

# Understanding and assessing social and emotional learning in schools.

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# Brief vita



- Psychologist, Associate Professor at Graduate Program in Psychology (Psychological Assessment) of University of São Francisco in Campinas, SP, Brazil
- I study psychological and educational assessment personality and psychometrics.
- 2014: invited by economist Daniel Santos, I joined Ayrton Senna Institute's (IAS) eduLab21 Science Laboratory for Education



F1 car Ayrton Senna won in a bet after winning 1990 Italian Grand Prix



# Summary

## 1. What is socio emotional skills

- Social and emotional big five model
- Instrument for assessment social and emotional skills in in Brazilian schools

## 2. Applied uses of the social and emotional big five in schools

- Social emotional skills and learning
- Monitoring social emotional skills development

## 3. Measurement challenges of social and emotional skills in international comparisons

# 1. What are social and emotional skills?

# It depends ..

## What framework?

Santos & Primi (2014): 20 major frameworks and 267 skills defined !

Scientific challenge (Olderbak & Wilhelm, 2020):

**Jangle Fallacy**: different Labels but Same Construct Assessed

CASEL Self Management, CASEL Self Efficacy, CGC Grit, B5 Conscientiousness

**Jingle Fallacy**: same Label but Different Constructs Assessed

CASEL Self Management

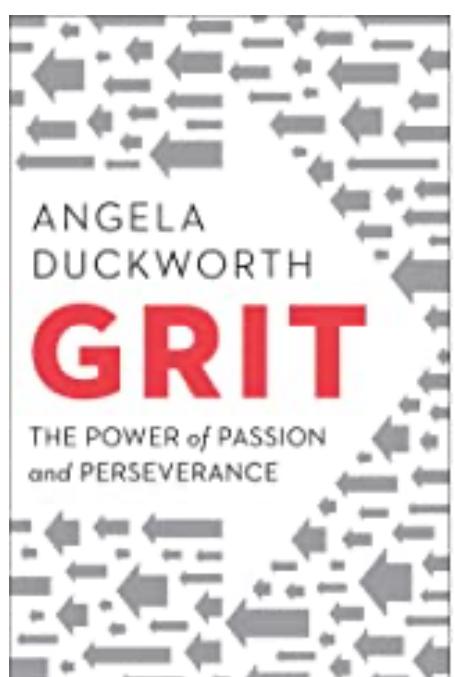
## CGC Grit

**Think about your behavior during this marking period (quarter or trimester). Please answer how often you did the following behaviors.**

...I finished whatever I began.

...I tried very hard even after experiencing failure.

1: Almost Never, 2: Very Rarely 3: Rarely,  
4: Sometimes, 5: Often, 6: Very Often,  
7: Almost Always



## CASEL Self Management

**Please answer how often you did the following during the past 30 days. During the past 30 days...**

I got my work done right away instead of waiting until the last minute.

I stayed on task without reminders from my teacher.

1: Almost Never, 2: Once in a While,  
3: Sometimes, 4: Often,  
5: Almost All the Time

## CASEL Self Efficacy

**How confident are you about the following at school?**

I can meet all the learning goals my teachers set.

I can master the hardest topics in my classes.

1: Not At All Confident, 2: A Little Confident,  
3: Somewhat Confident, 4: Mostly Confident,  
5: Completely Confident

**CASEL**



## CASEL Self Management

*Please answer how often you did the following during the past 30 days. During the past 30 days...*

I got my work done right away instead of waiting until the last minute.

I stayed on task without reminders from my teacher.

I kept my temper in check.

I stayed calm even when others bothered or criticized me.

1: Almost Never, 2: Once in a While,  
3: Sometimes, 4: Often,  
5: Almost All the Time

**Big Five Conscientiousness**

**Jingle Fallacy:** Same Label but Different Constructs Assessed

**Big Five Emotional Stability  
(vs. Negative Emotionality)**

# Mapping studies

## Need for a comprehensive taxonomy

Why it is important to pay attention to these fallacies?

Confusion in the taxonomy for social and emotional skills may result in a loss of connection to established empirical knowledge.

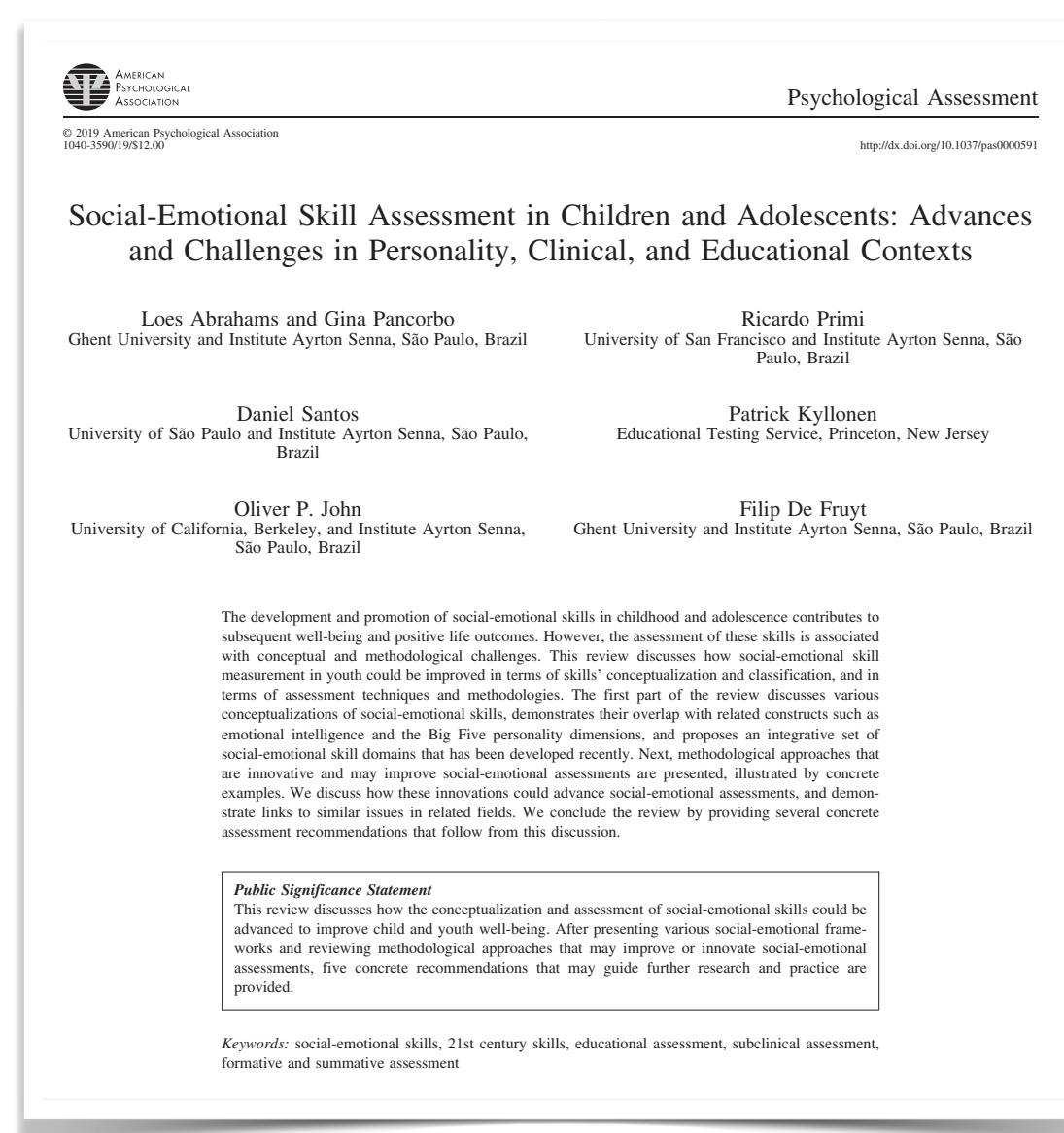
- The nomological network (validity of interpretations of the construct).
- Instruments of measurement.

# Mapping studies

## The need for a comprehensive taxonomy

We started running empirical studies of factor analysis of various instruments to see what are the core dimensions of social and emotional skills

We followed the recommendations made in the Kyllonen et al. (2014) review, in which the big five are proposed as an organizing framework.



This image shows the cover of another journal article. The journal title 'European Journal of Psychological Assessment 2016; Vol. 32(1):5–16' is at the top left, with the DOI 'DOI: 10.1027/1015-5759/a000343' below it. The article title is 'Development of an Inventory Assessing Social and Emotional Skills in Brazilian Youth'. The authors listed are Ricardo Primi, Daniel Santos, Oliver P. John, and Filip De Fruyt. Below the title is a short abstract: 'Whereas the structure of individual differences in personal attributes is well understood in adults, much less work has been done in children and adolescents. On the assessment side, numerous instruments are in use for children but they measure discordant attributes, ranging from one single factor (self-esteem; grit) to three factors (social, emotional, and academic self-efficacy) to five factors (strength and difficulties; Big Five traits). To construct a comprehensive measure for large-scale studies in Brazilian schools, we selected the eight most promising instruments and studied their structure at the item level (Study 1; N = 3,023). The resulting six-factor structure captures the major domains of child differences represented in these instruments and resembles the well-known Big Five personality dimensions plus a negative self-evaluation factor. In a large representative sample in Rio de Janeiro State (Study 2; N = 24,605), we tested a self-report inventory (SENNAI.0) assessing these six dimensions of socio-emotional skills with less than 100 items and found a robust and replicable structure and measurement invariance across grades, demonstrating feasibility for large-scale assessments across diverse student groups in Brazil. Discussion focuses on the contribution to socio-emotional research in education and its measurement as well as on limitations and suggestions for future research.' Key words listed at the bottom include: 21st century skills, social-emotional skills, instrument development, Big Five, five-factor model, measurement invariance, exploratory structural equation modeling.

This image shows the cover of a third journal article. The journal title 'Estudos de Psicologia (CAMPINAS)' is at the top left, with the DOI 'http://dx.doi.org/10.1590/1982-0275201936e180138' below it. The article title is 'Mapping self-report questionnaires for socio-emotional characteristics: What do they measure?'. The authors listed are Ricardo Primi, Daniel Domingues dos Santos, Nelson Hauck, Filip De Fruyt, and Oliver Peter John. Below the title is an abstract: 'Whereas the structure of individual differences in many social and emotional attributes is well understood in adults, much less work has been done in children and adolescents. This study aims to identify the major content domains that are assessed across multiple socio-emotional instruments (self-esteem, grit, self-efficacy, strengths and difficulties; Big Five) in research in the United States and Europe, to test them in a less developed context with considerable educational challenges (Brazilian schools). We selected the five most promising instruments and studied their structure at the item level in a large sample of Brazilian school students (N = 3,023). The extracted factors to capture the major domains of child differences represented in these instruments closely resembled the Big Five personality dimensions. We discuss the contribution of our findings to the assessment of socio-emotional skills in education research, as well as limitations of the current study, and suggestions for future research.' Key words listed at the bottom include: Big Five, Large-scale educational assessment, Socio-emotional learning, 21st Century skills. At the very bottom, there is a note: 'Support: This study was financed in part by the Instituto Ayrton Senna, Conselho Nacional de Desenvolvimento Científico e Tecnológico (Processo nº 310909/2017-1), and Fundação de Amparo à Pesquisa do Estado de São Paulo (Process nº 2018/0933-8).'



## SENN Inventory for the Assessment of Social and Emotional Skills in Public School Students in Brazil: Measuring Both Identity and Self-Efficacy

Ricardo Primi<sup>1,2\*</sup>, Daniel Santos<sup>2,3</sup>, Oliver P. John<sup>2,4</sup> and Filip De Fruyt<sup>2,5</sup>

<sup>1</sup> Post Graduate Program in Psychology, Universidade São Francisco, Campinas, Brazil, <sup>2</sup> EduLab21, Ayrton Senna Institute, São Paulo, Brazil, <sup>3</sup> Faculty of Economics, Administration and Accounting of Ribeirão Preto, University of São Paulo, Ribeirão Preto, Brazil, <sup>4</sup> Department of Psychology and Institute of Personality and Social Research, University of California, Berkeley, Berkeley, CA, United States, <sup>5</sup> Department of Developmental, Personality and Social Psychology, Ghent University, Ghent, Belgium

Responding to the need for school-based, broadly applicable, low-cost, and brief assessments of socio-emotional skills, we describe the conceptual background and empirical development of the SENNA inventory and provide new psychometric information on its internal structure. Data were obtained through a computerized survey from 50,000 Brazilian students enrolled in public school grades 6 to 12, spread across the entire State of São Paulo. The SENNA inventory was designed to assess 18 particular skills (e.g., empathy, responsibility, tolerance of frustration, and social initiative), each operationalized by nine items that represent three types of items: three positively keyed trait-identity items, three negatively keyed identity items, and three (always positively keyed) self-efficacy items, totaling a set of 162 items. Results show that the 18 skill constructs empirically defined a higher-order structure that we interpret as the social-emotional Big Five, labeled as Engaging with Others, Amity, Self-Management, Emotional Regulation, and Open-Mindedness. The same five factors emerged whether we assessed the 18 skills with items representing (a) a trait-identity approach that emphasizes lived skills (what do I typically do?) or (b) a self-efficacy approach that emphasizes capability (how well can I do that?). Given that its target youth group is as young as 11 years old (grade 6), a population particularly prone to the response bias of acquiescence, SENNA is also equipped to correct for individual differences in acquiescence, which are shown to systematically bias results when not corrected.

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**Accepted:** 05 October 2021  
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**Keywords:** 21st century skills, social-emotional skills, instrument development, Big Five, five-factor model, measurement invariance, exploratory structural equation modeling

### INTRODUCTION

Over the past two decades, education scientists and policy-makers showed an increased attention for the assessment and learning of Social-Emotional Skills, also called 21st century skills (from here onward abbreviated as SEMS) (Abrahams et al., 2019). This interest shift built on the notion that more traditional indicators of scholastic achievement, such as scores on math and reading, are

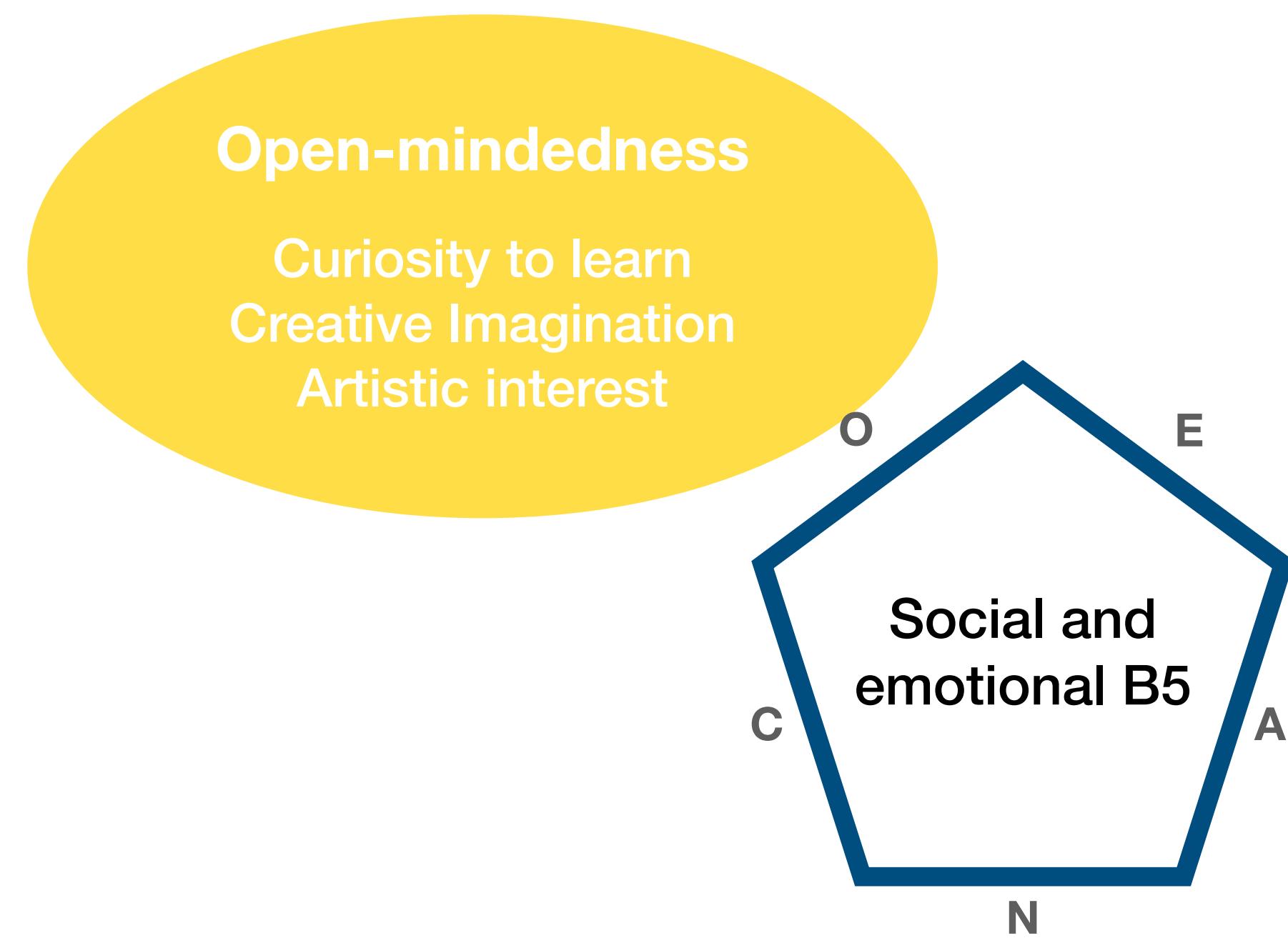
**TABLE 1 |** Relationship of Big Five traits, functional aspects, and dimensions in major socio-emotional skills frameworks.

