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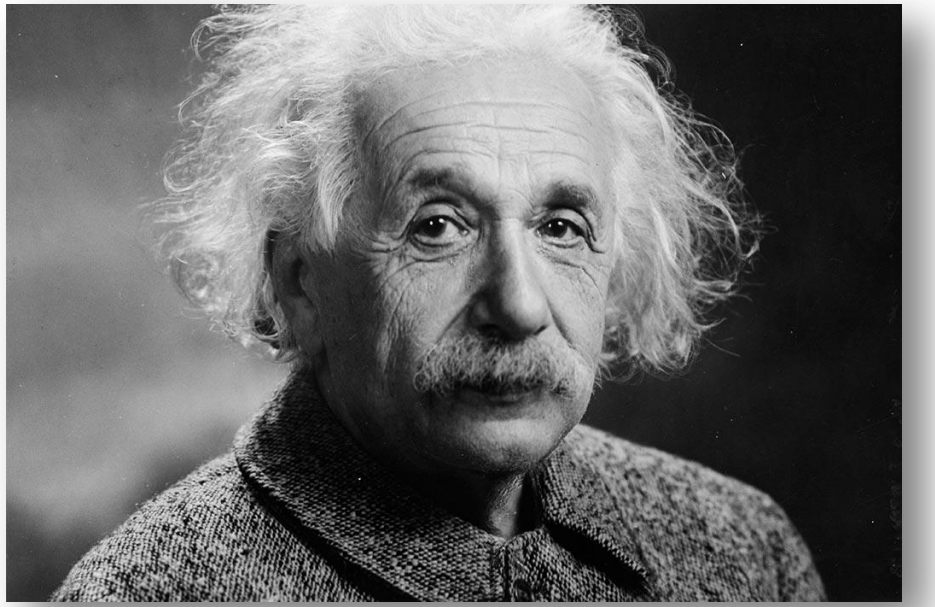

„Es ist nicht, dass ich so überaus intelligent bin, es ist nur, dass ich mich länger mit Problemen befasse und nicht aufgebe.“

Effects of students' GRIT on their academic success in vocational schools in Austria

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THE CONCEPT OF GRIT

Concept

- German translations: Durchhaltevermögen, Willensstärke, Beharrlichkeit (Fleckenstein et al., 2014)
- related concepts: resilience, robustness, ambition
- GRIT: **Hard work toward challenges, maintaining the effort and the interest for years despite failure and adversity.**
- GRIT = a aspect of **conscientiousness** (Credé, Tynan & Harms, 2016), but: effort is related to interest and a specific goal
- Grit represents a person's **attitude/belief**.
- 2 GRIT factors: **perseverance** and **passion for long-term goals** (passion more perseverance-like than enthusiam-like, Duckworth, 2016)

History

- Already **Aristoteles** distinguished between talent and hard work; he pointed at the importance of perseverance.
- So far mainly **American** research (positive psychology).
- In recent years, research interest in the **relation between grit and (student) achievement** has been growing.

GRIT SCALE

Passion for long-term goals

1. I often set a goal but later choose to pursue a different one.
2. New ideas and projects sometimes distract me from previous ones.
3. I become interested in new pursuits every few months.
4. My interests change from year to year.
5. I have been obsessed with a certain idea or project for a short time but later lost interest.
6. I have difficulty maintaining my focus on projects that take more than a few months to complete.

Perseverance

1. I have achieved a goal that took years of work.
2. I have overcome setbacks to conquer an important challenge.
3. I finish whatever I begin.
4. Setbacks don’t discourage me.
5. I am a hard worker.
6. I am diligent.

