732	0.035	0.003	0.01
Lawseq2	0.003	0.041	0.002	-0.035	-0.06	-0.062	0.006	0.769	-0.013	0.007
Lawseq3	0.037	-0.146	-0.003	0.15	0.016	0.058	0.003	0.51	0.013	-0.006
Lawseq4	0.043	-0.038	0.033	-0.092	0.094	0.049	-0.014	0.532	-0.008	0.016
Lawseq6	-0.035	0.071	-0.04	-0.025	0.018	0.015	-0.025	0.617	0.04	-0.004
Lawseq10	-0.088	0.051	-0.024	0.094	-0.029	0.043	0.031	0.632	-0.002	-0.035
Caraloc1	0.082	-0.07	0.044	0.056	0.518	-0.005	-0.034	0.141	-0.016	-0.018
Caraloc4	-0.034	-0.053	0.014	0.14	0.558	0.02	0.044	0.138	0.008	0.026
Caraloc5	-0.024	0.048	-0.028	-0.037	0.786	0.055	0.015	-0.082	0.014	0.011
Caraloc6	-0.006	-0.016	-0.037	0.034	0.669	-0.01	0.07	-0.147	-0.079	-0.009
Caraloc11	0.051	0.01	-0.029	0.024	0.691	-0.023	0.016	-0.043	0.047	-0.01
Caraloc14	-0.129	0.088	0.018	0.026	0.577	0.023	-0.071	0.012	0.044	0.024
Caraloc15	-0.061	0.069	-0.005	0.155	0.501	-0.034	-0.062	0.12	-0.028	0.064
Caraloc16	0.056	-0.038	0.022	-0.071	0.505	-0.022	-0.001	0.049	-0.019	-0.039
CDEV1	0.681	-0.113	0.037	0.099	-0.025	0.131	0.003	-0.04	-0.013	-0.025
CDEV2	0.172	-0.157	0.003	-0.126	-0.026	0.626	-0.037	0.049	0.01	0.024
CDEV3	0.575	0.015	0.033	-0.04	-0.013	0.048	-0.008	0.034	-0.031	0.058
CDEV5	0.028	0.64	0.044	0.043	0.015	0.099	0.023	-0.03	-0.024	0.006
CDEV6	-0.11	0.242	0.589	0.062	-0.041	0.011	0.047	-0.024	-0.078	0.061
CDEV8	-0.06	0.818	-0.013	0.014	-0.014	0.039	-0.03	-0.019	0.069	-0.009
CDEV9	0.01	0.841	-0.031	-0.01	0.035	-0.118	0.037	0.055	-0.011	-0.014
CDEV10	0.029	0.031	0.619	0.082	-0.004	0.129	0.007	-0.067	-0.034	0.045
CDEV12	0.685	0.237	-0.024	-0.006	-0.011	-0.011	-0.035	-0.013	-0.048	0.012
CDEV13	-0.787	-0.093	0.074	0.018	0.013	0.037	-0.03	0.005	-0.005	0.025
CDEV14	-0.055	-0.058	0.613	0.066	0.007	0.117	-0.05	-0.102	0.035	0.025
CDEV16	0.252	0.716	-0.003	0.02	0.015	-0.134	0.059	0.01	-0.041	-0.008
CDEV18	-0.086	0.041	0.8	0.004	-0.013	-0.013	-0.005	0.015	-0.004	-0.004
CDEV19	0.044	-0.078	0.114	-0.035	0.002	0.752	0.033	0.033	0	-0.017
CDEV20	-0.127	0.219	0.059	0.083	0.035	0.535	0.053	-0.037	-0.062	0.008
CDEV21	0.011	0.677	0.019	0.032	0.003	0.217	-0.007	-0.033	0.018	-0.046
CDEV23	-0.03	0.03	-0.045	0	-0.005	0.908	0.016	0.024	-0.007	-0.006
CDEV26	0.767	0.22	-0.07	0.01	-0.001	0	0.051	0.004	-0.025	-0.012
CDEV27	-0.044	0.134	-0.624	0.073	-0.061	0.05	0.039	-0.022	-0.069	0.049
CDEV28	-0.011	0.158	0.626	0.017	-0.03	0.001	0.028	0.024	-0.016	-0.017
CDEV29	-0.752	-0.116	0.012	0.061	-0.001	0.053	0.008	-0.019	-0.007	-0.009
CDEV32	0.561	-0.015	0.103	-0.179	-0.06	0.17	-0.01	0.07	0.015	0.003
CDEV34	0.087	0.806	-0.024	-0.032	0.021	-0.015	-0.012	-0.023	0.001	-0.006
CDEV35	-0.08	0.096	-0.651	0.088	-0.009	0.066	-0.048	-0.043	-0.017	0.014
CDEV37	0.034	0.617	0.167	-0.012	0.009	-0.069	0.029	0.018	0.015	0.004
CDEV40	0.131	0.014	0.557	-0.016	-0.051	-0.057	-0.009	0.027	0.024	0.022
CDEV43	0.005	0.806	0.008	-0.066	0.008	-0.138	-0.044	0.068	0.022	0.02
CDEV44	0.089	0.595	0.002	-0.039	-0.006	0.136	-0.123	-0.027	0.064	-0.021
CDEV48	-0.8	0.008	-0.045	-0.011	-0.026	0.044	0.019	0.021	-0.024	-0.009
CDEV49	0.096	0.562	0.01	0.002	-0.033	0.166	0.011	0.054	-0.024	0.024
CDEV50	-0.139	0.044	-0.53	0.066	-0.014	0.075	0.016	0	-0.039	0.044

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... table A3.12 continued

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10
CDEV51	0.806	0.03	-0.008	0.04	0.022	-0.009	-0.017	-0.058	0.028	0.003
CDEV53	-0.015	-0.028	-0.058	-0.019	0.046	0.827	-0.007	-0.059	0.024	-0.013

Note.— The cells display rotated factor loadings (using oblique promax rotation) obtained from factor analysis of all the raw measurements performed using the extraction method of maximum likelihood. Number of initial factors (K^S): 13 (following the Optimal Coordinates method). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6|\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.13: Maximum Likelihood Factor Analysis with Quartimin Rotation and $K^S = 13$, Final Structure from the Raw Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10
CogPLCT	0.088	-0.057	0.013	0.668	0.021	0.023	0.002	0.032	-0.024	0.002
CogFMT	-0.113	0.035	-0.022	0.731	-0.039	-0.052	-0.003	0.05	0.014	-0.012
CogSERT	-0.075	0	-0.034	0.795	-0.042	-0.033	-0.015	-0.009	0.02	-0.003
CogBASTM	-0.051	-0.014	-0.039	0.655	-0.062	0.006	0.034	-0.038	-0.012	-0.003
CogBASTS	0.069	-0.024	0.022	0.741	0.008	-0.003	-0.027	0.045	0.002	0.01
CogBASTWD	0.064	-0.042	0.027	0.783	0.018	-0.006	0	0.058	-0.023	-0.016
Rutter1	0.028	-0.038	-0.004	-0.042	-0.018	-0.005	0.808	0.02	0.01	-0.016
Rutter2	0.014	0.013	0.018	0.046	0.047	0	0.625	-0.033	0.013	0.113
Rutter8	-0.004	0.005	0.007	-0.015	-0.039	0.028	0.103	0.017	0.667	-0.026
Rutter15	-0.056	0.002	0.017	-0.074	0.606	0.009	0.199	0.023	-0.002	0.003
Conners1	0.021	-0.024	0.009	0.031	0.007	-0.011	0.011	-0.005	-0.013	0.836
Conners2	-0.014	0.004	-0.006	-0.039	-0.023	-0.003	-0.002	0.031	0.025	0.808
Conners3	0.15	0.032	-0.036	-0.043	0.511	-0.052	0.155	-0.055	-0.003	0.078
Conners6	-0.03	-0.004	-0.009	-0.023	0.037	0.021	0.012	-0.006	0.007	0.579
Conners9	-0.072	0.072	-0.017	0.034	0.141	0.019	0.577	-0.025	0.161	0.01
Conners12	0.072	0.021	-0.069	-0.022	0.015	0.018	-0.067	-0.033	0.511	0.126
Conners13	-0.003	-0.024	0.018	0.001	0.86	0.024	-0.023	0.01	0.026	-0.01
Conners16	0.004	0.006	-0.023	0.023	0.079	-0.019	0.023	-0.037	0.714	0.052
Conners17	-0.001	0.033	0.029	0.006	0.006	-0.001	-0.004	0.014	0.837	-0.021
Conners19	0.007	0.004	-0.011	-0.012	0.735	-0.012	-0.05	-0.021	0.033	0.029
Caraloc5	-0.004	0.021	-0.006	-0.005	0.025	0.055	-0.008	0.814	-0.014	0.015
Caraloc11	0.053	-0.012	-0.014	0.075	0.017	-0.027	0.003	0.659	0.01	-0.003
Caraloc14	-0.11	0.06	0.03	0.052	-0.078	0.016	0.012	0.608	0.005	0.021
CDEV1	0.651	-0.118	0.062	0.082	0.027	0.143	-0.007	-0.066	-0.007	-0.014
CDEV2	0.177	-0.149	0.03	-0.139	-0.026	0.598	-0.016	0	0.021	0.022
CDEV3	0.546	0	0.057	-0.058	0.006	0.058	0.011	-0.022	-0.025	0.057
CDEV5	0.039	0.615	0.062	0.031	0.023	0.118	0.03	-0.016	-0.018	0.018
CDEV6	-0.086	0.256	0.565	0.054	0.043	0.035	0.015	-0.066	-0.071	0.073
CDEV8	-0.049	0.793	0.006	-0.001	-0.018	0.064	0.016	-0.034	0.083	0.002
CDEV9	0.006	0.815	-0.014	-0.028	0.062	-0.098	-0.027	0.051	0.003	-0.007
CDEV10	0.048	0.054	0.601	0.084	0.063	0.142	-0.091	-0.063	-0.006	0.06
CDEV12	0.649	0.209	0.012	-0.026	0.006	0.011	-0.02	-0.044	-0.023	0.015
CDEV13	-0.747	-0.065	0.036	0.042	-0.056	0.018	-0.004	0.033	-0.017	0.02
CDEV14	-0.029	-0.03	0.589	0.073	-0.001	0.133	-0.069	-0.058	0.045	0.044
CDEV16	0.238	0.688	0.018	0.001	0.066	-0.102	0.033	0	-0.038	0
CDEV18	-0.056	0.051	0.768	-0.009	-0.017	0.007	0.04	-0.011	-0.023	0.004
CDEV19	0.06	-0.056	0.131	-0.036	0.014	0.731	0.028	-0.01	-0.001	-0.01
CDEV20	-0.108	0.236	0.068	0.092	0.055	0.527	-0.011	-0.017	-0.059	0.02
CDEV21	0.022	0.666	0.039	0.025	0.006	0.237	0.006	-0.036	0.026	-0.031
CDEV23	-0.01	0.059	-0.021	-0.007	0.015	0.885	-0.012	0.001	0	0.001
CDEV24	0.154	0.571	0.024	0.053	0.02	0.152	0.145	-0.013	-0.091	0.01
CDEV26	0.731	0.192	-0.035	-0.012	0.054	0.025	0.055	-0.027	-0.031	-0.005
CDEV27	-0.061	0.133	-0.603	0.075	0.041	0.039	-0.028	-0.065	-0.053	0.046
CDEV28	0.01	0.162	0.605	0.003	0.013	0.021	0.043	-0.033	-0.024	-0.008
CDEV29	-0.715	-0.082	-0.024	0.084	-0.012	0.035	-0.015	0.013	-0.019	-0.011
CDEV32	0.537	-0.033	0.129	-0.202	0.01	0.171	-0.002	-0.052	0.027	0
CDEV34	0.087	0.778	0	-0.044	0.004	0.015	0.01	-0.005	0.019	0.005
CDEV35	-0.099	0.095	-0.63	0.112	-0.059	0.057	0.008	-0.052	-0.015	0.01
CDEV37	0.04	0.588	0.177	-0.031	0.006	-0.043	0.077	0.004	0.008	0.011
CDEV40	0.144	0.012	0.541	-0.042	0	-0.042	0.006	-0.025	0.023	0.025
CDEV43	0.004	0.772	0.026	-0.083	-0.021	-0.117	-0.02	0.027	0.042	0.022
CDEV44	0.095	0.57	0.03	-0.051	-0.077	0.151	-0.049	-0.028	0.095	-0.014
CDEV48	-0.766	0.035	-0.077	0.012	-0.006	0.025	-0.001	0.001	-0.032	-0.017
CDEV50	-0.155	0.047	-0.518	0.089	0.01	0.06	-0.014	-0.043	-0.03	0.036
CDEV51	0.774	0.003	0.028	0.013	0.007	0.017	0.016	-0.006	0.036	0.011
CDEV53	0.009	-0.006	-0.03	-0.019	-0.01	0.805	0.007	0.023	0.03	-0.001