Big Five traits and facets (e.g., Soto and John, 2015, 2017)	Functional aspects	CASEL	CHICAGO consortium	OECD model	SENN Inventory v2.0
<b>O: Open-mindedness</b> Creative imagination Intellectual curiosity Aesthetic sensitivity	Exploration system	<i>Self-awareness:</i> Identification and recognition of one's own emotions		<i>Open-mindedness</i> Creativity Curiosity Tolerance	<i>Open-mindedness</i> Creative imagination Curiosity to learn Artistic interest
<b>C: Conscientiousness</b> Organization Productiveness Responsibility	Self-management system	<i>Self-management:</i> Persistence, goal setting, and motivation <i>Responsible decision making:</i> Evaluation and reflection, and personal and ethical responsibility.	Academic perseverance, learning strategies, academic behaviors	<i>Task performance</i> Responsibility Persistence Self-control Achievement-motivation	<i>Self-management</i> Determination Organization Focus Persistence Responsibility
<b>E: Extraversion</b> Sociability Assertiveness Energy level	Approach system	<i>Relationship skills:</i> Cooperation, help seeking and providing, and communication	Social skills	<i>Engaging with others</i> Sociability Assertiveness Energy	<i>Engaging with others</i> Social Initiative Assertiveness Enthusiasm
<b>A: Agreeableness</b> Compassion Respectfulness Trust	Belonging system	<i>Social awareness:</i> Empathy, respect for others, and perspective taking <i>Responsible decision making:</i> Evaluation and reflection, and personal and ethical responsibility.	Social skills	<i>Collaboration</i> Empathy Trust Co-operation	<i>Amity</i> Empathy Trust Respect Gratitude
<b>N: Emotional stability</b> (vs. neuroticism or negative emotionality) Anxiety Depression Emotional volatility	Coping system	<i>Self-awareness:</i> Sense of self-efficacy, and self-confidence. <i>Self-management:</i> Impulse control, stress management	Academic mindset	<i>Emotion regulation</i> Stress resistance Optimism Emotional control	<i>Negative-emotion regulation</i> Stress modulation Self-confidence Frustration tolerance

# Social and Emotional Big Five

*Motivational and  
learning related skills*

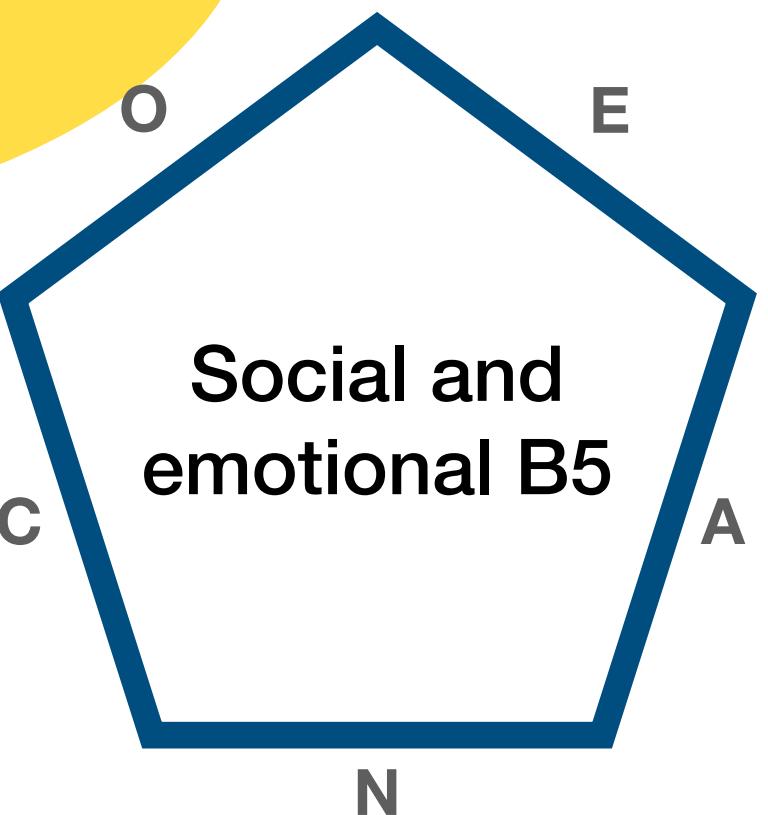
How well can you find out  
how something works



# Social and Emotional Big Five

*Motivational and learning related skills*

How well can you find out how something works



# Social and Emotional Big Five

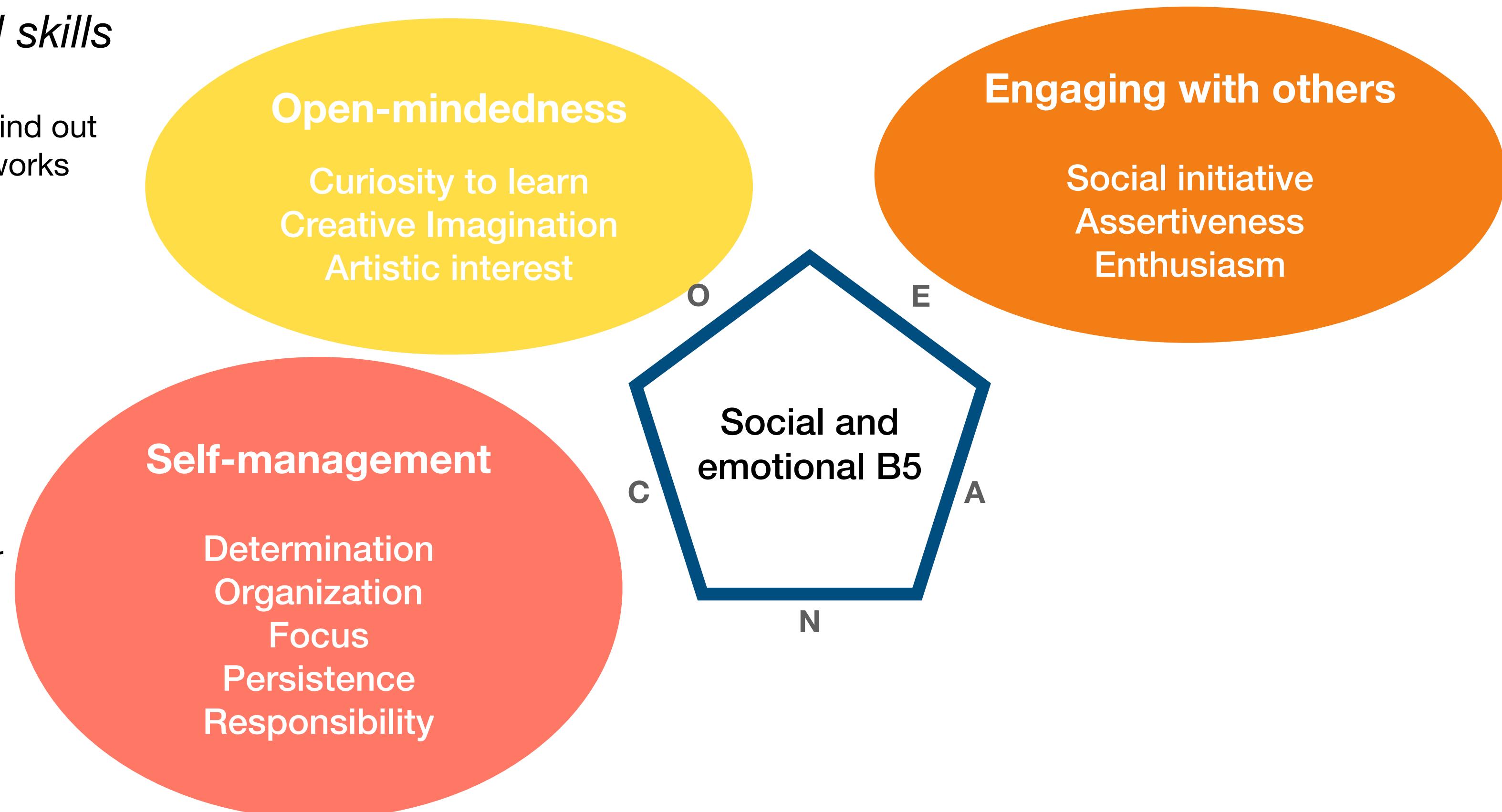
*Motivational and learning related skills*

How well can you find out how something works

How well can you put effort and necessary time in your tasks in order to achieve good results

*Social related skills*

How well can you take the lead in group work



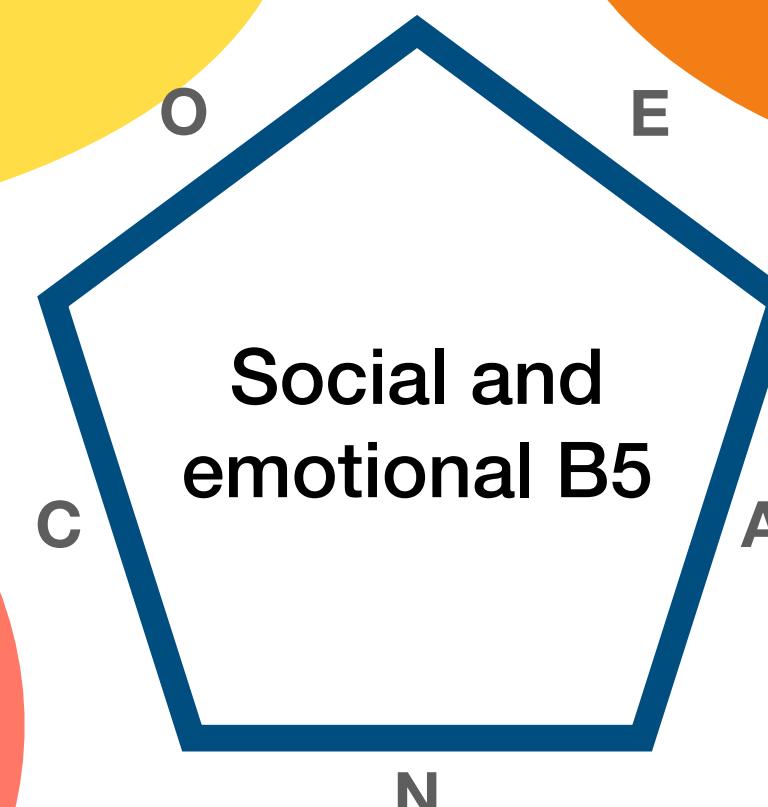
# Social and Emotional Big Five

Motivational and learning related skills

How well can you find out how something works

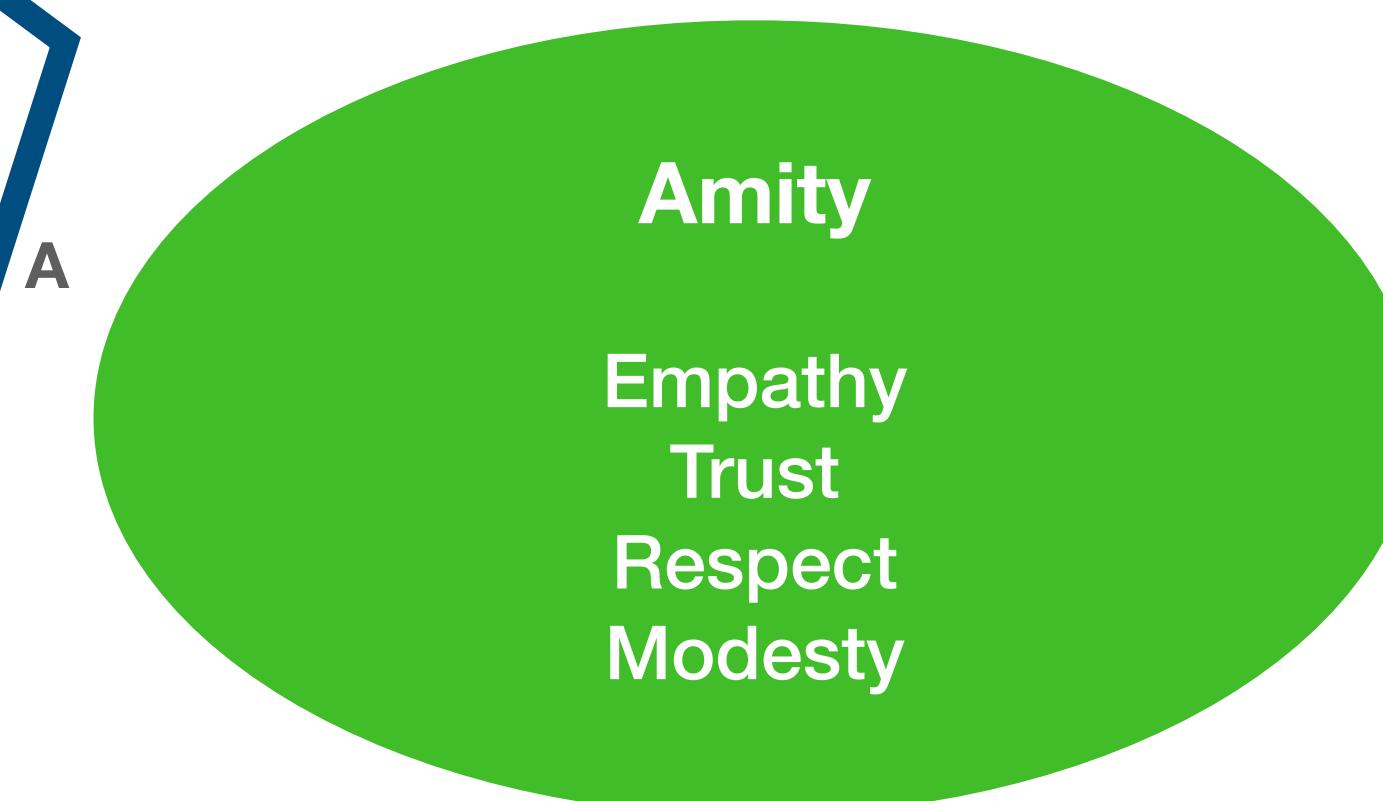


How well can you put effort and necessary time in your tasks in order to achieve good results



*Social related skills*

How well can you take the lead in group work



How well can you understand what others are feeling

# Social and Emotional Big Five

Motivational and learning related skills

How well can you find out how something works

## Open-mindedness

Curiosity to learn  
Creative Imagination  
Artistic interest

## Engaging with others

Social initiative  
Assertiveness  
Enthusiasm

*Social related skills*

How well can you take the lead in group work

How well can you put effort and necessary time in your tasks in order to achieve good results

## Self-management

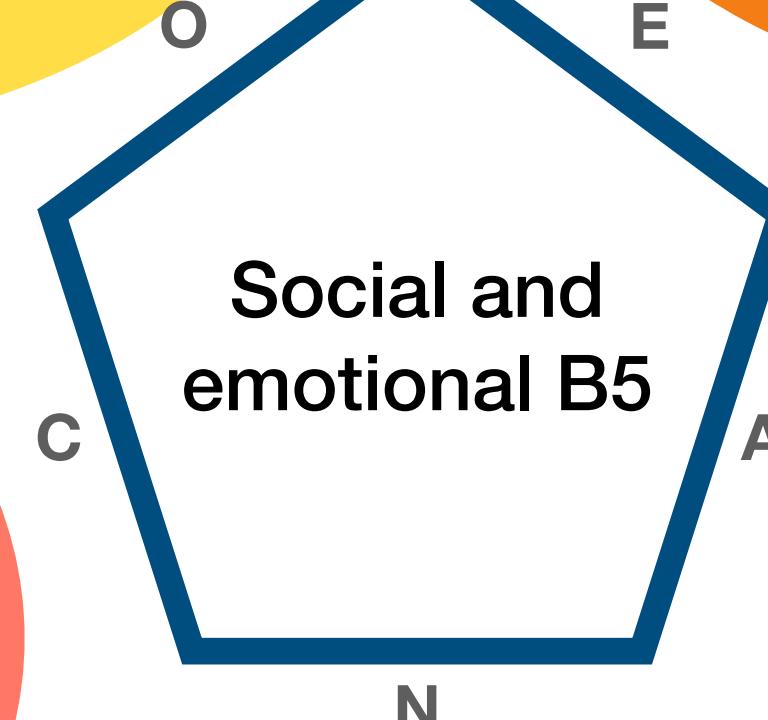
Determination  
Organization  
Focus  
Persistence  
Responsibility

## Amity

Empathy  
Trust  
Respect  
Modesty

How well can you understand what others are feeling

Social and emotional B5



## Negative-emotional regulation

Stress modulation  
Self-confidence  
Frustration

How well can you control your anger when other people make you annoyed

*Emotional regulation related skills*

# Social and Emotional Big Five

Motivational and learning related skills

How well can you find out how something works

## Open-mindedness

Curiosity to learn  
Creative Imagination  
Artistic interest

## Engaging with others

Social initiative  
Assertiveness  
Enthusiasm

*Social related skills*

How well can you take the lead in group work

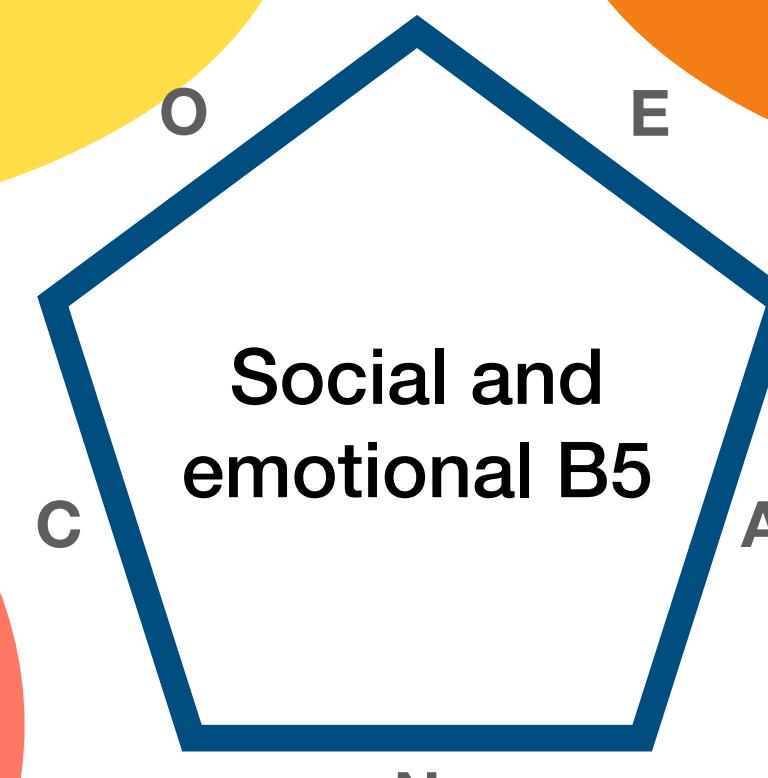
How well can you put effort and necessary time in your tasks in order to achieve good results

