Ability or Temperament? A Psychometric Analysis of Emotional Intelligence – is more better?

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Organized by Andrew Ortony and Marina Fiori

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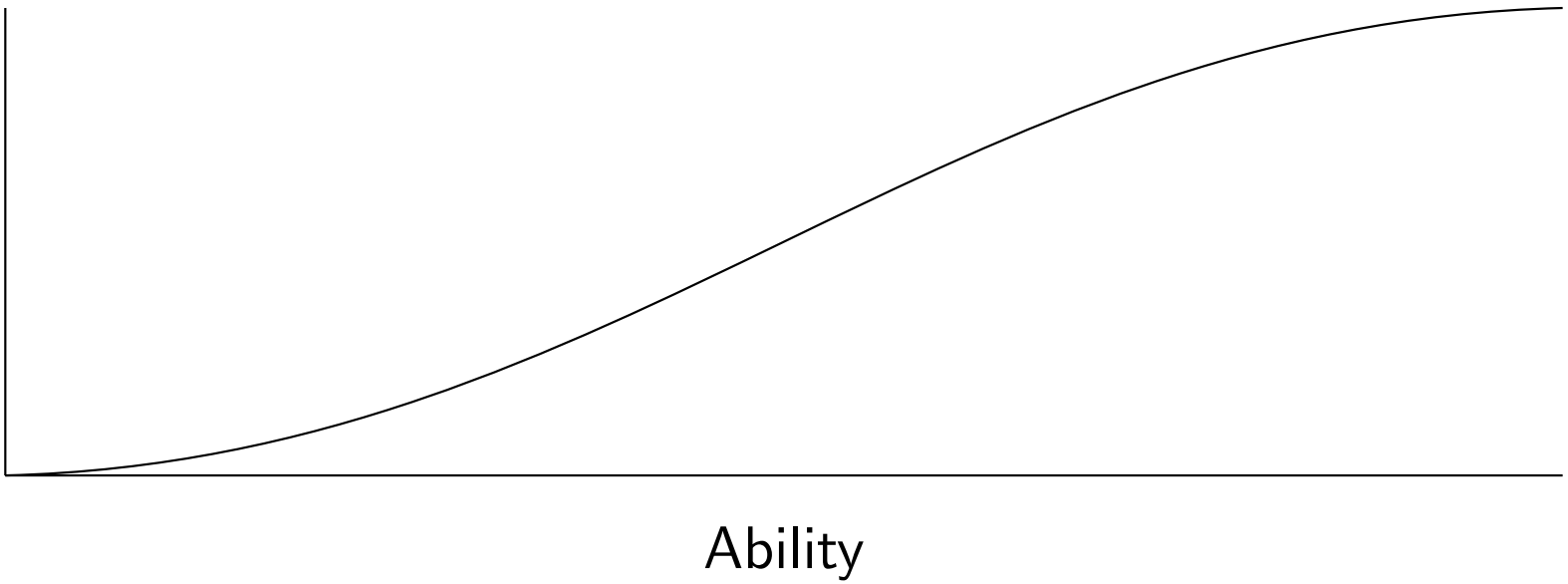
Outline

1. Overview
   - Temperament, Abilities, and Interest
   - Beyond Affect, Behavior, Cognition and Desire: Temperament, Ability and Interests
2. Method: Synthetic Aperture Personality Assessment–SAPA
3. Results
   - EI in the Temperament-Ability-Interests space
   - College Majors sorted by Temperament, Ability, and TEIQ
   - Majors draw for different mixtures of Temperament, Ability, and Interests
4. Conclusions

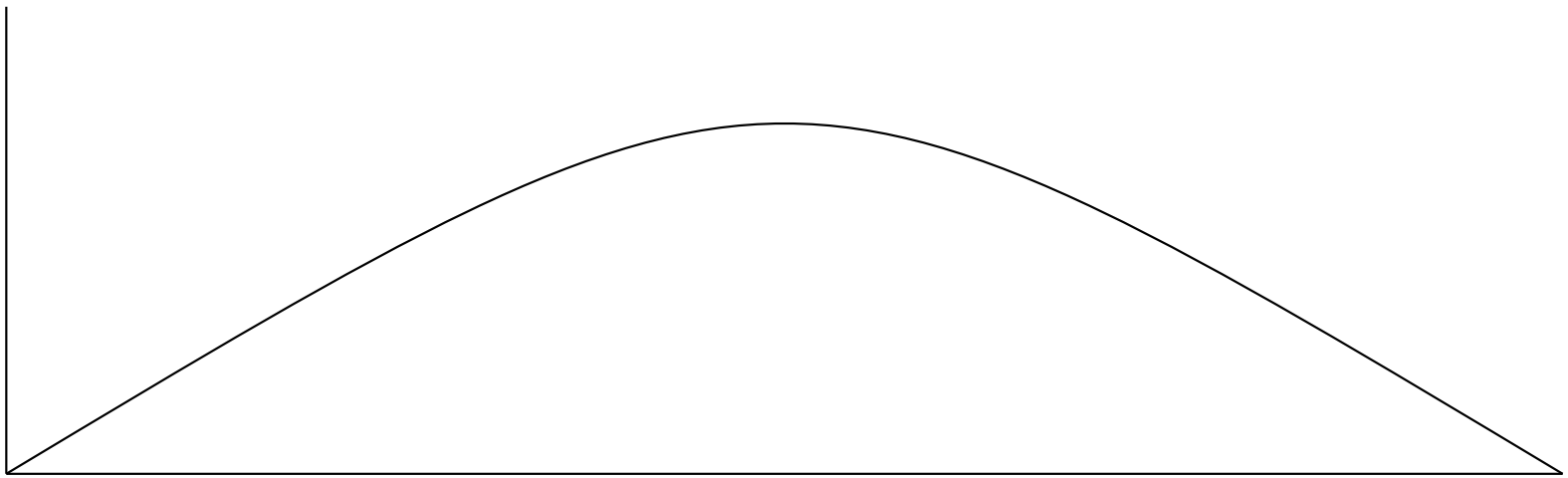
Abilities: What we can do

1. Maximal performance
2. Right or wrong answer
3. Monotonic trace lines (more is better)
4. Directional genetic selection



Trait dimensions: what we usually do or what we like to do

1. What we usually do reflects temperaments
2. What we like to do reflects interests
3. Conceptually: non-monontonic trace lines
4. Optimal level ("Goldilocks principal")
5. Balanced genetic selection



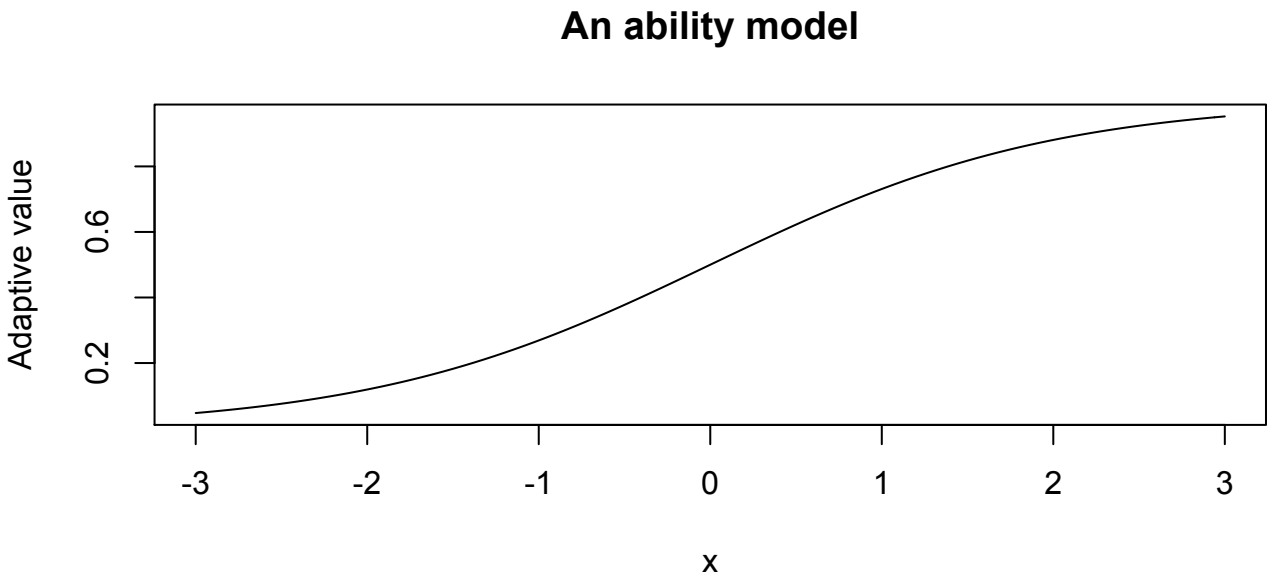
Trait dimension

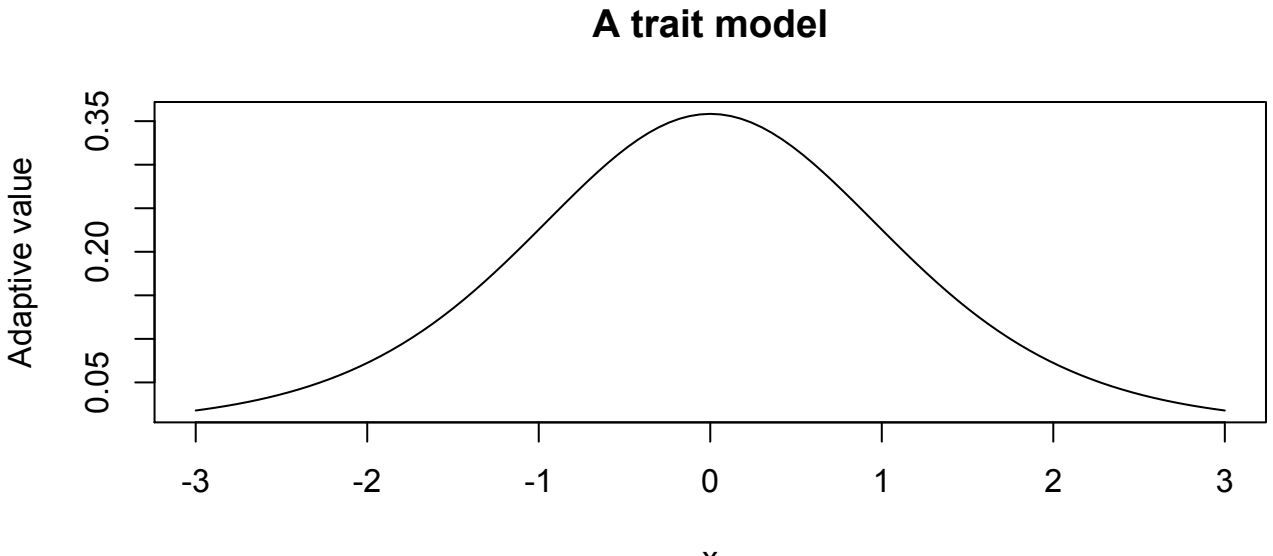
Abilities and temperamental dimensions differ in fundamental ways