Note.— The cells display rotated factor loadings (using oblique quartimin rotation) obtained from factor analysis of all the raw measurements performed using the extraction method of maximum likelihood. Number of initial factors (K^S): 13 (following the Optimal Coordinates method). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6|\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.14: Principal Axes Factor Analysis with Promax Rotation and $K^S = 13$, Final Structure from the Raw Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10
CogPLCT	-0.056	0.082	0.01	0.684	0.035	0.02	0.019	-0.019	-0.029	-0.02
CogFMT	0.039	-0.124	-0.021	0.715	-0.046	0.016	-0.056	0.016	0.06	0.013
CogSERT	-0.003	-0.08	-0.027	0.761	-0.057	0.004	-0.041	0.023	0.02	0.009
CogBASTM	-0.016	-0.057	-0.035	0.664	-0.035	-0.069	0.002	0.011	0.024	-0.01
CogBASTS	-0.022	0.074	0.023	0.741	-0.014	0.049	-0.015	0.002	-0.014	0.004
CogBASTWD	-0.035	0.063	0.025	0.787	0.027	0.067	-0.013	-0.03	-0.016	-0.023
Rutter1	0.012	-0.079	0.012	-0.025	0.652	0.016	-0.014	0.13	0.041	-0.144
Rutter2	0.04	-0.066	0.033	0.062	0.584	-0.028	-0.012	0.094	0.022	0.007
Rutter8	0.017	-0.052	0.035	-0.027	0.092	0.037	0.005	0.675	-0.031	-0.118
Rutter9	0.008	0.055	-0.012	0.044	-0.028	-0.003	0.04	0.542	-0.064	0.124
Rutter15	-0.04	0.011	-0.008	-0.085	0.675	0.033	0.014	0.005	-0.029	0.037
Conners1	-0.015	0.023	0.048	0.072	0.105	0.064	-0.009	-0.01	-0.061	0.648
Conners2	0.01	0.003	0.026	0.013	0.045	0.088	-0.006	0.033	-0.061	0.663
Conners3	0.013	0.204	-0.06	-0.038	0.58	-0.03	-0.052	-0.005	-0.037	0.076
Conners5	0.021	-0.038	-0.054	-0.059	-0.083	-0.043	-0.036	0.032	0.083	0.692
Conners6	0.021	-0.022	-0.012	0.005	0.04	-0.01	0.024	-0.03	0.021	0.673
Conners8	0.003	-0.053	0.001	0.015	0.215	-0.006	0.048	0.53	0.041	-0.018
Conners9	0.084	-0.14	-0.006	0.032	0.613	0.001	0.005	0.245	0.001	-0.057
Conners12	0.018	0.109	-0.059	-0.01	-0.084	-0.004	-0.01	0.585	-0.052	0.095
Conners13	-0.086	0.133	-0.019	-0.023	0.665	0.02	0.029	0.006	-0.049	0.077
Conners15	-0.041	0.057	0.029	0.051	-0.01	-0.039	0.032	0.504	0.004	0.127
Conners16	0.013	0.006	-0.004	0.006	0.118	-0.019	-0.033	0.685	0.03	0.011
Conners17	0.056	-0.033	0.04	-0.02	0.044	-0.013	-0.016	0.746	0.053	-0.029
Conners18	-0.049	-0.094	0.047	-0.06	0.003	-0.042	0.031	-0.026	0.069	0.599
Conners19	-0.049	0.142	-0.052	-0.037	0.562	0.003	-0.004	-0.02	-0.003	0.152
Lawseq2	0.041	0.003	-0.008	-0.057	-0.003	-0.021	-0.071	-0.031	0.719	0.01
Lawseq3	-0.146	0.053	0.001	0.171	-0.014	-0.012	0.059	0.041	0.56	0.005
Lawseq4	-0.041	0.048	0.042	-0.087	-0.026	0.101	0.044	0.003	0.525	0.019
Lawseq6	0.055	-0.015	-0.039	-0.022	-0.022	0.05	0.005	0.065	0.6	-0.026
Lawseq10	0.053	-0.064	-0.038	0.104	-0.013	-0.05	0.031	-0.005	0.653	0.023
Caraloc1	-0.052	0.062	0.048	0.072	-0.013	0.512	0.004	-0.025	0.157	-0.028
Caraloc4	-0.04	-0.011	0.013	0.159	0.01	0.56	0.009	-0.003	0.134	0.041
Caraloc5	0.069	-0.032	-0.028	0	0.003	0.737	0.051	0.012	-0.044	0.032
Caraloc6	-0.004	-0.001	-0.038	0.036	0.039	0.666	-0.018	-0.094	-0.135	0.034
Caraloc11	0.026	0.031	-0.021	0.048	0.029	0.659	-0.021	0.033	-0.01	-0.012
Caraloc14	0.094	-0.144	0.023	0.065	-0.059	0.536	0.027	0.061	0.041	0.007
Caraloc16	-0.023	0.025	0.038	-0.07	0.006	0.501	-0.024	-0.031	0.048	-0.034
CDEV1	-0.071	0.641	0.045	0.096	0.025	-0.028	0.149	-0.015	-0.022	-0.045
CDEV2	-0.154	0.2	0.011	-0.119	-0.038	-0.017	0.62	0.019	0.049	0.011
CDEV3	0.066	0.531	0.031	-0.043	0.025	-0.013	0.07	-0.056	0.037	0.042
CDEV5	0.64	0.026	0.017	0.034	-0.005	0.023	0.11	0.018	-0.046	-0.009
CDEV6	0.258	-0.125	0.567	0.055	0.032	-0.043	0.027	-0.091	-0.034	0.082
CDEV8	0.828	-0.049	-0.04	0.003	-0.077	-0.007	0.021	0.121	-0.026	-0.004
CDEV9	0.834	0.034	-0.061	-0.022	-0.033	0.045	-0.144	0.028	0.032	0.013
CDEV10	0.011	0.049	0.623	0.087	-0.056	0.005	0.154	0.007	-0.087	0.042
CDEV12	0.275	0.66	-0.038	-0.01	-0.037	-0.008	0	-0.034	-0.014	0.001
CDEV13	-0.143	-0.736	0.077	0.034	-0.048	0.013	0.022	0.004	0.001	0.033
CDEV14	-0.072	-0.041	0.609	0.082	-0.081	0.004	0.154	0.069	-0.105	0.013
CDEV16	0.732	0.227	-0.022	0.001	0.039	0.022	-0.142	-0.019	-0.012	-0.007
CDEV18	0.045	-0.09	0.767	-0.001	-0.01	-0.017	0.016	-0.005	0.012	0.003
CDEV19	-0.059	0.042	0.125	-0.045	0.039	0.002	0.732	-0.018	0.026	-0.009
CDEV20	0.229	-0.132	0.043	0.068	0.028	0.04	0.55	-0.05	-0.051	0.003
CDEV21	0.728	-0.018	-0.02	0.003	-0.038	0.006	0.225	0.027	-0.035	-0.032
CDEV22	0.716	-0.11	-0.043	0.017	0.147	0.02	0.121	-0.112	0.053	-0.017
CDEV23	0.059	-0.03	-0.027	-0.016	-0.001	-0.007	0.865	-0.01	0.022	0.002
CDEV24	0.698	0.026	-0.007	0.029	0.156	-0.02	0.143	-0.121	0.078	-0.006
CDEV27	0.147	-0.045	-0.633	0.087	0.027	-0.074	0.038	-0.065	-0.026	0.06
CDEV28	0.173	-0.035	0.61	0.003	0.027	-0.03	0.016	-0.023	0.014	-0.017
CDEV29	-0.163	-0.715	0.006	0.066	-0.015	-0.005	0.052	-0.009	-0.02	0.015
CDEV32	0.029	0.519	0.108	-0.187	0.016	-0.058	0.179	0.005	0.06	-0.023
CDEV34	0.798	0.091	-0.04	-0.051	-0.06	0.042	-0.037	0.052	-0.054	-0.003
CDEV35	0.108	-0.091	-0.668	0.102	-0.029	-0.021	0.068	-0.014	-0.039	0.012

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... table A3.14 continued

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10
CDEV37	0.621	0.047	0.161	-0.006	0.021	0.009	-0.105	0.036	0	0
CDEV38	0.553	0.011	0.223	0.02	0.097	-0.02	-0.085	-0.083	0.002	0.017
CDEV39	0.516	0.062	0.194	0.084	0.078	-0.102	-0.081	-0.084	0.037	0.012
CDEV40	0.027	0.126	0.567	-0.022	-0.01	-0.044	-0.061	0.013	0.029	0.021
CDEV43	0.796	0.032	-0.013	-0.08	-0.108	0.033	-0.175	0.067	0.032	0.038
CDEV44	0.593	0.125	-0.015	-0.044	-0.198	0.003	0.113	0.135	-0.038	-0.014
CDEV48	-0.039	-0.799	-0.038	-0.026	-0.004	-0.026	0.04	-0.015	-0.001	0.004
CDEV49	0.615	0.039	-0.011	-0.01	0.024	-0.041	0.185	-0.01	0.059	0.013
CDEV50	0.041	-0.142	-0.546	0.072	0.022	-0.017	0.078	-0.034	-0.023	0.032
CDEV51	0.086	0.787	-0.018	0.056	0.011	0.008	-0.005	0.021	-0.037	-0.006
CDEV53	-0.028	0.012	-0.036	-0.023	-0.024	0.041	0.787	0.037	-0.05	-0.006

Note.— The cells display rotated factor loadings (using oblique promax rotation) obtained from factor analysis of all the raw measurements performed using the extraction method of principal factors. Number of initial factors (K^S): 13 (following the Optimal Coordinates method). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6|\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.15: Principal Axes Factor Analysis with Quartimin Rotation and $K^S = 13$, Final Structure from the Raw Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10
CogPLCT	0.08	-0.058	0.01	0.681	0.02	0.011	-0.01	0.008	-0.02	-0.015
CogFMT	-0.117	0.044	-0.028	0.708	-0.049	-0.06	0.01	0.047	0.067	0.011
CogSERT	-0.08	0.001	-0.038	0.758	-0.064	-0.044	0.019	0.018	0.029	0.01
CogBASTM	-0.054	-0.014	-0.045	0.651	-0.037	-0.007	0.002	-0.047	0.021	-0.011
CogBASTS	0.072	-0.026	0.022	0.73	-0.025	-0.014	0.006	0.069	-0.006	0.007
CogBASTWD	0.06	-0.036	0.025	0.776	0.013	-0.014	-0.025	0.081	-0.004	-0.021
Rutter1	-0.053	0.026	0.023	-0.036	0.61	-0.022	0.159	0.023	0.033	-0.113
Rutter2	-0.037	0.049	0.045	0.042	0.548	-0.019	0.12	-0.001	0.009	0.032
Rutter8	-0.022	0.013	0.009	0	0.056	0.029	0.687	-0.002	-0.037	-0.057
Rutter15	0.004	-0.019	0.018	-0.104	0.657	0.001	0.011	0.018	-0.033	0.054
Conners1	0.036	-0.019	0.047	0.082	0.088	-0.003	0.017	0.036	-0.059	0.652
Conners2	0.011	0.005	0.025	0.02	0.037	0.005	0.046	0.068	-0.059	0.665
Conners3	0.197	0.011	-0.028	-0.057	0.564	-0.064	0.008	-0.061	-0.05	0.094
Conners5	-0.03	0.014	-0.056	-0.06	-0.077	-0.031	0.033	-0.032	0.068	0.684
Conners6	0	0.01	-0.012	0.005	0.021	0.028	0.005	-0.002	0.007	0.67
Conners8	-0.025	0.008	-0.009	0.031	0.182	0.054	0.541	-0.031	0.03	0.032
Conners9	-0.107	0.096	0	0.029	0.57	0.001	0.276	-0.006	-0.011	-0.018
Conners12	0.095	0.008	-0.068	-0.019	-0.057	0.018	0.516	-0.014	-0.063	0.129
Conners13	0.114	-0.067	0.014	-0.061	0.651	0.019	0.008	0.027	-0.06	0.093
Conners16	0.023	0.007	-0.024	0.016	0.094	-0.009	0.677	-0.04	0.011	0.069
Conners17	-0.001	0.047	0.019	-0.007	0.01	0.011	0.758	-0.014	0.033	0.033
Conners18	-0.091	-0.036	0.038	-0.052	0.009	0.026	-0.028	-0.06	0.056	0.59
Conners19	0.118	-0.039	-0.018	-0.072	0.549	-0.013	-0.013	0.003	-0.019	0.163
Lawseq2	0.002	0.024	0.004	-0.035	-0.014	-0.082	-0.016	-0.042	0.693	0.003
Lawseq3	0.052	-0.151	0.005	0.157	-0.011	0.055	0.017	0.032	0.555	0.001
Lawseq4	0.046	-0.046	0.054	-0.085	-0.029	0.048	-0.001	0.126	0.527	0.014
Lawseq6	-0.019	0.045	-0.019	-0.018	-0.021	0.003	0.058	0.064	0.599	-0.029
Lawseq10	-0.051	0.039	-0.023	0.089	-0.01	0.024	-0.013	0.01	0.638	0.012
Caraloc5	-0.059	0.074	-0.006	0.041	0.018	0.087	-0.029	0.672	0.047	0.021
Caraloc6	-0.046	0.006	-0.029	0.085	0.039	0.016	-0.115	0.552	-0.044	0.021
Caraloc11	0.014	0.023	-0.005	0.081	0.026	0.017	0.016	0.623	0.067	-0.014
CDEV1	0.647	-0.123	0.064	0.081	0.017	0.155	-0.001	-0.057	-0.037	-0.031
CDEV2	0.2	-0.148	0.032	-0.134	-0.051	0.607	0.039	-0.007	0.026	0.018
CDEV3	0.54	0.013	0.058	-0.052	0.016	0.077	-0.028	-0.039	0.024	0.052
CDEV5	0.039	0.616	0.065	0.037	0.029	0.111	0.008	-0.019	-0.055	-0.005
CDEV6	-0.089	0.264	0.554	0.059	0.058	0.028	-0.101	-0.065	-0.038	0.083
CDEV8	-0.032	0.79	0.012	-0.011	-0.039	0.033	0.109	-0.01	-0.052	0
CDEV9	0.048	0.785	-0.002	-0.037	0.003	-0.126	0.02	0.053	0.016	0.012
CDEV10	0.059	0.035	0.613	0.099	-0.025	0.148	-0.019	-0.049	-0.079	0.05
CDEV12	0.652	0.208	0.014	-0.032	-0.028	0.013	-0.021	-0.029	-0.033	0.01
CDEV13	-0.727	-0.074	0.03	0.056	-0.05	0.01	-0.009	0.042	0.019	0.019
CDEV14	-0.03	-0.042	0.585	0.107	-0.058	0.147	0.048	-0.065	-0.092	0.026
CDEV16	0.248	0.672	0.031	-0.007	0.069	-0.127	-0.024	-0.002	-0.025	-0.003
CDEV18	-0.063	0.066	0.742	-0.003	0.011	0.022	-0.019	-0.021	0.011	0.011
CDEV19	0.068	-0.046	0.134	-0.048	0.026	0.715	0.004	-0.012	0.007	-0.001
CDEV20	-0.112	0.248	0.061	0.098	0.043	0.526	-0.054	-0.04	-0.047	0.006
CDEV21	0.009	0.698	0.03	0.005	-0.008	0.227	0.026	-0.022	-0.052	-0.027
CDEV22	-0.043	0.678	-0.016	0.046	0.175	0.119	-0.117	-0.039	0.056	-0.017
CDEV23	-0.001	0.075	-0.006	-0.017	-0.004	0.841	0.001	-0.019	0.002	0.006
CDEV24	0.093	0.648	0.023	0.048	0.177	0.142	-0.115	-0.077	0.069	-0.003
CDEV26	0.711	0.216	-0.035	-0.008	0.105	0.031	-0.038	-0.057	0.003	-0.014
CDEV27	-0.041	0.122	-0.618	0.096	0.017	0.027	-0.051	-0.09	-0.031	0.05
CDEV28	-0.001	0.174	0.592	0.008	0.048	0.021	-0.034	-0.062	0.009	-0.009
CDEV29	-0.704	-0.09	-0.038	0.097	-0.017	0.03	-0.022	0.001	0	0.002
CDEV32	0.528	-0.013	0.132	-0.197	0.012	0.184	0.023	-0.086	0.039	-0.008
CDEV34	0.107	0.751	0.015	-0.052	-0.023	-0.024	0.043	0.008	-0.069	0.001
CDEV35	-0.091	0.091	-0.655	0.119	-0.042	0.059	-0.001	-0.033	-0.034	0.004
CDEV37	0.063	0.572	0.19	-0.033	0.038	-0.079	0.042	0.018	-0.027	0.004
CDEV40	0.138	0.021	0.552	-0.044	-0.007	-0.048	0.02	-0.033	0.008	0.03
CDEV43	0.046	0.747	0.042	-0.1	-0.079	-0.152	0.07	0.061	0.01	0.038
CDEV44	0.123	0.557	0.035	-0.07	-0.169	0.127	0.13	0.022	-0.069	-0.009
CDEV48	-0.767	0.026	-0.085	0.008	-0.002	0.02	-0.029	-0.01	0.017	-0.011

