Twin Research and Human Genetics

Genetic and Environmental Stability of Intelligence in Childhood and Adolescence

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(1) Supplementary Figures S1 and S2



*Figure S1*. Overview of the data. The total sample consisted of 4 longitudinally measured subsamples (Samples 1–4 on the y-axis). x-axis represents approximate age at testing. The data are represented by the squares and the circles (color/shape codes for type of test; see legend). Sample size per measurement occasion is given (*N* = number of individuals).



*Figure S2*. The relative magnitude of the A, C, and E variance components (y-axis) as a function of age in the four samples. The legend is given in the upper right panel.

(2) A description of the models fitted to Samples1–4

*Phenotypic simplex models*. The phenotypic simplex models fitted to each of the four samples are depicted in Figure S3. Here, age is given on the x-axis; thus the spatial distance between the variables at the different measurement occasions corresponds to the temporal distance between these measurement occasions. The temporal distance between the measurement occasions is important, because the interpretation of the stability parameters depends on it: with equal stability over time, the *estimate* of stability between two measurement points decreases as an exponential function of the temporal distance between those measurement points. For instance, with a constant stability of .5 between any two measurement points 2 years apart (e.g., from age 4 to age 6, from age 6 to age 8, etc.), the stability estimate would be .52 = .25 if one were to estimate the stability between two measurement points 4 years apart (e.g., age 4 to age 8). Therefore, the stability estimate is a function not only of the underlying stability, but also of the temporal distance between the measurement points used for estimation. This fact will be brought in mind while interpreting the results.

In all of the models depicted in Figure S3, each of the subscales measured at a given time point is specified to predict each of the subscales measured at the subsequent time point. Thus, not only the main regression paths (e.g., from RAKIT V at age 5 to RAKIT V at age 7), but also the cross-paths (e.g. from RAKIT V at age 5 to RAKIT NV at age 7), are estimated. In other words, any possible temporal contribution of one domain of intelligence to another is assessed. Although in Figure S3 we depict the phenotypic models for all the four samples, in subsequent text (the phenotypic model with a *g* factor, the ACE simplex model and the ACE model with a *g* factor) the models will only be illustrated for Sample 1. The structure of the models for the remaining samples, however, can be deduced from Figure S3: for instance, in the ACE simplex model for Sample 2, the structure of each of the three variance components (A, C, and E) is equal to the phenotypic structure for Sample 2 depicted in Figure S3.



*Figure S3*. Phenotypic simplex models fitted to the four samples. The spatial distance between the measurement points within a model corresponds to their temporal distance. V = RAKIT verbal score, NV = RAKIT nonverbal score, VCI = Verbal Comprehension Index, POI = Perceptual Organization Index, FDI = Freedom from Distractibility Index, Rav = Raven sum score. The figure depicts the phenotypic simplex models; the structure of these phenotypic models can be used to deduce the structure of the other models. For instance, the structure of each of the A, C, and E variance components in the ACE simplex model for Sample 3 is equal to the phenotypic structure for Sample 3 given in the figure.

*Phenotypic simplex models with a* g *factor*. In addition to assessing the phenotypic stability at the subscale level (Figure S3), a series of models assessing the phenotypic stability at the level of general cognitive ability (*g*) was fitted. Here, *g* was defined as a first-order latent factor underlying overall subscale performance at a given age, and autoregressions were specified to account for the stability and change at the level of *g* (main text: upper right panel Figure 3). In addition to the autoregressions at the level of *g*, simplex models were also specified to account for the stability and change at the level of subscale-specific abilities, that is, the residuals in the model: the residual Verbal scores at *t*-1 predict the residual Verbal scores at *t*, the residual Nonverbal scores at *t*-1 predict the residual Nonverbal scores at *t*, and the residual VCI, POI, and FDI factors at *t*-1 predict the residual VCI, POI, and FDI factors at *t*, respectively (main text: upper right panel Figure 3).

 *ACE simplex models*. In addition to assessing phenotypic stability, a series of ACE simplex models was fitted to the subscale scores in order to assess the contributions of genes and the environment to the observed stability. An example model (fitted to Sample 1) is depicted in the lower left panel of Figure 3 (main text). To avoid clutter in the Figure, the A, C, and E components are depicted separately; however, the three components are part of the same model, in which the subscale scores are modeled as a function of genetic and environmental latent series.