1. Ability: What we can do
   - Maximal performance
   - Right or wrong answer
   - Monotonic trace lines (more is better)
   - Directional genetic selection
2. Trait dimensions
   - What we usually do reflects temperaments
   - What we like to do reflects interests
   - Conceptually: non-monontonic trace lines
   - Optimal level ("Goldilocks principal")
   - Balanced genetic selection
3. Which is Emotional Intelligence?

Ability vs traits is not a new distinction, but one that needs to be thought of carefully (Pérez, Petrides & Furnham, 2005; Penke, Denissen & Miller, 2007).

Comparing an ability model to a trait model





Traditional view of Personality and Temperament

Hogan (1982) distinguishes between personality as identity and personality as reputation. To this we would add actions.

1. Identity
   - How we see ourselves
   - Studies of the structure of self report
2. Reputation
   - How others see us
   - Studies of the structure of peer report
3. Actions
   - What we actually do
   - Studies of the residues of our choices and our actions.
   - One important outcome is choice of college major.
   - Another is the choice of occupation.

A more inclusive theory of personality: Temperament, Ability, and Interest

1. Temperament: what we usually do
   - Identity, Reputation, and Actions
   - Affective, Cognitive and Behavioral reactions to situations: the "Big 5" (Goldberg, 1990), the "Giant 3" (Eysenck, 1990)
2. Ability: What we can do
   - Measures of intellectual ability – life as an intelligence test (Deary, Penke & Johnson, 2010; Gottfredson, 1997; Horn & Cattell, 1966; Johnson & Bouchard, 2005)
3. Interests: What we like to do
   - 6 dimensions: Realistic, Investigative, Artistic, Social, Enterprising, Conventional (aka RIASEC Holland, 1996)
   - 2 dimensions (e.g., people vs. things/facts vs. ideas, Prediger & Vansickle, 1992) of interests

Emotional Intelligence: Temperament, Ability, or Interest

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   - 2 dimensions (e.g., people vs. things/facts vs. ideas, Prediger & Vansickle, 1992) of interests
4. Where does emotional intelligence fit in?

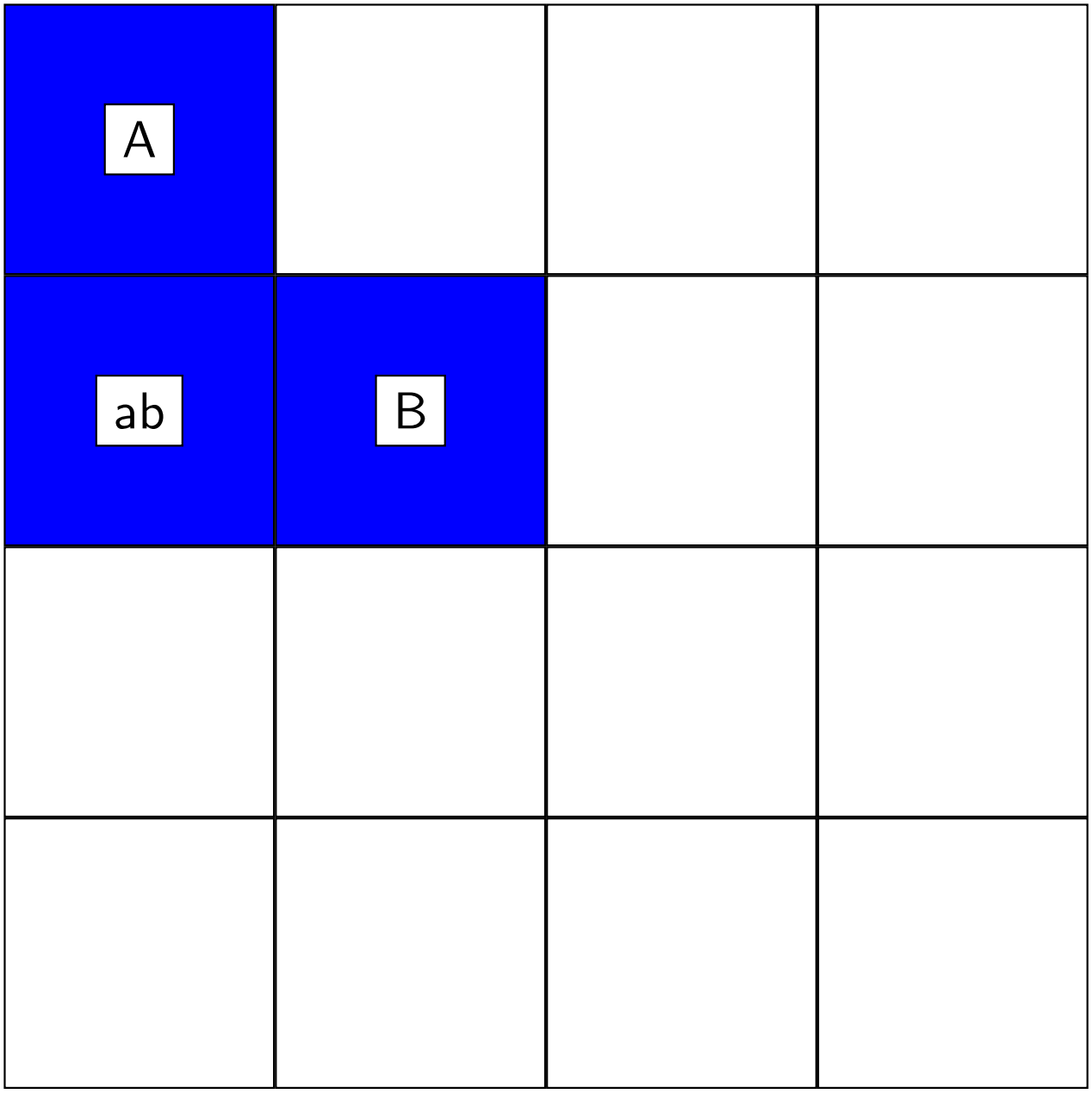
Fitting EI into the Temperament-Ability-Interest Space

1. Multiple possible measures of Emotional Intelligence
   - MSCEIT (Mayer, Salovey, Caruso & Sitarenios, 2003)
   - Measures discussed by Austin and by Robins
   - Trait Emotional Intelligence Questionnaire (Pérez et al., 2005)
2. TAI measures
   - Big 5 from IPIP (Goldberg, 1999)
   - IQ
   - 8 interest domains
3. Data collected as part of a much larger project studying the structure of personality using a web based data system
4. Simple correlations between TEIQ and Big5 and IQ
5. Applied to the problem of selecting college majors

Method

1. Synthetic Aperture Personality Assessment (Revelle, Wilt & Rosenthal, 2010) forms large covariance matrices by sampling items across people
   - $\approx 120/day$ particpants are recruited to `test.personality-project.org`
   - Each participant is given 60-70 items
   - Total set of items being analyzed > 400
2. Item content being sampled
   - 100 "IPIP" Big 5 items
   - ≈ 200 other temperamental items
   - 54-75 home brewed ability items
   - 92 Oregon Vocational Interest items (ORVIS)
3. Although $> 200,000$ participants have been run in all, we will report only those data from the last 65,000
4. Demographic information included
   - Age, Gender
   - Level of education
   - College major and broad field (if appropriate)
   - Occupation (if appropriate)