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... table A3.15 continued

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10
CDEV49	0.072	0.58	0.029	0.005	0.054	0.18	-0.016	-0.103	0.046	0.018
CDEV50	-0.142	0.038	-0.537	0.092	0.012	0.064	-0.028	-0.035	-0.014	0.022
CDEV51	0.765	0.015	0.027	0.025	0.011	0.013	0.033	-0.018	-0.054	0.01
CDEV53	0.02	-0.007	-0.012	-0.041	-0.034	0.772	0.051	0.063	-0.073	-0.001

Note.— The cells display rotated factor loadings (using oblique quartimin rotation) obtained from factor analysis of all the raw measurements performed using the extraction method of principal factors. Number of initial factors (K^S): 13 (following the Optimal Coordinates method). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6|\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.16: Principal Components Factor Analysis with Promax Rotation and $K^S = 12$, Final Structure from the Raw Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10	Factor11
CogPLCT	-0.065	0.112	0.005	0.768	0.051	0.017	-0.021	0.005	-0.026	-0.032	0.028
CogFMT	0.044	-0.147	-0.025	0.725	-0.048	-0.057	0.008	0.029	0.063	0.018	-0.02
CogSERT	0.004	-0.105	-0.031	0.763	-0.062	-0.042	0.02	0.028	0.022	0.011	-0.006
CogBASTM	-0.022	-0.049	-0.037	0.734	-0.031	0.006	0.006	-0.07	0.018	-0.01	-0.064
CogBASTS	-0.018	0.078	0.019	0.788	-0.013	-0.012	0.007	0.076	-0.015	-0.001	0.024
CogBASTWD	-0.026	0.052	0.021	0.811	0.025	-0.013	-0.029	0.081	-0.01	-0.026	0.043
Rutter1	0.008	-0.091	0.021	0.001	0.734	0.004	0.093	0.022	0.038	-0.149	-0.109
Rutter2	0.039	-0.081	0.037	0.089	0.677	0.008	0.058	-0.046	0.034	0.009	-0.034
Rutter8	0.027	-0.078	0.041	-0.034	0.106	0.006	0.727	0.035	-0.033	-0.138	-0.019
Rutter9	0.004	0.075	-0.009	0.064	-0.06	0.029	0.631	-0.007	-0.068	0.135	-0.029
Rutter15	-0.039	0.016	-0.015	-0.099	0.74	0.016	-0.012	0.016	-0.015	0.037	0.08
Conners1	-0.016	0.025	0.044	0.076	0.121	-0.013	0.008	0.039	-0.048	0.685	0.095
Conners2	0.007	0.005	0.023	0.03	0.052	-0.008	0.051	0.067	-0.052	0.712	0.02
Conners3	0	0.242	-0.067	-0.034	0.626	-0.067	-0.017	-0.059	-0.03	0.081	0.017
Conners5	0.014	-0.04	-0.056	-0.079	-0.095	-0.036	0.041	-0.003	0.064	0.77	-0.03
Conners6	0.017	-0.022	-0.017	0.022	0.038	0.036	-0.041	-0.012	0.015	0.77	-0.064
Conners8	0.006	-0.068	0.008	0.011	0.248	0.047	0.581	-0.013	0.053	-0.037	0.014
Conners9	0.093	-0.159	-0.003	0.035	0.677	0.02	0.23	0.019	-0.007	-0.057	-0.032
Conners12	0.017	0.131	-0.065	-0.011	-0.123	-0.028	0.683	-0.002	-0.055	0.097	-0.005
Conners13	-0.084	0.156	-0.023	-0.033	0.692	0.022	0.008	0.006	-0.036	0.083	0.063
Conners15	-0.048	0.077	0.035	0.076	-0.044	0.023	0.593	-0.068	0.014	0.143	-0.031
Conners16	0.02	-0.008	-0.005	-0.014	0.136	-0.04	0.725	-0.017	0.031	0.005	0.022
Conners17	0.068	-0.059	0.041	-0.042	0.067	-0.016	0.77	-0.003	0.05	-0.034	-0.001
Conners18	-0.051	-0.108	0.055	-0.087	-0.013	0.039	-0.029	0.015	0.042	0.693	-0.044
Conners19	-0.056	0.167	-0.059	-0.055	0.606	-0.018	-0.026	0	0.003	0.16	0.071
Lawseq1	-0.071	0.047	0.063	-0.048	0.083	-0.031	0.044	0.556	-0.131	-0.08	0.101
Lawseq2	0.039	-0.009	0.003	-0.074	0.007	-0.098	-0.046	-0.038	0.777	0.008	0.007
Lawseq3	-0.16	0.073	0.005	0.183	0.003	0.061	0.042	-0.008	0.651	-0.001	0.045
Lawseq4	-0.038	0.05	0.059	-0.125	-0.029	0.05	0.006	0.175	0.62	0.026	-0.011
Lawseq6	0.061	-0.024	-0.033	-0.033	-0.006	0.001	0.065	0.053	0.701	-0.034	0.006
Lawseq10	0.054	-0.066	-0.037	0.126	0.009	0.026	-0.025	-0.105	0.755	0.029	0.014
Caraloc1	-0.043	0.052	0.058	0.116	-0.038	0.003	-0.017	0.56	0.184	-0.015	-0.043
Caraloc5	0.104	-0.07	-0.046	0.092	-0.018	0.078	0.017	0.673	0.033	0.069	0.011
Caraloc6	0.027	-0.038	-0.048	0.086	0	0.008	-0.089	0.721	-0.123	0.072	-0.049
Caraloc11	0.051	0.009	-0.034	0.12	0.01	0.002	0.042	0.667	0.039	0.014	-0.009
Caraloc16	0.002	-0.004	0.049	-0.106	-0.032	-0.023	-0.011	0.655	0.035	-0.026	0.014
CDEV1	-0.095	0.728	0.033	0.124	0.018	0.151	-0.011	-0.031	-0.02	-0.055	0.004
CDEV2	-0.144	0.196	-0.003	-0.116	-0.028	0.702	0.009	-0.018	0.057	0.013	0.018
CDEV3	0.042	0.625	0.021	-0.032	0.014	0.056	-0.055	0.013	0.031	0.044	-0.007
CDEV5	0.674	0.024	0.011	0.037	-0.007	0.102	0.025	0.003	-0.033	-0.014	0.033
CDEV6	0.288	-0.154	0.59	0.035	0.044	0.045	-0.099	-0.045	-0.034	0.084	0.102
CDEV8	0.844	-0.059	-0.044	0.007	-0.064	0.036	0.118	-0.015	-0.023	-0.007	-0.005
CDEV9	0.848	0.032	-0.068	-0.03	-0.027	-0.151	0.034	0.038	0.046	0.005	0.054
CDEV10	0.034	0.043	0.626	0.067	-0.046	0.168	0.015	-0.021	-0.07	0.029	0.156
CDEV12	0.273	0.691	-0.039	-0.021	-0.04	-0.009	-0.029	0.001	-0.014	-0.008	0.019
CDEV13	-0.135	-0.772	0.077	0.047	-0.046	0.036	-0.001	0.018	0	0.043	-0.033
CDEV14	-0.065	-0.046	0.638	0.089	-0.081	0.159	0.08	-0.023	-0.101	0.005	0.052
CDEV16	0.735	0.24	-0.022	-0.014	0.039	-0.154	-0.01	0.036	-0.013	-0.016	0.036
CDEV18	0.058	-0.098	0.802	-0.003	-0.008	0.025	-0.01	-0.006	0.009	0.007	0.015
CDEV19	-0.028	0.021	0.125	-0.029	0.046	0.79	-0.033	-0.002	0.019	-0.001	-0.017
CDEV21	0.75	-0.018	-0.018	0.008	-0.041	0.23	0.03	0.012	-0.037	-0.032	0
CDEV22	0.736	-0.1	-0.039	0.027	0.135	0.115	-0.11	0.055	0.032	-0.012	-0.035
CDEV23	0.093	-0.047	-0.017	-0.005	0.002	0.89	-0.014	0.007	0.005	0.003	-0.001
CDEV24	0.71	0.04	0.001	0.041	0.143	0.144	-0.122	0.015	0.049	0.001	-0.07
CDEV27	0.162	-0.035	-0.715	0.089	0.035	0.051	-0.075	-0.1	-0.029	0.066	0.019
CDEV28	0.188	-0.047	0.644	0.001	0.033	0.025	-0.033	-0.034	0.012	-0.017	0.015
CDEV29	-0.155	-0.742	0.001	0.071	-0.011	0.058	-0.01	-0.012	-0.019	0.018	0.02
CDEV32	0.032	0.538	0.113	-0.205	0.015	0.185	0.005	-0.044	0.049	-0.028	0.015
CDEV34	0.808	0.092	-0.043	-0.051	-0.052	-0.038	0.055	0.022	-0.043	-0.01	0.028
CDEV35	0.12	-0.099	-0.725	0.093	-0.028	0.076	-0.008	-0.021	-0.041	0.006	0.036
CDEV37	0.647	0.04	0.161	0.004	0.027	-0.099	0.027	-0.003	0.002	0.004	-0.03
CDEV38	0.571	0.019	0.231	0.036	0.086	-0.082	-0.093	0.003	-0.021	0.032	-0.081

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... table A3.16 continued

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10	Factor11
CDEV39	0.529	0.077	0.204	0.102	0.068	-0.083	-0.099	-0.084	0.007	0.025	-0.107
CDEV40	0.017	0.137	0.623	0.009	-0.016	-0.063	0.002	-0.059	0.027	0.036	-0.097
CDEV43	0.815	0.02	-0.022	-0.1	-0.094	-0.173	0.069	0.029	0.045	0.029	0.075
CDEV44	0.626	0.109	-0.029	-0.048	-0.196	0.138	0.139	-0.016	-0.022	-0.019	0.036
CDEV48	-0.028	-0.826	-0.046	-0.034	0	0.044	-0.013	-0.024	0	0.004	0.043
CDEV49	0.641	0.044	-0.012	-0.008	0.025	0.187	-0.012	-0.033	0.053	0.012	-0.015
CDEV50	0.061	-0.162	-0.615	0.043	0.035	0.092	-0.032	-0.022	-0.024	0.023	0.094
CDEV51	0.077	0.811	-0.013	0.068	0.007	-0.006	0.018	-0.01	-0.036	-0.006	-0.044
CDEV53	0.008	-0.026	-0.038	-0.002	-0.014	0.865	0.022	0.051	-0.058	0.002	-0.039
Height at 10	0.029	-0.028	-0.029	0.01	0.024	0.065	-0.033	0.036	-0.001	-0.04	0.814
Head at 10	0.001	-0.008	0.059	0.082	-0.066	-0.056	0.014	-0.082	0.081	-0.008	0.663
Weight at 10	0.015	-0.022	0.037	-0.03	0.045	-0.062	-0.003	-0.007	0.004	0.009	0.884