## Self-management

Determination  
Organization  
Focus  
Persistence  
Responsibility

Domain scales

Facet scales



## Amity

Empathy  
Trust  
Respect  
Modesty

How well can you understand what others are feeling

## Negative-emotional regulation

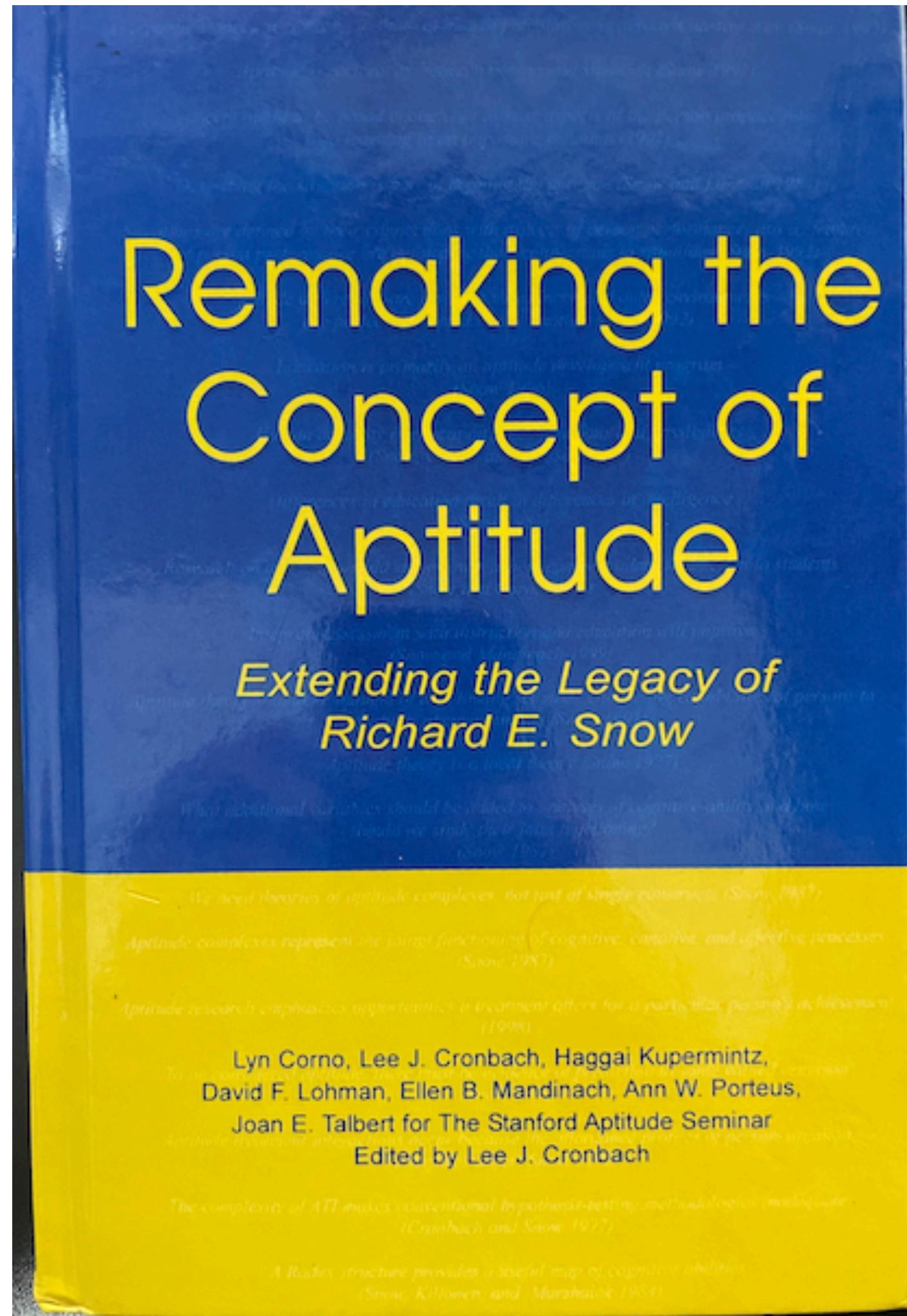
Stress modulation  
Self-confidence  
Frustration tolerance

How well can you control your anger when other people make you annoyed

*Emotional regulation related skills*

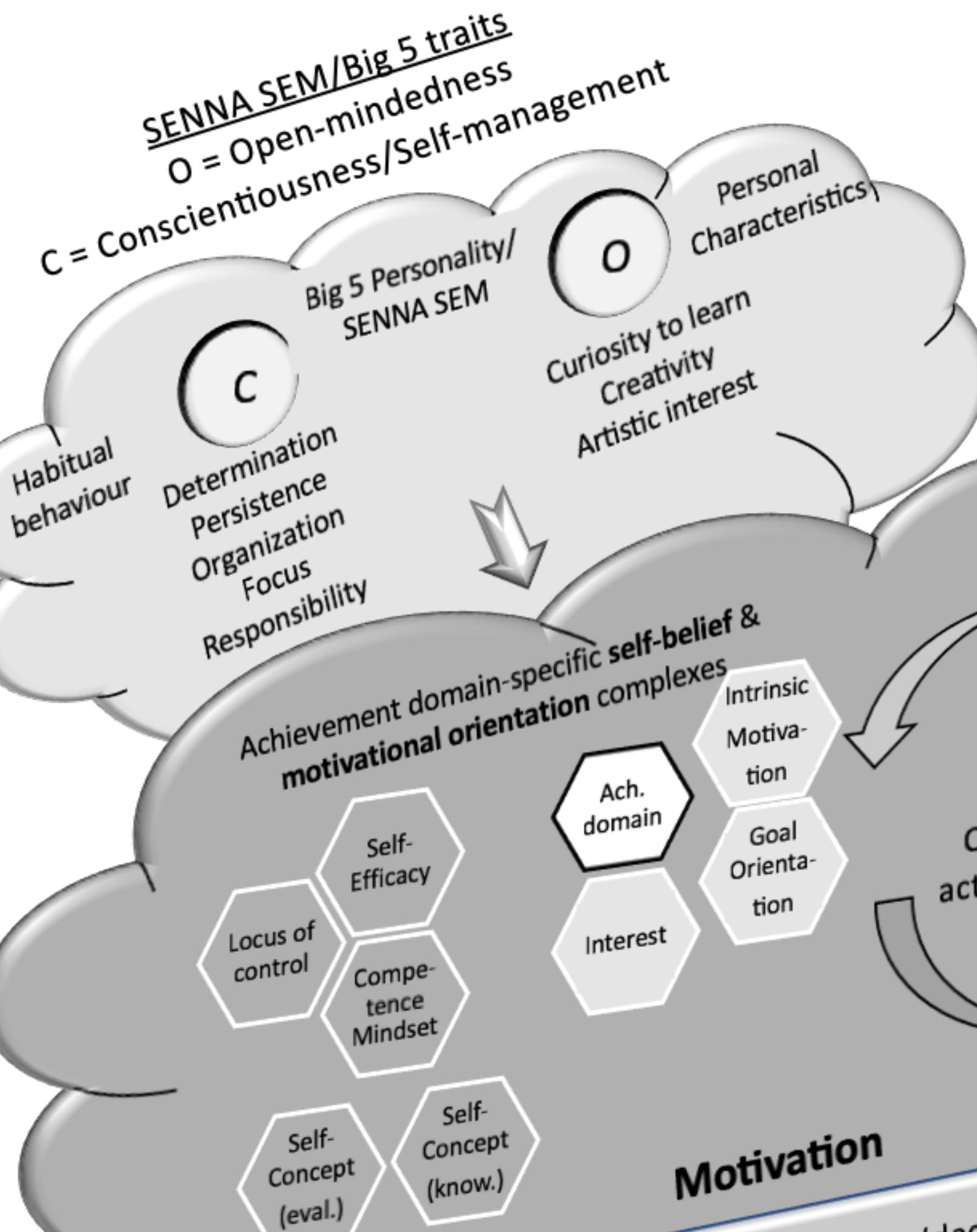
# The Cognitive-Affective-Motivation Model of Learning (CAMML)

McGrew, K. S. (2022). The Cognitive-Affective-Motivation Model of Learning (CAMML): Standing on the Shoulders of Giants. *Canadian Journal of School Psychology*, 37(1), 117–134. <https://doi.org/10.1177/08295735211054270>



*"Academic aptitude is the multivariate repertoire of cognitive-conative-affective (CAMML) complexes or constellations"* p. 8

## Learning-related conative & affective constructs

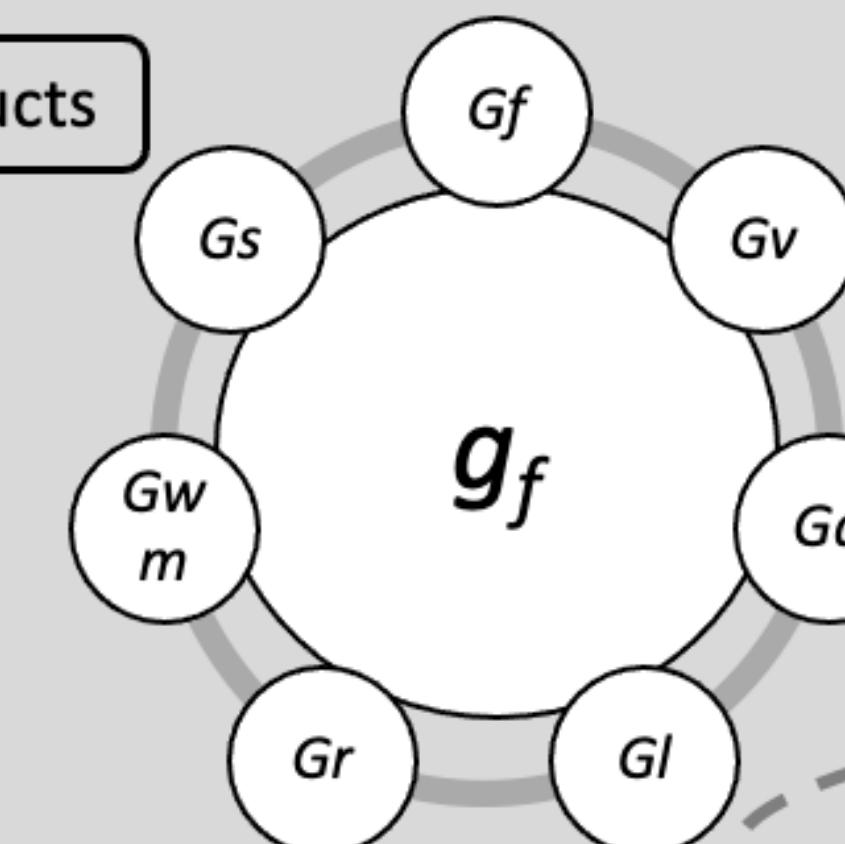


## Learning-related cognitive constructs

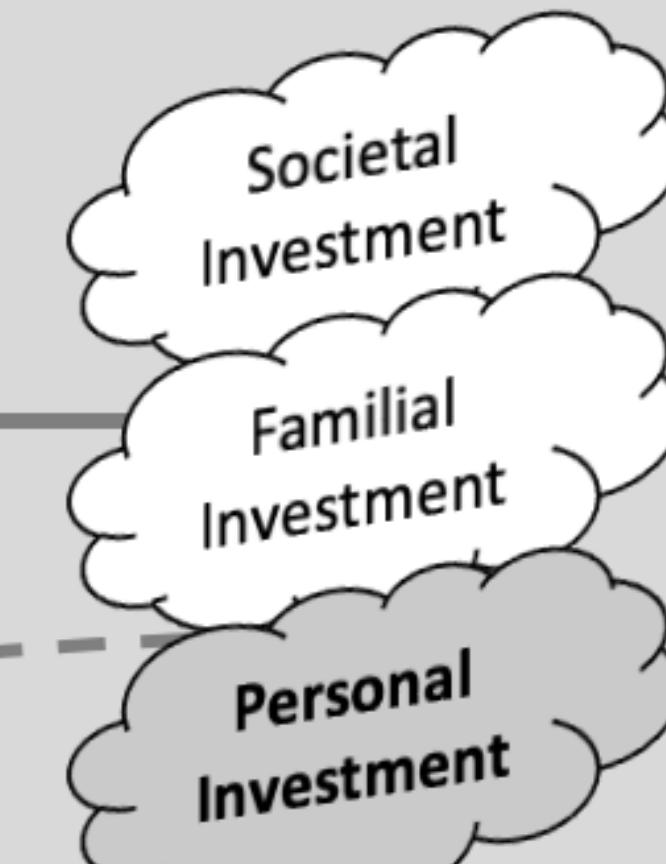
### Cattell's (general) $g_f$

- Fluid cognitive processes
- Intelligence-as-process (Ackerman)
- Snow's procedural skills (cognitive)

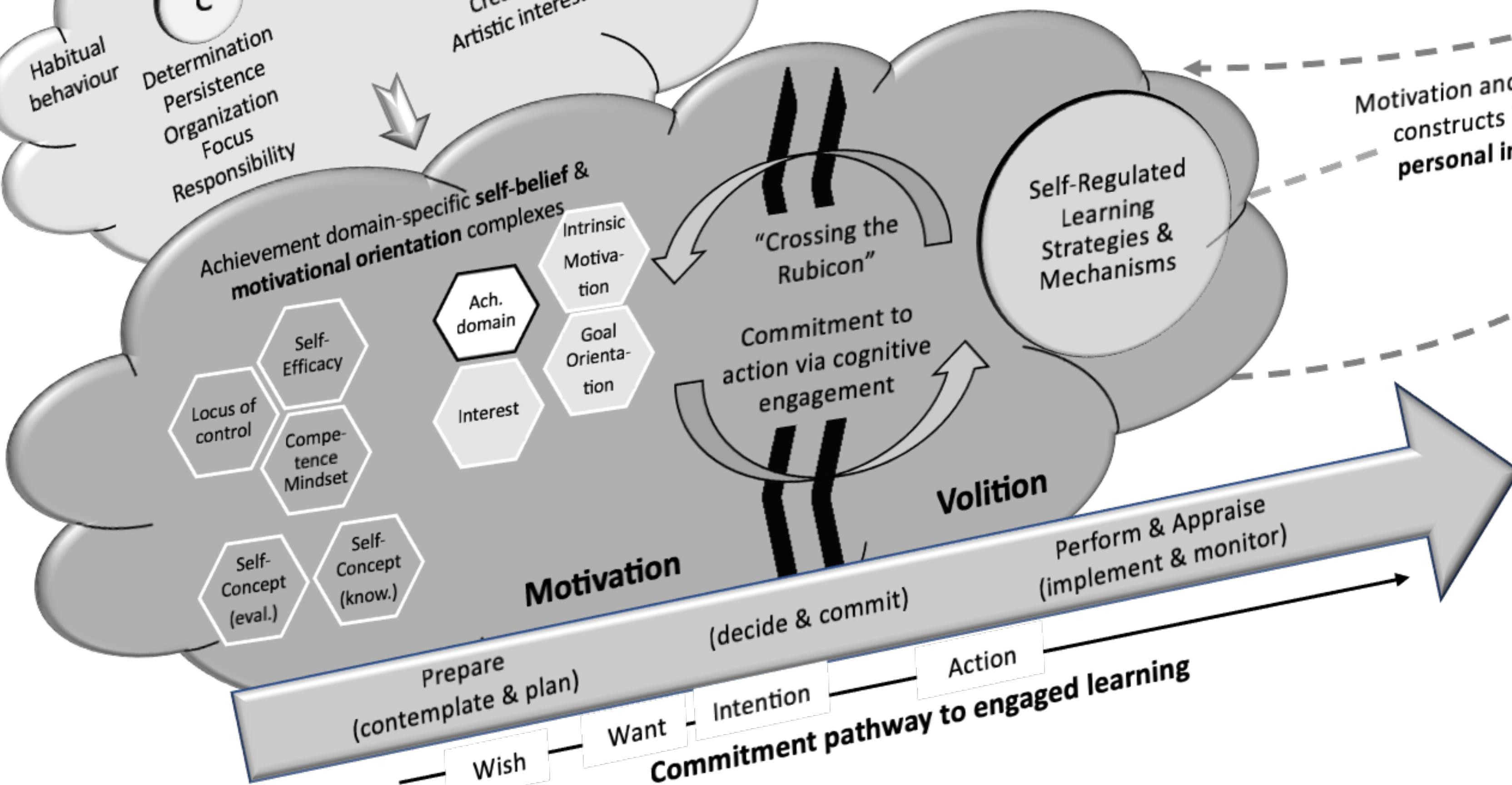
Small circles represent broad ability constructs as per CHC theory. Large circles represent Cattell's  $g_f$ - $g_c$  theory.



Cattell's Investment Theory



Motivation and volition (SRL) constructs involved in personal investment



### Cattell's (general) $g_c$

- Learning outcomes
  - Achievement
- Acquired knowledge systems
- Intelligence-as-knowledge (Ackerman)
- Snow's declarative knowledge (cognitive)

# Conclusions 1

## What are social and emotional skills

- We presented an empirically derived comprehensive model (based on literature).
- We developed an instrument based on the model.
- So what ..
- Is this model/instrument useful for monitoring and developing social and emotional skills in schools?



Oliver John      Filip de Fruyt



## **2. Applied uses of the social and emotional big five in schools**

# Social and emotional skills and learning

## Association with achievement

- A meta-analysis of five factors that are related to academic performance found that self-management ( $r = .22$ ) and open-mindedness ( $r = .13$ ) enhance learning (Poropat, 2009).
- Studies tend to focus on domains rather than facets, explore domains independently, and assess academic performance typically through grades rather than standardized tests.
- **Objective**
- Which skills (facets) help predict academic performance (as measured by standardized grades)?
- Which combination of skills best predicts success?
- Are there any interactions among facets in predicting achievement?

# SENNA vs standardized achievement

## Participants

12.987 children and adolescents (52.7% female) from 425 public schools of 216 cities located in the state of Sao Paulo, Brazil (5th to 12th grade, aged  $M = 16$   $SD = 1.85$ ).

## Instruments

They answered Senna, a computerized 162-item questionnaire measuring 18 facets.