SAPA: what the subject sees



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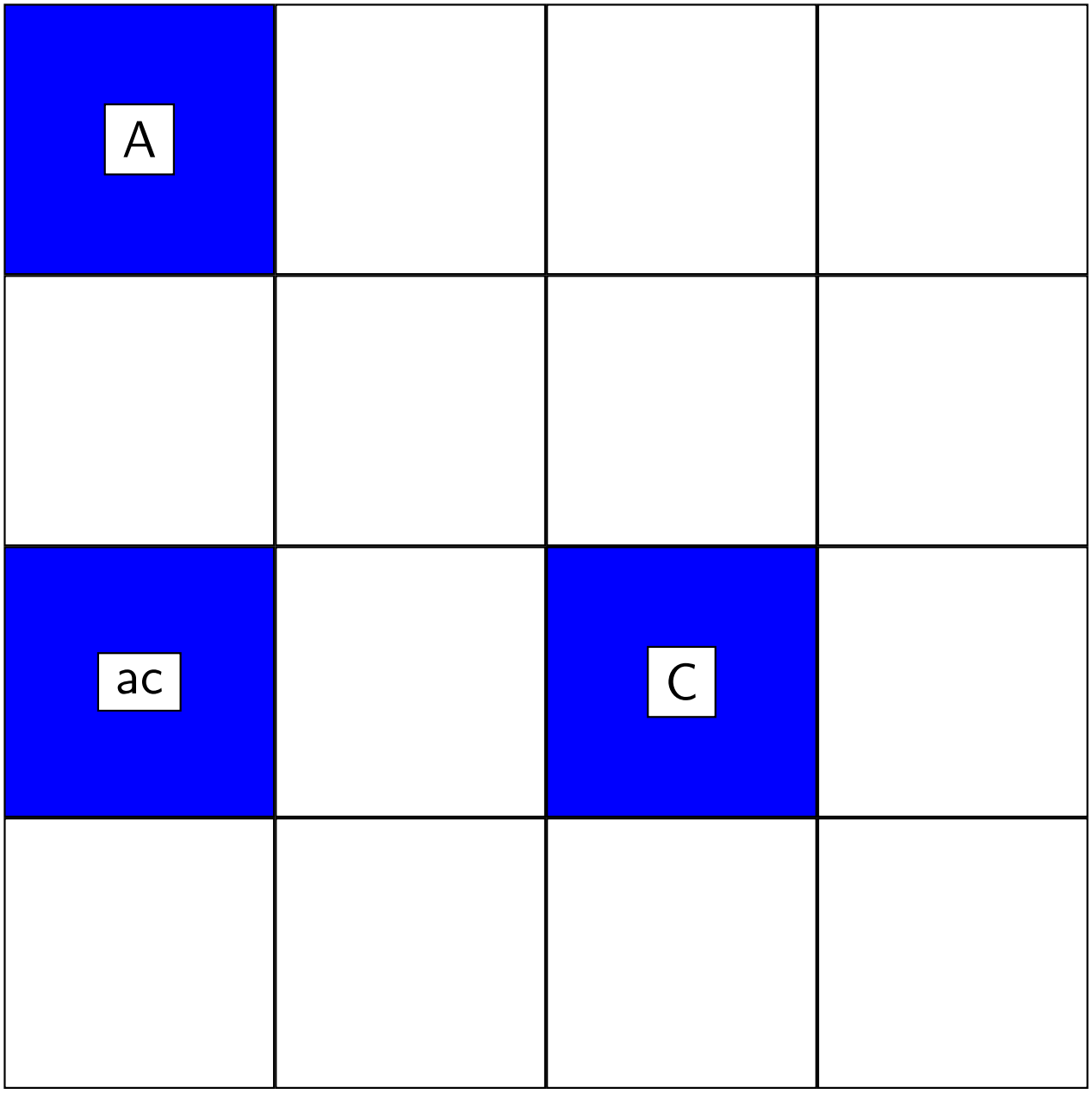

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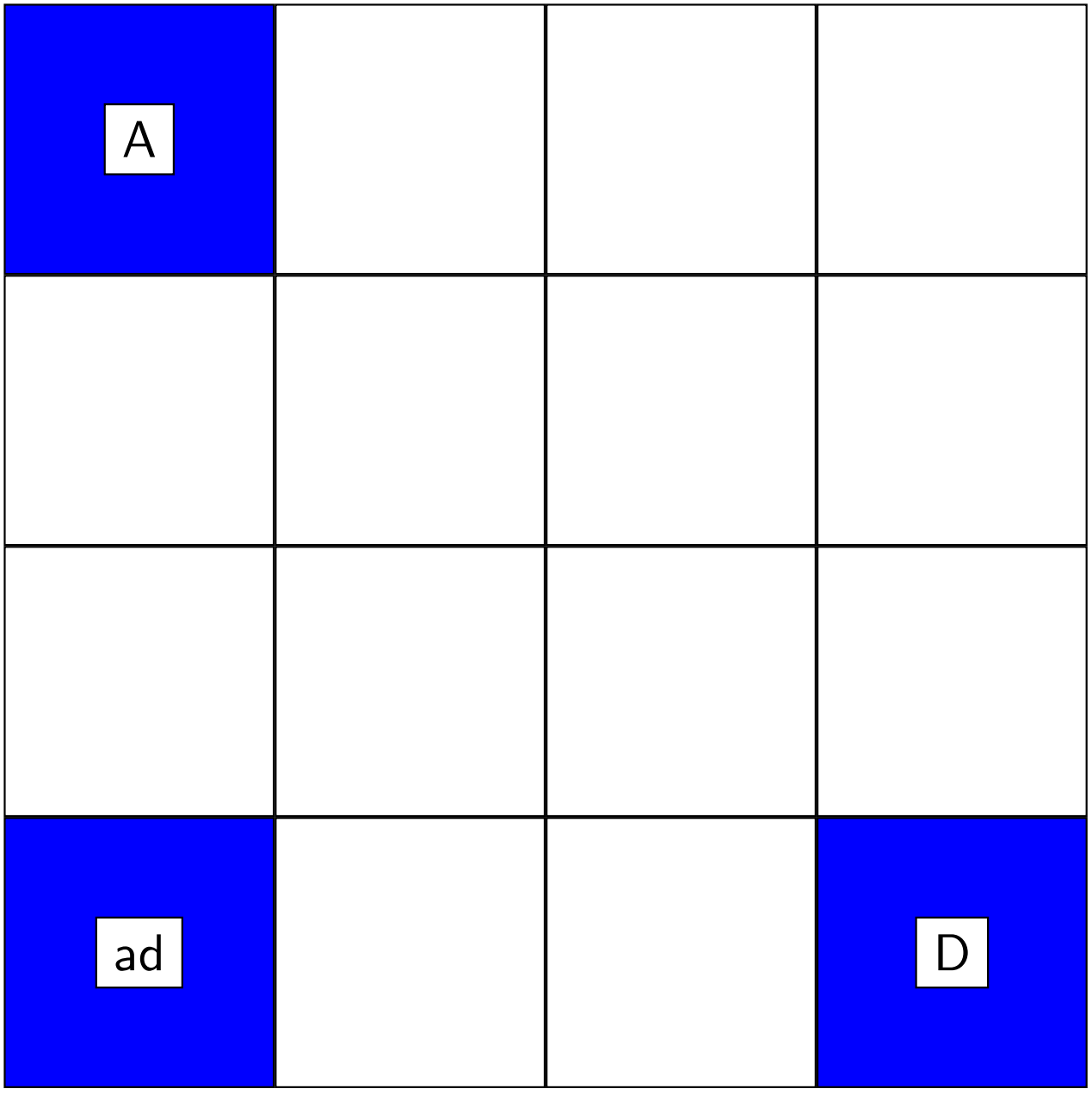

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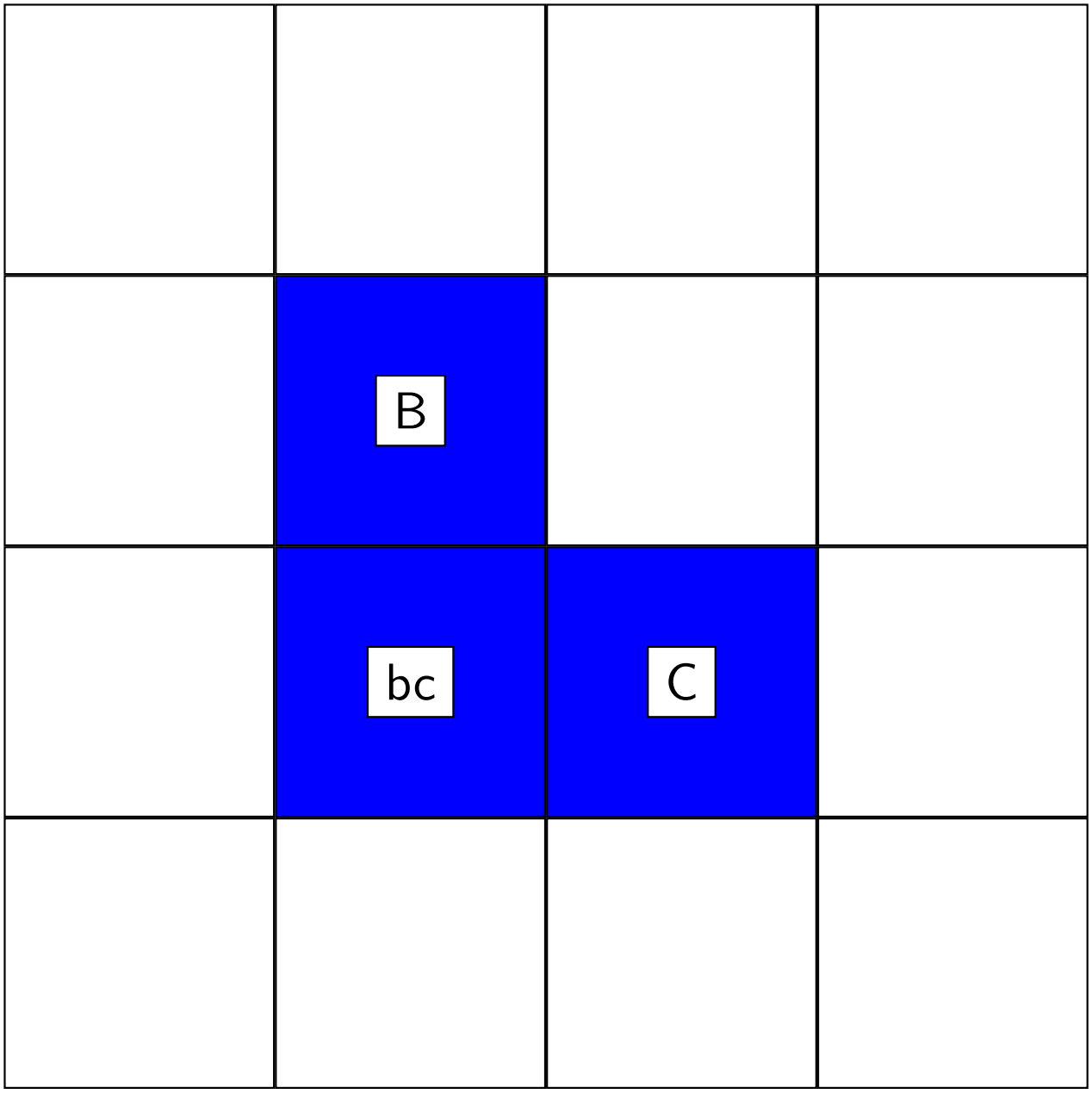