Note.— The cells display rotated factor loadings (using oblique promax rotation) obtained from factor analysis of all the raw measurements performed using the extraction method of principal components. Number of initial components (K^S): 12 (following Velicer's method). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6 |\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.17: Principal Components Factor Analysis with Quartimin Rotation and $K^S = 12$, Final Structure from the Raw Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10	Factor11
CogPLCT	0.1	-0.062	0.008	0.758	0.049	0.015	-0.024	0.004	-0.021	-0.028	0.037
CogFMT	-0.142	0.05	-0.034	0.728	-0.052	-0.063	-0.002	0.039	0.072	0.017	-0.013
CogSERT	-0.107	0.01	-0.04	0.762	-0.065	-0.045	0.012	0.038	0.031	0.009	0.004
CogBASTM	-0.049	-0.016	-0.04	0.732	-0.034	-0.005	0.001	-0.063	0.024	-0.01	-0.055
CogBASTS	0.075	-0.02	0.019	0.779	-0.017	-0.018	0.006	0.078	-0.008	0.001	0.035
CogBASTWD	0.048	-0.026	0.018	0.802	0.022	-0.016	-0.032	0.084	-0.002	-0.025	0.054
Rutter1	-0.054	0.016	0.029	-0.012	0.715	-0.011	0.081	0.015	0.029	-0.117	-0.116
Rutter2	-0.038	0.044	0.046	0.077	0.655	-0.009	0.052	-0.054	0.021	0.04	-0.039
Rutter8	-0.058	0.026	0.026	-0.039	0.105	0.016	0.713	0.034	-0.039	-0.115	-0.02
Rutter9	0.068	0.003	-0.013	0.051	-0.065	0.048	0.628	-0.013	-0.076	0.153	-0.027
Rutter15	0.046	-0.031	-0.008	-0.119	0.695	0.013	-0.018	0.006	-0.03	0.081	0.07
Conners1	0.029	-0.014	0.048	0.071	0.124	-0.006	0.023	0.028	-0.055	0.683	0.101
Conners2	0.003	0.007	0.029	0.025	0.061	0.001	0.068	0.055	-0.058	0.705	0.026
Conners3	0.251	0.002	-0.043	-0.054	0.6	-0.061	-0.019	-0.074	-0.047	0.118	0.006
Conners5	-0.033	0.013	-0.05	-0.069	-0.091	-0.041	0.059	-0.01	0.059	0.757	-0.029
Conners6	-0.013	0.017	-0.005	0.024	0.046	0.03	-0.02	-0.024	0.009	0.759	-0.059
Conners8	-0.055	0.009	0.003	0.01	0.265	0.058	0.568	-0.019	0.047	-0.02	0.009
Conners9	-0.121	0.095	0.004	0.025	0.679	0.011	0.223	0.011	-0.015	-0.032	-0.037
Conners10	-0.092	0.086	0.034	-0.007	0.515	-0.014	0.302	0.008	0.013	0.017	-0.01
Conners12	0.119	0.009	-0.066	-0.021	-0.122	-0.009	0.682	-0.007	-0.063	0.111	-0.003
Conners13	0.175	-0.078	-0.011	-0.057	0.646	0.025	0.005	-0.008	-0.052	0.129	0.054
Conners15	0.082	-0.05	0.024	0.066	-0.048	0.037	0.593	-0.067	0.004	0.16	-0.026
Conners16	0.004	0.018	-0.014	-0.022	0.133	-0.027	0.715	-0.017	0.021	0.029	0.02
Conners17	-0.04	0.064	0.031	-0.045	0.071	-0.006	0.759	-0.005	0.042	-0.012	-0.004
Conners18	-0.089	-0.041	0.05	-0.076	-0.016	0.033	-0.016	0.008	0.039	0.687	-0.044
Conners19	0.173	-0.052	-0.045	-0.079	0.567	-0.008	-0.026	-0.011	-0.013	0.199	0.063
Lawseq1	0.048	-0.08	0.051	-0.059	0.072	-0.025	0.044	0.551	-0.116	-0.076	0.108
Lawseq2	-0.012	0.038	0.003	-0.069	0.007	-0.09	-0.058	-0.014	0.767	0.003	0.001
Lawseq3	0.07	-0.161	-0.001	0.179	-0.008	0.059	0.04	0.013	0.646	-0.002	0.048
Lawseq4	0.051	-0.045	0.056	-0.126	-0.034	0.055	0.002	0.189	0.617	0.022	-0.012
Lawseq6	-0.029	0.054	-0.028	-0.032	-0.004	0.002	0.055	0.069	0.695	-0.039	0.001
Lawseq10	-0.061	0.05	-0.035	0.129	0.006	0.024	-0.031	-0.082	0.746	0.024	0.011
Caraloc1	0.032	-0.051	0.056	0.108	-0.028	0.012	-0.021	0.559	0.2	-0.026	-0.035
Caraloc5	-0.069	0.088	-0.037	0.088	-0.016	0.065	0.02	0.661	0.053	0.058	0.015
Caraloc6	-0.037	0.012	-0.048	0.074	-0.011	-0.003	-0.081	0.715	-0.101	0.063	-0.037
Caraloc11	0.014	0.034	-0.028	0.115	0.007	-0.013	0.042	0.657	0.059	0.008	-0.004
Caraloc16	0	-0.015	0.034	-0.116	-0.039	-0.013	-0.008	0.658	0.052	-0.033	0.025
CDEV1	0.706	-0.121	0.062	0.091	0.012	0.17	0.009	-0.048	-0.034	-0.043	0.011
CDEV2	0.206	-0.159	0.017	-0.138	-0.041	0.677	0.036	-0.036	0.05	0.013	0.025
CDEV3	0.599	0.016	0.055	-0.058	0.019	0.081	-0.039	-0.004	0.016	0.05	-0.004
CDEV5	0.038	0.649	0.045	0.035	0.024	0.133	0.014	-0.023	-0.046	-0.007	0.018
CDEV6	-0.102	0.29	0.576	0.038	0.053	0.049	-0.104	-0.054	-0.046	0.094	0.1
CDEV8	-0.029	0.807	0.003	0.007	-0.035	0.036	0.112	-0.041	-0.037	-0.004	-0.021
CDEV9	0.051	0.81	-0.023	-0.029	0.001	-0.132	0.026	0.018	0.031	0.009	0.037
CDEV10	0.065	0.047	0.609	0.067	-0.036	0.185	0.006	-0.039	-0.078	0.042	0.152
CDEV12	0.666	0.235	0.013	-0.045	-0.027	0.016	-0.014	-0.025	-0.031	0	0.014
CDEV13	-0.744	-0.099	0.028	0.075	-0.049	0.012	-0.017	0.04	0.018	0.03	-0.029
CDEV14	-0.037	-0.041	0.61	0.09	-0.063	0.186	0.065	-0.036	-0.105	0.015	0.051
CDEV16	0.257	0.694	0.021	-0.02	0.064	-0.125	-0.015	0.014	-0.029	-0.007	0.022
CDEV18	-0.067	0.077	0.772	-0.004	0.004	0.044	-0.023	-0.012	0	0.019	0.017
CDEV19	0.066	-0.043	0.132	-0.049	0.032	0.765	-0.01	-0.018	0.013	0.002	-0.007
CDEV20	-0.132	0.259	0.038	0.077	0.041	0.625	-0.058	0.014	-0.055	0.009	0.01
CDEV21	0.017	0.714	0.022	0.005	-0.018	0.24	0.027	-0.014	-0.05	-0.027	-0.012
CDEV22	-0.033	0.697	-0.018	0.029	0.156	0.128	-0.114	0.042	0.021	-0.008	-0.043
CDEV23	0.003	0.073	-0.004	-0.02	-0.008	0.867	0.008	-0.014	0	0.003	0.005
CDEV24	0.106	0.665	0.03	0.034	0.161	0.152	-0.119	0	0.034	0.006	-0.075
CDEV26	0.7	0.248	-0.018	-0.044	0.1	0.035	-0.036	-0.01	-0.017	-0.021	-0.022
CDEV27	-0.029	0.135	-0.694	0.089	0.018	0.036	-0.061	-0.09	-0.026	0.058	0.021
CDEV28	-0.004	0.193	0.625	-0.003	0.038	0.04	-0.04	-0.039	-0.001	-0.003	0.016
CDEV29	-0.715	-0.12	-0.046	0.101	-0.014	0.035	-0.027	0.009	0	0.006	0.021
CDEV32	0.538	0.006	0.14	-0.227	0.017	0.197	0.023	-0.061	0.031	-0.02	0.016
CDEV34	0.114	0.768	0.002	-0.052	-0.023	-0.019	0.05	-0.003	-0.058	-0.005	0.012

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Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10	Factor11
CDEV35	-0.1	0.095	-0.711	0.095	-0.037	0.064	0.004	-0.009	-0.033	-0.009	0.04
CDEV37	0.06	0.618	0.195	-0.009	0.041	-0.09	0.027	-0.017	-0.016	0.013	-0.035
CDEV38	0.06	0.532	0.238	0.01	0.098	-0.058	-0.08	0.008	-0.039	0.034	-0.065
CDEV40	0.146	0.025	0.616	-0.002	-0.005	-0.054	0.002	-0.066	0.014	0.044	-0.093
CDEV43	0.036	0.779	0.023	-0.096	-0.065	-0.163	0.064	0.009	0.03	0.03	0.057
CDEV44	0.118	0.59	0.018	-0.053	-0.171	0.138	0.143	-0.042	-0.035	-0.021	0.024
CDEV48	-0.777	-0.001	-0.098	0	-0.006	0.023	-0.031	0.001	0.017	-0.007	0.042
CDEV49	0.074	0.609	0.022	-0.013	0.049	0.206	-0.016	-0.055	0.038	0.016	-0.026
CDEV50	-0.157	0.045	-0.611	0.048	0.022	0.084	-0.026	-0.01	-0.016	0.014	0.096
CDEV51	0.772	0.043	0.039	0.034	0.015	0.012	0.04	-0.035	-0.053	0.004	-0.042
CDEV53	0.015	-0.011	-0.016	-0.018	-0.026	0.818	0.049	0.026	-0.058	-0.001	-0.032
Height at 10	-0.012	0.009	-0.041	0.011	0.003	0.061	-0.019	0.043	-0.005	-0.039	0.816
Head at 10	-0.01	-0.008	0.037	0.083	-0.078	-0.034	0.018	-0.067	0.074	-0.007	0.666
Weight at 10	-0.017	0.002	0.018	-0.025	0.028	-0.048	0.003	0.001	-0.002	0.014	0.881

Note.— The cells display rotated factor loadings (using oblique quartimin rotation) obtained from factor analysis of all the raw measurements performed using the extraction method of principal components. Number of initial components (K^S): 12 (following Velicer's method). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6|\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.18: Maximum Likelihood Factor Analysis with Promax Rotation and $K^S = 5$, Final Structure from the Residualized Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5
CogFMT	-0.009	-0.018	-0.055	0.796	0.012
CogSERT	-0.037	-0.014	-0.025	0.818	0.015
CogBASTM	-0.031	-0.02	0.02	0.645	-0.01
CogBASTS	0	0.069	0.006	0.663	0.012
CogBASTWD	-0.004	0.061	-0.005	0.693	0.003
Rutter8	-0.05	-0.006	0.044	0.016	0.701
Rutter14	0.14	-0.021	-0.059	-0.064	0.507
Conners8	-0.04	-0.007	0.042	-0.02	0.663
Conners9	0.116	0.005	-0.039	0.005	0.532
Conners10	0.076	0.03	-0.051	-0.012	0.548
Conners16	-0.042	-0.007	0.007	0.021	0.739
Conners17	-0.038	0.01	0.034	0.034	0.784
CDEV2	-0.119	0.061	0.633	-0.166	0.008
CDEV5	0.65	0.027	0.094	0.054	0.001
CDEV6	0.22	0.581	-0.01	0.066	-0.031
CDEV8	0.803	-0.088	0.036	0.058	0.058
CDEV9	0.843	-0.081	-0.142	0.007	0.004
CDEV10	0.013	0.654	0.133	0.031	-0.013
CDEV14	-0.113	0.627	0.13	0.062	0.034
CDEV16	0.817	0.019	-0.131	-0.081	-0.012
CDEV18	-0.011	0.79	-0.022	0.039	-0.005
CDEV19	-0.05	0.146	0.733	-0.049	0.019
CDEV20	0.201	0.04	0.508	0.101	-0.011
CDEV21	0.721	-0.045	0.219	0.041	0
CDEV22	0.711	-0.06	0.073	0.067	-0.029
CDEV23	0.047	-0.043	0.892	0.009	0.005
CDEV24	0.741	0.008	0.113	0.018	-0.035
CDEV25	0.665	0.119	0.035	-0.106	-0.044
CDEV27	0.149	-0.601	0.024	0.029	-0.034
CDEV28	0.155	0.631	-0.013	0.008	-0.013
CDEV34	0.834	-0.051	-0.016	-0.043	0
CDEV35	0.078	-0.636	0.044	0.105	-0.011
CDEV37	0.634	0.147	-0.089	-0.018	0.033
CDEV38	0.565	0.225	-0.09	-0.011	-0.013
CDEV39	0.542	0.218	-0.077	0.012	-0.043
CDEV40	0.052	0.566	-0.037	-0.085	0.008
CDEV43	0.78	-0.042	-0.149	-0.025	0.009
CDEV44	0.589	-0.017	0.154	-0.025	0.003
CDEV49	0.631	-0.007	0.156	-0.037	-0.015
CDEV53	-0.025	-0.048	0.821	-0.001	0.03

Note.— The cells display rotated factor loadings (using oblique promax rotation) obtained from factor analysis of all the residualized measurements performed using the extraction method of maximum likelihood. Number of initial factors (K^S): 5 (following Onatski (2009)). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6|\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.19: Maximum Likelihood Factor Analysis with Quartimin Rotation and $K^S = 5$, Final Structure from the Residualized Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5
CogFMT	-0.003	-0.023	-0.05	0.796	0
CogSERT	-0.03	-0.02	-0.022	0.818	0.002
CogBASTM	-0.025	-0.024	0.022	0.644	-0.021
CogBASTS	0.007	0.064	0.011	0.661	0.002
CogBASTWD	0.003	0.055	0	0.691	-0.008
Rutter8	-0.035	-0.004	0.033	0.007	0.696
Rutter14	0.143	-0.017	-0.063	-0.07	0.508
Conners8	-0.027	-0.005	0.032	-0.028	0.659
Conners9	0.122	0.008	-0.043	-0.002	0.531
Conners10	0.083	0.032	-0.055	-0.019	0.547
Conners16	-0.028	-0.006	-0.003	0.012	0.734
Conners17	-0.022	0.012	0.023	0.024	0.779
CDEV2	-0.099	0.074	0.62	-0.172	0.004
CDEV5	0.641	0.046	0.104	0.048	0.01
CDEV6	0.228	0.575	0.006	0.054	-0.025
CDEV8	0.788	-0.063	0.047	0.053	0.07
CDEV9	0.821	-0.06	-0.126	0.004	0.019
CDEV10	0.03	0.644	0.143	0.017	-0.011
CDEV14	-0.092	0.614	0.137	0.05	0.033
CDEV16	0.797	0.039	-0.115	-0.086	0.004
CDEV18	0.005	0.773	-0.007	0.025	-0.003
CDEV19	-0.026	0.161	0.722	-0.057	0.014
CDEV20	0.212	0.058	0.504	0.095	-0.013
CDEV21	0.712	-0.019	0.227	0.035	0.01
CDEV22	0.698	-0.038	0.083	0.063	-0.019
CDEV23	0.07	-0.018	0.876	0.002	-0.002
CDEV24	0.729	0.031	0.124	0.012	-0.023
CDEV25	0.654	0.136	0.048	-0.113	-0.03
CDEV27	0.134	-0.585	0.015	0.039	-0.035
CDEV28	0.165	0.622	0.002	-0.005	-0.008
CDEV34	0.816	-0.028	-0.003	-0.047	0.015
CDEV35	0.065	-0.621	0.033	0.116	-0.014
CDEV37	0.622	0.16	-0.074	-0.024	0.045
CDEV38	0.556	0.234	-0.075	-0.018	-0.002
CDEV39	0.533	0.226	-0.061	0.005	-0.032
CDEV40	0.062	0.556	-0.025	-0.095	0.013
CDEV43	0.759	-0.024	-0.134	-0.028	0.024
CDEV44	0.581	0.004	0.161	-0.03	0.012
CDEV49	0.623	0.015	0.164	-0.043	-0.005
CDEV53	-0.002	-0.026	0.806	-0.007	0.022