□ Very much like me □ Mostly like me □ Somewhat like me □ Not much like me □ Not like me at all

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GRIT THEORY (DUCKWORTH ET AL., 2007)

- Achievement is the product of **talent** and **effort** (“skill n will”).
- Ability or talent are not sufficient predictors of success.
- **Academic achievement is more strongly affected by a student perseverance and passion for long-term goals than by students’ intelligence or talent.**
- With regard to school we expect that gritty students…
  - ☐ **engage harder,** invest more time in learning and homework, etc.
  - ☐ possess **higher self-concepts** and more favourable attribution patterns
  - ☐ have **higher intrinsic motivation**
  - ☐ are more self-regluated in their learning
  - ☐ experience more often success
  - ☐ …

FINDINGS

- GRIT theory explains why persons with **equal intelligent** accomplish **different success** (Terman & Oden, 1947). Refuting the idea which explains that intelligence is the best predictor of achievement.
  - Adults who are **more gritty,** accomplish **higher levels of education** and **change less** often their **career** than the ones who are less gritty (Duckworth et al., 2017).
  - Duckworth et al. (2007) found GRIT as reason why some **cadets remain** in a hard summer program while others drop out.
  - Participants in the **Scripps National Spelling Bee** passing higher rounds were more gritty than their companions (Duckworth et al., 2010, 2009, 2007).

FINDINGS – ACADEMIC LEARNING

Relations between GRIT and …

- **intrinsic motivation** (Esskreis-Winkler et al., 2014)
- **test motivation** (Tucker-Drob et al., 2016)
- **school satisfaction** (Ivcevic & Brackett, 2014)
- **well-being** (Singh & Jda, 2008)

FINDINGS – ACADEMIC LEARNING

Relations between GRIT and …

- **school engagement** (Datu et al., 2016)
- **mastery goal orientations ↑ performance goal orientations↓** (Dweck & Leggett, 1988)
- **self-control** (Duckworth et al., 2007; Feldman & Freitas, 2016; Li et al., 2016; Schmidt et al., 2016)
- **deliberate practice** (Duckworth et al., 2011)

FINDINGS – ACADEMIC LEARNING

Relations between GRIT and …

- **academic achievement** (Duckworth et al., 2007; Duckworth & Quinn, 2009)
- **higher GPA** (Duckworth et al., 2007; Cross, 2014)**.**
- **work performance** (Suzuk et al., 2015)