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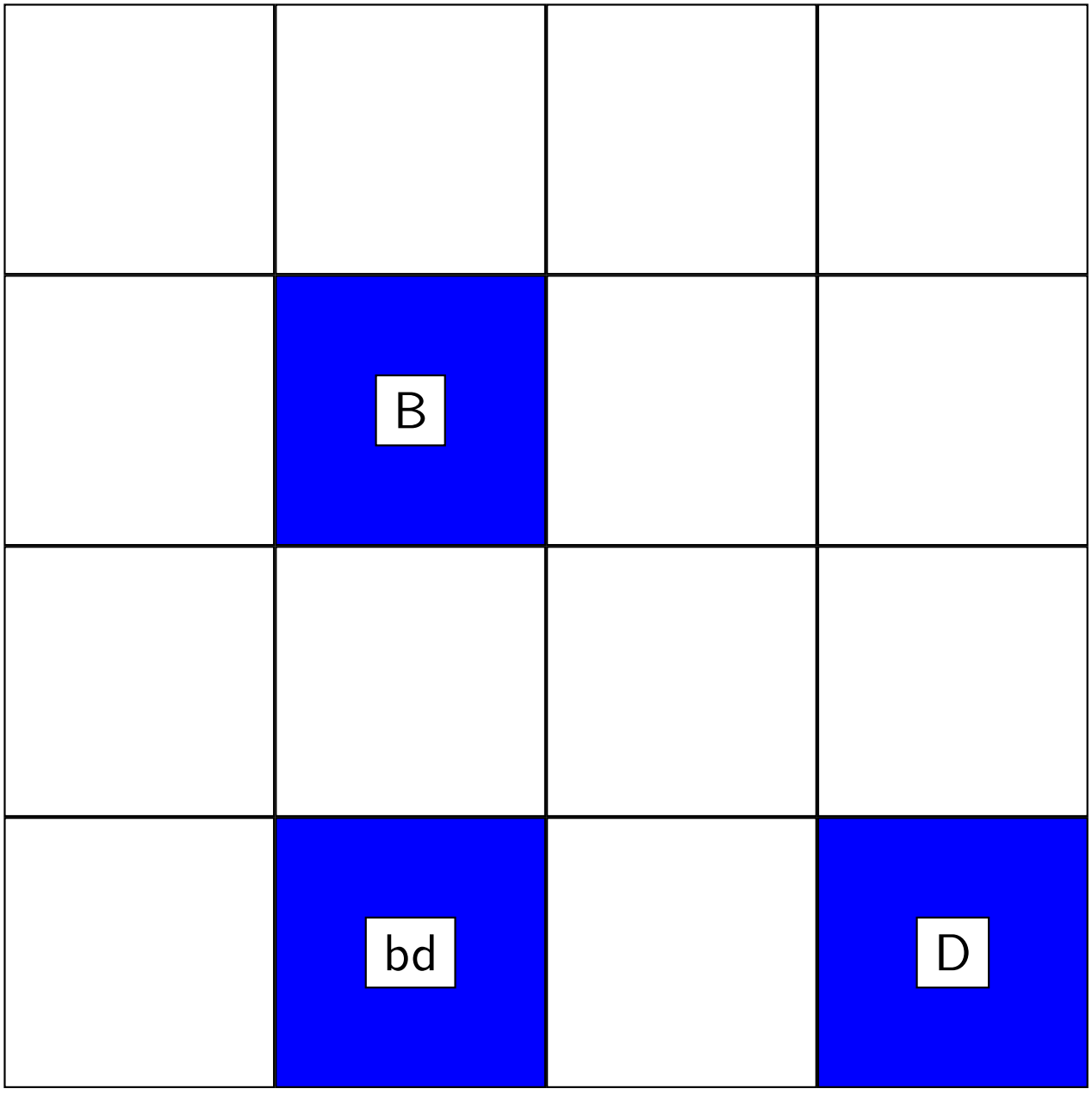

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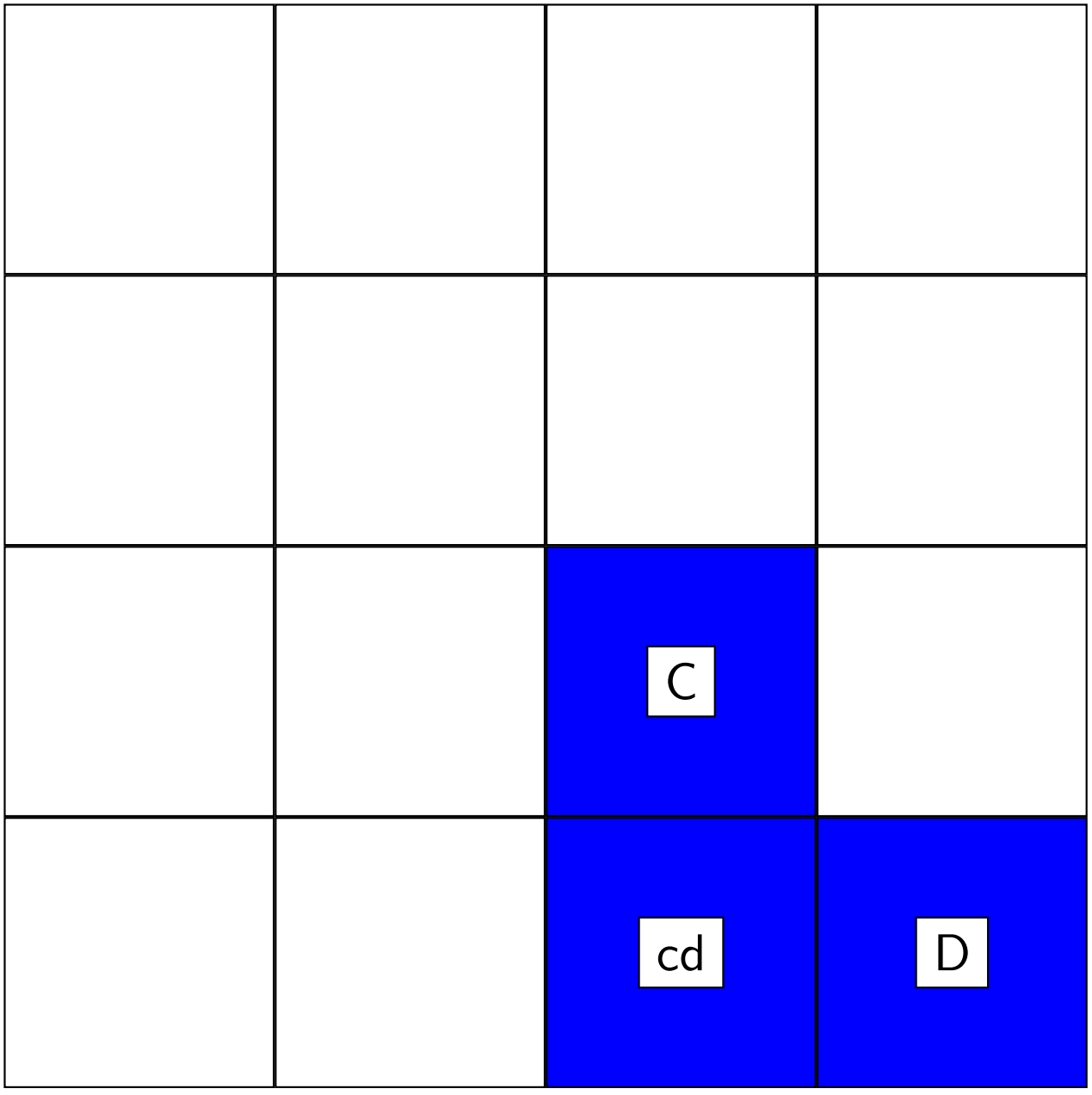
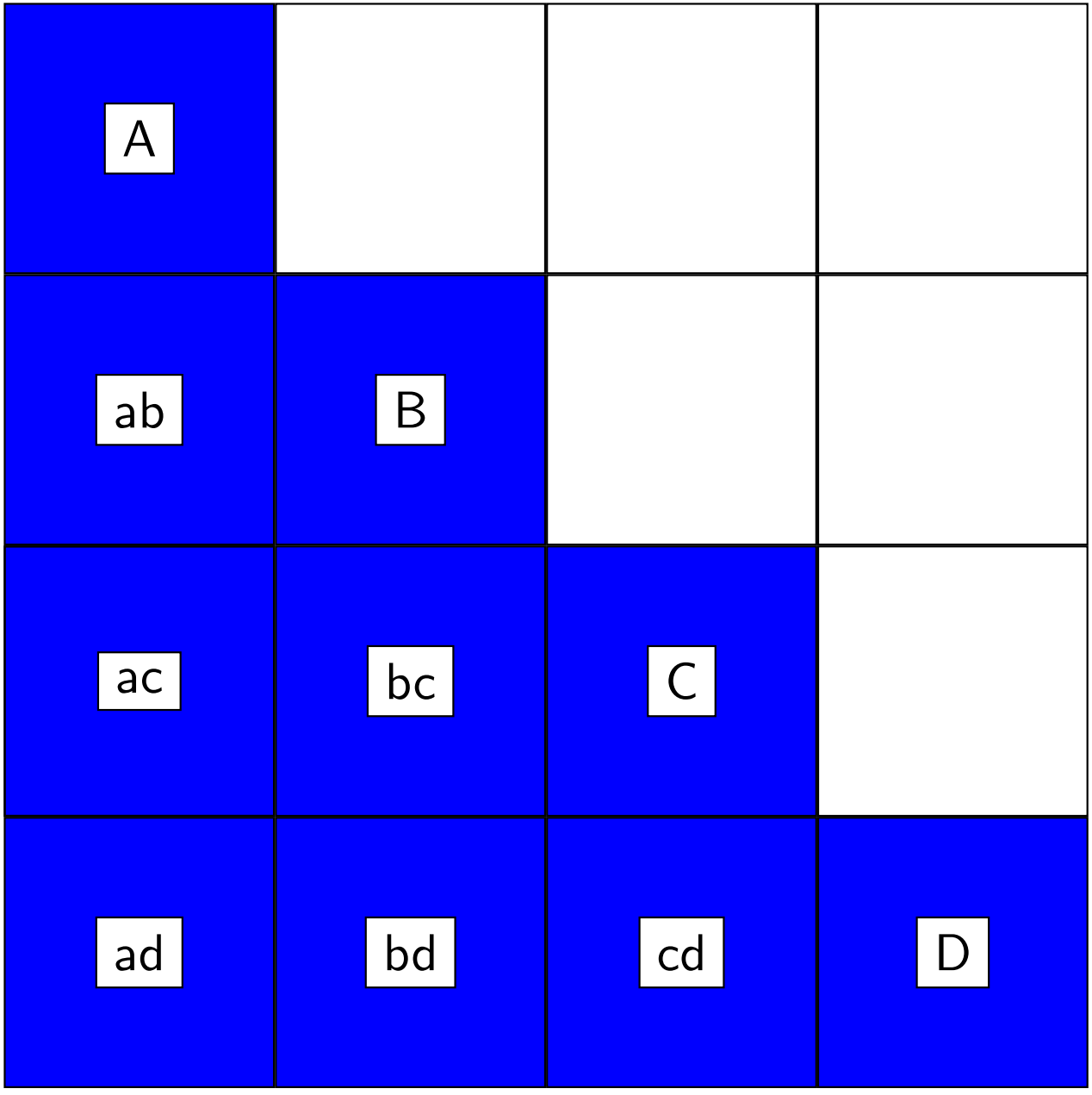