Note.— The cells display rotated factor loadings (using oblique quartimin rotation) obtained from factor analysis of all the residualized measurements performed using the extraction method of maximum likelihood. Number of initial factors (K^S): 5 (following Onatski (2009)). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6|\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.20: Principal Axes Factor Analysis with Promax Rotation and $K^S = 5$, Final Structure from the Residualized Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4
CogFMT	-0.014	-0.08	0.004	0.773
CogSERT	-0.044	-0.049	0.008	0.784
CogBASTM	-0.043	0.005	-0.011	0.635
CogBASTS	0.02	0.026	0.009	0.672
CogBASTWD	0.007	0.006	0.005	0.697
Rutter8	-0.053	0.039	0.676	0.009
Rutter14	0.123	-0.059	0.512	-0.061
Conners8	-0.045	0.039	0.671	-0.018
Conners9	0.09	-0.041	0.582	0.008
Conners10	0.068	-0.048	0.592	-0.008
Conners16	-0.048	0.011	0.712	0.018
Conners17	-0.035	0.042	0.752	0.026
CDEV2	-0.138	0.665	-0.002	-0.173
CDEV5	0.662	0.113	-0.011	0.046
CDEV8	0.799	0.011	0.043	0.062
CDEV9	0.842	-0.191	-0.006	0.004
CDEV16	0.818	-0.132	-0.014	-0.095
CDEV19	-0.069	0.783	0.012	-0.077
CDEV20	0.184	0.522	-0.02	0.082
CDEV21	0.704	0.217	-0.014	0.037
CDEV22	0.648	0.016	-0.01	0.053
CDEV23	-0.027	0.852	0.004	-0.004
CDEV30	0.277	0.537	0	0.035
CDEV33	0.001	0.539	0.031	0.09
CDEV34	0.831	-0.022	-0.012	-0.041
CDEV37	0.675	-0.019	0.018	-0.042
CDEV43	0.808	-0.176	-0.013	-0.032
CDEV44	0.604	0.2	-0.026	-0.016
CDEV49	0.615	0.158	-0.016	-0.043
CDEV53	-0.086	0.81	0.024	-0.002

Note.— The cells display rotated factor loadings (using oblique promax rotation) obtained from factor analysis of all the residualized measurements performed using the extraction method of principal factors. Number of initial factors (K^S): 5 (following Onatski (2009)). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6|\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental ‘A’ Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.21: Principal Axes Factor Analysis with Quartimin Rotation and $K^S = 5$, Final Structure from the Residualized Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5
CogFMT	-0.007	-0.055	-0.006	0.77	-0.029
CogSERT	-0.033	-0.027	-0.004	0.784	-0.03
CogBASTM	-0.025	0.025	-0.022	0.633	-0.038
CogBASTS	0.015	0.034	0.005	0.684	0.052
CogBASTWD	0.007	0.005	-0.001	0.706	0.058
Rutter8	-0.039	0.035	0.672	-0.001	-0.02
Rutter14	0.127	-0.062	0.514	-0.064	0.002
Conners8	-0.039	0.027	0.669	-0.027	-0.001
Conners9	0.1	-0.07	0.582	0.012	0.053
Conners10	0.064	-0.078	0.595	-0.004	0.071
Conners16	-0.033	0.011	0.707	0.007	-0.028
Conners17	-0.027	0.045	0.749	0.017	-0.014
CDEV2	-0.095	0.636	-0.004	-0.168	0.045
CDEV5	0.654	0.126	0.009	0.036	-0.026
CDEV8	0.791	0.073	0.065	0.051	-0.108
CDEV9	0.815	-0.143	0.018	-0.003	-0.07
CDEV16	0.795	-0.123	0.01	-0.089	0.039
CDEV18	0.109	0.137	-0.016	0.012	0.584
CDEV19	-0.014	0.727	0.008	-0.059	0.132
CDEV21	0.718	0.242	0.002	0.031	-0.052
CDEV22	0.701	-0.001	-0.011	0.054	0.003
CDEV23	0.063	0.821	-0.007	-0.009	-0.02
CDEV24	0.736	0.058	-0.013	0.011	0.094
CDEV25	0.666	0.021	-0.021	-0.105	0.186
CDEV27	0.094	-0.08	-0.032	0.024	-0.587
CDEV30	0.267	0.526	0.019	0.065	0.141
CDEV33	0.008	0.509	0.04	0.111	0.117
CDEV34	0.813	0.021	0.013	-0.047	-0.061
CDEV35	0.013	-0.059	-0.009	0.097	-0.605
CDEV37	0.637	-0.031	0.047	-0.011	0.155
CDEV38	0.578	-0.086	0.009	0.001	0.297
CDEV39	0.555	-0.053	-0.026	0.033	0.285
CDEV43	0.764	-0.123	0.017	-0.032	-0.046
CDEV44	0.595	0.257	-0.004	-0.02	-0.081
CDEV49	0.633	0.16	-0.004	-0.048	-0.019
CDEV53	-0.014	0.806	0.017	-0.005	-0.037

Note.— The cells display rotated factor loadings (using oblique quartimin rotation) obtained from factor analysis of all the residualized measurements performed using the extraction method of principal factors. Number of initial factors (K^S): 5 (following Onatski (2009)). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6|\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.22: Principal Components Factor Analysis with Promax Rotation and $K^S = 4$, Final Structure from the Residualized Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4
CogPLCT	0.014	0.021	0.048	0.663
CogFMT	-0.008	-0.004	-0.125	0.787
CogSERT	-0.041	-0.002	-0.077	0.811
CogBASTM	-0.035	-0.007	-0.014	0.692
CogBASTS	0.031	0.005	0.037	0.753
CogBASTWD	0.031	-0.008	0.001	0.787
Rutter3	0.03	0.536	-0.045	-0.043
Rutter8	-0.051	0.652	0.041	0.014
Rutter9	-0.07	0.612	0.131	0.042
Rutter10	0.083	0.511	-0.111	-0.055
Rutter14	0.131	0.595	-0.085	-0.06
Rutter18	0.103	0.545	-0.122	-0.083
Rutter19	0.049	0.54	-0.11	-0.044
Conners7	-0.138	0.538	0.113	0.072
Conners8	-0.05	0.666	0.043	-0.007
Conners9	0.132	0.564	-0.075	0.015
Conners10	0.099	0.563	-0.063	0
Conners11	0.118	0.579	-0.048	-0.016
Conners12	-0.08	0.607	0.086	-0.001
Conners15	-0.103	0.569	0.141	0.044
Conners16	-0.056	0.731	0.019	0.025
Conners17	-0.037	0.732	0.046	0.023
CDEV2	-0.128	0.001	0.684	-0.194
CDEV5	0.672	0.007	0.109	0.06
CDEV8	0.782	0.064	0.019	0.084
CDEV9	0.829	0.012	-0.179	0.026
CDEV10	0.177	-0.036	0.571	-0.01
CDEV14	0.039	0.004	0.574	0.029
CDEV16	0.83	0.005	-0.111	-0.072
CDEV19	-0.011	-0.006	0.767	-0.088
CDEV21	0.719	-0.001	0.188	0.044
CDEV22	0.74	-0.037	-0.044	0.061
CDEV23	0.037	-0.004	0.773	-0.024
CDEV24	0.783	-0.037	0.041	0.001
CDEV25	0.733	-0.041	0.064	-0.118
CDEV30	0.271	0.02	0.61	0.058
CDEV33	-0.026	0.063	0.656	0.128
CDEV34	0.814	0.016	-0.006	-0.023
CDEV37	0.702	0.029	0.017	-0.012
CDEV38	0.682	-0.024	-0.002	-0.03
CDEV39	0.652	-0.053	0.023	0
CDEV43	0.782	0.005	-0.143	-0.004
CDEV44	0.577	0.006	0.242	0
CDEV47	-0.064	-0.005	0.655	-0.014
CDEV49	0.649	-0.007	0.157	-0.028
CDEV53	-0.053	0.026	0.775	-0.015

Note.— The cells display rotated factor loadings (using oblique promax rotation) obtained from factor analysis of all the residualized measurements performed using the extraction method of principal components. Number of initial components (K^S): 4 (following the Scree plot). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6|\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.23: Principal Components Factor Analysis with Quartimin Rotation and $K^S = 4$, Final Structure from the Residualized Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4
CogPLCT	0.014	0.015	0.063	0.664
CogFMT	-0.013	-0.01	-0.106	0.788
CogSERT	-0.045	-0.008	-0.058	0.813
CogBASTM	-0.037	-0.013	0.002	0.693
CogBASTS	0.03	-0.001	0.054	0.755
CogBASTWD	0.028	-0.014	0.02	0.789
Rutter3	0.034	0.535	-0.051	-0.049
Rutter8	-0.042	0.649	0.034	0.008
Rutter9	-0.06	0.608	0.124	0.037
Rutter10	0.084	0.511	-0.115	-0.061
Rutter14	0.134	0.595	-0.089	-0.067
Rutter18	0.104	0.545	-0.126	-0.09
Rutter19	0.051	0.54	-0.114	-0.051
Conners7	-0.129	0.534	0.107	0.068
Conners8	-0.042	0.663	0.036	-0.013
Conners9	0.135	0.564	-0.077	0.008
Conners10	0.103	0.563	-0.067	-0.006
Conners11	0.122	0.579	-0.052	-0.022
Conners12	-0.07	0.605	0.079	-0.006
Conners15	-0.092	0.566	0.135	0.04
Conners16	-0.048	0.728	0.012	0.019
Conners17	-0.028	0.729	0.039	0.016
CDEV2	-0.108	-0.001	0.673	-0.191
CDEV5	0.67	0.014	0.119	0.056
CDEV8	0.777	0.072	0.031	0.078
CDEV9	0.818	0.022	-0.166	0.019
CDEV10	0.191	-0.035	0.569	-0.009
CDEV14	0.055	0.003	0.572	0.031
CDEV16	0.821	0.015	-0.1	-0.078
CDEV19	0.011	-0.007	0.759	-0.085
CDEV21	0.719	0.006	0.198	0.04
CDEV22	0.733	-0.029	-0.032	0.057
CDEV23	0.058	-0.005	0.768	-0.022
CDEV24	0.778	-0.028	0.053	-0.004
CDEV25	0.729	-0.032	0.071	-0.123
CDEV30	0.286	0.021	0.611	0.058
CDEV33	-0.007	0.06	0.654	0.13
CDEV34	0.808	0.025	0.005	-0.029
CDEV37	0.698	0.037	0.026	-0.017
CDEV38	0.677	-0.016	0.007	-0.034
CDEV39	0.647	-0.046	0.033	-0.004
CDEV43	0.773	0.014	-0.131	-0.01
CDEV44	0.58	0.012	0.249	-0.003
CDEV47	-0.046	-0.007	0.65	-0.011
CDEV49	0.649	0.001	0.164	-0.032
CDEV53	-0.031	0.024	0.769	-0.012

Note.— The cells display rotated factor loadings (using oblique quartimin rotation) obtained from factor analysis of all the residualized measurements performed using the extraction method of principal components. Number of initial components (K^S): 4 (following the Scree plot). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6|\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.24: Maximum Likelihood Factor Analysis with Promax Rotation and $K^S = 11$, Final Structure from the Residualized Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
CogPLCT	0.092	-0.053	0.009	0.024	0.028	0.613	-0.006	0.008
CogFMT	-0.135	0.039	-0.005	-0.034	-0.051	0.711	0.014	-0.009
CogSERT	-0.082	-0.003	-0.019	-0.053	-0.025	0.758	0.024	0.001
CogBASTM	-0.058	-0.012	-0.033	-0.015	0.026	0.604	-0.018	-0.002
CogBASTS	0.067	-0.018	0.028	-0.012	0.002	0.7	0.001	0.018
CogBASTWD	0.061	-0.037	0.032	0.018	-0.004	0.752	-0.016	-0.006
Rutter1	-0.039	0.017	0	0.546	-0.019	0.024	0.128	-0.077
Rutter2	-0.032	0.043	0.024	0.511	-0.009	0.069	0.086	0.05
Rutter8	-0.013	0.004	0.013	-0.017	0.015	-0.006	0.723	-0.049
Rutter15	-0.04	-0.028	0.02	0.76	0.025	-0.057	-0.047	-0.018
Conners1	0.011	-0.02	0.018	0.022	-0.019	0.018	-0.02	0.834
Conners2	-0.025	0.009	0	-0.021	-0.015	-0.012	0.016	0.807
Conners3	0.186	0.013	-0.039	0.625	-0.047	-0.06	-0.041	0.055
Conners6	-0.034	-0.008	-0.005	0.057	0.02	-0.015	0.002	0.575
Conners8	-0.035	0.001	-0.008	0.152	0.038	-0.016	0.536	0.006
Conners9	-0.107	0.09	-0.01	0.552	0.016	0.055	0.239	-0.045
Conners12	0.093	0.009	-0.063	-0.082	0.013	-0.017	0.516	0.117
Conners13	0.068	-0.067	0.013	0.756	0.042	-0.027	-0.04	0.012
Conners16	0.018	-0.006	-0.018	0.051	-0.021	0.016	0.714	0.042
Conners17	0.006	0.024	0.032	-0.055	-0.013	0.005	0.841	-0.026
Conners19	0.07	-0.041	-0.012	0.659	0.007	-0.028	-0.049	0.039
CDEV1	0.671	-0.119	0.038	0.011	0.14	0.077	-0.009	-0.026
CDEV2	0.161	-0.164	0.001	-0.033	0.627	-0.105	0.017	0.021
CDEV3	0.56	0.005	0.041	-0.006	0.043	-0.035	-0.024	0.044
CDEV5	0.024	0.636	0.045	0.028	0.108	0.052	-0.033	0.007
CDEV6	-0.104	0.243	0.583	0.052	0.023	0.03	-0.082	0.062
CDEV8	-0.057	0.821	-0.016	-0.034	0.045	0.013	0.067	-0.003
CDEV9	0.008	0.83	-0.034	0.016	-0.132	-0.007	-0.017	-0.005
CDEV10	0.04	0.04	0.612	-0.022	0.134	0.051	-0.027	0.058
CDEV12	0.678	0.231	-0.021	-0.031	-0.009	-0.014	-0.038	0.009
CDEV13	-0.791	-0.082	0.076	-0.036	0.036	0.014	-0.01	0.026
CDEV14	-0.045	-0.05	0.609	-0.059	0.132	0.046	0.04	0.032
CDEV16	0.244	0.71	-0.003	0.063	-0.138	0.004	-0.046	-0.009
CDEV18	-0.089	0.034	0.805	0	-0.013	0.007	-0.003	-0.012
CDEV19	0.038	-0.087	0.114	0.042	0.75	-0.021	-0.002	-0.023
CDEV20	-0.128	0.222	0.06	0.038	0.541	0.054	-0.055	0.007
CDEV21	0.014	0.677	0.014	-0.017	0.222	0.023	0.018	-0.036
CDEV23	-0.032	0.026	-0.043	0.01	0.903	-0.002	-0.009	-0.011
CDEV26	0.758	0.211	-0.069	0.069	-0.003	0.001	-0.028	-0.021
CDEV27	-0.032	0.137	-0.625	0.034	0.056	0.01	-0.065	0.045
CDEV28	-0.013	0.15	0.628	0.036	0.002	0.002	-0.023	-0.024
CDEV29	-0.751	-0.106	0.012	-0.001	0.057	0.041	-0.013	-0.006
CDEV32	0.559	-0.027	0.107	-0.006	0.165	-0.181	0.023	-0.011
CDEV34	0.088	0.807	-0.025	-0.014	-0.016	-0.03	-0.001	-0.001
CDEV35	-0.079	0.107	-0.654	-0.038	0.074	0.058	-0.01	0.014
CDEV37	0.027	0.611	0.166	0.047	-0.073	-0.01	0.006	-0.001
CDEV40	0.128	0.006	0.562	-0.008	-0.059	-0.029	0.023	0.012
CDEV43	0.004	0.799	0.008	-0.062	-0.151	-0.049	0.026	0.024
CDEV44	0.093	0.602	0	-0.14	0.139	-0.026	0.074	-0.01
CDEV48	-0.794	0.015	-0.045	0.011	0.048	-0.029	-0.027	-0.01
CDEV49	0.088	0.554	0.011	0.032	0.161	-0.014	-0.034	0.01
CDEV50	-0.133	0.044	-0.532	0.018	0.081	0.05	-0.041	0.041
CDEV51	0.804	0.023	-0.008	0	-0.005	0.054	0.028	0.003
CDEV53	-0.014	-0.023	-0.06	-0.001	0.83	0.001	0.02	-0.005