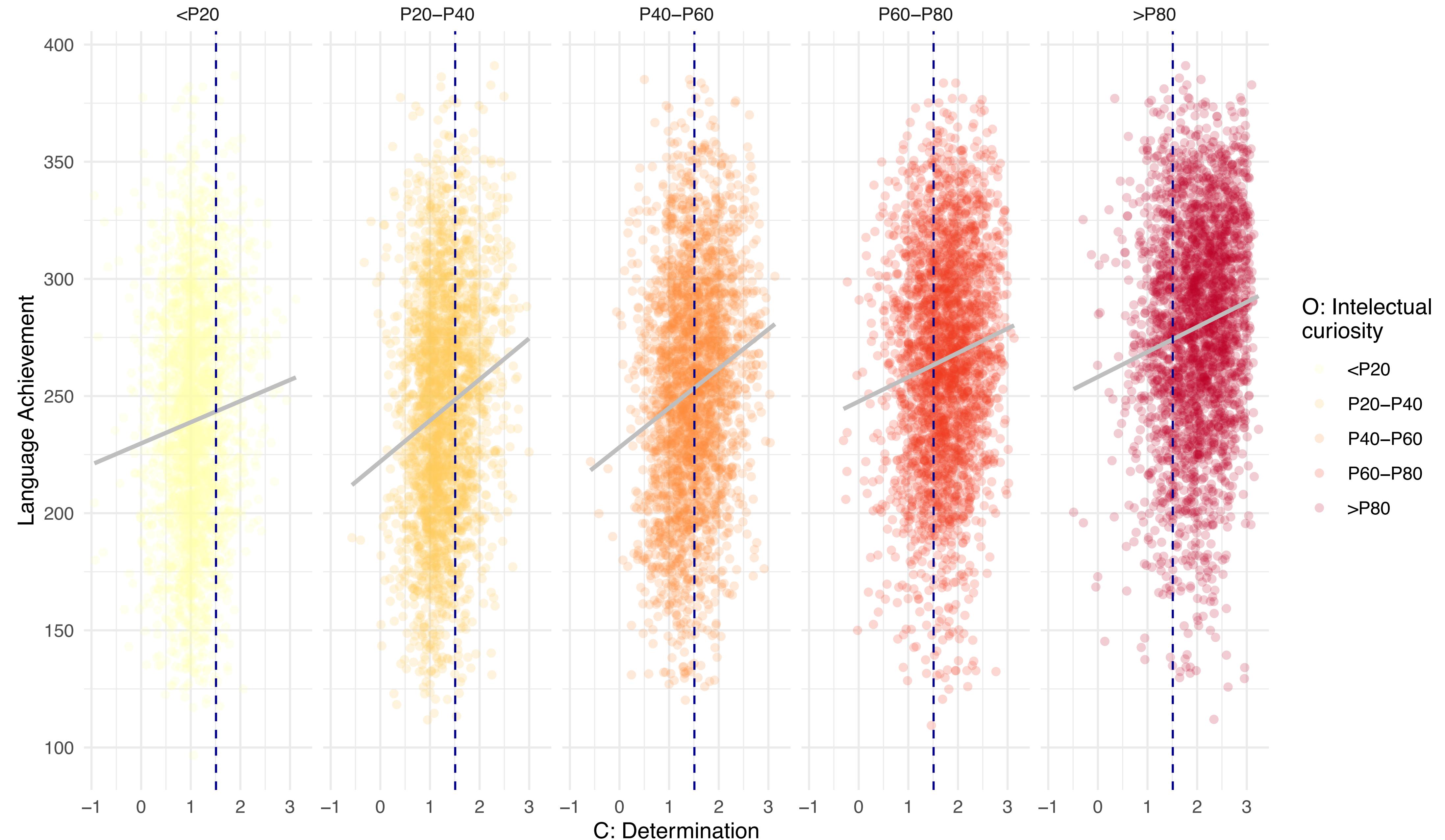
The criterion measure was a standardized achievement test on language and math (SARESP).

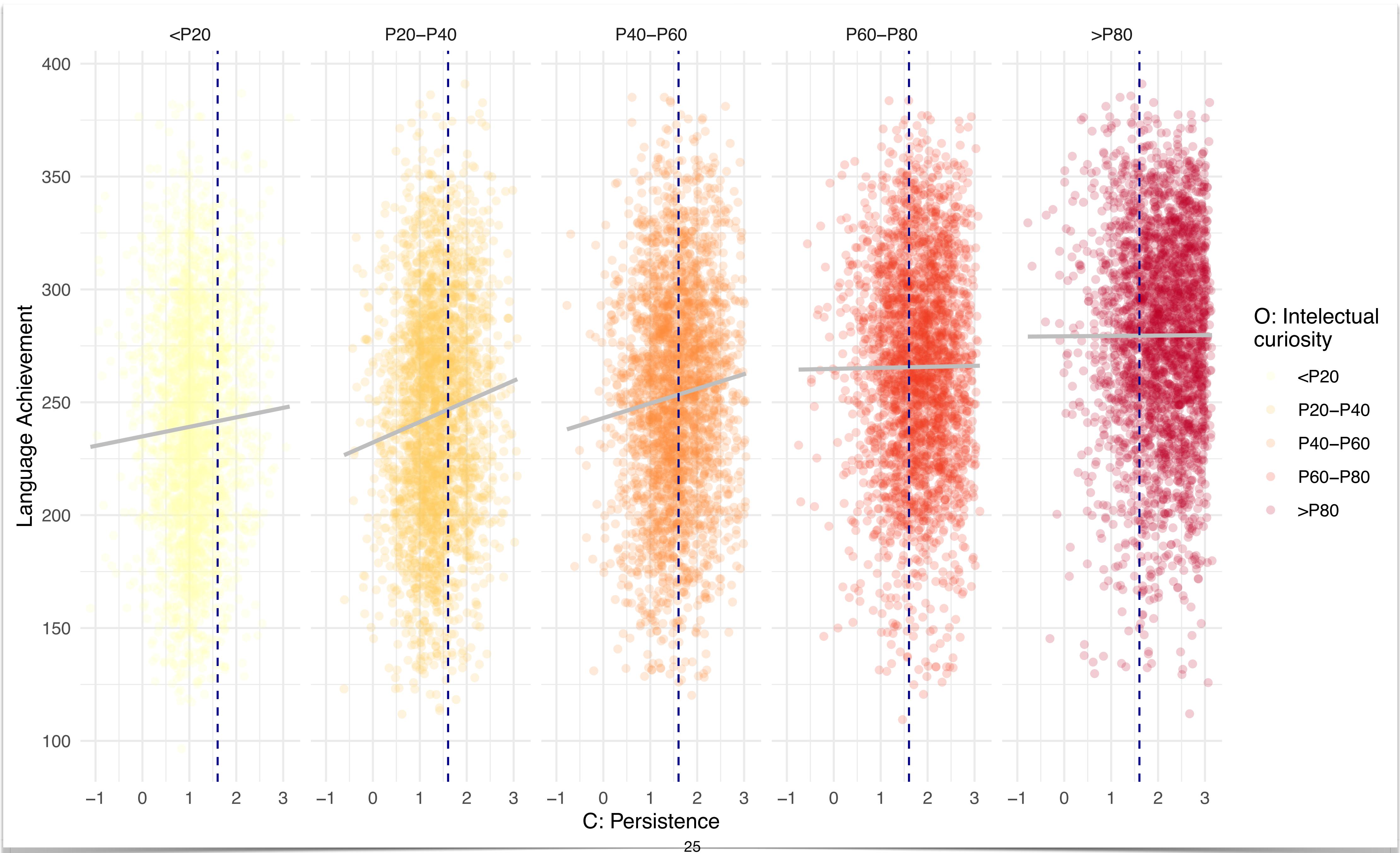
## Analysis

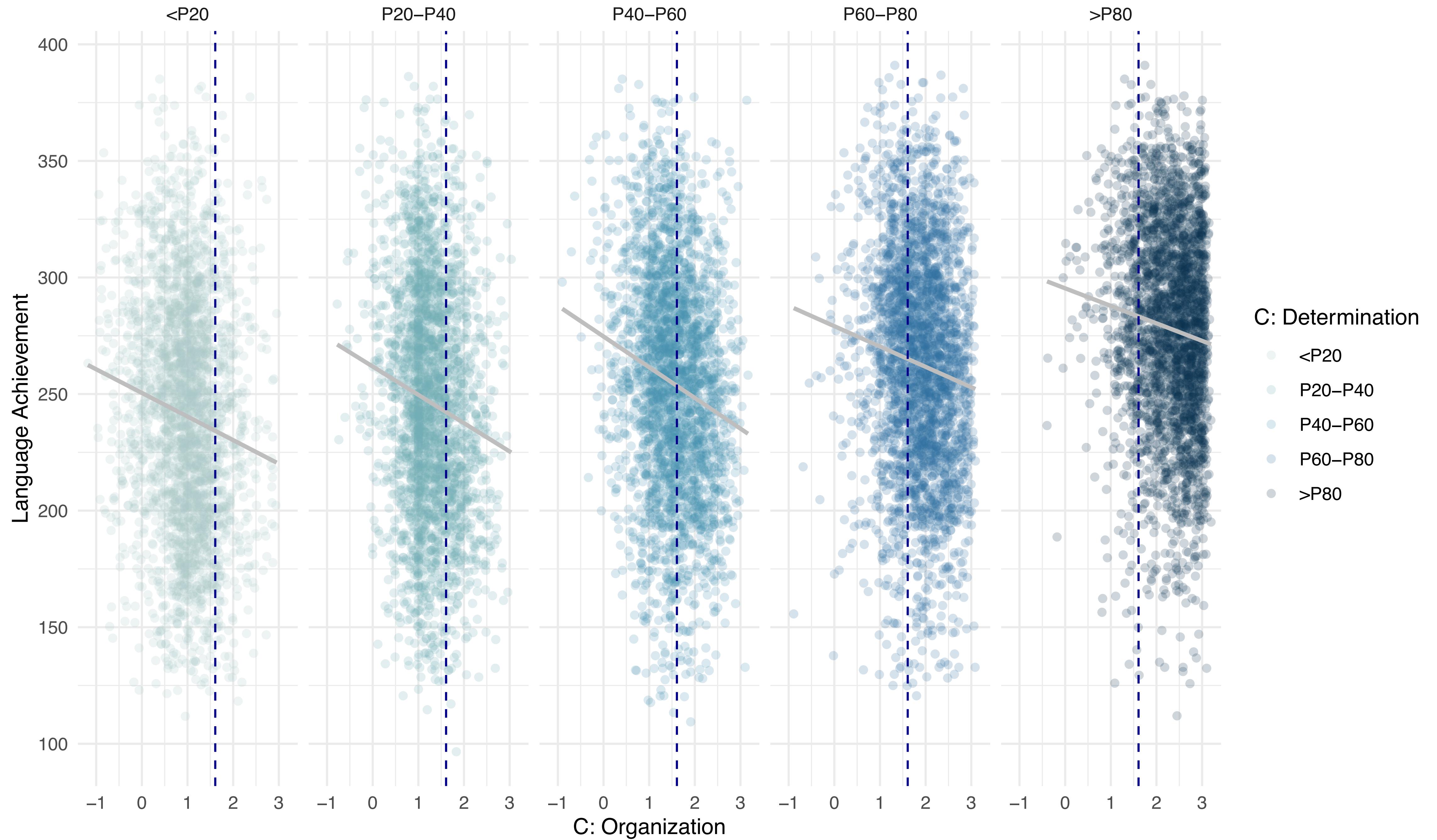
Multiple regression predicting standardized achievement by social and emotional skill scales (control variables; gender, age, grade, ses, and educational opportunity)

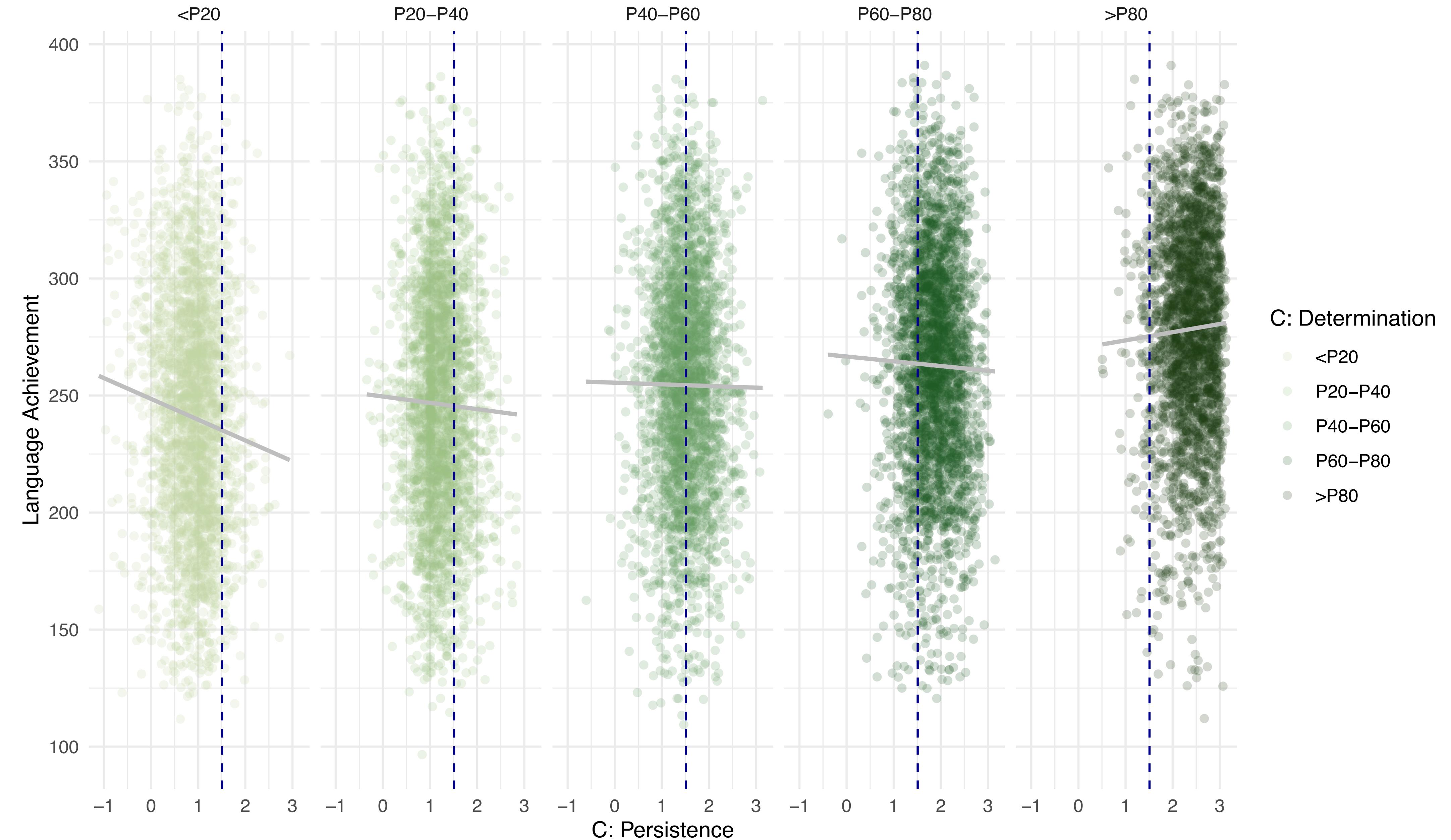
Alves, G. A. S. & Primi, R. (2019). Self-reports of the Big Five and their facets differentially predict objective measures of school achievement in language and math. Paper presented at the 3rd World Conference on Personality (WAPP 2019), Hanoi, Vietnam.

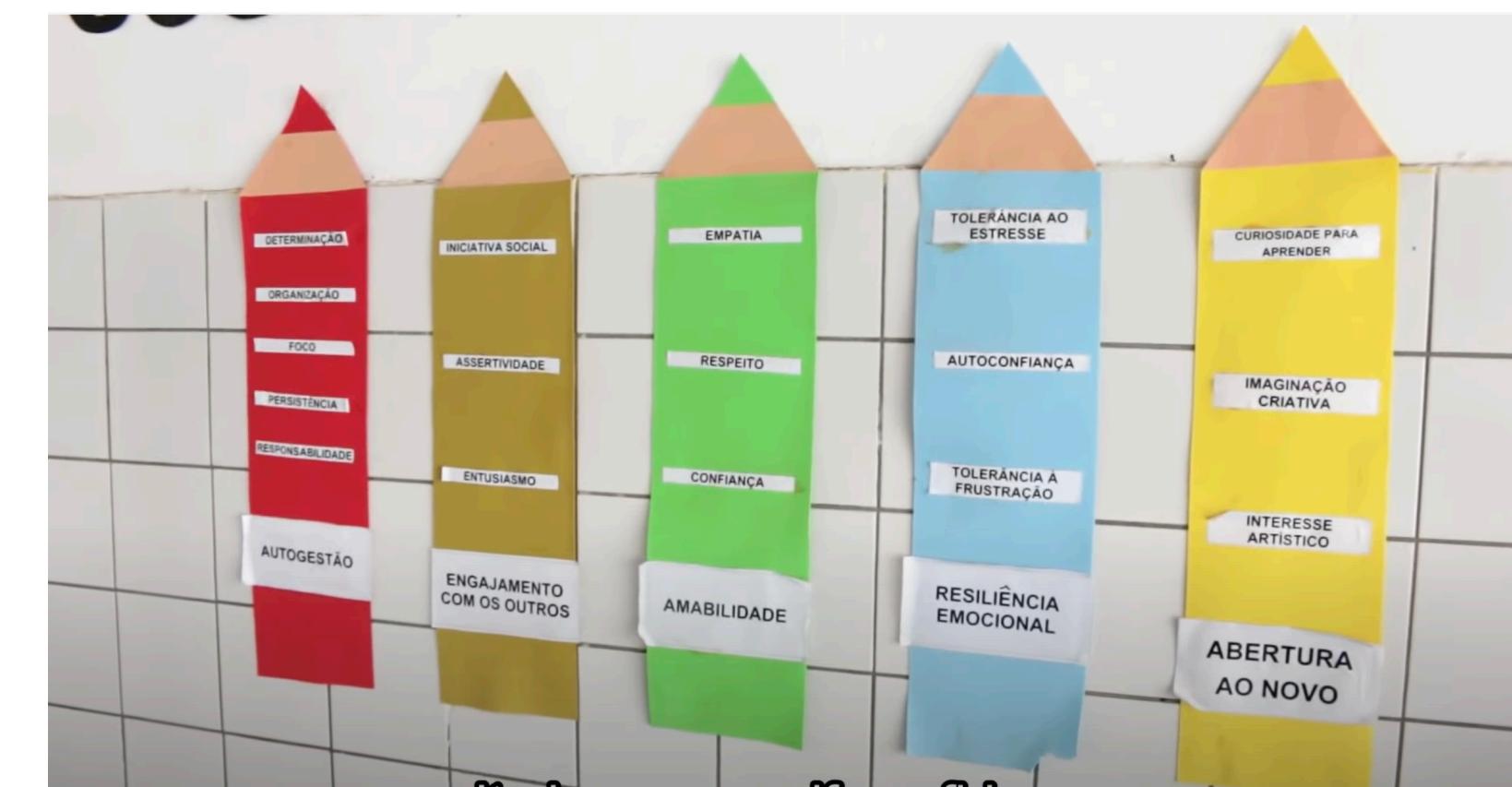
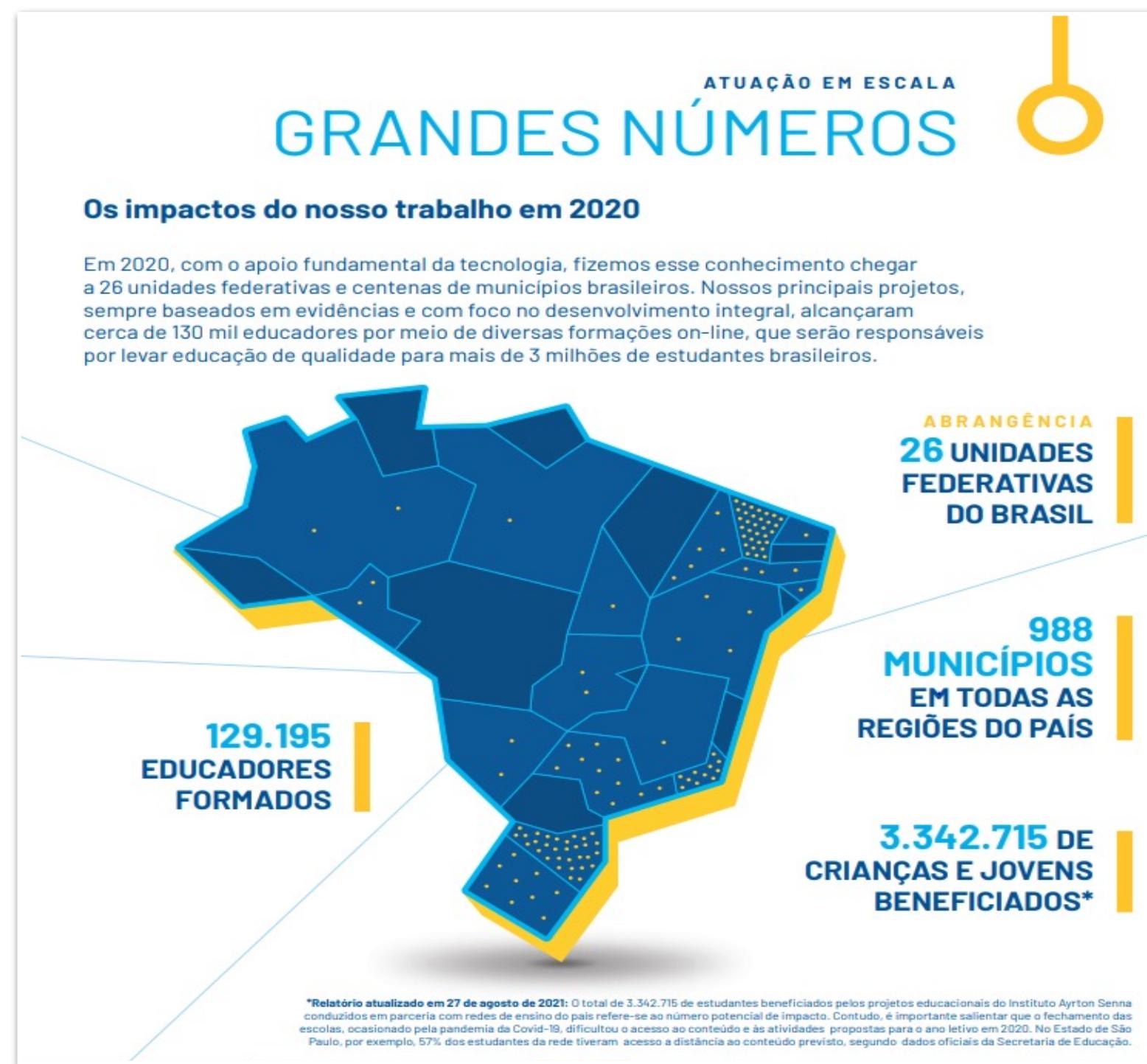
Predictors	Language			Math		
	B	$\beta$	p	B	$\beta$	p
(Intercept)	234.84		<0.001	258.69		<0.001
<b>Open-mindness</b>						
Artistic Interest	-3.98	-0.06	<0.001	-6.18	-0.09	<0.001
Creative Imagination	0.68	0.01	0.41	0.12	0.00	0.89
Intellectual Curiosity	14.09	<b>0.18</b>	<0.001	12.50	<b>0.16</b>	<0.001
<b>Self-management</b>						
Determination	17.79	<b>0.22</b>	<0.001	14.72	<b>0.19</b>	<0.001
Focus	2.76	0.04	0.01	1.14	0.02	0.26
Organization	-13.21	<b>-0.20</b>	<0.001	-9.98	<b>-0.16</b>	<0.001
Persistence	-5.97	-0.08	<0.001	-3.77	-0.05	<0.001
Responsibility	7.52	0.10	<0.001	6.09	0.08	<0.001
<b>Engaging with others</b>						
Enthusiasm	-3.37	-0.04	0.00	-2.87	-0.03	0.01
Assertiveness	9.62	<b>0.13</b>	<0.001	9.51	<b>0.13</b>	<0.001
Social Initiative	-4.87	-0.06	<0.001	-3.70	-0.05	<0.001
<b>Amity</b>						
Compassion	4.29	0.05	<0.001	-0.89	-0.01	0.35
Modesty	11.89	<b>0.14</b>	<0.001	10.37	<b>0.13</b>	<0.001
Respect	3.11	0.04	0.00	0.65	0.01	0.48
Trust	-1.40	-0.02	0.04	1.32	0.02	0.06
<b>Negative emotional regulation</b>						
Frustration Tolerance	0.63	0.01	0.39	4.05	0.06	<0.001
Stress Modulation	-6.61	-0.08	<0.001	-1.44	-0.02	0.14
Self-confidence	-3.62	-0.05	<0.001	-5.39	-0.07	<0.001
Observations	12987			12987		
$R^2$ / adjusted $R^2$	0.183 / 0.182			0.121 / 0.120		