SAPA: what the experimenter sees: A Synthetic matrix



SAPA: Technical overview

1. n x n synthetic covariance matrices are formed by giving p items to Np subjects

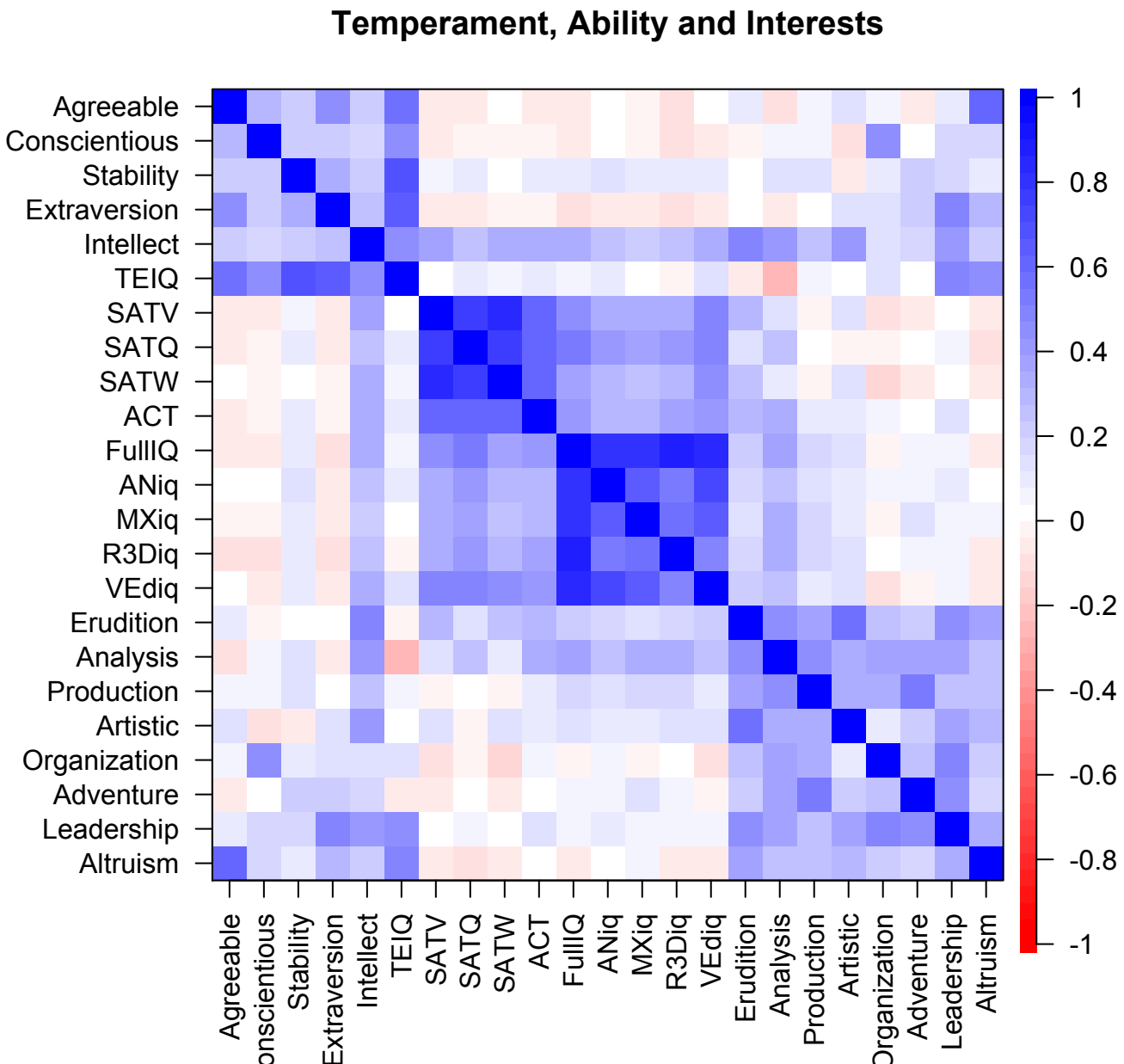
N	Total number of subjects
n	Total number of items in synthetic matrix
p	Probability of any item being given
pN	Number of subjects taking any one item
p^2N	Number of subjects for any pair of items

2. Basic statistics
   - Data are Massively Missing at Random
   - Means and Variances are based upon pN subjects
   - Covariances are based upon p^2N subjects
3. Power of large samples and sampling of items
   - 100-150 people per day => 40,000 subjects per year
   - 700-1000 subjects/week
   - By varying p, one can prototype items rapidly.

Choosing majors as selection, optimization, and compensation

1. Traits and abilities are independent at individual level
   - This is seen in the plot of all the TAI variables based upon individual level analysis
2. Majors draw for certain constellations of traits
   - Selection, Optimization, and Compensation (Baltes & Baltes, 1990)
   - Sorting of majors by TAI dimensions
3. Choice of major selects for constellations
   - This is seen in the plot of the personality dimensions at the aggregate level of majors

EI in the Temperament-Ability-Interests space



Big 5, ability and Trait Emotional Intelligence

	Agreeable	Cons	Extravn	Stability	Intellect	FullIQ	TEIQ
Agreeable	1.00	0.28	0.43	0.19	0.19	-0.08	0.55
Conscientious	0.28	1.00	0.19	0.21	0.15	-0.08	0.44
Extraversion	0.43	0.19	1.00	0.30	0.25	-0.11	0.64
Stability	0.19	0.21	0.30	1.00	0.20	0.09	0.65
Intellect	0.19	0.15	0.25	0.20	1.00	0.30	0.44
FullIQ	-0.08	-0.08	-0.11	0.09	0.30	1.00	0.02
TEIQ	0.55	0.44	0.64	0.65	0.44	0.02	1.00

Predicting Trait Emotional Intelligence from Big 5 + ability

Multiple Regression from **matrix** input

Beta **weights**

	TEIQ
Agreeable	0.24
Conscientious	0.19
Extraversion	0.32
Stability	0.43
Intellect	0.20
FullIQ	−0.01