Note.— The cells display rotated factor loadings (using oblique promax rotation) obtained from factor analysis of all the residualized measurements performed using the extraction method of maximum likelihood. Number of initial factors (K^S): 11 (following the Optimal Coordinates method). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6|\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.25: Maximum Likelihood Factor Analysis with Quartimin Rotation and $K^S = 11$, Final Structure from the Residualized Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9
CogPLCT	0.103	-0.052	0.009	0.615	0.018	0.025	-0.004	0.007	0.009
CogFMT	-0.117	0.045	-0.017	0.72	-0.033	-0.049	0.008	0.003	-0.013
CogSERT	-0.067	0.002	-0.028	0.769	-0.033	-0.024	0.017	-0.014	-0.006
CogBASTM	-0.039	-0.013	-0.037	0.607	-0.041	0.023	-0.025	0.033	-0.001
CogBASTS	0.078	-0.016	0.026	0.705	0.008	0.001	0.006	-0.021	0.015
CogBASTWD	0.074	-0.034	0.028	0.757	0.019	-0.004	-0.017	0.008	-0.008
Rutter1	0.024	-0.037	-0.003	-0.025	-0.015	-0.007	0.014	0.793	-0.014
Rutter2	0.02	0.011	0.018	0.029	0.054	0.001	0.006	0.616	0.114
Rutter8	-0.003	0.005	0.009	-0.015	-0.054	0.018	0.686	0.092	-0.029
Rutter15	-0.056	0	0.017	-0.055	0.606	0.008	-0.007	0.198	0.003
Conners1	0.019	-0.02	0.01	0.016	0.004	-0.008	-0.013	0.01	0.837
Conners2	-0.018	0.007	-0.007	-0.014	-0.024	-0.003	0.021	-0.005	0.806
Conners3	0.158	0.028	-0.033	-0.063	0.514	-0.053	-0.006	0.152	0.07
Conners6	-0.029	-0.003	-0.011	-0.017	0.037	0.026	0.011	0.013	0.579
Conners8	-0.018	-0.002	-0.011	-0.029	0.033	0.037	0.505	0.183	0.033
Conners9	-0.064	0.068	-0.015	0.022	0.132	0.022	0.175	0.581	0.011
Conners12	0.078	0.013	-0.057	-0.013	0.01	0.014	0.518	-0.08	0.113
Conners13	-0.003	-0.022	0.017	0.003	0.855	0.024	0.025	-0.025	-0.01
Conners16	0.008	0.008	-0.021	0.019	0.085	-0.02	0.706	0.006	0.05
Conners17	-0.002	0.037	0.028	0.006	0.008	-0.009	0.824	-0.02	-0.02
Conners19	0.009	0.002	-0.01	-0.004	0.744	-0.012	0.025	-0.058	0.023
CDEV1	0.653	-0.127	0.064	0.056	0.026	0.145	-0.004	-0.012	-0.019
CDEV2	0.171	-0.152	0.026	-0.116	-0.022	0.604	0.022	-0.021	0.027
CDEV3	0.543	-0.007	0.062	-0.054	-0.001	0.057	-0.027	0.011	0.05
CDEV5	0.038	0.609	0.068	0.043	0.022	0.123	-0.016	0.028	0.013
CDEV6	-0.083	0.253	0.566	0.022	0.049	0.039	-0.076	0.012	0.072
CDEV8	-0.048	0.794	0.007	0.006	-0.011	0.07	0.079	0.007	0
CDEV9	-0.004	0.817	-0.018	-0.013	0.055	-0.099	0.004	-0.023	-0.003
CDEV10	0.052	0.052	0.604	0.047	0.063	0.137	-0.003	-0.098	0.055
CDEV12	0.653	0.203	0.014	-0.035	0.005	0.012	-0.028	-0.022	0.011
CDEV13	-0.759	-0.059	0.041	0.037	-0.055	0.018	-0.017	0	0.021
CDEV14	-0.024	-0.037	0.595	0.042	-0.002	0.13	0.052	-0.073	0.034
CDEV16	0.232	0.689	0.017	-0.011	0.057	-0.103	-0.036	0.038	0
CDEV18	-0.058	0.045	0.775	-0.008	-0.023	0.003	-0.017	0.042	0.003
CDEV19	0.06	-0.056	0.13	-0.034	0.013	0.73	-0.002	0.027	-0.008
CDEV20	-0.105	0.235	0.076	0.053	0.042	0.528	-0.039	-0.006	0.012
CDEV21	0.023	0.664	0.038	0.016	0.008	0.24	0.028	0.001	-0.032
CDEV23	-0.012	0.06	-0.02	-0.007	0.014	0.883	-0.004	-0.011	-0.001
CDEV24	0.151	0.568	0.028	0.048	0.017	0.155	-0.098	0.15	0.007
CDEV26	0.736	0.189	-0.036	-0.024	0.046	0.022	-0.032	0.059	-0.008
CDEV27	-0.05	0.131	-0.601	0.023	0.041	0.046	-0.047	-0.029	0.036
CDEV28	0.009	0.158	0.609	-0.012	0.014	0.02	-0.03	0.043	-0.01
CDEV29	-0.724	-0.077	-0.02	0.066	-0.013	0.037	-0.015	-0.01	-0.013
CDEV32	0.546	-0.039	0.132	-0.202	0.006	0.172	0.026	-0.004	-0.002
CDEV34	0.086	0.78	0	-0.042	0.003	0.014	0.014	0.008	0.004
CDEV35	-0.087	0.096	-0.632	0.068	-0.057	0.063	-0.009	0.006	0.008
CDEV37	0.037	0.589	0.175	-0.027	0.006	-0.046	0.008	0.075	0.013
CDEV40	0.14	0.006	0.548	-0.043	0.001	-0.044	0.019	0.005	0.02
CDEV43	-0.002	0.775	0.024	-0.058	-0.024	-0.117	0.039	-0.02	0.026
CDEV44	0.098	0.57	0.03	-0.034	-0.07	0.154	0.09	-0.059	-0.013
CDEV48	-0.769	0.039	-0.074	-0.003	-0.005	0.03	-0.029	0.003	-0.017
CDEV50	-0.142	0.046	-0.517	0.062	0.012	0.067	-0.03	-0.014	0.035
CDEV51	0.78	-0.003	0.025	0.028	0.008	0.012	0.029	0.011	0.011
CDEV53	0.008	-0.003	-0.032	-0.007	-0.008	0.801	0.024	0.007	0.004

Note.— The cells display rotated factor loadings (using oblique quartimin rotation) obtained from factor analysis of all the residualized measurements performed using the extraction method of maximum likelihood. Number of initial factors (K^S): 11 (following the Optimal Coordinates method). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6|\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.26: Principal Axes Factor Analysis with Promax Rotation and $K^S = 11$, Final Structure from the Residualized Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
CogPLCT	-0.051	0.099	0.005	0.034	0.027	0.625	-0.002	-0.007
CogFMT	0.04	-0.138	-0.017	-0.045	-0.059	0.69	0.01	0.018
CogSERT	0.001	-0.089	-0.025	-0.057	-0.032	0.732	0.018	0.019
CogBASTM	-0.015	-0.053	-0.038	-0.016	0.022	0.595	-0.014	-0.002
CogBASTS	-0.018	0.078	0.026	-0.016	-0.005	0.707	0.011	0.017
CogBASTWD	-0.032	0.066	0.026	0.028	-0.006	0.764	-0.019	-0.012
Rutter1	0.004	-0.078	0.01	0.644	-0.021	0.013	0.131	-0.143
Rutter2	0.033	-0.052	0.029	0.58	-0.013	0.067	0.091	0.008
Rutter8	0.02	-0.035	0.034	0.072	0.021	-0.004	0.678	-0.077
Rutter15	-0.042	0.009	-0.008	0.679	0.01	-0.072	-0.004	0.031
Conners1	-0.018	0.03	0.055	0.097	0.004	0.083	0.003	0.654
Conners2	0.006	0.007	0.031	0.041	0.005	0.056	0.032	0.67
Conners3	0.012	0.208	-0.059	0.585	-0.052	-0.063	-0.011	0.071
Conners5	0.024	-0.032	-0.064	-0.074	-0.047	-0.062	0.025	0.687
Conners6	0.017	-0.013	-0.01	0.033	0.028	0.014	-0.018	0.671
Conners8	0.005	-0.043	0	0.195	0.05	-0.014	0.534	0.007
Conners9	0.084	-0.129	-0.01	0.6	0.009	0.041	0.251	-0.043
Conners12	0.018	0.106	-0.05	-0.056	0.017	-0.004	0.51	0.12
Conners13	-0.082	0.126	-0.018	0.669	0.029	-0.04	0.001	0.071
Conners16	0.013	0.011	-0.005	0.114	-0.013	0.02	0.663	0.045
Conners17	0.048	-0.014	0.042	0.023	-0.006	-0.003	0.753	0.008
Conners18	-0.043	-0.1	0.041	0.012	0.025	-0.075	-0.034	0.583
Conners19	-0.053	0.134	-0.048	0.562	-0.011	-0.038	-0.025	0.141
CDEV1	-0.081	0.628	0.045	0.03	0.157	0.071	-0.022	-0.04
CDEV2	-0.167	0.194	0.008	-0.039	0.623	-0.093	0.025	0.016
CDEV3	0.049	0.517	0.039	0.018	0.066	-0.038	-0.049	0.037
CDEV5	0.638	0.027	0.018	-0.009	0.119	0.048	0.02	-0.003
CDEV6	0.264	-0.123	0.562	0.036	0.036	0.02	-0.087	0.077
CDEV8	0.83	-0.04	-0.042	-0.079	0.029	0.01	0.12	0.005
CDEV9	0.826	0.028	-0.061	-0.037	-0.155	-0.01	0.032	0.013
CDEV10	0.018	0.054	0.62	-0.059	0.166	0.062	0.011	0.05
CDEV12	0.262	0.658	-0.036	-0.038	0.004	-0.017	-0.032	0.005
CDEV13	-0.13	-0.74	0.079	-0.053	0.019	0.028	0.007	0.031
CDEV14	-0.067	-0.028	0.605	-0.082	0.172	0.063	0.07	0.026
CDEV16	0.73	0.219	-0.023	0.038	-0.146	-0.012	-0.018	-0.008
CDEV18	0.041	-0.091	0.77	-0.013	0.015	-0.003	-0.002	0.001
CDEV19	-0.067	0.041	0.122	0.034	0.728	-0.028	-0.007	-0.009
CDEV20	0.236	-0.138	0.045	0.023	0.555	0.044	-0.037	0.002
CDEV21	0.728	-0.013	-0.024	-0.041	0.23	0.004	0.036	-0.026
CDEV22	0.706	-0.133	-0.039	0.159	0.112	0.018	-0.127	-0.036
CDEV23	0.054	-0.036	-0.027	0	0.862	-0.015	-0.009	-0.001
CDEV24	0.687	0.007	-0.005	0.167	0.131	0.022	-0.137	-0.025
CDEV27	0.156	-0.04	-0.634	0.03	0.047	0.014	-0.065	0.053
CDEV28	0.171	-0.039	0.609	0.031	0.016	-0.016	-0.027	-0.023
CDEV29	-0.146	-0.717	0.007	-0.021	0.054	0.044	-0.002	0.013
CDEV32	0.014	0.517	0.112	0.018	0.179	-0.186	0.003	-0.029
CDEV34	0.798	0.101	-0.041	-0.066	-0.035	-0.036	0.058	0.005
CDEV35	0.121	-0.087	-0.674	-0.028	0.079	0.062	-0.014	0.018
CDEV37	0.619	0.049	0.157	0.018	-0.11	-0.008	0.04	0.001
CDEV38	0.553	-0.002	0.219	0.109	-0.081	-0.002	-0.093	0.007
CDEV39	0.513	0.052	0.193	0.095	-0.073	0.038	-0.104	-0.002
CDEV40	0.017	0.125	0.573	-0.014	-0.063	-0.031	0.019	0.016
CDEV43	0.787	0.04	-0.01	-0.124	-0.183	-0.045	0.087	0.044
CDEV44	0.591	0.14	-0.016	-0.208	0.122	-0.021	0.144	0.003
CDEV48	-0.021	-0.796	-0.039	-0.008	0.042	-0.045	-0.008	-0.002
CDEV49	0.607	0.035	-0.012	0.033	0.176	-0.029	-0.027	0.006
CDEV50	0.047	-0.136	-0.547	0.023	0.089	0.053	-0.039	0.034
CDEV51	0.069	0.791	-0.02	0.019	0.001	0.062	0.008	0.002
CDEV53	-0.027	0.021	-0.038	-0.027	0.787	0.001	0.044	0.005