 *ACE models with a* g *factor*. In addition to modeling subscale scores, the contributions of genes and the environment to the observed stability in the *g* factor were assessed. This was achieved by modeling the subscale scores at each time point as a function of underlying genetic and environmental *g* factors (Ag, Cg, and Eg), and specifying simplex models to account for the stability and change at the level of these genetic and environmental factors, as depicted in the lower right panel of Figure 3 (main text). Although the A, C, and E components of the model are depicted separately, they are part of the same model. In addition to modeling the genetic and environmental *g* factors, we assessed the extent to which any possible subscale-specific stability is due to genetic/environmental factors, by fitting an ACE simplex model to the subscale residuals (main text: lower right panel Figure 3).

(3) Parameter estimates for the models fitted to Samples 1-4

The fitted models include: 1) the phenotypic simplex model, 2) the phenotypic simplex model with a *g* factor, 3) the ACE simplex model, and 4) the ACE simplex model with a *g* factor. All results for Sample 1 are also given in the main text (Figure 3). The solutions are completely standardized, i.e., the total variance of each (observed and latent) variable is 1. ****= matrix containing the variances and covariances (for the first measurement occasion) and the residual variances and covariances (for all the subsequent measurement occasions) of the variables in the simplex chain. ****= matrix of autoregressive coefficients (). ****= matrix containing the factor loadings () of the subscale scores on the *g* factor (or on the Ag, Cg, and Eg factors in an ACE model) and on the subscale-specific residual factors.

For instance, in the ACE simplex model with a *g* factor in Sample 4, the following estimates are obtained:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Eg15 | Eg18 | ErVCI | ErPOI | ErFDI |  |  |  | Eg15 | Eg18 | ErVCI | ErPOI | ErFDI |  |  |  | Eg15 | Eg18 | ErVCI | ErPOI | ErFDI |
|  | Eg15 | 1 | 0 | 0 | 0 | 0 |  |  | Eg15 | 0 | 0 | 0 | 0 | 0 |  |  |  |  |  |  |  |  |
|  | Eg18 | 0 | .84 | 0 | 0 | 0 |  |  | Eg18 | .40 | 0 | 0 | 0 | 0 |  |  | ERav | 1 | 0 | 0 | 0 | 0 |
| ****E= | ErVCI | 0 | 0 | 1 | 0 | 0 | , | ****E**=** | ErVCI | 0 | 0 | 0 | 0 | 0 | , | ****E= | EVCI | 0 | .44 | .90 | 0 | 0 |
|  | ErPOI | 0 | 0 | 0 | 1 | 0 |  |  | ErPOI | 0 | 0 | 0 | 0 | 0 |  |  | EPOI | 0 | .36 | 0 | .93 | 0 |
|  | ErFDI | 0 | 0 | 0 | 0 | 1 |  |  | ErFDI | 0 | 0 | 0 | 0 | 0 |  |  | EFDI | 0 | .55 | 0 | 0 | .83 |

The above matrices imply the following model:



*Figure S4*. The E component of the ACE simplex model with a *g* factor fitted to data in Sample 4.

The expected covariance structure of the subscale scores is:

**** = ****(**I** – **B**)-1****(**I** – **B**)-1t****t

in the phenotypic models, and

****A = ****A(**I** – **B**A)-1****A(**I** – **B**A)-1t****At,

****C = ****C(**I** – **B**C)-1****C(**I** – **B**C)-1t****C t,

****E = ****E(**I** – **B**E)-1****E(**I** – **B**E)-1t****Et,

**** = ****A + ****C + ****E

in the ACE models.

The phenotypic variables (i.e., the intelligence test subscales) modeled in each of the samples are given in Figure S3.