# Social and emotional development

## Normative changes: association with grade (age) gender

### ESTUDANTES AVALIADOS

2019

**3.586**  
escolas

**110.198**  
estudantes

**5º ano** 26.002 estudantes

**9º ano** 41.277 estudantes

**3ª série** 42.919 estudantes



2021



**7465**  
escolas

**694.405**  
estudantes

**5º ano** 203.063 estudantes

**9º ano** 267.585 estudantes

**3ª série** 223.757 estudantes

## The Policy Relevance of Personality Traits

Wiebke Bleidorn  
University of California, Davis

Mitja D. Back  
Westfälische Wilhelms-Universität Münster

Marie Hennecke  
University of Siegen

Markus Jokela  
University of Helsinki

Richard E. Lucas  
Michigan State University

Ulrich Orth  
University of Bern

Cornelia Wrzus  
University of Heidelberg

Brent Roberts  
University of Illinois at Urbana-Champaign

Patrick L. Hill  
Washington University in St. Louis

Jaap J. A. Denissen  
Tilburg University

Christopher J. Hopwood  
University of California, Davis

Christian Kandler  
University of Bremen

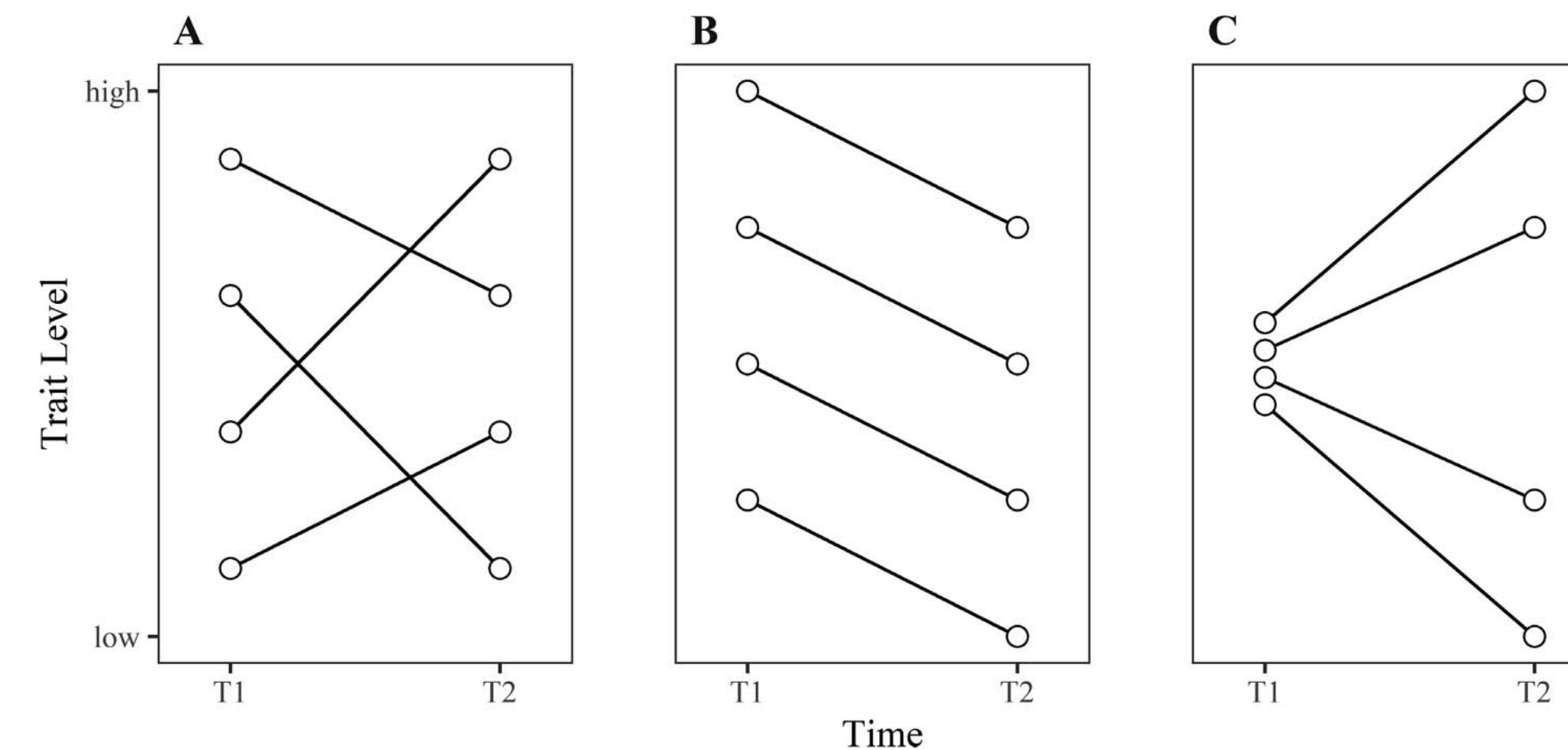
Maike Luhmann  
Ruhr-University Bochum

Jenny Wagner  
University of Hamburg

Johannes Zimmerman  
University of Kassel

## POLICY RELEVANCE OF PERSONALITY

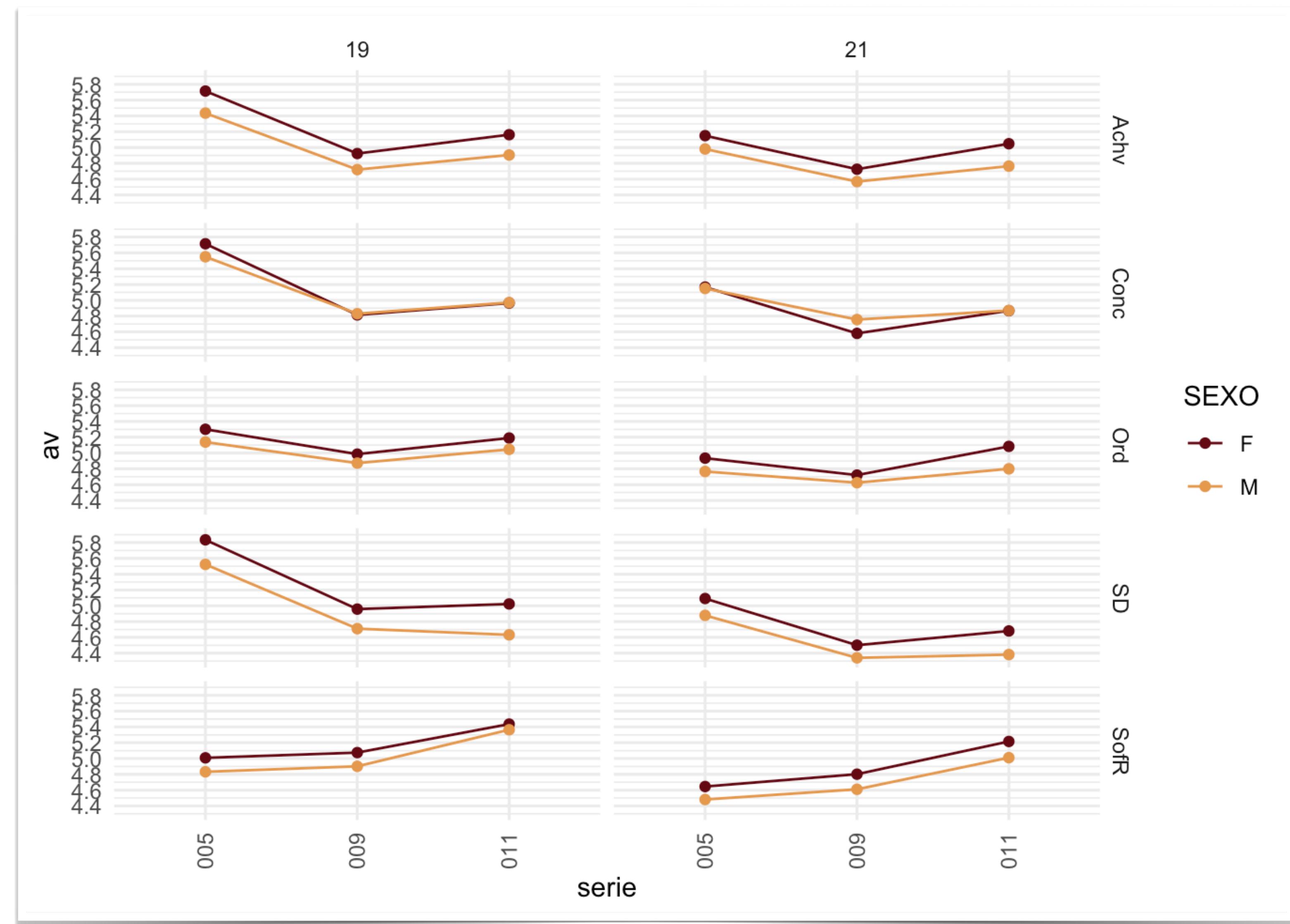
1059



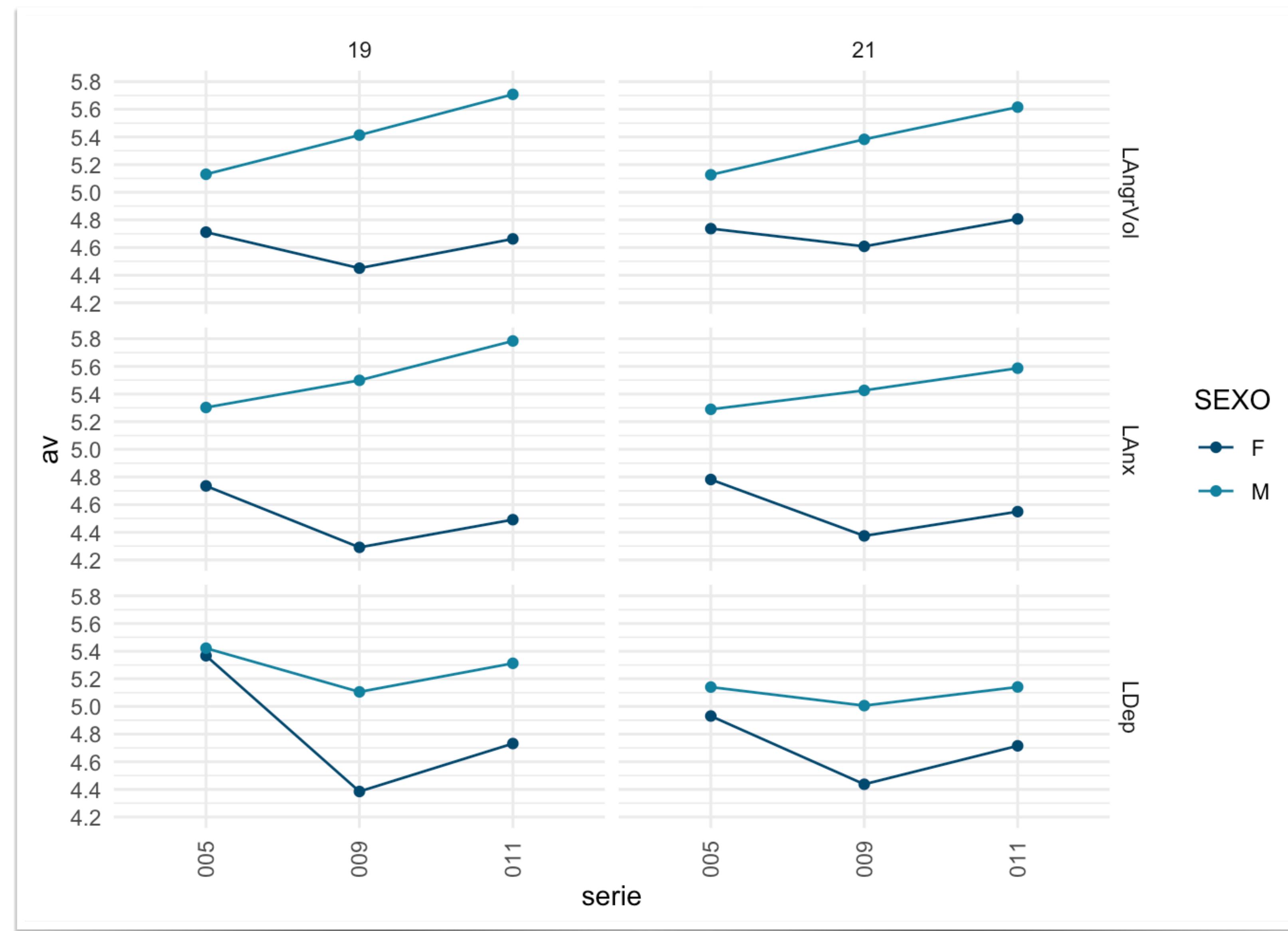
**Figure 1.** Rank-order, mean-level, and individual differences in change. Panels show hypothetical longitudinal data of four individuals. Panel A shows rank-order change and individual differences in change in the absence of mean-level change. Panel B shows mean-level change in the absence of rank-order change or individual differences in change. Panel C shows individual differences in change in the absence of mean-level change or rank-order change. See text for further explanation. Adapted from “Stability and Change in Personality Disorders,” by L. C. Morey and C. J. Hopwood, 2013, *Annual Review of Clinical Psychology*, 9, p. 510. Copyright 2013 by Annual Reviews.

Personality traits are powerful predictors of outcomes in the domains of education, work, relationships, health, and well-being. The recognized importance of personality traits has raised questions about their policy relevance, that is, their potential to inform policy actions designed to improve human welfare. Traditionally, the use of personality traits in applied settings has been predicated on their ability to predict valued outcomes, typically under the assumption that traits are functionally unchanging. This assumption, however, is both untrue and a limiting factor on using personality traits more widely in applied settings. In this article, we present the case that traits can serve both as relatively stable predictors of success and actionable targets for policy changes and interventions. Though trait change will likely prove a more difficult target than typical targets in applied interventions, it also may be a more fruitful one given the variety of life domains affected by personality traits.