Note.— The cells display rotated factor loadings (using oblique promax rotation) obtained from factor analysis of all the residualized measurements performed using the extraction method of principal factors. Number of initial factors (K^S): 11 (following the Optimal Coordinates method). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6|\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.27: Principal Axes Factor Analysis with Quartimin Rotation and $K^S = 11$, Final Structure from the Residualized Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
CogPLCT	0.103	-0.052	0.008	0.029	0.622	0.027	-0.003	-0.009
CogFMT	-0.128	0.05	-0.027	-0.039	0.698	-0.057	-0.003	0.01
CogSERT	-0.078	0.005	-0.035	-0.057	0.739	-0.031	0.011	0.011
CogBASTM	-0.048	-0.009	-0.045	-0.014	0.599	0.024	-0.021	-0.008
CogBASTS	0.084	-0.019	0.025	-0.015	0.706	-0.003	0.005	0.012
CogBASTWD	0.08	-0.035	0.025	0.023	0.766	-0.007	-0.02	-0.015
Rutter1	-0.072	0.018	0.014	0.628	0.015	-0.019	0.128	-0.124
Rutter2	-0.047	0.046	0.035	0.571	0.066	-0.008	0.087	0.024
Rutter8	-0.009	0.008	0.014	0.034	-0.008	0.019	0.693	-0.058
Rutter15	-0.012	-0.019	0.011	0.678	-0.081	0.012	-0.014	0.046
Conners1	0.039	-0.02	0.055	0.089	0.077	0.006	0.018	0.655
Conners2	0.01	0.006	0.029	0.037	0.049	0.009	0.045	0.669
Conners3	0.192	0.012	-0.028	0.581	-0.075	-0.048	-0.013	0.086
Conners5	-0.029	0.02	-0.065	-0.077	-0.065	-0.047	0.038	0.681
Conners6	-0.003	0.011	-0.012	0.026	0.01	0.031	0	0.669
Conners8	-0.028	0.009	-0.008	0.17	-0.018	0.044	0.538	0.023
Conners9	-0.117	0.096	-0.009	0.586	0.042	0.014	0.247	-0.024
Conners12	0.104	0.009	-0.054	-0.075	-0.017	0.019	0.519	0.129
Conners13	0.099	-0.062	0.008	0.668	-0.055	0.03	-0.008	0.086
Conners16	0.026	0.004	-0.019	0.079	0.011	-0.014	0.678	0.063
Conners17	0.006	0.039	0.023	-0.011	-0.011	-0.008	0.766	0.026
Conners18	-0.092	-0.035	0.035	0.011	-0.075	0.021	-0.026	0.58
Conners19	0.102	-0.039	-0.022	0.564	-0.055	-0.006	-0.032	0.153
CDEV1	0.647	-0.124	0.065	0.014	0.053	0.162	0	-0.03
CDEV2	0.184	-0.149	0.024	-0.041	-0.111	0.609	0.029	0.019
CDEV3	0.533	0.004	0.064	0.005	-0.054	0.071	-0.024	0.046
CDEV5	0.021	0.631	0.058	0.049	0.044	0.138	-0.017	-0.007
CDEV6	-0.088	0.268	0.551	0.062	0.023	0.047	-0.099	0.081
CDEV8	-0.044	0.804	0.003	-0.021	0.007	0.055	0.087	0
CDEV9	0.019	0.796	-0.016	0.023	-0.012	-0.124	-0.002	0.008
CDEV10	0.059	0.049	0.613	-0.024	0.051	0.164	-0.018	0.053
CDEV12	0.646	0.217	0.011	-0.021	-0.041	0.021	-0.03	0.011
CDEV13	-0.737	-0.073	0.033	-0.047	0.053	0.009	-0.011	0.02
CDEV14	-0.019	-0.035	0.589	-0.062	0.054	0.166	0.05	0.031
CDEV16	0.227	0.687	0.022	0.084	-0.015	-0.117	-0.038	-0.007
CDEV18	-0.065	0.063	0.745	0.005	-0.007	0.017	-0.015	0.009
CDEV19	0.065	-0.053	0.129	0.031	-0.037	0.716	0.001	-0.004
CDEV20	-0.111	0.245	0.065	0.042	0.048	0.545	-0.046	0.002
CDEV21	0.014	0.69	0.025	-0.004	0.006	0.24	0.024	-0.027
CDEV23	-0.002	0.064	-0.008	0	-0.017	0.843	-0.002	0.001
CDEV24	0.103	0.602	0.033	0.157	0.041	0.136	-0.102	-0.016
CDEV26	0.718	0.206	-0.033	0.093	-0.027	0.025	-0.032	-0.019
CDEV27	-0.038	0.128	-0.617	0.022	0.026	0.053	-0.055	0.045
CDEV28	-0.006	0.175	0.593	0.049	-0.017	0.026	-0.036	-0.014
CDEV29	-0.708	-0.091	-0.033	-0.017	0.072	0.037	-0.02	0.002
CDEV32	0.536	-0.025	0.135	0.003	-0.205	0.18	0.027	-0.016
CDEV34	0.091	0.774	0.005	-0.001	-0.043	-0.005	0.02	0.001
CDEV35	-0.088	0.101	-0.661	-0.036	0.076	0.082	-0.006	0.008
CDEV37	0.041	0.593	0.176	0.062	-0.019	-0.069	0.019	0.002
CDEV40	0.136	0.017	0.558	-0.008	-0.045	-0.053	0.019	0.025
CDEV43	0.017	0.766	0.029	-0.056	-0.053	-0.148	0.046	0.037
CDEV44	0.104	0.588	0.022	-0.14	-0.039	0.148	0.099	-0.004
CDEV48	-0.774	0.03	-0.085	0.005	-0.009	0.033	-0.033	-0.014
CDEV49	0.067	0.567	0.03	0.059	-0.026	0.185	-0.029	0.007
CDEV50	-0.139	0.041	-0.539	0.019	0.066	0.087	-0.037	0.025
CDEV51	0.78	0.012	0.026	0.006	0.031	0.013	0.034	0.014
CDEV53	0.018	0	-0.02	-0.015	-0.011	0.774	0.037	0.005

Note.— The cells display rotated factor loadings (using oblique quartimin rotation) obtained from factor analysis of all the residualized measurements performed using the extraction method of principal factors. Number of initial factors (K^S): 11 (following the Optimal Coordinates method). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6|\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.28: Principal Components Factor Analysis with Promax Rotation and $K^S = 11$, Final Structure from the Residualized Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9
CogPLCT	-0.063	0.135	-0.005	0.056	0.033	0.727	-0.012	-0.019	0.018
CogFMT	0.049	-0.167	-0.021	-0.05	-0.065	0.709	0.004	0.019	-0.023
CogSERT	0.008	-0.116	-0.03	-0.065	-0.039	0.75	0.019	0.016	-0.006
CogBASTM	-0.018	-0.045	-0.043	-0.031	0.027	0.673	-0.002	0.006	-0.067
CogBASTS	-0.019	0.092	0.02	-0.01	-0.01	0.784	0.009	0.008	0.023
CogBASTWD	-0.028	0.065	0.019	0.036	-0.011	0.816	-0.026	-0.023	0.044
Rutter1	0.002	-0.092	0.021	0.731	-0.01	0.03	0.09	-0.152	-0.105
Rutter2	0.032	-0.066	0.036	0.672	-0.005	0.082	0.058	0.006	-0.023
Rutter8	0.026	-0.072	0.039	0.108	0.009	-0.02	0.724	-0.14	-0.02
Rutter9	0.014	0.07	-0.01	-0.059	0.045	0.041	0.624	0.138	-0.019
Rutter15	-0.042	0.016	-0.013	0.742	0.014	-0.083	-0.012	0.034	0.083
Conners1	-0.018	0.017	0.048	0.126	0	0.072	0.001	0.688	0.101
Conners2	0.004	-0.004	0.026	0.056	0.003	0.052	0.041	0.715	0.031
Conners3	0.009	0.24	-0.063	0.628	-0.058	-0.06	-0.017	0.081	0.02
Conners5	0.022	-0.034	-0.069	-0.101	-0.058	-0.062	0.04	0.776	-0.054
Conners6	0.016	-0.021	-0.018	0.036	0.034	0.021	-0.045	0.771	-0.066
Conners8	0.008	-0.078	0.005	0.242	0.046	-0.028	0.577	-0.039	-0.006
Conners9	0.094	-0.151	-0.008	0.67	0.014	0.044	0.229	-0.051	-0.031
Conners12	0.015	0.131	-0.054	-0.129	-0.015	-0.004	0.686	0.096	0.007
Conners13	-0.081	0.151	-0.02	0.69	0.026	-0.045	0.016	0.08	0.063
Conners15	-0.043	0.07	0.032	-0.04	0.035	0.05	0.585	0.141	-0.02
Conners16	0.018	-0.013	-0.006	0.142	-0.035	0.003	0.72	0	0.025
Conners17	0.059	-0.054	0.042	0.068	-0.023	-0.025	0.769	-0.042	-0.006
Conners18	-0.047	-0.108	0.042	-0.017	0.029	-0.077	-0.03	0.694	-0.06
Conners19	-0.057	0.157	-0.056	0.606	-0.014	-0.044	-0.027	0.156	0.075
CDEV1	-0.101	0.711	0.034	0.018	0.171	0.101	-0.01	-0.052	0.006
CDEV2	-0.185	0.21	-0.008	-0.031	0.693	-0.095	0.016	0.01	0.008
CDEV3	0.036	0.599	0.026	0.011	0.069	-0.017	-0.065	0.044	-0.013
CDEV5	0.67	0.017	0.004	-0.002	0.131	0.039	0.02	-0.012	0.04
CDEV6	0.288	-0.137	0.58	0.039	0.049	0.008	-0.089	0.087	0.104
CDEV8	0.842	-0.043	-0.047	-0.067	0.025	0.008	0.121	-0.005	-0.002
CDEV9	0.845	0.025	-0.069	-0.024	-0.166	-0.019	0.03	0.003	0.047
CDEV10	0.032	0.05	0.615	-0.048	0.191	0.041	0.019	0.033	0.158
CDEV12	0.271	0.683	-0.037	-0.037	0.003	-0.02	-0.032	-0.007	0.02
CDEV13	-0.134	-0.774	0.077	-0.05	0.027	0.03	-0.002	0.044	-0.033
CDEV14	-0.064	-0.041	0.624	-0.079	0.204	0.056	0.077	0.015	0.057
CDEV16	0.743	0.227	-0.025	0.041	-0.151	-0.017	-0.012	-0.012	0.029
CDEV18	0.052	-0.097	0.797	-0.013	0.032	-0.004	-0.009	0.007	0.014
CDEV19	-0.07	0.051	0.118	0.037	0.777	-0.025	-0.018	-0.007	-0.022
CDEV20	0.251	-0.166	0.023	0.027	0.644	0.043	-0.042	0.007	0.001
CDEV21	0.739	-0.007	-0.027	-0.04	0.234	0.004	0.036	-0.03	-0.001
CDEV22	0.724	-0.114	-0.043	0.133	0.116	0.032	-0.115	-0.013	-0.044
CDEV23	0.053	-0.022	-0.026	-0.007	0.883	-0.014	-0.005	-0.001	-0.01
CDEV24	0.698	0.035	-0.003	0.138	0.135	0.039	-0.125	0	-0.075
CDEV27	0.173	-0.027	-0.72	0.021	0.058	0.012	-0.062	0.072	0.015
CDEV28	0.186	-0.043	0.639	0.028	0.028	-0.018	-0.029	-0.019	0.016
CDEV29	-0.151	-0.744	-0.002	-0.016	0.059	0.042	-0.009	0.021	0.019
CDEV32	0.015	0.55	0.115	0.015	0.191	-0.188	0.006	-0.035	0.007
CDEV34	0.81	0.1	-0.046	-0.05	-0.038	-0.044	0.056	-0.008	0.031
CDEV35	0.129	-0.091	-0.736	-0.033	0.085	0.057	-0.003	0.017	0.038
CDEV37	0.648	0.049	0.16	0.022	-0.118	-0.006	0.033	0.005	-0.032
CDEV38	0.576	0.021	0.225	0.084	-0.083	0.019	-0.088	0.036	-0.079
CDEV39	0.535	0.08	0.201	0.063	-0.078	0.066	-0.096	0.029	-0.101
CDEV40	0.013	0.137	0.633	-0.02	-0.071	-0.015	0.005	0.028	-0.095
CDEV43	0.811	0.026	-0.019	-0.094	-0.197	-0.063	0.068	0.025	0.071
CDEV44	0.616	0.13	-0.029	-0.197	0.126	-0.037	0.143	-0.02	0.042
CDEV48	-0.024	-0.818	-0.052	-0.004	0.045	-0.05	-0.009	0.005	0.04
CDEV49	0.633	0.039	-0.022	0.025	0.193	-0.028	-0.022	0.014	-0.027
CDEV50	0.062	-0.151	-0.626	0.033	0.11	0.036	-0.034	0.034	0.096
CDEV51	0.074	0.814	-0.01	0.009	-0.001	0.068	0.017	-0.004	-0.039
CDEV53	-0.033	0.02	-0.044	-0.02	0.836	0.003	0.034	0.001	-0.039
Height at 10	0.017	-0.019	-0.027	0.029	0.044	0.009	-0.029	-0.05	0.815

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... table A3.28 continued

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9
Head at 10	-0.001	-0.018	0.053	-0.063	-0.047	0.05	0.015	-0.014	0.653
Weight at 10	0.009	-0.021	0.035	0.055	-0.067	-0.02	-0.002	0.003	0.879

Note.— The cells display rotated factor loadings (using oblique promax rotation) obtained from factor analysis of all the residualized measurements performed using the extraction method of principal components. Number of initial components (K^S): 11 (following Velicer's method). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6|\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

Table A3.29: Principal Components Factor Analysis with Quartimin Rotation and $K^S = 11$, Final Structure from the Residualized Measurements