**Parameter estimates**

Phenotypic simplex model, Samples 1-4

**Phenotypic simplex model, Sample 1**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **** |  |  |  |  |  |  |  |  |  |  |  |
| 1 | 0.338 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.338 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0.589 | 0.154 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0.154 | 0.657 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.626 | 0.094 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.094 | 0.514 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0.491 | 0.104 | 0.109 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0.104 | 0.549 | 0.083 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0.109 | 0.083 | 0.657 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.341 | 0.071 | 0.155 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.071 | 0.567 | 0.116 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.155 | 0.116 | 0.458 |
| **** |  |  |  |  |  |  |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.611 | 0.078 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.065 | 0.561 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0.541 | 0.152 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0.038 | 0.683 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.614 | 0.207 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.243 | 0.546 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.273 | 0.431 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0.648 | 0.114 | 0.171 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0.094 | 0.5 | 0.173 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0.168 | 0.04 | 0.619 | 0 | 0 | 0 |

**Phenotypic simplex model, Sample 2**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **** |  |  |  |  |  |  |  |
| 1 | 0.528 | 0.527 | 0.348 | 0 | 0 | 0 | 0 |
| 0.528 | 1 | 0.544 | 0.46 | 0 | 0 | 0 | 0 |
| 0.527 | 0.544 | 1 | 0.387 | 0 | 0 | 0 | 0 |
| 0.348 | 0.46 | 0.387 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.642 | 0.043 | 0.137 | 0.063 |
| 0 | 0 | 0 | 0 | 0.043 | 0.509 | 0.153 | 0.078 |
| 0 | 0 | 0 | 0 | 0.137 | 0.153 | 0.657 | 0.028 |
| 0 | 0 | 0 | 0 | 0.063 | 0.078 | 0.028 | 0.589 |
| **** |  |  |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.395 | 0.034 | 0.074 | 0.244 | 0 | 0 | 0 | 0 |
| 0.053 | 0.612 | 0.08 | 0.023 | 0 | 0 | 0 | 0 |
| 0.26 | 0.012 | 0.422 | -0.058 | 0 | 0 | 0 | 0 |
| 0.188 | 0.079 | -0.049 | 0.527 | 0 | 0 | 0 | 0 |

**Phenotypic simplex model, Sample 3**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **** |  |  |  |  |  |
| 1 | 0.414 | 0 | 0 | 0 | 0 |
| 0.414 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0.837 | 0.257 | 0.315 | 0 |
| 0 | 0 | 0.257 | 0.766 | 0.238 | 0 |
| 0 | 0 | 0.315 | 0.238 | 0.869 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0.557 |
| **** |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 0.41 | -0.014 | 0 | 0 | 0 | 0 |
| 0.152 | 0.401 | 0 | 0 | 0 | 0 |
| 0.176 | 0.252 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0.168 | 0.382 | 0.294 | 0 |

**Phenotypic simplex model, Sample 4**

|  |  |  |  |
| --- | --- | --- | --- |
| **** |  |  |  |
| 1 | 0 | 0 | 0 |
| 0 | 0.648 | 0.229 | 0.253 |
| 0 | 0.229 | 0.756 | 0.159 |
| 0 | 0.253 | 0.159 | 0.686 |
| **** |  |  |  |
| 0 | 0 | 0 | 0 |
| 0.593 | 0 | 0 | 0 |
| 0.494 | 0 | 0 | 0 |
| 0.561 | 0 | 0 | 0 |

Phenotypic simplex model with a *g* factor

**Phenotypic simplex model with a *g* factor, Sample 1**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | .253 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | -.097 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | -.102 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | .125 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | .725 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .781 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .878 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .702 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .913 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .826 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .933 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .724 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .794 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .695 |
| **** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .865 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 1.047 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1.05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | .935 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | .524 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | .468 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | .349 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .546 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .295 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .417 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .259 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .526 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .454 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .552 | 0 | 0 | 0 |
| **** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| .642 | 0 | 0 | 0 | 0 | .767 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .566 | 0 | 0 | 0 | 0 | 0 | .824 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | .547 | 0 | 0 | 0 | 0 | 0 | .837 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | .566 | 0 | 0 | 0 | 0 | 0 | 0 | .824 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | .68 | 0 | 0 | 0 | 0 | 0 | 0 | .733 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | .556 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .831 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | .767 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .642 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | .641 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .767 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | .636 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .772 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | .882 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .471 | 0 | 0 |
| 0 | 0 | 0 | 0 | .577 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .817 | 0 |
| 0 | 0 | 0 | 0 | .728 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .685 |