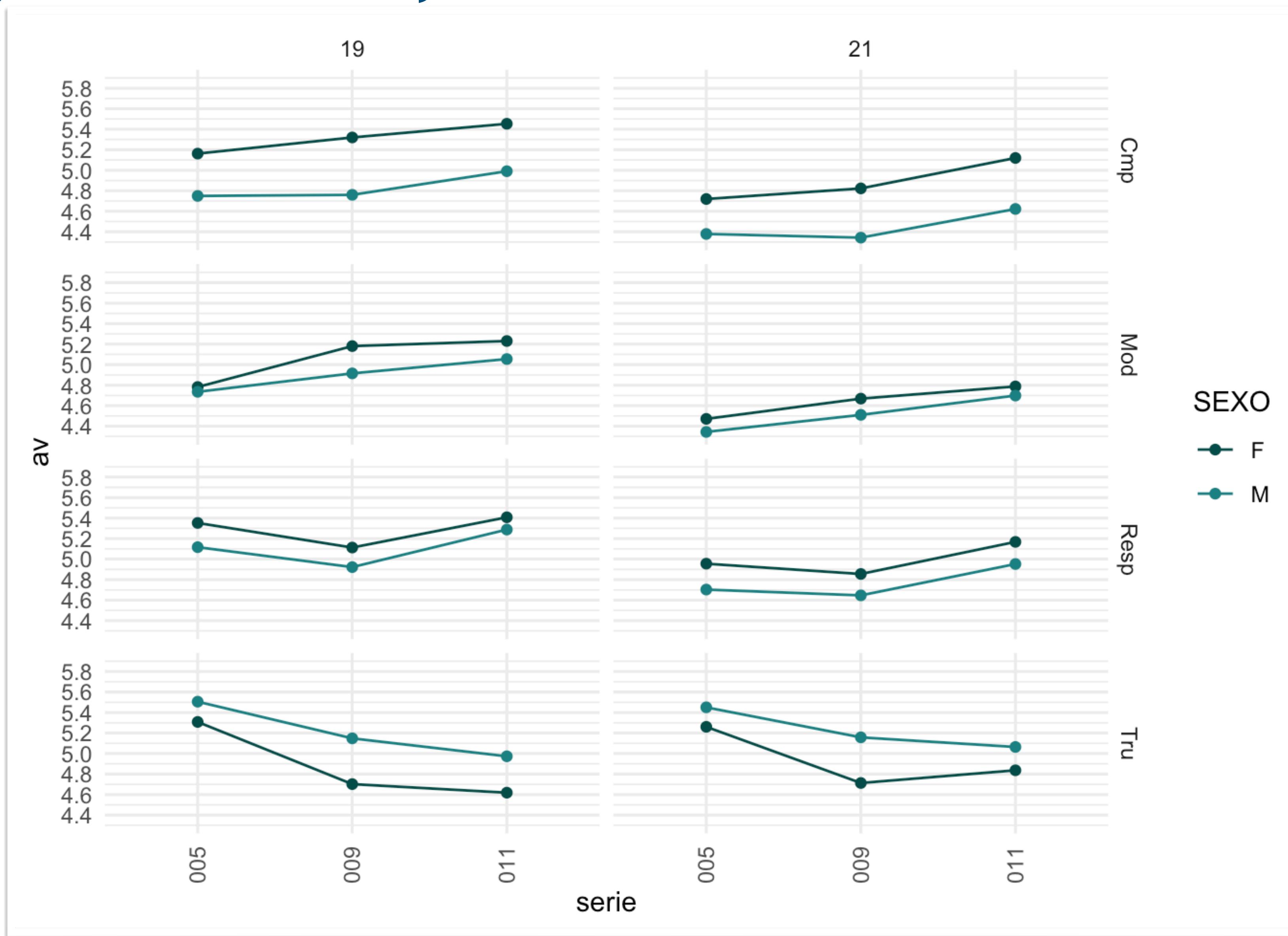
# Self-management (2%, 0,14)



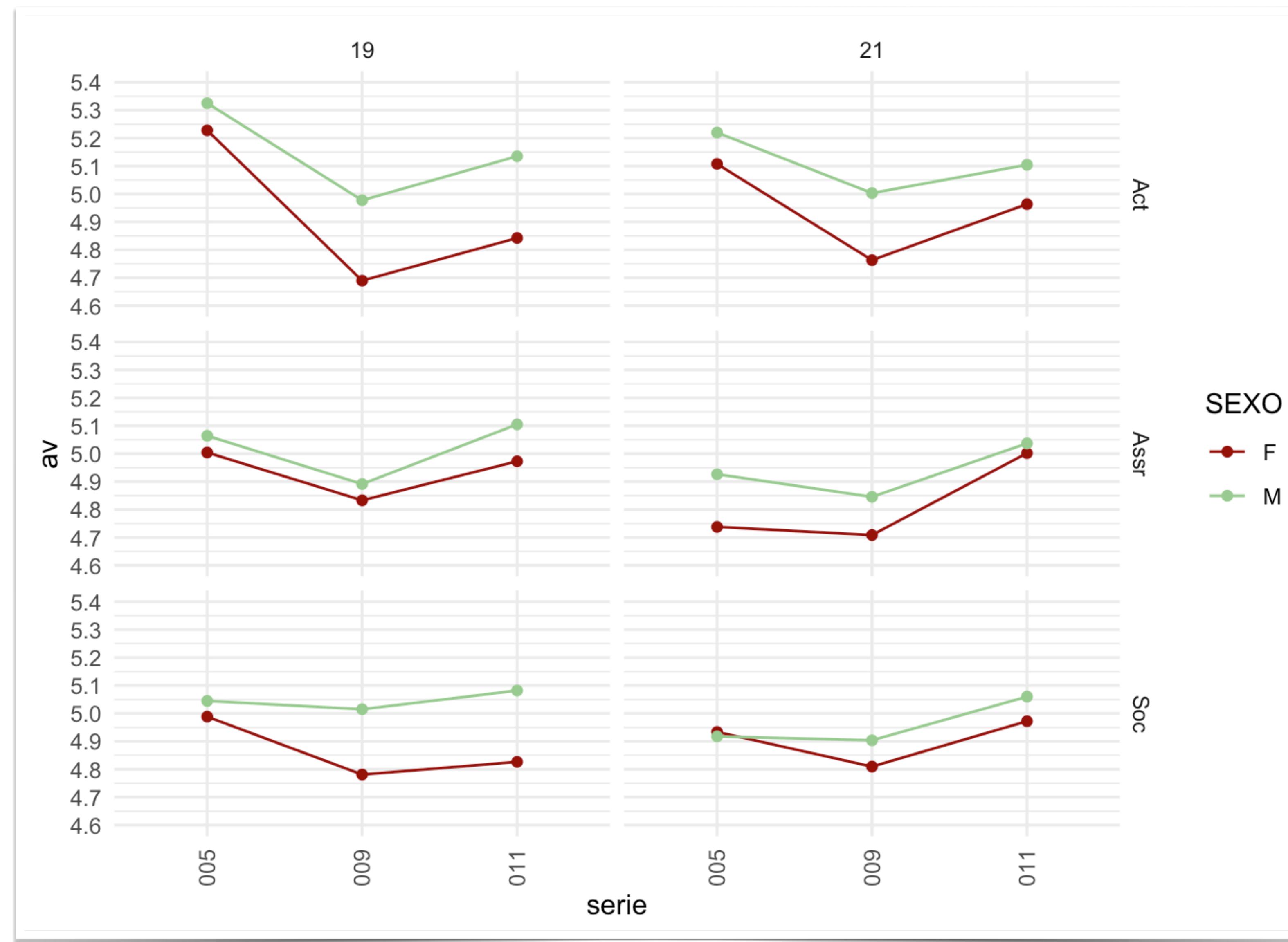
# Negative emotional regulation (8%, R=0,28)