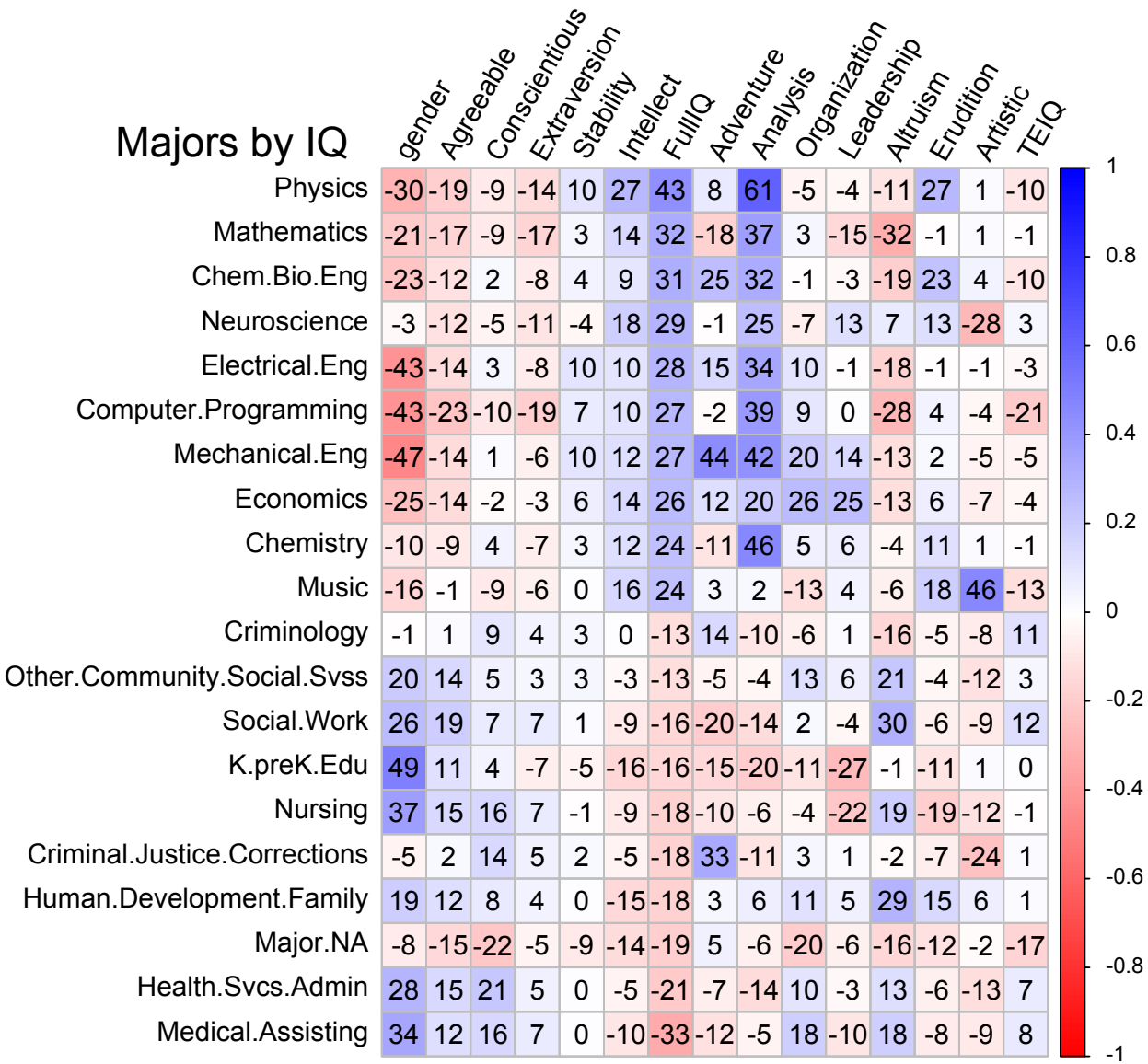
Multiple **R**

TEIQ
0.89

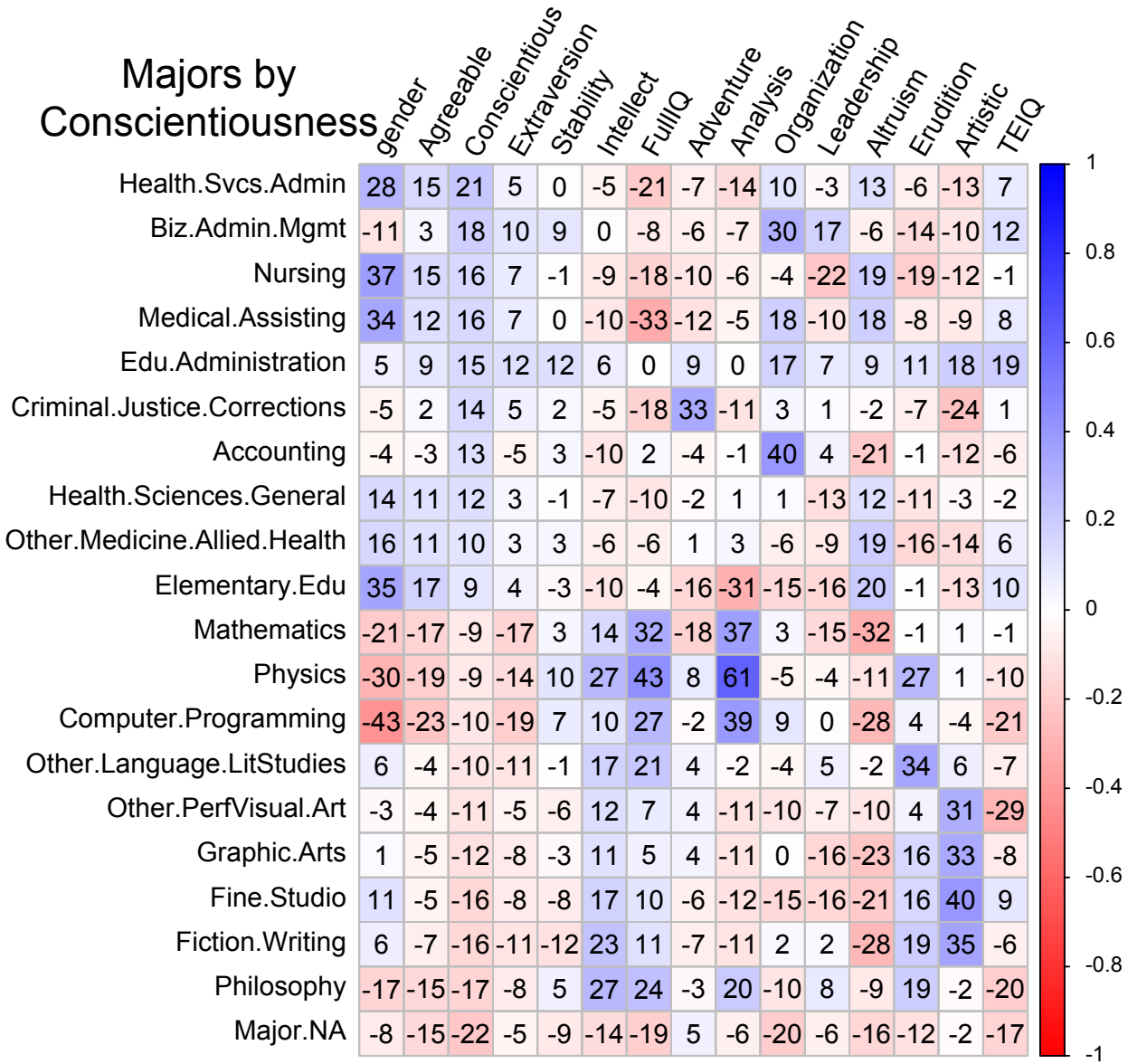
Multiple R2

TEIQ
0.79

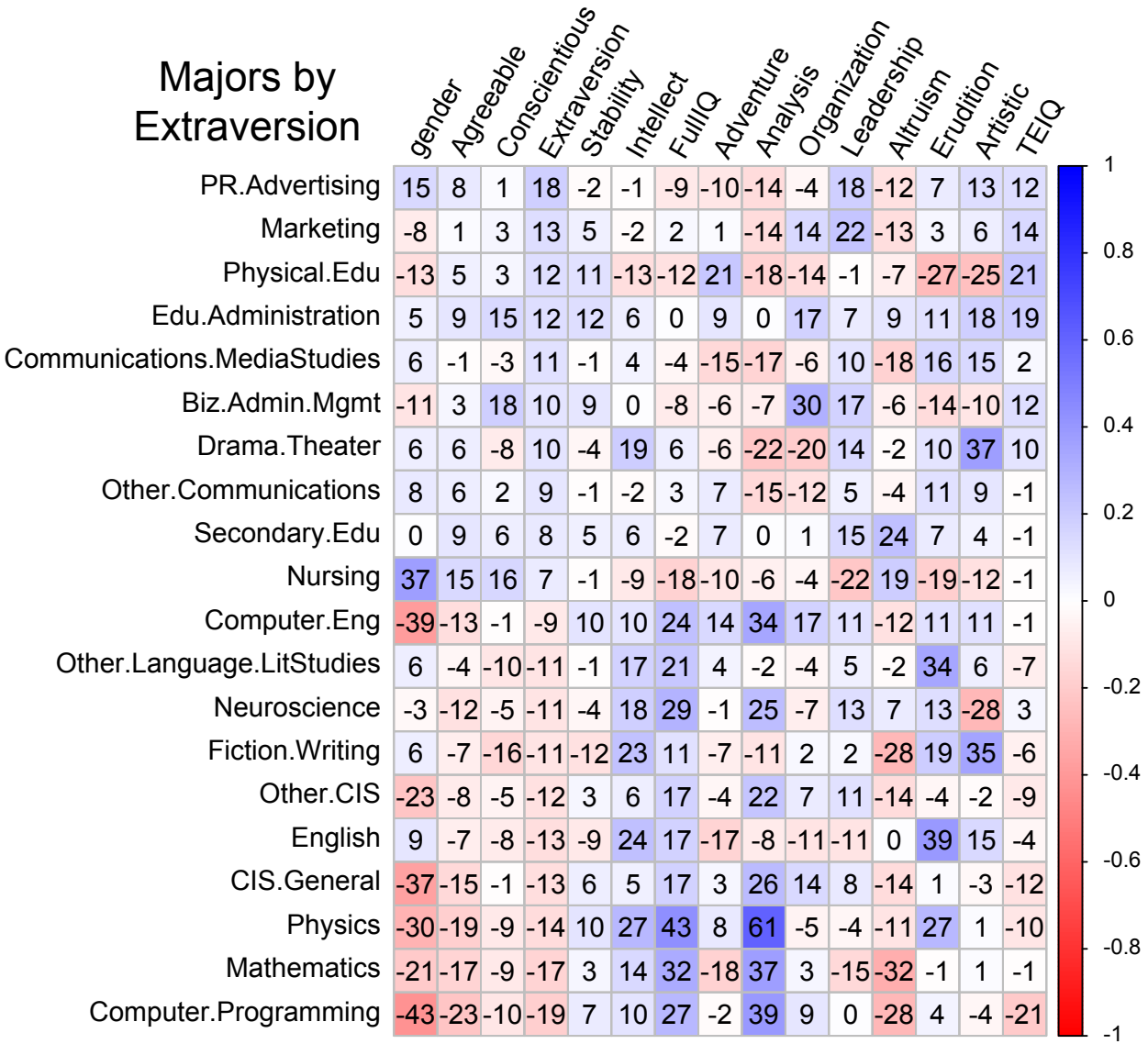
College major sorted by Intelligence (top and bottom 10 majors)