**Phenotypic simplex model with a *g* factor, Sample 2**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **** |  |  |  |  |  |  |  |  |  |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | .185 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | .951 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | .748 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .905 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .769 |
| **** |  |  |  |  |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .903 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | .222 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | .502 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | .309 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | .481 | 0 | 0 | 0 | 0 |
| **** |  |  |  |  |  |  |  |  |  |
| .703 | 0 | .711 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .754 | 0 | 0 | .656 | 0 | 0 | 0 | 0 | 0 | 0 |
| .722 | 0 | 0 | 0 | .692 | 0 | 0 | 0 | 0 | 0 |
| .56 | 0 | 0 | 0 | 0 | .828 | 0 | 0 | 0 | 0 |
| 0 | .636 | 0 | 0 | 0 | 0 | .772 | 0 | 0 | 0 |
| 0 | .666 | 0 | 0 | 0 | 0 | 0 | .746 | 0 | 0 |
| 0 | .601 | 0 | 0 | 0 | 0 | 0 | 0 | .799 | 0 |
| 0 | .527 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .85 |

**Phenotypic simplex model with a *g* factor, Sample 3**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **** |  |  |  |  |  |  |  |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0.584 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0.345 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0.908 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0.904 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.99 |
|  |  |  |  |  |  |  |  |
| **** |  |  |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.645 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0.81 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0.304 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.31 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.098 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  |
| **** |  |  |  |  |  |  |  |
| 0.652 | 0 | 0 | 0.758 | 0 | 0 | 0 | 0 |
| 0.647 | 0 | 0 | 0 | 0.763 | 0 | 0 | 0 |
| 0 | 0.592 | 0 | 0 | 0 | 0.806 | 0 | 0 |
| 0 | 0.658 | 0 | 0 | 0 | 0 | 0.753 | 0 |
| 0 | 0.649 | 0 | 0 | 0 | 0 | 0 | 0.761 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

**Phenotypic simplex model with a *g* factor, Sample 4**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **** |  |  |  |  |
| 1 | 0 | 0 | 0 | 0 |
| 0 | 0.425 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 |
| 0 | 0 | 0 | 0 | 1 |
|  |  |  |  |  |
| **** |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 |
| 0.758 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
|  |  |  |  |  |
| **** |  |  |  |  |
| 1 | 0 | 0 | 0 | 0 |
| 0 | 0.798 | 0.603 | 0 | 0 |
| 0 | 0.637 | 0 | 0.771 | 0 |
| 0 | 0.726 | 0 | 0 | 0.688 |

ACE simplex model

**ACE simplex model, Sample 1**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A** |  |  |  |  |  |  |  |  |  |  |  |
| 1 | 0.306 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.306 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0.13 | -0.094 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | -0.094 | 0.07 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0.028 | 0.016 | -0.115 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0.016 | 0.009 | -0.064 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | -0.115 | -0.064 | 0.476 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.037 | -0.008 | 0.031 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -0.008 | 0.009 | 0.019 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.031 | 0.019 | 0.121 |
| **A** |  |  |  |  |  |  |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.81 | 0.276 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.135 | 0.914 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1.019 | -0.039 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | -0.049 | 1.024 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.872 | 0.215 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.149 | 0.921 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.313 | 0.53 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0.819 | 0.074 | 0.182 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | -0.158 | 1.105 | -0.005 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0.226 | 0.042 | 0.771 | 0 | 0 | 0 |
| **C** |  |  |  |  |  |  |  |  |  |  |  |
| 1 | 0.777 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| 0.777 | 1 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| 0  | 0  | 0.279 | 0.466 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| 0  | 0  | 0.466 | 0.778 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| 0  | 0  | 0  | 0  | 0.282 | 0.522 | 0  | 0  | 0  | 0  | 0  | 0  |
| 0  | 0  | 0  | 0  | 0.522 | 0.964 | 0  | 0  | 0  | 0  | 0  | 0  |
| 0  | 0  | 0  | 0  | 0  | 0  | 0.852 | 0.335 | 0.839 | 0  | 0  | 0  |
| 0  | 0  | 0  | 0  | 0  | 0  | 0.335 | 0.134 | 0.33 | 0  | 0  | 0  |
| 0  | 0  | 0  | 0  | 0  | 0  | 0.839 | 0.33 | 0.827 | 0  | 0  | 0  |
| 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0.499 | 0.487 | 0.455 |
| 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0.487 | 0.489 | 0.445 |
| 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0.455 | 0.445 | 0.414 |
| **C** |  |  |  |  |  |  |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.331 | -0.897 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -0.605 | 0.747 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | -0.136 | -0.811 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | -0.062 | 0.191 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | -0.096 | 0.41 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.303 | -1.003 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | -0.44 | 0.256 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0.519 | -0.071 | 0.2 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1.655 | 0.283 | -1.845 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | -0.555 | -0.708 | 0.994 | 0 | 0 | 0 |
| **E** |  |  |  |  |  |  |  |  |  |  |  |
| 1 | 0.036 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.036 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0.977 | 0.142 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0.142 | 0.993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.993 | 0.02 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.02 | 0.967 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0.99 | 0.193 | 0.204 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0.193 | 0.975 | 0.077 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0.204 | 0.077 | 0.95 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.951 | 0.13 | 0.142 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.13 | 0.902 | 0.168 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.142 | 0.168 | 0.918 |
| **E** |  |  |  |  |  |  |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.148 | -0.039 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -0.024 | 0.08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | -0.01 | 0.086 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0.022 | 0.177 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | -0.024 | -0.095 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.108 | 0.111 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.055 | 0.214 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0.186 | 0.04 | 0.07 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0.175 | 0.098 | 0.189 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0.083 | 0.008 | 0.258 | 0 | 0 | 0 |