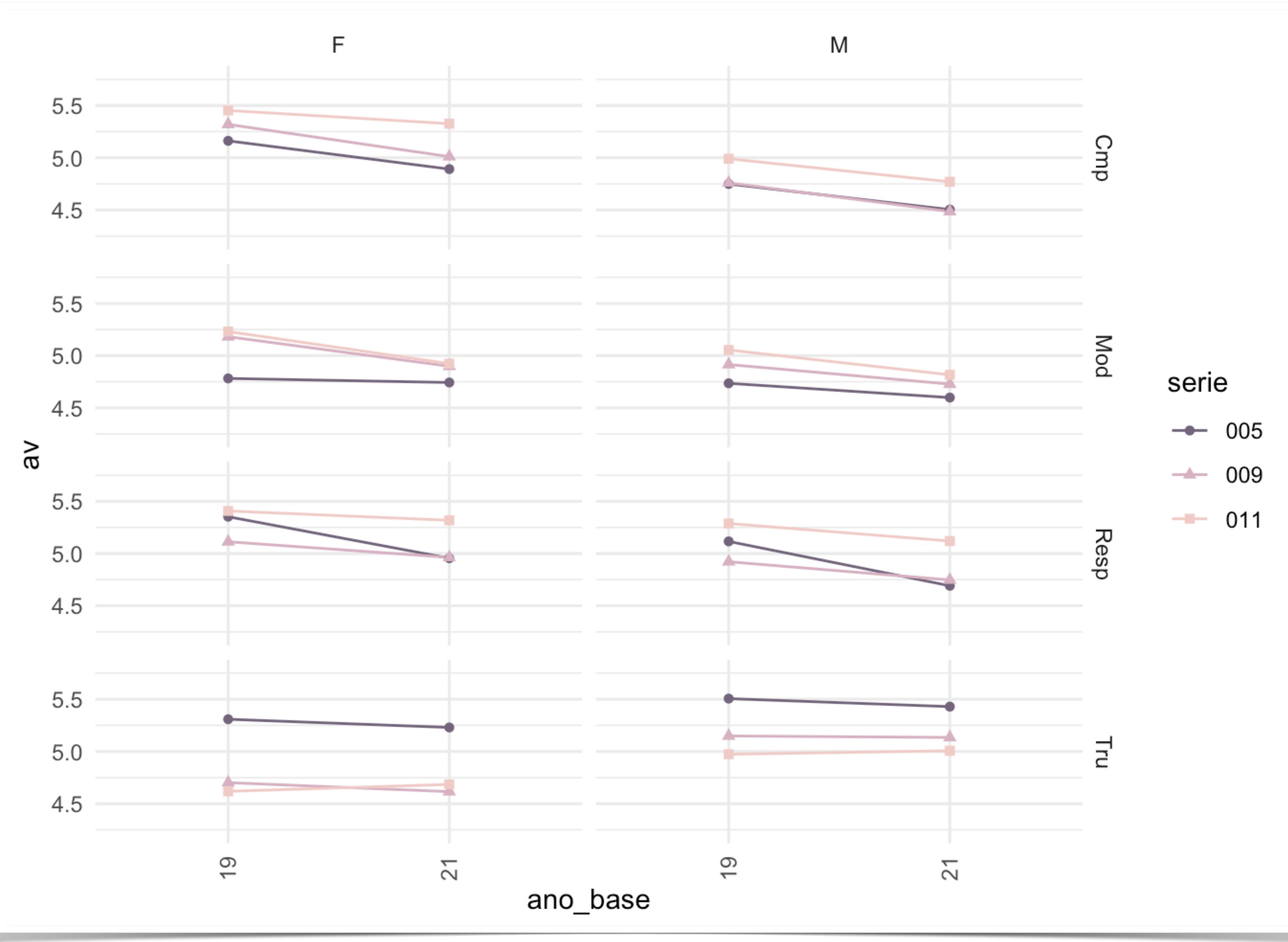
# Amity 2% R = 0,13

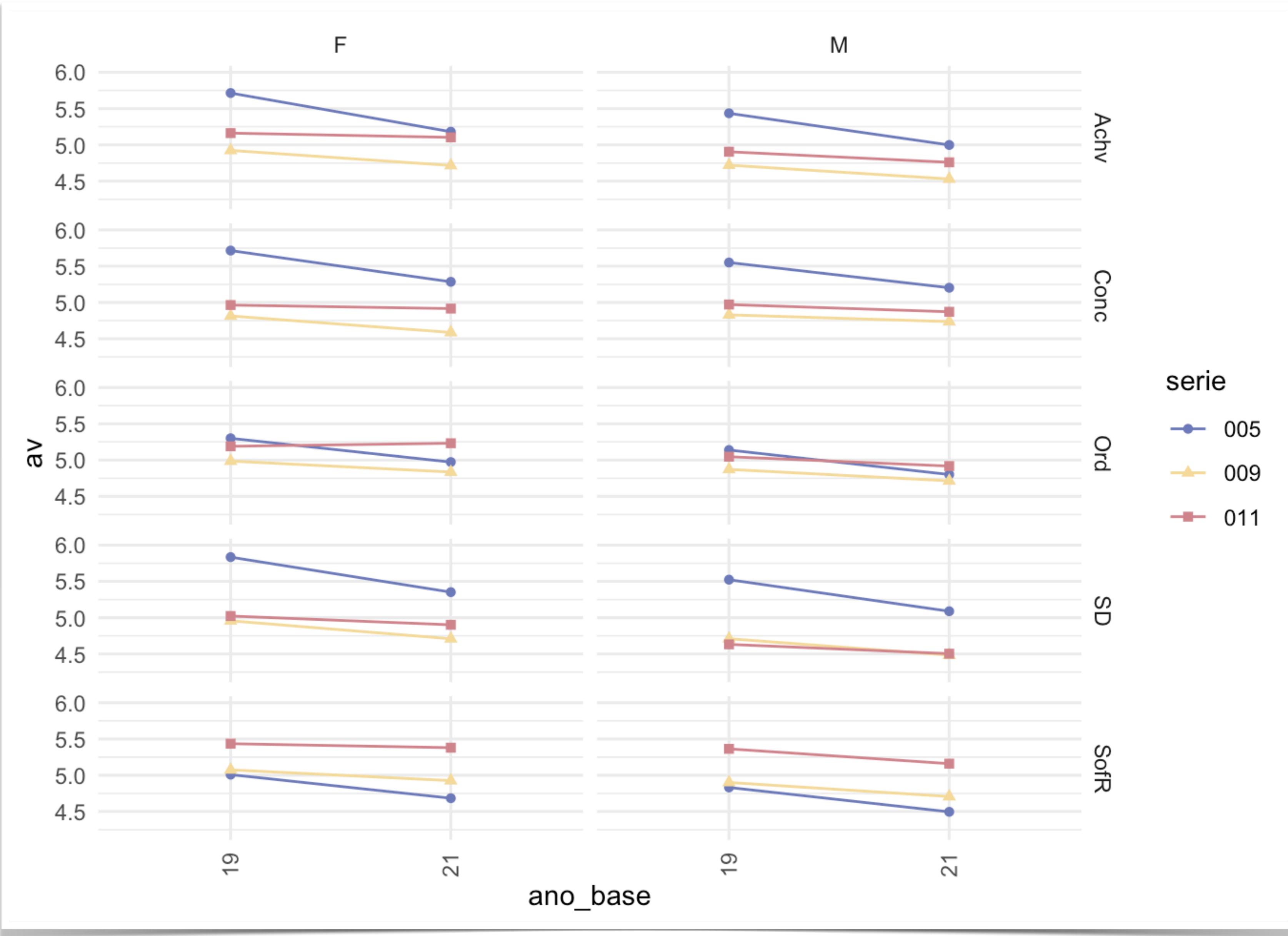


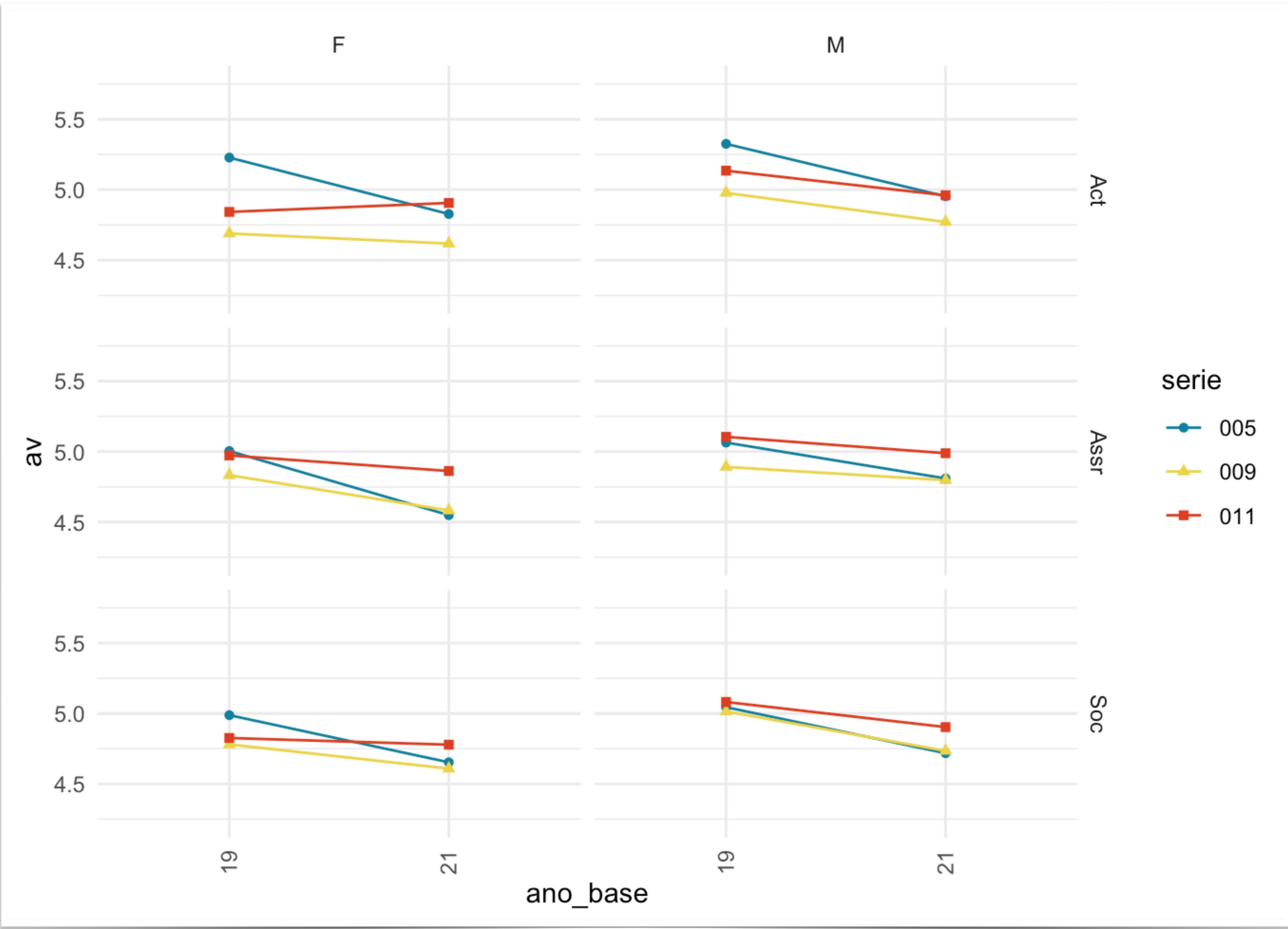
# Engagement with others

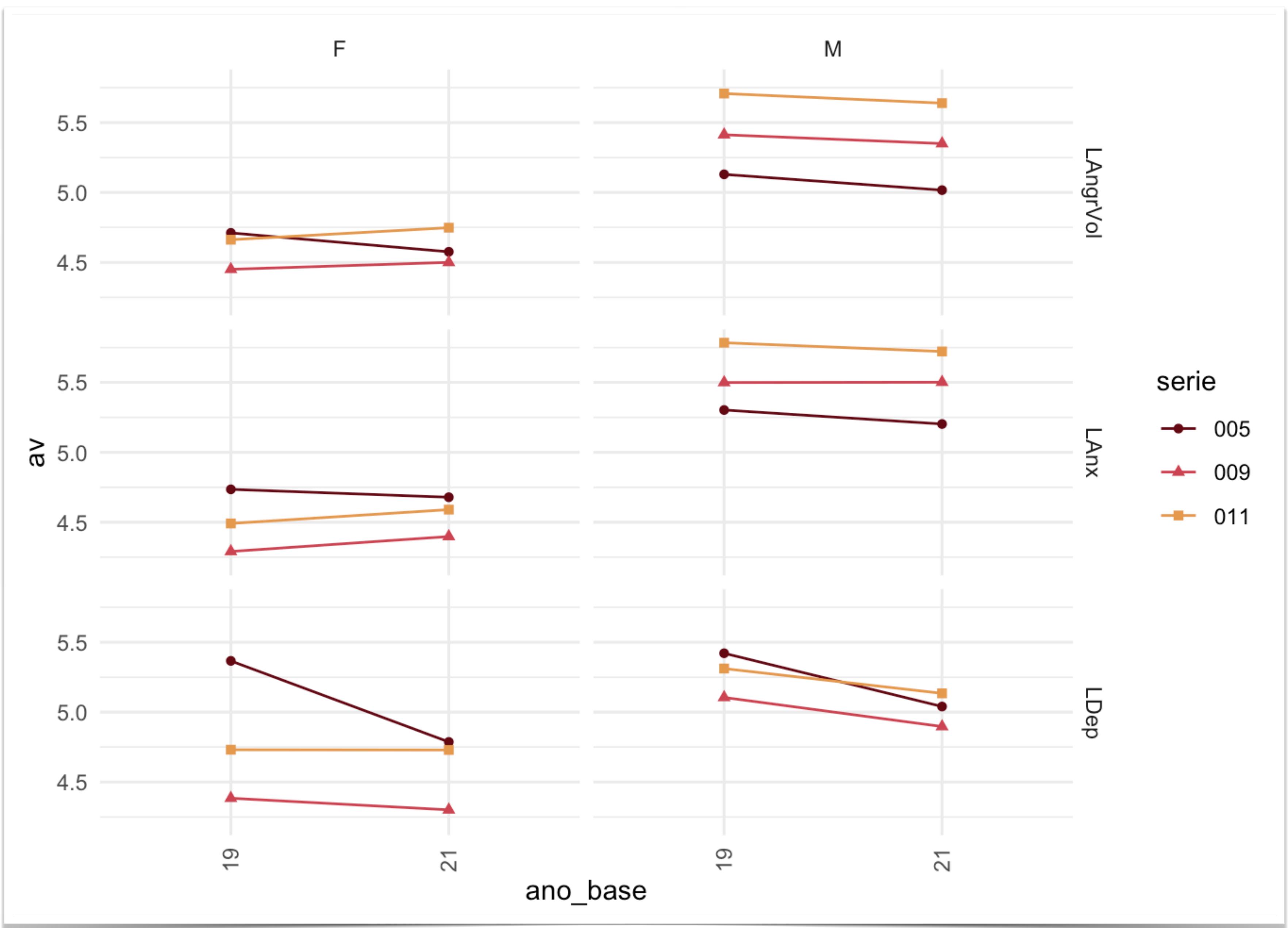


# **Before and after COVID19**









# **Conclusions 2**

## **Applied uses of the social and emotional big five in schools**

- The SENNA/socio-emotional big five provided useful insights on relation to learning
- It was useful language to facilitate self-awareness of socio-emotional skills in schools
- Comprehensive model -> understanding of normative changes

### **3. Measurement challenges of social and emotional skills in international comparisons**

# **Programme for International Student Assessment (PISA)**

## **Assessing social and emotional skills as outcomes**

- PISA has been an important system for providing benchmarks for international comparisons and monitoring trends over time.
- Cognitive tests measure the ability to apply knowledge to solve practical problems (language, math science, and an innovative domain).
- Self-report questionnaires assess additional constructs such as social-emotional skills (Bertling & Alegre, 2018).
  - explanatory factors of learning outcomes
  - outcomes of 21st century education

# Examining aptitude achievement paradox in PISA

The **challenge** with PISA self-assessment is how to achieve cross-culturally comparable measures.

How can we compare different cultures in self reported perseverance for instance?

Aptitude-achievement paradox (Kyllonen & Bertling, 2013).

There have been many attempts to solve this problem (like anchoring vignettes), but none have been completely successful

One of the techniques, we used in SENNA to control acquiescence and assist with resolving part of this issue.

Primi, R; Bertling, J., Kyllonen, P., Hauck-Filho, N., & Valentini, F. (2019) Acquiescence and attitude-achievement paradox in PISA 2012. Paper presented at 84th Annual Meeting of the Psychometric Society, Santiago, Chile.

# PISA 2012

## Reanalysis of data on social and emotional characteristics

Scale	Constructs/Indices	var	pairs	lik	type	Booklets		
						A	B	C
<b>Socio emotional skills mapping: personality and conative constructs</b>								
Mathematics anxiety	Emotional regulation: math anxiety	ANX_SC	*2	4	agree	0	1	1
Mathematics self-concept	Emotional regulation: math self concept	ANX_SC		4	agree	0	1	1
Perceived control of success in mathematics	Belief of control and self-efficacy	LOCUSMAT	4	4	agree	1	1	0
Perceived control of success at school	Belief of control and self-efficacy	LOCUSCH		4	agree	1	1	0
Intrinsic Motivation for Mathematics (Math Interest)	Motivation and interest	INTMAT		4	agree	1	1	0
Instrumental Motivation for Mathematics	Motivation and interest	INSTMOT		4	agree	1	1	0
Subjective Norms	Values	SUBNORM		4	agree	1	1	0
Mathematics Self-Efficacy	Belief of self-efficacy	MATHEFF		4	agree	1	1	0
Mathematics work ethic	Self-manangement: organization and focus	MATWKETH		4	agree	1	1	0
Students' perseverance	Self-manangement: perseverance	PERSEV	2	5	like me	1	1	0
Openness for problem solving	Open-mindedness: intellectual curiosity	OPENPS		5	like me	1	1	0
<b>Teacher, school and opportunity to learn variables</b>								
Teacher's support	Teacher: support	MTSUP		4	agree	0	1	1
Teacher's classroom management	Teacher: management	CLSMAN		4	agree	0	1	1
Teacher's student relations	Teacher: relationship / school climate	STUDREL		4	agree	0	1	1
Sense of belonging to school	School climate: belonging	BELONG	3	4	agree	0	1	1
Attitude towards school: learning outcomes	School attitude	ATSCHL	2	4	agree	0	1	1
Familiarity with Maths Concepts	Overclaim	FAMCON	**3	5	heard	1	0	1
Teacher's support anchoring vignettes	Vignettes	MTSUP_AV	1	4	agree	0	1	1
Teacher's classroom management anchoring vignettes	Vignettes	CLSMAN_AV	1	4	agree	0	1	1

Note: \*semantic pairs between math anxiety and math self concept; \*\* three items are a direct measure of acquiescence

480,174 students from  
66 countries and  
economies

17 scales

Inconsistent index  
based on 18 pairs of  
items

We proposed a method  
for rescaling responses  
and rescoring that  
controls for  
inconsistent responses

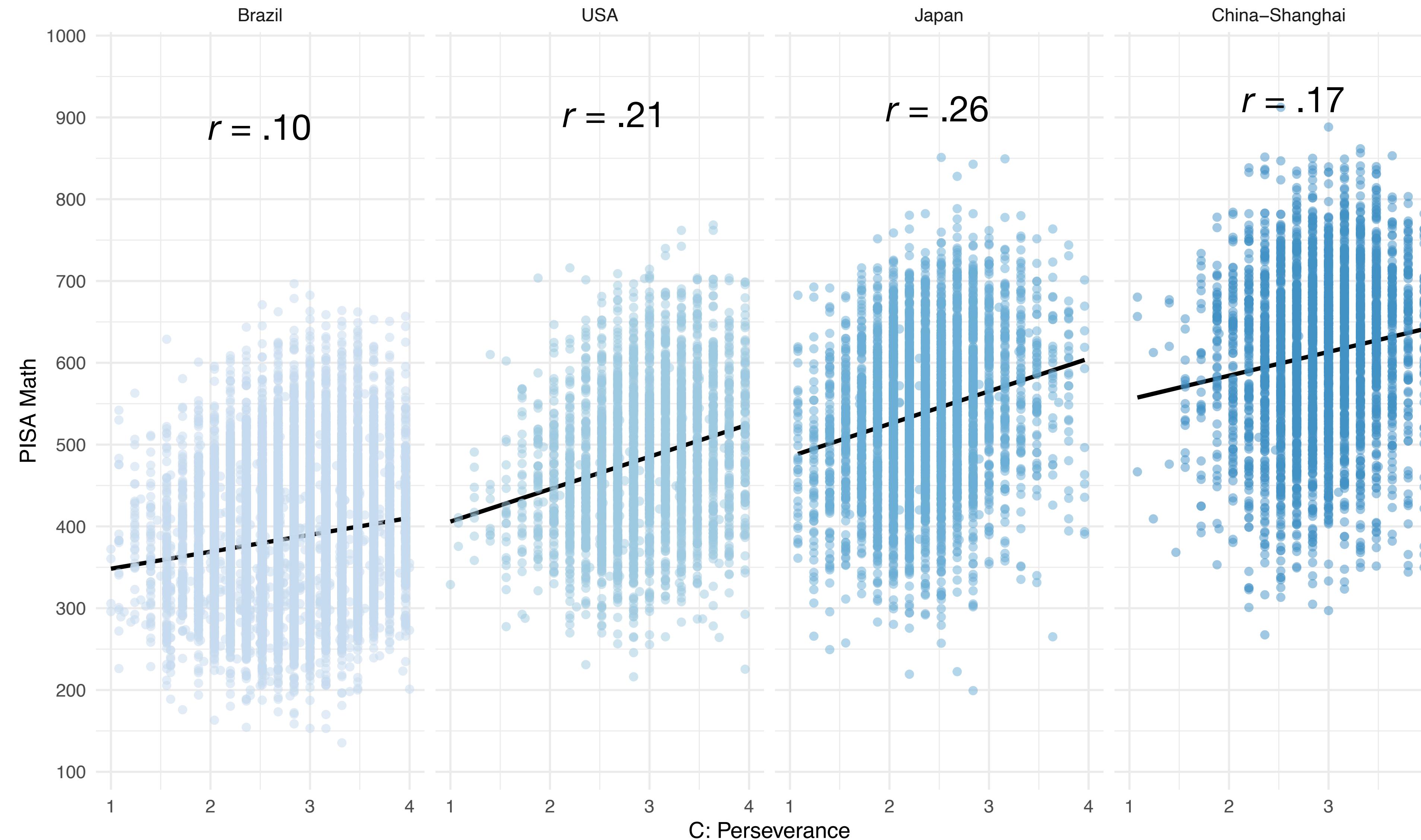
# Perseverance scale PISA 2012

**Q36 How well does each of the following statements below describe you?**

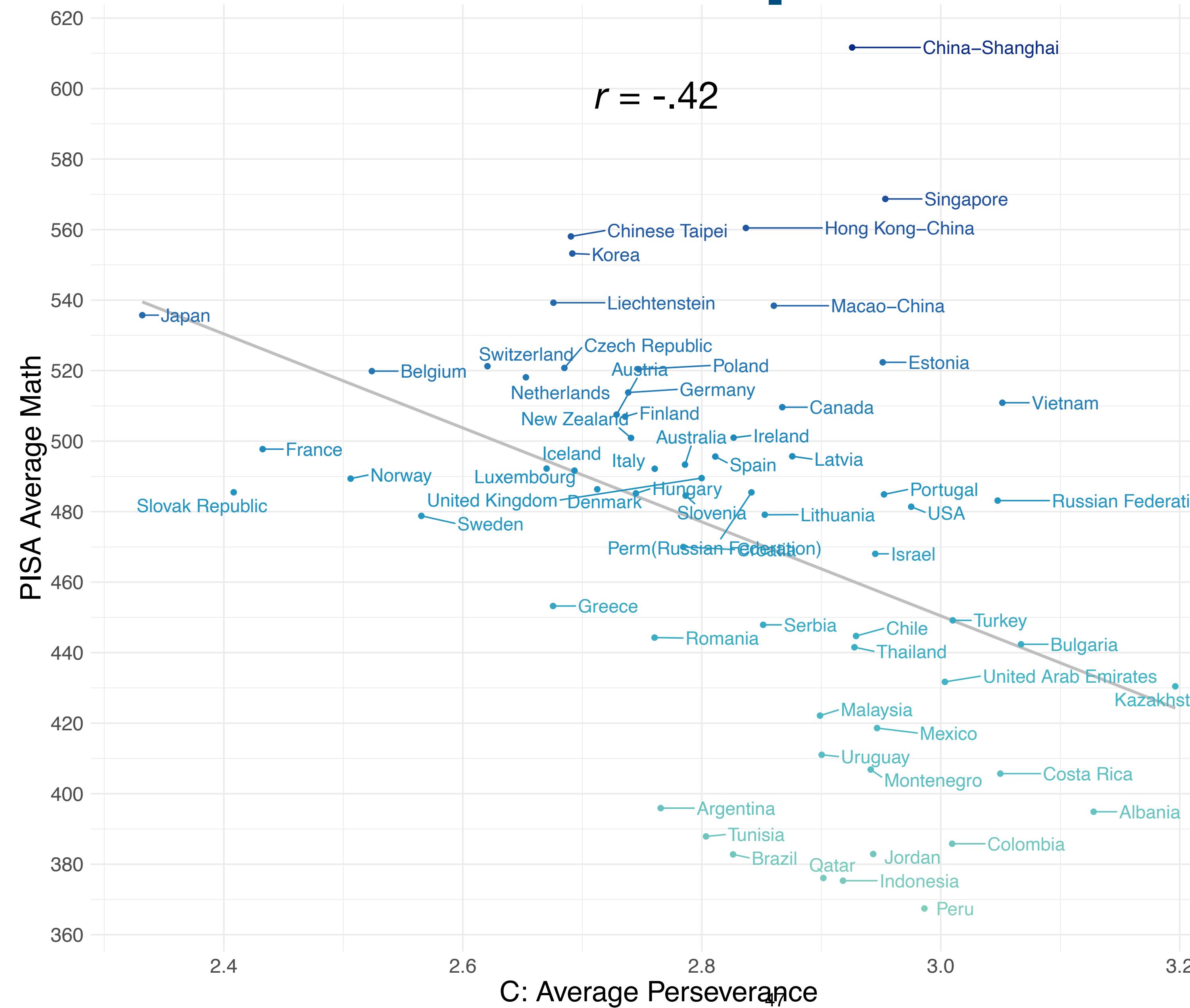
*(Please tick only one box in each row.)*

	<i>Very much like me</i>	<i>Mostly like me</i>	<i>Somewhat like me</i>	<i>Not much like me</i>	<i>Not at all like me</i>
a) When confronted with a problem, I give up easily.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
b) I put off difficult problems.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
c) I remain interested in the tasks that I start.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
d) I continue working on tasks until everything is perfect.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
e) When confronted with a problem, I do more than what is expected of me.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

# Aptitude achievement paradox

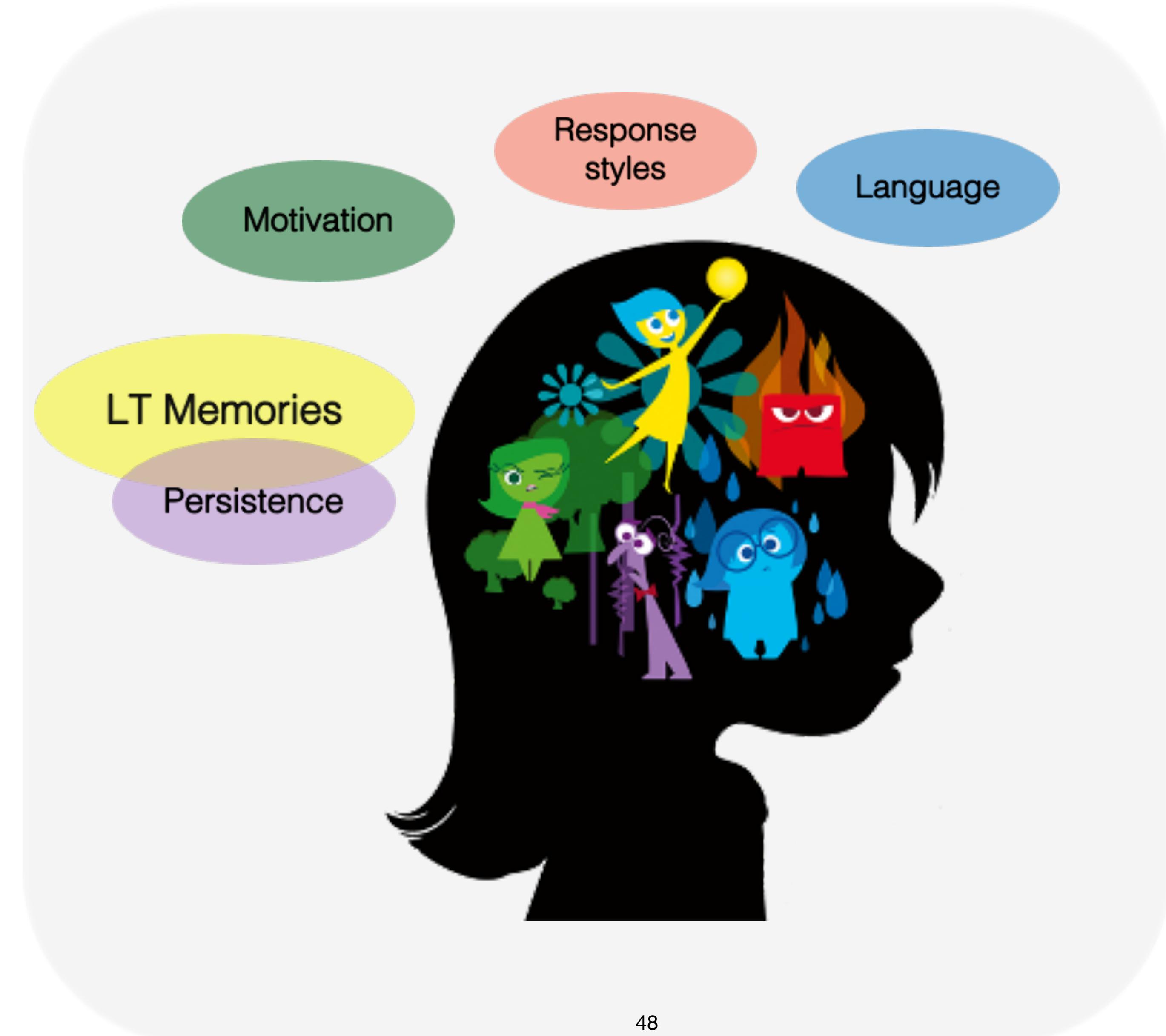


# Aptitude achievement paradox



Example of a Simpson's paradox when we encounter data where "an association that is observed on entire population reverses in every subpopulation" (Pearl et al., 2016, p. 3)