College major sorted by Conscientiousness (top and bottom 10)

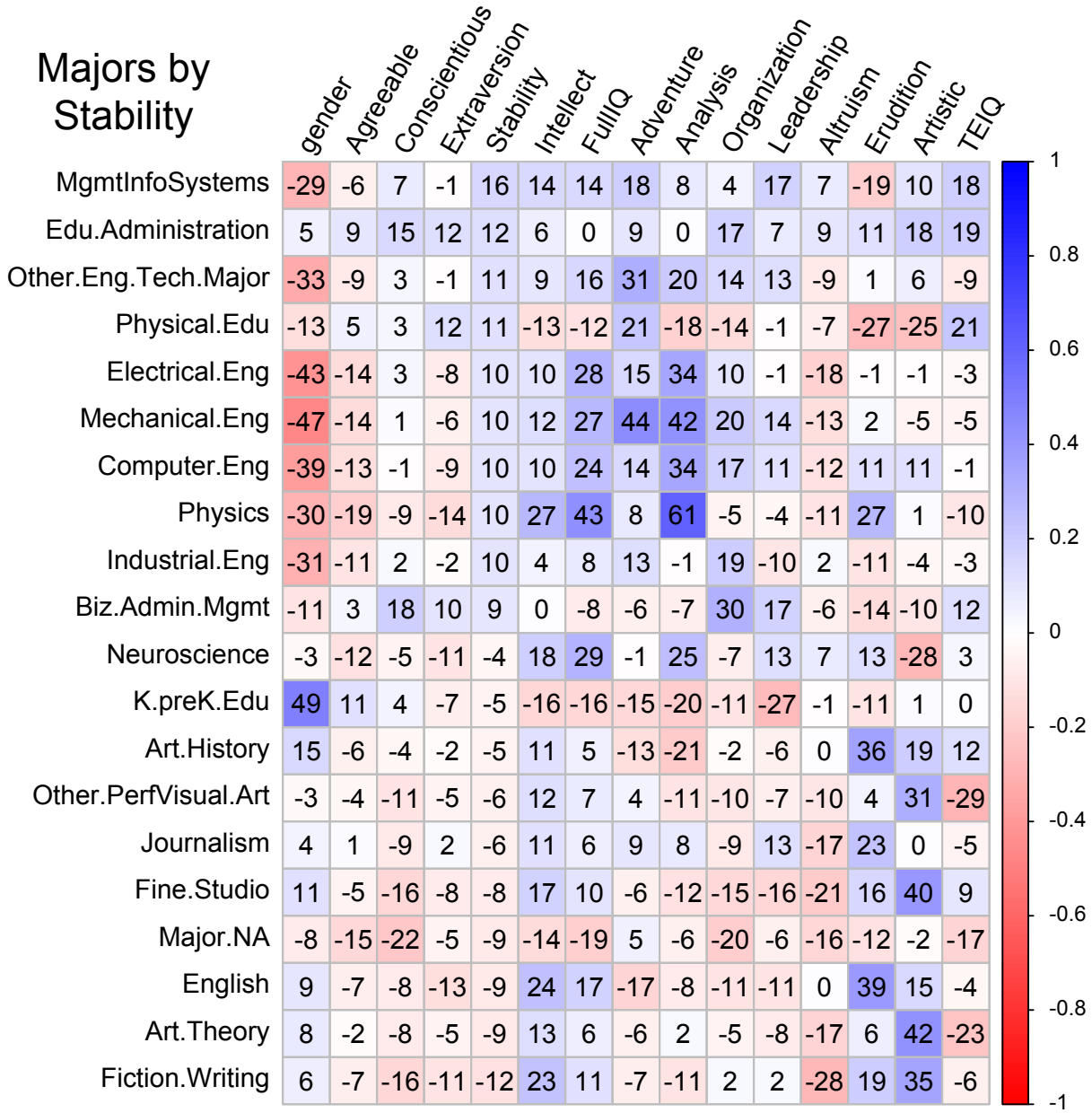


College major sorted by Extraversion (top and bottom 10 majors)

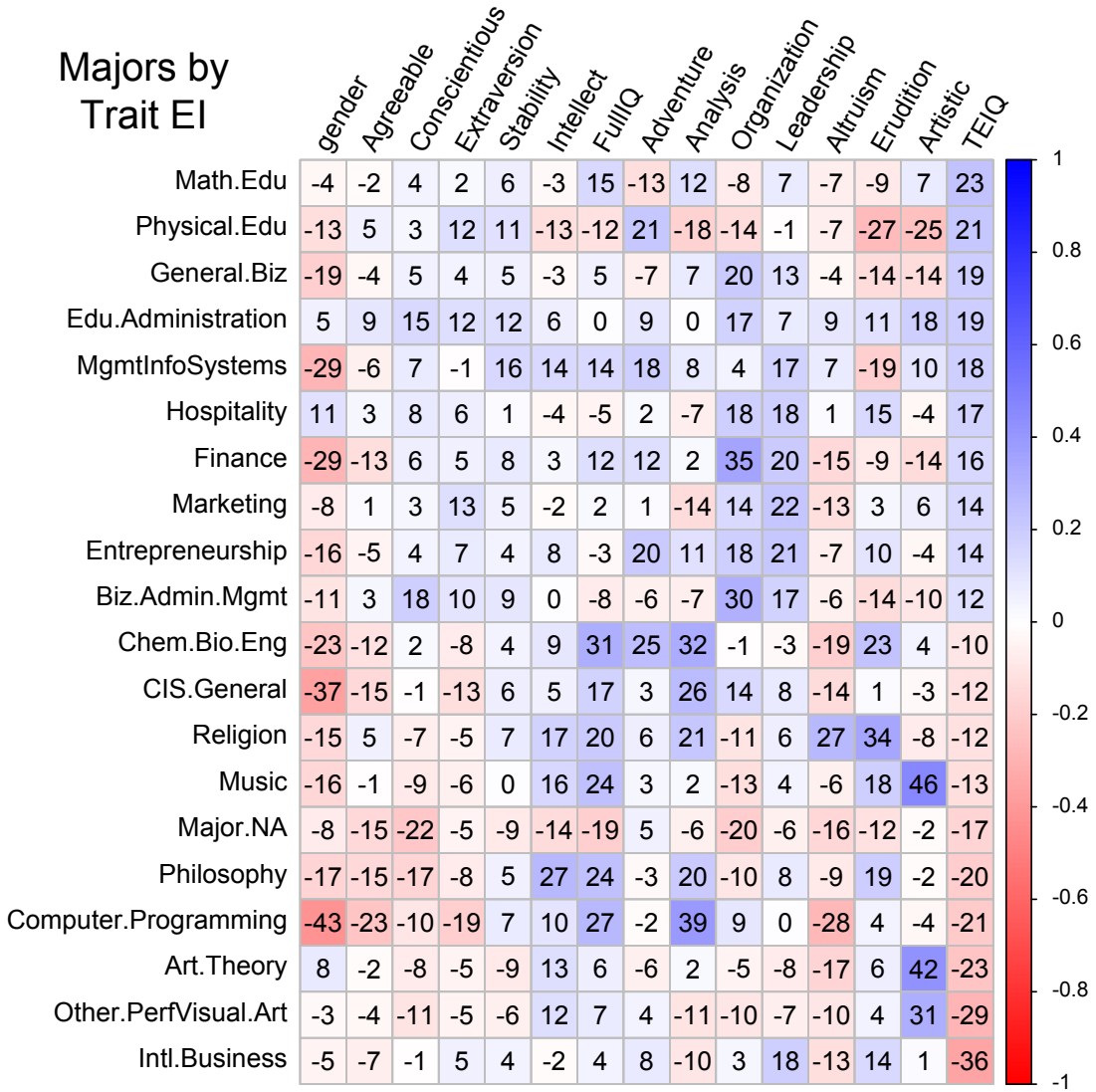


Majors by Extraversion	gender	Agreeable	Conscientious	Extraversion	Stability	Intellect	FullIQ	Adventure	Analysis	Organization	Leadership	Altruism	Erudition	Artistic	TEIQ
PR.Advertising	15	8	1	18	-2	-1	-9	-10	-14	-4	18	-12	7	13	12
Marketing	-8	1	3	13	5	-2	2	1	-14	14	22	-13	3	6	14
Physical.Edu	-13	5	3	12	11	-13	-12	21	-18	-14	-1	-7	-27	-25	21
Edu.Administration	5	9	15	12	12	6	0	9	0	17	7	9	11	18	19
Communications.MediaStudies	6	-1	-3	11	-1	4	-4	-15	-17	-6	10	-18	16	15	2
Biz.Admin.Mgmt	-11	3	18	10	9	0	-8	-6	-7	30	17	-6	-14	-10	12
Drama.Theater	6	6	-8	10	-4	19	6	-6	-22	-20	14	-2	10	37	10
Other.Communications	8	6	2	9	-1	-2	3	7	-15	-12	5	-4	11	9	-1
Secondary.Edu	0	9	6	8	5	6	-2	7	0	1	15	24	7	4	-1
Nursing	37	15	16	7	-1	-9	-18	-10	-6	-4	-22	19	-19	-12	-1
Computer.Eng	-39	-13	-1	-9	10	10	24	14	34	17	11	-12	11	11	-1
Other.Language.LitStudies	6	-4	-10	-11	-1	17	21	4	-2	-4	5	-2	34	6	-7
Neuroscience	-3	-12	-5	-11	-4	18	29	-1	25	-7	13	7	13	-28	3
Fiction.Writing	6	-7	-16	-11	-12	23	11	-7	-11	2	2	-28	19	35	-6
Other.CIS	-23	-8	-5	-12	3	6	17	-4	22	7	11	-14	-4	-2	-9
English	9	-7	-8	-13	-9	24	17	-17	-8	-11	-11	0	39	15	-4
CIS.General	-37	-15	-1	-13	6	5	17	3	26	14	8	-14	1	-3	-12
Physics	-30	-19	-9	-14	10	27	43	8	61	-5	-4	-11	27	1	-10
Mathematics	-21	-17	-9	-17	3	14	32	-18	37	3	-15	-32	-1	1	-1
Computer.Programming	-43	-23	-10	-19	7	10	27	-2	39	9	0	-28	4	-4	-21