**ACE simplex model, Sample 2**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A** |  |  |  |  |  |  |  |
| 1 | 0.99 | 0.508 | 0.411 | 0 | 0 | 0 | 0 |
| 0.99 | 1 | 0.509 | 0.534 | 0 | 0 | 0 | 0 |
| 0.508 | 0.509 | 1 | 0.357 | 0 | 0 | 0 | 0 |
| 0.411 | 0.534 | 0.357 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.005 | -0.033 | 0.022 | 0.005 |
| 0 | 0 | 0 | 0 | -0.033 | 0.231 | -0.15 | -0.034 |
| 0 | 0 | 0 | 0 | 0.022 | -0.15 | 0.097 | 0.022 |
| 0 | 0 | 0 | 0 | 0.005 | -0.034 | 0.022 | 0.005 |
| **A** |  |  |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.105 | 0.336 | 0.497 | 0.301 | 0 | 0 | 0 | 0 |
| 0.129 | 0.867 | 0.064 | -0.522 | 0 | 0 | 0 | 0 |
| 0.003 | -0.11 | 1.046 | -0.214 | 0 | 0 | 0 | 0 |
| 0.888 | -0.648 | 0.04 | 0.924 | 0 | 0 | 0 | 0 |
| **C** |  |  |  |  |  |  |  |
| 1 | 0.66 | 0.919 | 0.915 | 0 | 0 | 0 | 0 |
| 0.66 | 1 | 0.795 | 0.693 | 0 | 0 | 0 | 0 |
| 0.919 | 0.795 | 1 | 0.753 | 0 | 0 | 0 | 0 |
| 0.915 | 0.693 | 0.753 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.02 | -0.017 | -0.045 | -0.092 |
| 0 | 0 | 0 | 0 | -0.017 | 0.014 | 0.038 | 0.078 |
| 0 | 0 | 0 | 0 | -0.045 | 0.038 | 0.100 | 0.205 |
| 0 | 0 | 0 | 0 | -0.092 | 0.078 | 0.205 | 0.420 |
| **C** |  |  |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -0.29 | -0.626 | 1.229 | 0.6 | 0 | 0 | 0 | 0 |
| 0.12 | 0.733 | -0.052 | 0.271 | 0 | 0 | 0 | 0 |
| -0.235 | 0.035 | 1.143 | -0.016 | 0 | 0 | 0 | 0 |
| -0.063 | -0.002 | -0.12 | 0.904 | 0 | 0 | 0 | 0 |
| **E** |  |  |  |  |  |  |  |
| 1 | 0.044 | 0.351 | -0.027 | 0 | 0 | 0 | 0 |
| 0.044 | 1 | 0.385 | 0.192 | 0 | 0 | 0 | 0 |
| 0.351 | 0.385 | 1 | 0.257 | 0 | 0 | 0 | 0 |
| -0.027 | 0.192 | 0.257 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.939 | 0.1 | 0.008 | 0.098 |
| 0 | 0 | 0 | 0 | 0.1 | 0.84 | 0.415 | 0.044 |
| 0 | 0 | 0 | 0 | 0.008 | 0.415 | 0.806 | -0.152 |
| 0 | 0 | 0 | 0 | 0.098 | 0.044 | -0.152 | 0.952 |
| **E** |  |  |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.253 | 0.027 | -0.186 | 0.057 | 0 | 0 | 0 | 0 |
| -0.214 | 0.018 | 0.201 | 0.263 | 0 | 0 | 0 | 0 |
| 0.448 | -0.083 | -0.117 | 0.154 | 0 | 0 | 0 | 0 |
| 0.06 | -0.087 | -0.005 | 0.213 | 0 | 0 | 0 | 0 |