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9
CogPLCT	-0.057	0.132	0.004	0.056	0.722	0.032	-0.01	-0.016	0.02
CogFMT	0.058	-0.154	-0.029	-0.05	0.721	-0.068	-0.003	0.017	-0.024
CogSERT	0.016	-0.108	-0.037	-0.064	0.76	-0.041	0.016	0.012	-0.004
CogBASTM	-0.009	-0.041	-0.044	-0.03	0.677	0.023	-0.002	0.004	-0.064
CogBASTS	-0.016	0.096	0.023	-0.01	0.783	-0.009	0.011	0.009	0.026
CogBASTWD	-0.023	0.071	0.02	0.038	0.816	-0.01	-0.026	-0.021	0.047
Rutter1	0.014	-0.06	0.025	0.719	0.014	-0.013	0.074	-0.117	-0.111
Rutter2	0.041	-0.032	0.041	0.656	0.067	-0.005	0.048	0.039	-0.027
Rutter8	0.024	-0.056	0.025	0.107	-0.024	0.017	0.712	-0.117	-0.021
Rutter9	0.009	0.068	-0.011	-0.069	0.031	0.055	0.625	0.155	-0.017
Rutter15	-0.032	0.047	-0.006	0.695	-0.106	0.012	-0.018	0.081	0.076
Conners1	-0.016	0.027	0.055	0.126	0.068	0.005	0.019	0.687	0.107
Conners2	0.005	0	0.034	0.063	0.049	0.008	0.06	0.709	0.038
Conners3	0.005	0.258	-0.04	0.599	-0.086	-0.056	-0.016	0.119	0.012
Conners5	0.019	-0.032	-0.063	-0.094	-0.056	-0.056	0.059	0.763	-0.05
Conners6	0.018	-0.015	-0.006	0.046	0.02	0.035	-0.026	0.76	-0.059
Conners8	0.011	-0.065	0.002	0.258	-0.03	0.049	0.567	-0.024	-0.01
Conners9	0.1	-0.12	-0.002	0.678	0.033	0.015	0.219	-0.025	-0.035
Conners10	0.086	-0.097	0.033	0.519	0.011	-0.017	0.291	0.015	-0.004
Conners12	0.001	0.124	-0.055	-0.133	-0.012	-0.002	0.689	0.109	0.01
Conners13	-0.075	0.177	-0.008	0.641	-0.073	0.025	0.015	0.128	0.056
Conners15	-0.048	0.078	0.022	-0.048	0.044	0.045	0.589	0.156	-0.015
Conners16	0.013	0	-0.015	0.137	-0.003	-0.024	0.713	0.024	0.024
Conners17	0.054	-0.041	0.031	0.072	-0.029	-0.012	0.759	-0.021	-0.008
Conners18	-0.036	-0.093	0.04	-0.018	-0.07	0.025	-0.018	0.689	-0.058
Conners19	-0.055	0.173	-0.041	0.562	-0.071	-0.013	-0.024	0.197	0.069
CDEV1	-0.125	0.703	0.062	0.008	0.07	0.18	0.011	-0.041	0.015
CDEV2	-0.169	0.199	0.014	-0.038	-0.114	0.681	0.034	0.011	0.021
CDEV3	0.01	0.587	0.06	0.012	-0.043	0.08	-0.047	0.05	-0.008
CDEV5	0.652	0.037	0.045	0.02	0.036	0.141	0.013	-0.006	0.029
CDEV6	0.298	-0.099	0.569	0.05	0.009	0.062	-0.096	0.097	0.104
CDEV8	0.815	-0.029	-0.001	-0.037	0.005	0.041	0.111	-0.002	-0.014
CDEV9	0.809	0.041	-0.026	0.001	-0.021	-0.146	0.021	0.007	0.033
CDEV10	0.054	0.071	0.606	-0.043	0.037	0.197	0.013	0.048	0.156
CDEV12	0.231	0.671	0.013	-0.03	-0.048	0.02	-0.017	0	0.019
CDEV13	-0.093	-0.759	0.03	-0.047	0.063	0.011	-0.019	0.031	-0.034
CDEV14	-0.034	-0.026	0.607	-0.07	0.055	0.207	0.07	0.025	0.057
CDEV16	0.702	0.251	0.018	0.061	-0.025	-0.129	-0.016	-0.004	0.017
CDEV18	0.076	-0.07	0.772	-0.003	-0.007	0.045	-0.02	0.02	0.017
CDEV19	-0.049	0.069	0.13	0.032	-0.038	0.764	-0.005	-0.002	-0.007
CDEV20	0.268	-0.132	0.042	0.032	0.045	0.631	-0.042	0.011	0.003
CDEV21	0.72	0.019	0.016	-0.018	0.001	0.244	0.03	-0.025	-0.009
CDEV22	0.699	-0.051	-0.018	0.155	0.042	0.123	-0.122	-0.009	-0.05
CDEV23	0.073	0.002	-0.005	-0.009	-0.02	0.866	0.007	0.001	0.001
CDEV24	0.668	0.093	0.028	0.159	0.039	0.146	-0.126	0.006	-0.077
CDEV26	0.249	0.703	-0.021	0.098	-0.043	0.032	-0.04	-0.021	-0.024
CDEV27	0.144	-0.023	-0.699	0.006	0.019	0.05	-0.049	0.061	0.018
CDEV28	0.195	-0.007	0.622	0.033	-0.023	0.043	-0.038	-0.004	0.019
CDEV29	-0.111	-0.728	-0.045	-0.014	0.076	0.04	-0.025	0.009	0.017
CDEV32	-0.006	0.548	0.14	0.014	-0.214	0.2	0.021	-0.026	0.013
CDEV34	0.774	0.119	0	-0.025	-0.049	-0.019	0.05	-0.003	0.019
CDEV35	0.103	-0.092	-0.72	-0.039	0.069	0.076	0.009	0.001	0.041
CDEV37	0.623	0.058	0.19	0.039	-0.02	-0.094	0.028	0.013	-0.034
CDEV38	0.538	0.056	0.232	0.1	0.005	-0.052	-0.079	0.037	-0.064
CDEV40	0.02	0.141	0.623	-0.007	-0.03	-0.054	0.003	0.036	-0.09
CDEV43	0.776	0.032	0.022	-0.065	-0.065	-0.174	0.059	0.026	0.058
CDEV44	0.592	0.124	0.015	-0.173	-0.046	0.141	0.142	-0.021	0.036
CDEV48	0.007	-0.783	-0.099	-0.005	-0.011	0.027	-0.027	-0.006	0.038
CDEV49	0.613	0.066	0.018	0.046	-0.031	0.201	-0.025	0.018	-0.033
CDEV50	0.046	-0.144	-0.618	0.019	0.049	0.098	-0.026	0.023	0.098
CDEV51	0.037	0.787	0.038	0.012	0.03	0.016	0.038	0.005	-0.034
CDEV53	-0.009	0.024	-0.018	-0.02	-0.009	0.819	0.046	0.002	-0.028

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... table A3.29 continued

Variable Names	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9
Height at 10	0.006	-0.015	-0.04	0.008	0.011	0.056	-0.021	-0.046	0.816
Head at 10	-0.011	-0.015	0.034	-0.079	0.054	-0.033	0.021	-0.013	0.656
Weight at 10	-0.002	-0.016	0.017	0.031	-0.017	-0.051	0.004	0.01	0.878

Note.— The cells display rotated factor loadings (using oblique quartimin rotation) obtained from factor analysis of all the residualized measurements performed using the extraction method of principal components. Number of initial components (K^S): 11 (following Velicer's method). After rotation, we apply the following rules as suggested in Costello and Osborne (2005). We exclude items with loadings smaller than 0.5, and also items with a loading of 0.32 or higher (as suggested in Tabachnick and Fidell, 2001) on two or more factors. Finally, we exclude items in cases where only two of them load on a single factor. White cell if $|\alpha| < 0.5$, light gray cell if $\geq 0.6 |\alpha| \geq 0.5$, dark gray cell if $|\alpha| \geq 0.6$. Items: PLCT = Picture Language Comprehension Test, FMT = Friendly Math Test, SERT = Shortened Edinburgh Reading Test, BASTM = British Ability Scales Matrices, BASTRD = British Ability Scales Recall Digits, BASTS = British Ability Scales Similarities, BASTWD = British Ability Scales Word Definition, Conners = Conners Hyperactivity Scale, Rutter = Rutter Parental 'A' Scale of Behavioral Disorder, Lawseq = Self-Esteem Scale, Caraloc = Locus of Control Scale, CDEV = Child Development Scale.

A4 Proof of Identification of the Model when the Allocation of Factors to Measurements is Known

$$M = \begin{pmatrix} \alpha_{11} & 0 & \\ \vdots & 0 & \\ \alpha_{J_1} & \vdots & \text{etc} \\ 0 & \alpha_{2,J_1+1} & \\ 0 & \vdots & \end{pmatrix} \begin{pmatrix} \theta_1 \\ \theta_2 \\ \vdots \\ \theta_K \end{pmatrix} + \varepsilon \tag{A4.1}$$

Normalize $Var(\theta_k) = 1$, $\forall k$, $k = 1, \ldots, K$.

$$\begin{aligned} \text{Cov}(M_1, M_2) &= \alpha_{11}\alpha_{21} \\ \text{Cov}(M_1, M_3) &= \alpha_{11}\alpha_{31} \\ \text{Cov}(M_2, M_3) &= \alpha_{21}\alpha_{31} \\ \cdots \quad & \quad \cdots \\ \text{Cov}(M_1, M_{J1}) &= \alpha_{11}\alpha_{1_{J1}} \end{aligned}$$

We only need three measurements. Hence we have

$$\frac{\text{Cov}(M_1, M_2)}{\text{Cov}(M_1, M_3)} = \frac{\alpha_{21}}{\alpha_{31}}$$

Thus

$$\alpha_{21} = (C_{12,13})\alpha_{31}$$

where

$$C_{12,13} = \frac{\text{Cov}(M_1, M_2)}{\text{Cov}(M_1, M_3)} \qquad \text{(known)}$$

$$\text{Cov}(M_2, M_3) = \alpha_{21}\alpha_{31} \qquad \text{(known)}$$

Hence

$$\begin{aligned} \text{Cov}(M_2, M_3) &= (C_{12,13})(\alpha_{31})^2 \\ \alpha_{31} &= \pm\left(\frac{\text{Cov}(M_2, M_3)}{C_{12,13}}\right)^{\frac{1}{2}} \end{aligned}$$

Thus we know α_{11} and α_{21} etc.

References

Akaike, H. (1974): "A new look at the statistical model identification," *IEEE Transactions on Automatic Control*, 19, 716–723.

Browne, M. W. (2001): "An Overview of Analytic Rotation in Exploratory Factor Analysis," *Multivariate Behavioral Research*, 36, 111–150.

Carroll, J. (1953): "An analytical solution for approximating simple structure in factor analysis," *Psychometrika*, 18, 23–38, 10.1007/BF02289025.

Cattell, R. B. (1966): "The Scree Test for the Number of Factors," *Multivariate Behavioral Research*, 1, 245–276.

Costello, A. B. and J. W. Osborne (2005): "Best Practices in Exploratory Factor Analysis: Four Recommendations for Getting the Most From Your Analysis," *Practical Assessment, Research & Evaluation*, 10.

Crawford, C. and G. Ferguson (1970): "A general rotation criterion and its use in orthogonal rotation," *Psychometrika*, 35, 321–332, 10.1007/BF02310792.

Dien, J., W. Khoe, and G. Mangun (2007): "Evaluation of PCA and ICA of simulated ERPs: Promax vs. Infomax rotations," *Human brain mapping*, 28, 742–763.

Gorsuch, R. (1983): *Factor Analysis*, Hillsdale, NJ: Lawrence Erlbaum Associates.

Gupta, A. K. and D. K. Nagar (2000): *Matrix Variate Distributions*, Chapman & HALL/CRC.

Guttman, L. (1954): "Some necessary conditions for common-factor analysis," *Psychometrika*, 19, 149–161.

Heckman, J. J., R. Pinto, and P. A. Savelyev (2013): "Understanding the Mechanisms Through Which an Influential Early Childhood Program Boosted Adult Outcomes," *American Economic Review*, 103, 1–35.

Hendrickson, A. and P. White (1964): "Promax: A quick method for rotation to oblique simple structure," *British Journal of Statistical Psychology*, 17, 65–70.

Horn, J. L. (1965): "A Rationale and Test for the Number of Factors in Factor Analysis," *Psychometrika*, 30, 179–185.

Iwata, N., N. Mishima, T. Shimizu, T. Mizoue, M. FUKUHARA, T. Hidano, and D. CHARLES (1998): "Positive and negative affect in the factor structure of the State-Trait Anxiety Inventory for Japanese workers," *Psychological reports*, 82, 651–656.

Jennrich, R. I. and P. F. Sampson (1966): "Rotation for simple loadings." *Psychometrika*, 31(3), 313–323.

Kaiser, H. (1958): "The varimax criterion for analytic rotation in factor analysis," *Psychometrika*, 23, 187–200.

Kaiser, H. F. (1960): "The Application of Electronic Computers to Factor Analysis," *Educational and Psychological Measurement*, 20, 141–151.

Onatski, A. (2009): "Testing hypotheses about the number of factors in large factor models," *Econometrica*, 77, 1447–1479.

Osman, A., F. Barrios, P. Gutierrez, J. Williams, and J. Bailey (2008): "Psychometric properties of the Beck Depression Inventory-II in nonclinical adolescent samples," *Journal of Clinical Psychology*, 64, 83–102.

Raîche, G., M. Riopel, and J.-G. Blais (2006): "Non Graphical Solutions for the Cattell's Scree Test," *Paper presented at the International Annual meeting of the Psychometric Society, Montreal*.

Schwarz, G. (1978): "Estimating the dimension of a model," *The annals of statistics*, 6, 461–464.

Tabachnick, B. G. and L. S. Fidell (2001): *Using multivariate statistics*, Boston: Allyn and Bacon, chap. Principal components and factor analysis, 582–633, 4th ed.

Tataryn, D., J. Wood, and R. Gorsuch (1999): "Setting the value of k in promax: A Monte Carlo study," *Educational and Psychological Measurement*, 59, 384–391.

Tiffany, S. and D. Drobes (1991): "The development and initial validation of a questionnaire on smoking urges," *British journal of addiction*, 86, 1467–1476.

Tracy, C. and H. Widom (1994): "Level-spacing distributions and the Airy kernel," *Communications in Mathematical Physics*, 159, 151–174.

Velicer, W. F. (1976): "Determining the Number of Components from the Matrix of Partial Correlations," *Psychometrika*, 41, 321–327.

Watson, D., K. Weber, J. Assenheimer, L. Clark, M. Strauss, and R. McCormick (1995): "Testing a tripartite model: I. Evaluating the convergent and discriminant validity of anxiety and depression symptom scales." *Journal of Abnormal Psychology; Journal of Abnormal Psychology*, 104, 3.

Wolraich, M., I. Feurer, J. Hannah, A. Baumgaertel, and T. Pinnock (1998): "Obtaining systematic teacher reports of disruptive behavior disorders utilizing DSM-IV," *Journal of Abnormal Child Psychology*, 26, 141–152.

Zwick, W. and W. Velicer (1982): "Factors influencing four rules for determining the number of components to retain," *Multivariate Behavioral Research*, 17, 253–269.

Zwick, W. R. and W. F. Velicer (1986): "Comparison of Five Rules for Determining the Number of Components to Retain," *Psychological Bulletin*, 99, 432–442.