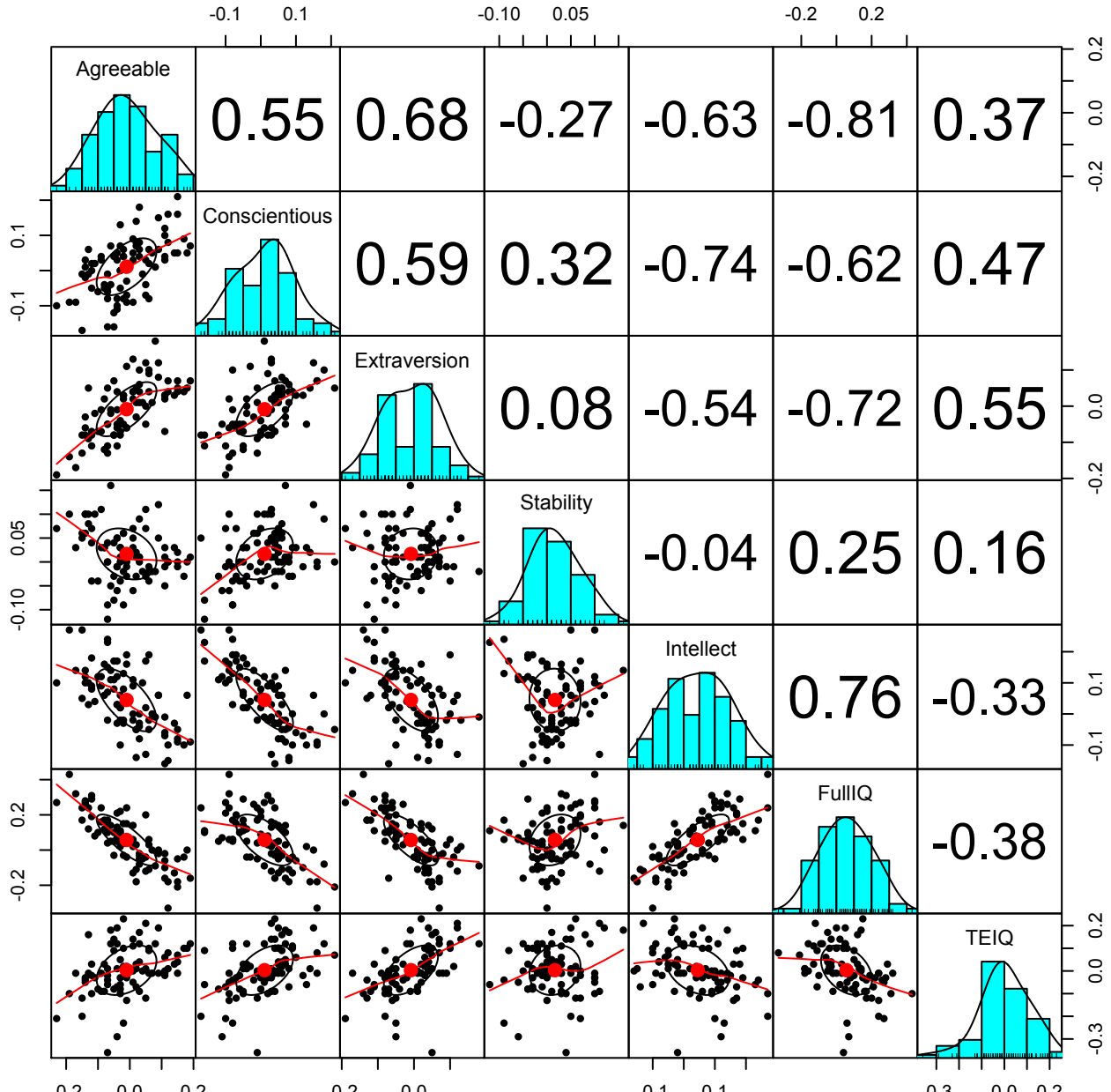
College major sorted by Stabilty–Neuroticsm (top and bottom 10)



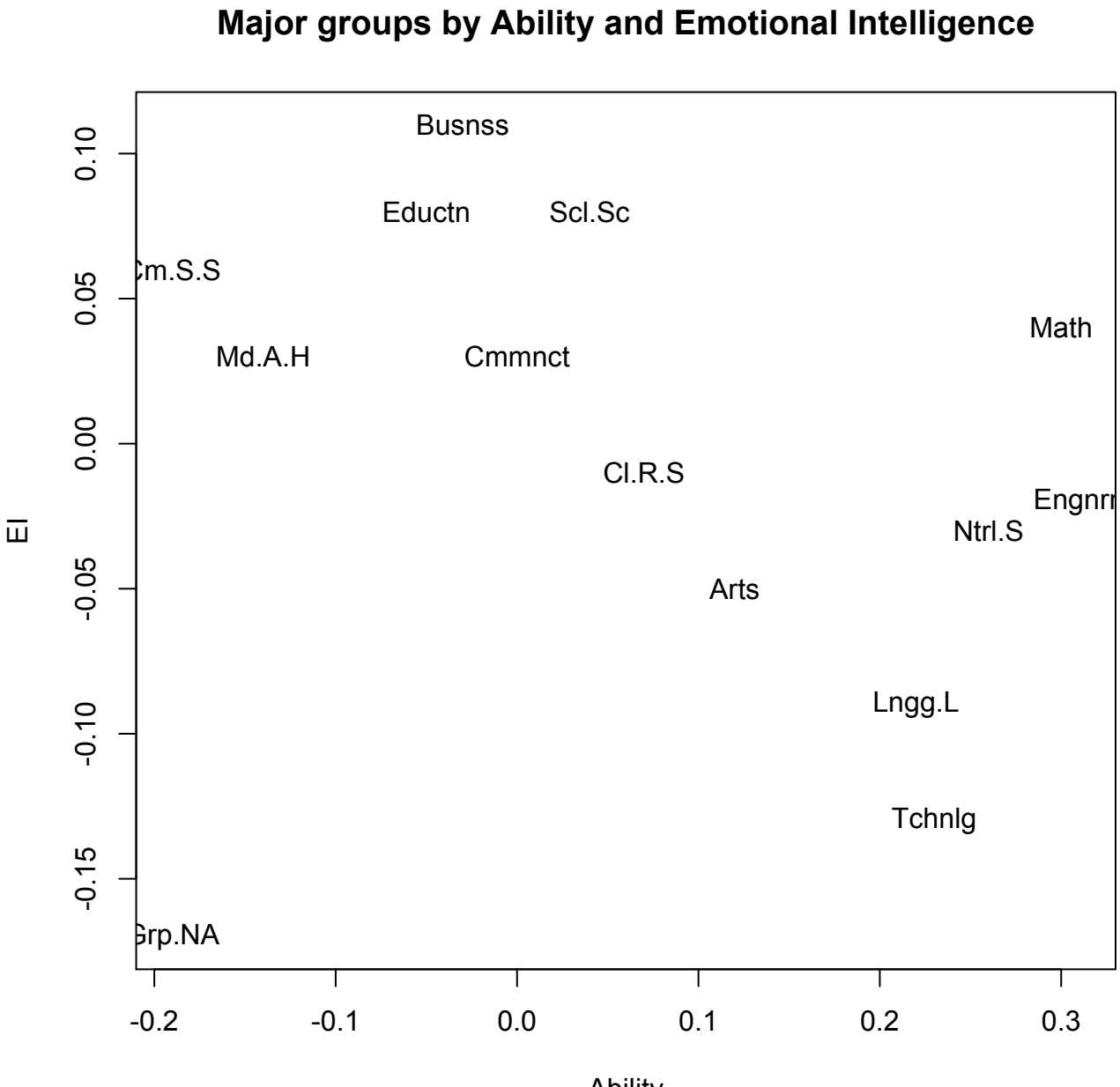
Sort by Emotional Intelligence (top and bottom 10 majors)



Temperament, Ability, and Trait EI by college major



Majors grouped in the Ability by "Emotional Intelligence" space



The place of Emotional Intelligence in the Temperament-Ability-Interest space

1. TEIQ highly related to traditional measures of Temperament (the Big 5)
   - Multiple R of .89 with Big 5 + ability
   - Multiple R of .89 with just Big 5
2. What unique variance is provided for by the Trait EI scale?
   - Pattern of relationships with college major do not suggest any special benefit of TEIQ
3. Of course, this is all a criticism of the TEIQ, not of the latent variable called Emotional Intelligence
   - If there is something there, it is not found in the TEIQ

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