**ACE simplex model, Sample 3**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **A** |  |  |  |  |  |
| 1 | 0.598 | 0 | 0 | 0 | 0 |
| 0.598 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0.006 | 0.005 | 0.06 | 0 |
| 0 | 0 | 0.005 | 0.004 | 0.049 | 0 |
| 0 | 0 | 0.06 | 0.049 | 0.616 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| **A** |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 0.736 | 0.364 | 0 | 0 | 0 | 0 |
| -0.331 | 1.16 | 0 | 0 | 0 | 0 |
| 0.179 | 0.496 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0.276 | 0.787 | 0.026 | 0 |
| **C** |  |  |  |  |  |
| 1 | 0.612 | 0 | 0 | 0 | 0 |
| 0.612 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0.667 | 0.52 | 0.446 | 0 |
| 0 | 0 | 0.52 | 0.623 | 0.377 | 0 |
| 0 | 0 | 0.446 | 0.377 | 0.303 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| **C** |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| -0.641 | 0.116 | 0 | 0 | 0 | 0 |
| 0.472 | 0.2 | 0 | 0 | 0 | 0 |
| -0.611 | 1.055 | 0 | 0 | 0 | 0 |
| 0 | 0 | -0.441 | -0.658 | 1.334 | 0 |
| **E** |  |  |  |  |  |
| 1 | 0.231 | 0 | 0 | 0 | 0 |
| 0.231 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0.997 | 0.071 | 0.081 | 0 |
| 0 | 0 | 0.071 | 0.974 | 0.001 | 0 |
| 0 | 0 | 0.081 | 0.001 | 0.997 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0.944 |
|  |  |  |  |  |  |
| **E** |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 0.051 | 0.004 | 0 | 0 | 0 | 0 |
| 0.084 | 0.118 | 0 | 0 | 0 | 0 |
| 0.038 | 0.029 | 0 | 0 | 0 | 0 |
| 0 | 0 | -0.004 | -0.071 | 0.227 | 0 |

**ACE simplex model, Sample 4**

|  |  |  |  |
| --- | --- | --- | --- |
| **A** |  |  |  |
| 1 | 0 | 0 | 0 |
| 0 | 0.032 | 0.018 | -0.08 |
| 0 | 0.018 | 0.419 | -0.134 |
| 0 | -0.08 | -0.134 | 0.221 |
| **A** |  |  |  |
| 0 | 0 | 0 | 0 |
| 0.984 | 0 | 0 | 0 |
| 0.762 | 0 | 0 | 0 |
| 0.883 | 0 | 0 | 0 |
| **C** |  |  |  |
| 1 | 0 | 0 | 0 |
| 0 | 0.732 | -0.329 | -0.435 |
| 0 | -0.329 | 0.709 | 0.307 |
| 0 | -0.435 | 0.307 | 0.281 |
| **C** |  |  |  |
| 0 | 0 | 0 | 0 |
| 0.518 | 0 | 0 | 0 |
| 0.539 | 0 | 0 | 0 |
| 0.848 | 0 | 0 | 0 |
| **E** |  |  |  |
| 1 | 0 | 0 | 0 |
| 0 | 0.985 | 0.117 | 0.251 |
| 0 | 0.117 | 0.956 | 0.147 |
| 0 | 0.251 | 0.147 | 0.966 |
| **E** |  |  |  |
| 0 | 0 | 0 | 0 |
| 0.124 | 0 | 0 | 0 |
| 0.209 | 0 | 0 | 0 |
| 0.186 | 0 | 0 | 0 |