# Self-report is a rater mediated assessment

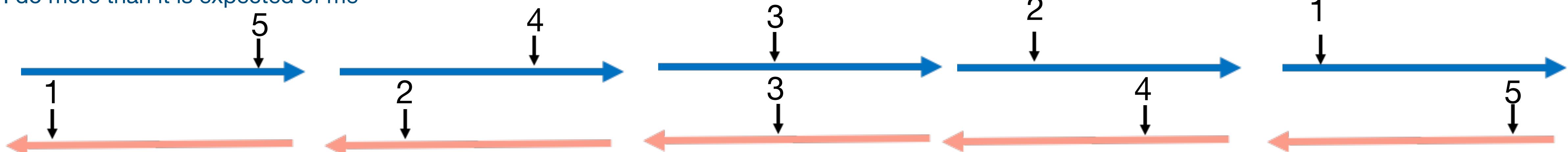


# Inconsistent agreement responses

## index from positive pole vs negative pole items

Consistent responses

When confronted with a problem  
I do more than it is expected of me



When confronted with a problem  
I give up easily

High persistence

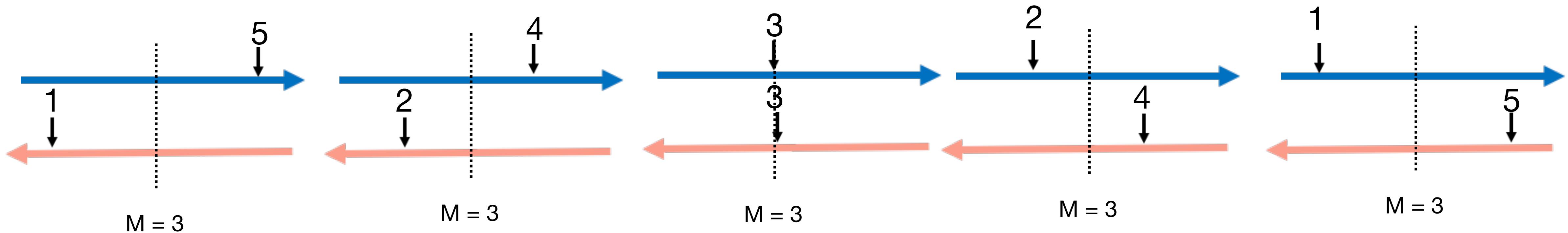
Low persistence



# Inconsistent agreement responses

## index from positive pole vs negative pole items

Consistent responses

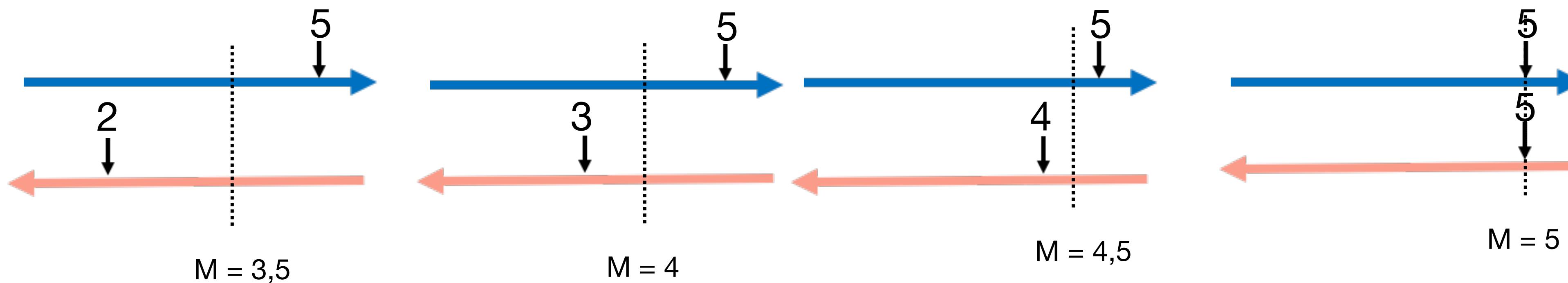


# Inconsistent agreement responses

## index from positive pole vs negative pole items

### Inconsistent responses

When confronted with a problem  
I do more than it is expected of me



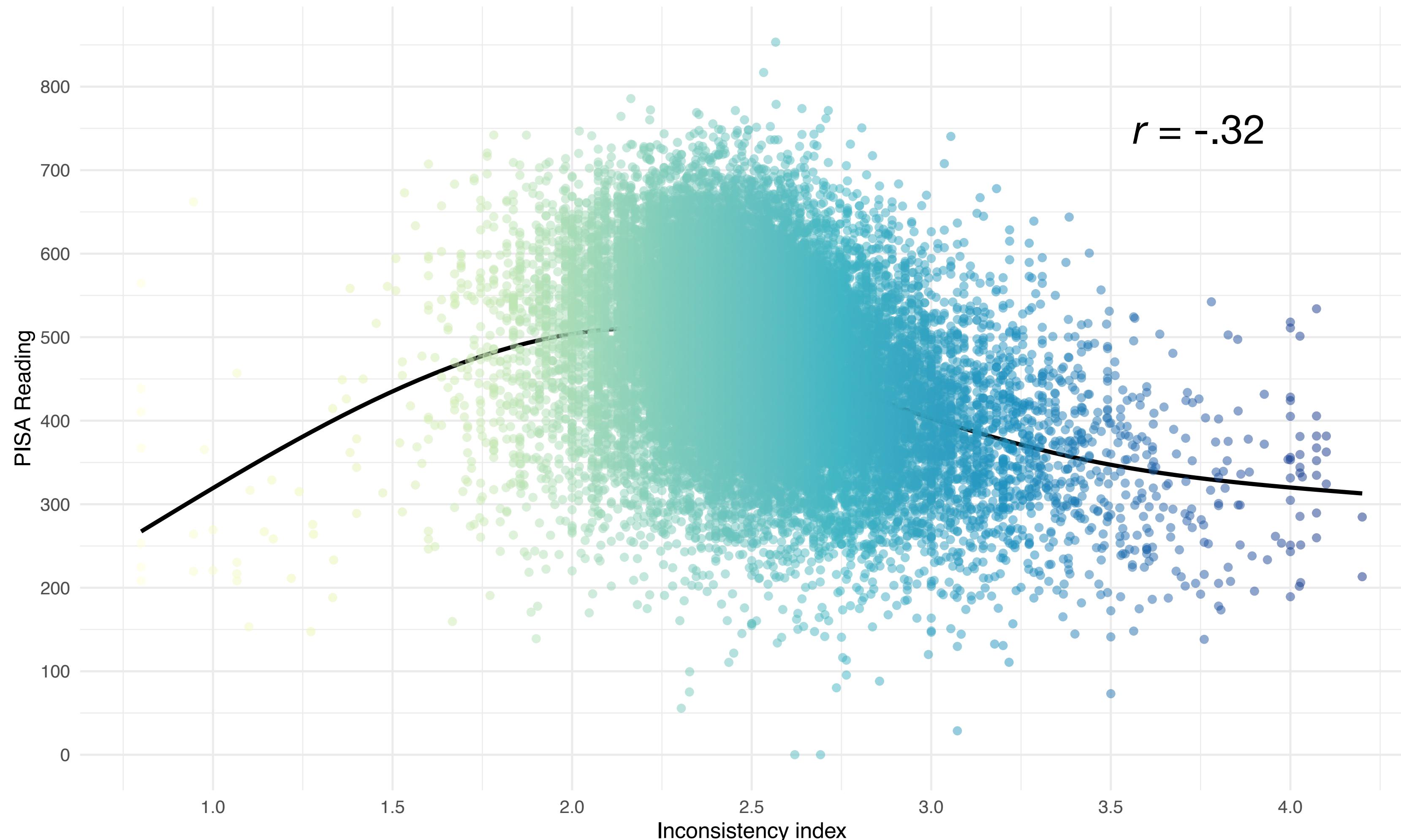
When confronted with a problem  
I give up easily

Consistent

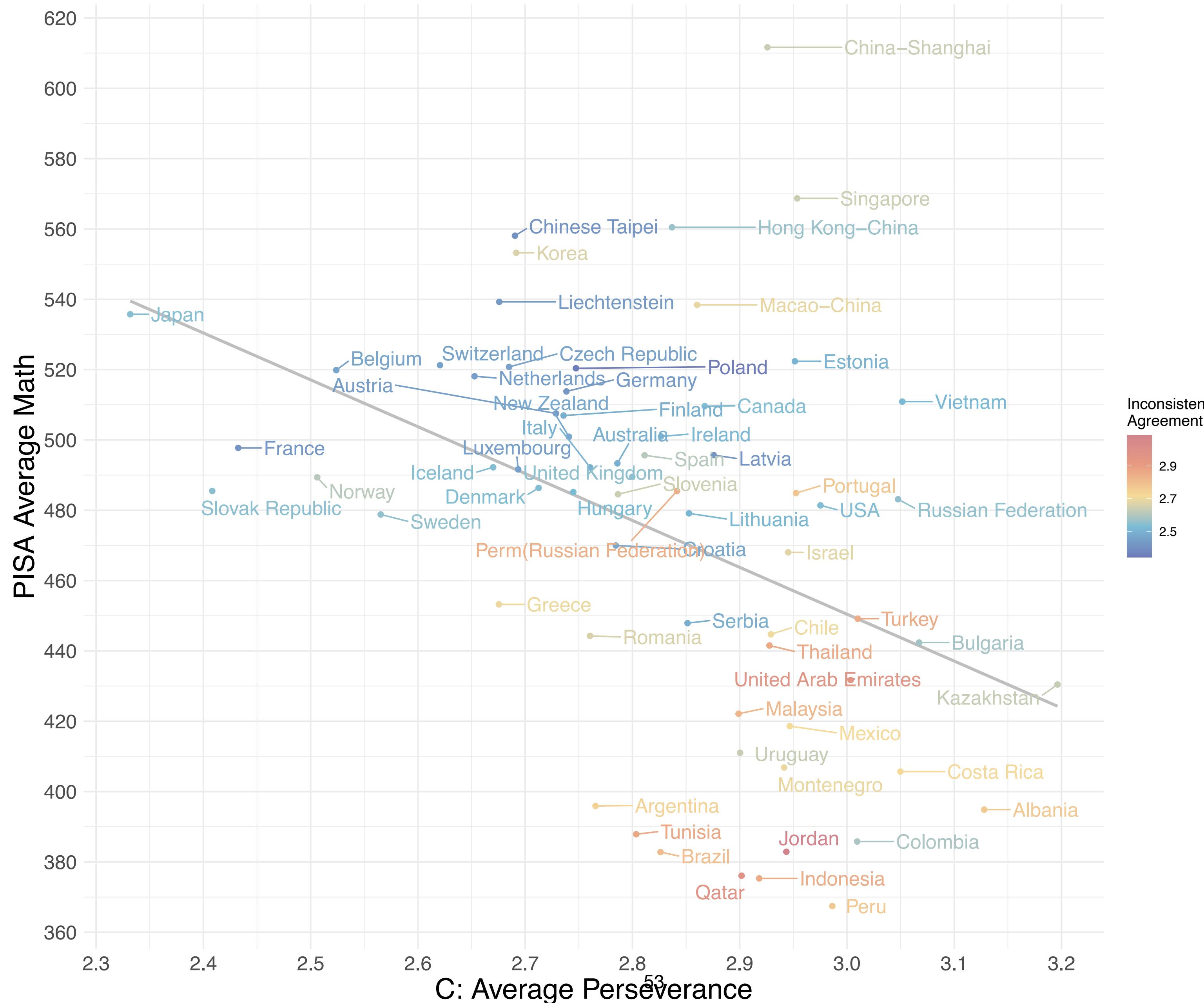
High inconsistent  
agreement

# Inconsistency vs achievement

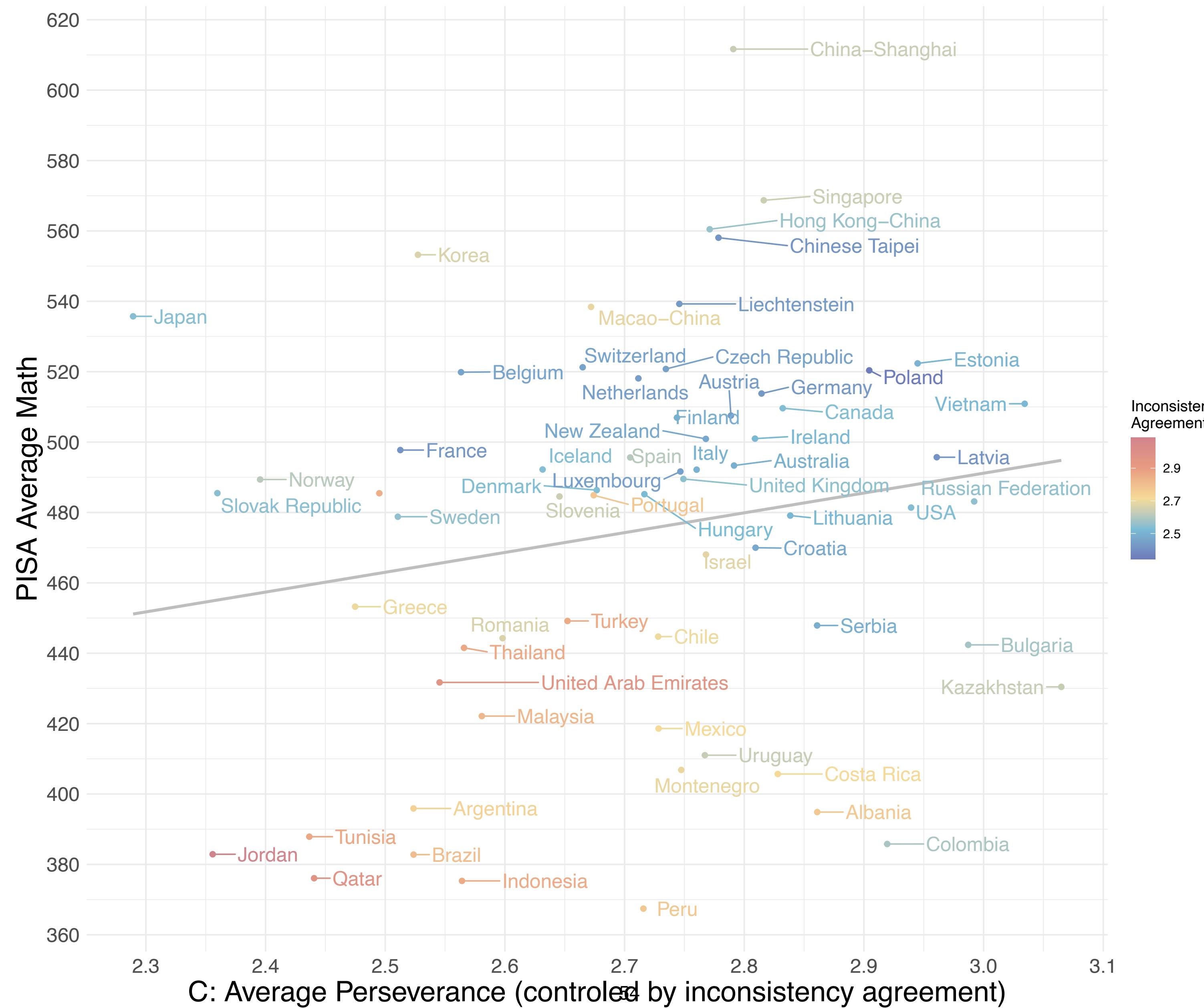
Inconsistency -> low achievement



# Revisiting aptitude achievement paradox



# Solving part of the aptitude achievement paradox



# Final conclusions

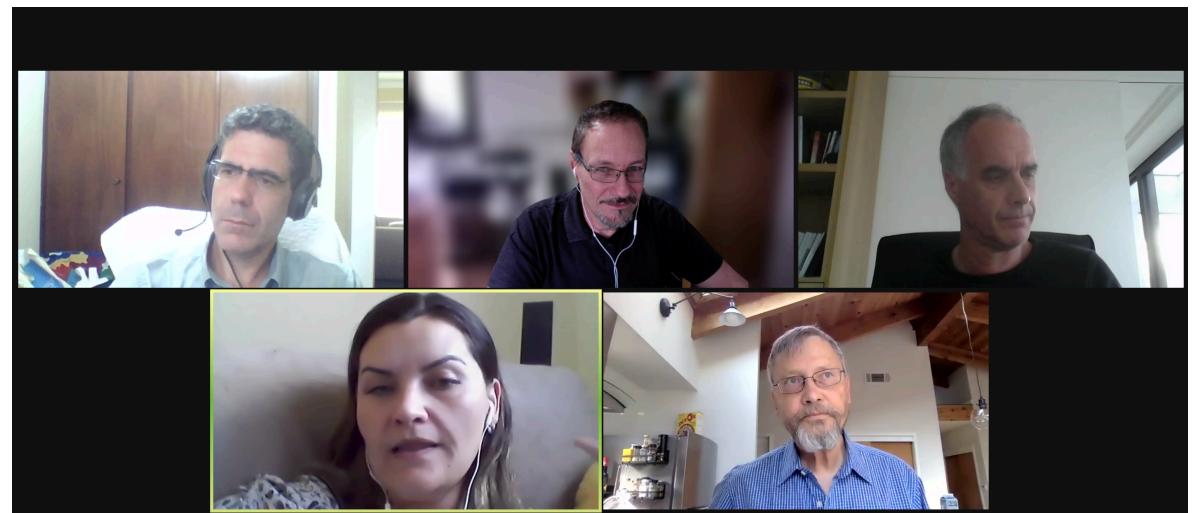
1. An overview of the social and emotional big five as a comprehensive model for understanding and assessing social and emotional skills.
2. This model/instrument are useful to understand the social and emotional aspects of learning, and to enhance school awareness of these skills.
3. Measurement matters. Acquiescence can help overcome some of the difficulties associated with cross-cultural comparisons in the PISA program.

Agenda for the future:

AI Innovation on development of direct assessment

Teachers' social and emotional skills

# Many thanks for your attention



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**IAS In-house researchers team:**

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**External associate researchers:**

Felipe Valentini, Nelson Hauck Filho



I have no special talents. I am only passionately curious.

*Einstein Letter to Carl Seelig (11 March 1952)*

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