ACE simplex model with a *g* factor

**ACE simplex model with a *g* factor, Sample 1**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | .062 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | .66 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .504 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .925 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .406 |
| **A** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | .969 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | .583 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .705 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .274 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .77 | 0 | 0 | 0 |
| **A** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| .709 | 0 | 0 | 0 | 0 | .705 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .76 | 0 | 0 | 0 | 0 | 0 | .65 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | .894 | 0 | 0 | 0 | 0 | 0 | .448 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | .759 | 0 | 0 | 0 | 0 | 0 | 0 | .651 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | .772 | 0 | 0 | 0 | 0 | 0 | 0 | .635 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | .737 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .676 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | .847 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .531 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | .742 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .67 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | .691 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .722 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | .977 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .215 | 0 | 0 |
| 0 | 0 | 0 | 0 | .677 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .736 | 0 |
| 0 | 0 | 0 | 0 | .838 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .546 |
| **C** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | .952 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | .758 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | .001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | .001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .767 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .93 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .166 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .001 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **C** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .219 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | .492 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .483 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .264 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .913 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .999 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| **C** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| .447 | 0 | 0 | 0 | 0 | .894 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .848 | 0 | 0 | 0 | 0 | 0 | .53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | .415 | 0 | 0 | 0 | 0 | 0 | .91 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | .646 | 0 | 0 | 0 | 0 | 0 | 0 | .763 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | .402 | 0 | 0 | 0 | 0 | 0 | 0 | .916 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | .92 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .391 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | .294 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .956 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | -.297 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .955 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | .568 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .823 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | .515 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .857 | 0 | 0 |
| 0 | 0 | 0 | 0 | .855 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .519 | 0 |
| 0 | 0 | 0 | 0 | .842 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .540 |
| **E** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | .001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | .968 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | .824 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | .977 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .965 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .001 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .967 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .935 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .979 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .987 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .923 |
| **E** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | .178 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | .419 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | .153 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | .026 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | .02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .187 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -.999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .181 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .255 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -.143 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .115 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .278 | 0 | 0 | 0 |
| **E** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| .204 | 0 | 0 | 0 | 0 | .979 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.251 | 0 | 0 | 0 | 0 | 0 | .968 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | .102 | 0 | 0 | 0 | 0 | 0 | .995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | -.169 | 0 | 0 | 0 | 0 | 0 | 0 | .986 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | .261 | 0 | 0 | 0 | 0 | 0 | 0 | .965 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | -.398 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .917 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | .999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .047 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | .203 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .979 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | .136 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .991 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | .42 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .908 | 0 | 0 |
| 0 | 0 | 0 | 0 | .515 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .857 | 0 |
| 0 | 0 | 0 | 0 | .32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .947 |

**ACE simplex model with a *g* factor, Sample 2**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A** |  |  |  |  |  |  |  |  |  |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | .276 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | .644 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **A** |  |  |  |  |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .851 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | .596 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| **A** |  |  |  |  |  |  |  |  |  |
| .672 | 0 | .741 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .89 | 0 | 0 | .456 | 0 | 0 | 0 | 0 | 0 | 0 |
| .679 | 0 | 0 | 0 | .734 | 0 | 0 | 0 | 0 | 0 |
| .753 | 0 | 0 | 0 | 0 | .658 | 0 | 0 | 0 | 0 |
| 0 | .973 | 0 | 0 | 0 | 0 | .23 | 0 | 0 | 0 |
| 0 | .644 | 0 | 0 | 0 | 0 | 0 | .765 | 0 | 0 |
| 0 | .47 | 0 | 0 | 0 | 0 | 0 | 0 | .883 | 0 |
| 0 | .548 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .837 |
| **C** |  |  |  |  |  |  |  |  |  |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | .947 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .976 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .980 |
| **C** |  |  |  |  |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | .231 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | .156 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | .14 | 0 | 0 | 0 | 0 |
| **C** |  |  |  |  |  |  |  |  |  |
| 1 | 0 | .003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .798 | 0 | 0 | .602 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | .004 | 0 | 0 | 0 | 0 | 0 |
| .991 | 0 | 0 | 0 | 0 | .133 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | .011 | 0 | 0 | 0 |
| 0 | .856 | 0 | 0 | 0 | 0 | 0 | .518 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | .017 | 0 |
| 0 | .918 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .397 |
| **E** |  |  |  |  |  |  |  |  |  |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | .699 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | .932 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | .982 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .001 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .970 |
| **E** |  |  |  |  |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.548 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | .261 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | .132 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | -1 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | .173 | 0 | 0 | 0 | 0 |
| **E** |  |  |  |  |  |  |  |  |  |
| .449 | 0 | .894 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .37 | 0 | 0 | .929 | 0 | 0 | 0 | 0 | 0 | 0 |
| .867 | 0 | 0 | 0 | .499 | 0 | 0 | 0 | 0 | 0 |
| .145 | 0 | 0 | 0 | 0 | .989 | 0 | 0 | 0 | 0 |
| 0 | .046 | 0 | 0 | 0 | 0 | .999 | 0 | 0 | 0 |
| 0 | -.501 | 0 | 0 | 0 | 0 | 0 | .865 | 0 | 0 |
| 0 | -.733 | 0 | 0 | 0 | 0 | 0 | 0 | .68 | 0 |
| 0 | .052 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .999 |

**ACE simplex model with a *g* factor, Sample 3**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A** |  |  |  |  |  |  |  |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | .065 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| **A** |  |  |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | .967 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | .004 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **A** |  |  |  |  |  |  |  |
| .566 | 0 | 0 | .824 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | .002 | 0 | 0 | 0 |
| 0 | .803 | 0 | 0 | 0 | .595 | 0 | 0 |
| 0 | .978 | 0 | 0 | 0 | 0 | .209 | 0 |
| 0 | .729 | 0 | 0 | 0 | 0 | 0 | .684 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| **C** |  |  |  |  |  |  |  |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | .558 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | .002 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | .98 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| **C** |  |  |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | -.665 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | -.999 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | -.143 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **C** |  |  |  |  |  |  |  |
| .597 | 0 | 0 | .802 | 0 | 0 | 0 | 0 |
| .993 | 0 | 0 | 0 | .121 | 0 | 0 | 0 |
| 0 | .704 | 0 | 0 | 0 | .71 | 0 | 0 |
| 0 | -.435 | 0 | 0 | 0 | 0 | .9 | 0 |
| 0 | -1 | 0 | 0 | 0 | 0 | 0 | .016 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| **E** |  |  |  |  |  |  |  |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | .985 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | .957 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | .998 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | .982 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| **E** |  |  |  |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .121 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | .207 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | .05 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | .136 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **E** |  |  |  |  |  |  |  |
| .648 | 0 | 0 | .761 | 0 | 0 | 0 | 0 |
| .343 | 0 | 0 | 0 | .939 | 0 | 0 | 0 |
| 0 | .167 | 0 | 0 | 0 | .986 | 0 | 0 |
| 0 | -.036 | 0 | 0 | 0 | 0 | .999 | 0 |
| 0 | .822 | 0 | 0 | 0 | 0 | 0 | .57 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

**ACE simplex model with a *g* factor, Sample 4**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **A** |  |  |  |  |
| 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 |
| 0 | 0 | 0 | 0 | 1 |
| **A** |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| **A** |  |  |  |  |
| 1 | 0 | 0 | 0 | 0 |
| 0 | .986 | .169 | 0 | 0 |
| 0 | .737 | 0 | .676 | 0 |
| 0 | .771 | 0 | 0 | .636 |
| **C** |  |  |  |  |
| 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 |
| 0 | 0 | 0 | 0 | 1 |
| **C** |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| **C** |  |  |  |  |
| 1 | 0 | 0 | 0 | 0 |
| 0 | .408 | .913 | 0 | 0 |
| 0 | .62 | 0 | .784 | 0 |
| 0 | 1 | 0 | 0 | 0 |
| **E** |  |  |  |  |
| 1 | 0 | 0 | 0 | 0 |
| 0 | .842 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 |
| 0 | 0 | 0 | 0 | 1 |
| **E** |  |  |  |  |
| 0 | 0 | 0 | 0 | 0 |
| .397 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| **E** |  |  |  |  |
| 1 | 0 | 0 | 0 | 0 |
| 0 | .44 | .898 | 0 | 0 |
| 0 | .363 | 0 | .932 | 0 |
| 0 | .553 | 0 | 0 | .833 |