AIM OF THE STUDY

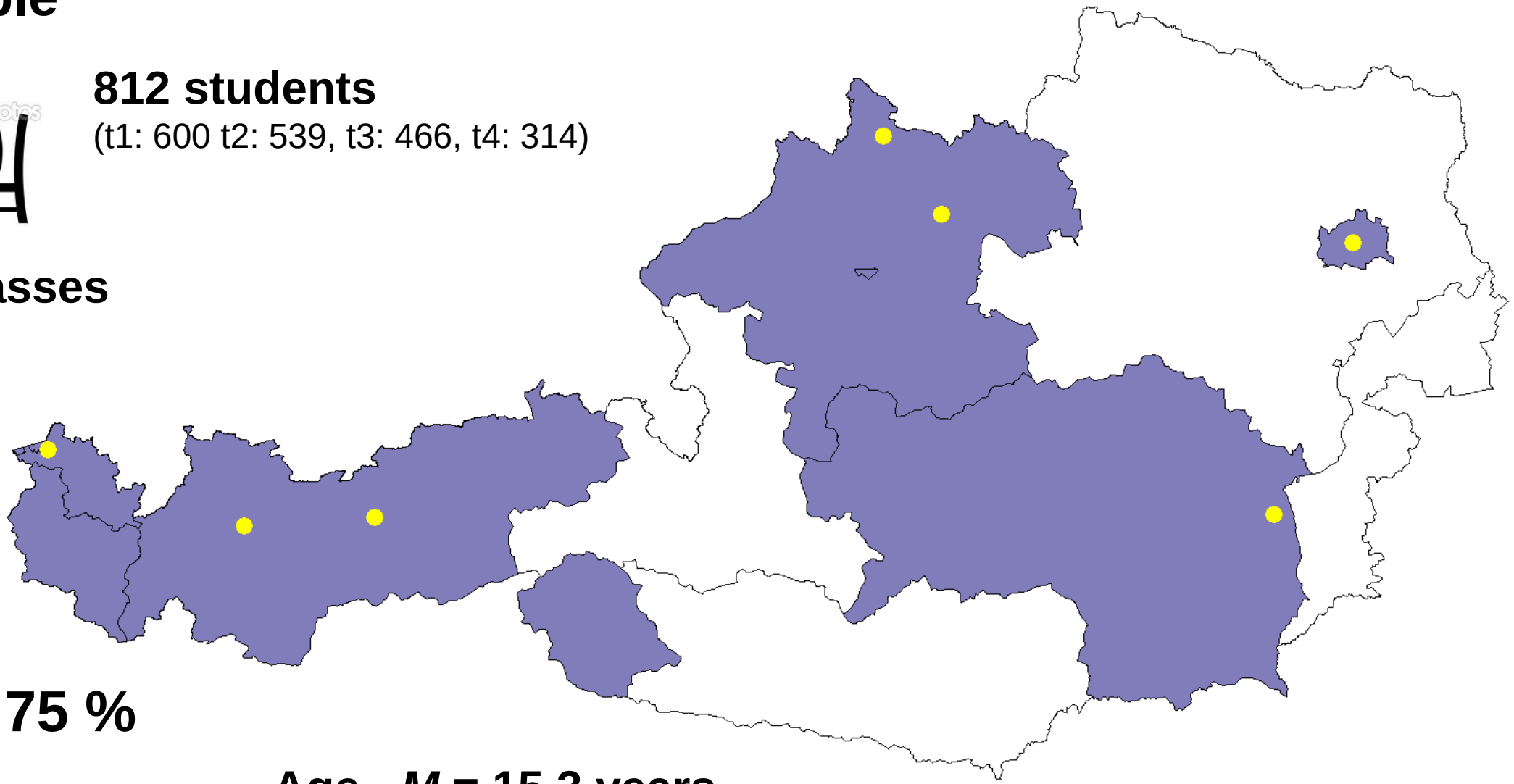
As presented, there is some early research on how GRIT is related to success in the non-academic fields, but **few educational research** has been done on how grit is influencing students scholastic learning. Furthermore, there is **no study in vocational education and training.**

Thus, the present study focusses on the relation between students' GRIT and students' academic achievement/development in vocational schools (more particular in accounting).

Sample

812 students
(t1: 600 t2: 539, t3: 466, t4: 314)

24 classes



75 %

Age$_{t1}$ *M* = 15,3 years

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MEASURES

Measure	#	Sample item	α	M	SD	min	max
GRIT/BISS – passion f. lt. goals	6	New ideas and projects sometimes distract me from previous ones. (Fleckenstein et al. 2014)	.76	2.76	.74	1	5
GRIT/BISS – perseverance	6	I am diligent. (Fleckenstein et al. 2014)	.77	3.55	.70	1	5
accounting ability* (t1 bis t5)	34 to 53	Book entry for purchasing goods (CAT)	.75 to .89	-.67 .27 -.23	1.48 .93 1.81	~ -5	~ 5
GPA	4	exam grade and school report grade in Accounting, Business, Math and German	-	-	-	1 (+)	5 (-)

* test construction: Helm 2016; Guggemos 2016; Guggemos & Schönlein 2015; mark 1 = excellent, mark 5 = failed

STATISTICAL PROCEDURE

Multilevel structural equation modeling:

- Confirmatory Factor Analysis for GRIT scale
- WITHIN-effects are of interest (>> group-mean centering, Enders and Tofighi, 2007): Otherwise the reported correlation coefficients would be biased due to the fact that some teachers give good marks more easily than others.

Competence modeling (Helm, 2016):

- Student ability in accounting was estimated based on the assumptions of the Rasch model in R (TAM, Kiefer et al. 2018)
- Using anchor items, the IRT-based competence scores were vertically linked and rescaled across the three grades (Haberman linking in sirt, Robitzsch 2018)
- Latent basis growth model (Zhang, Hamagami, Lijuan Wang, Nesselroade, & Grimm, 2007)

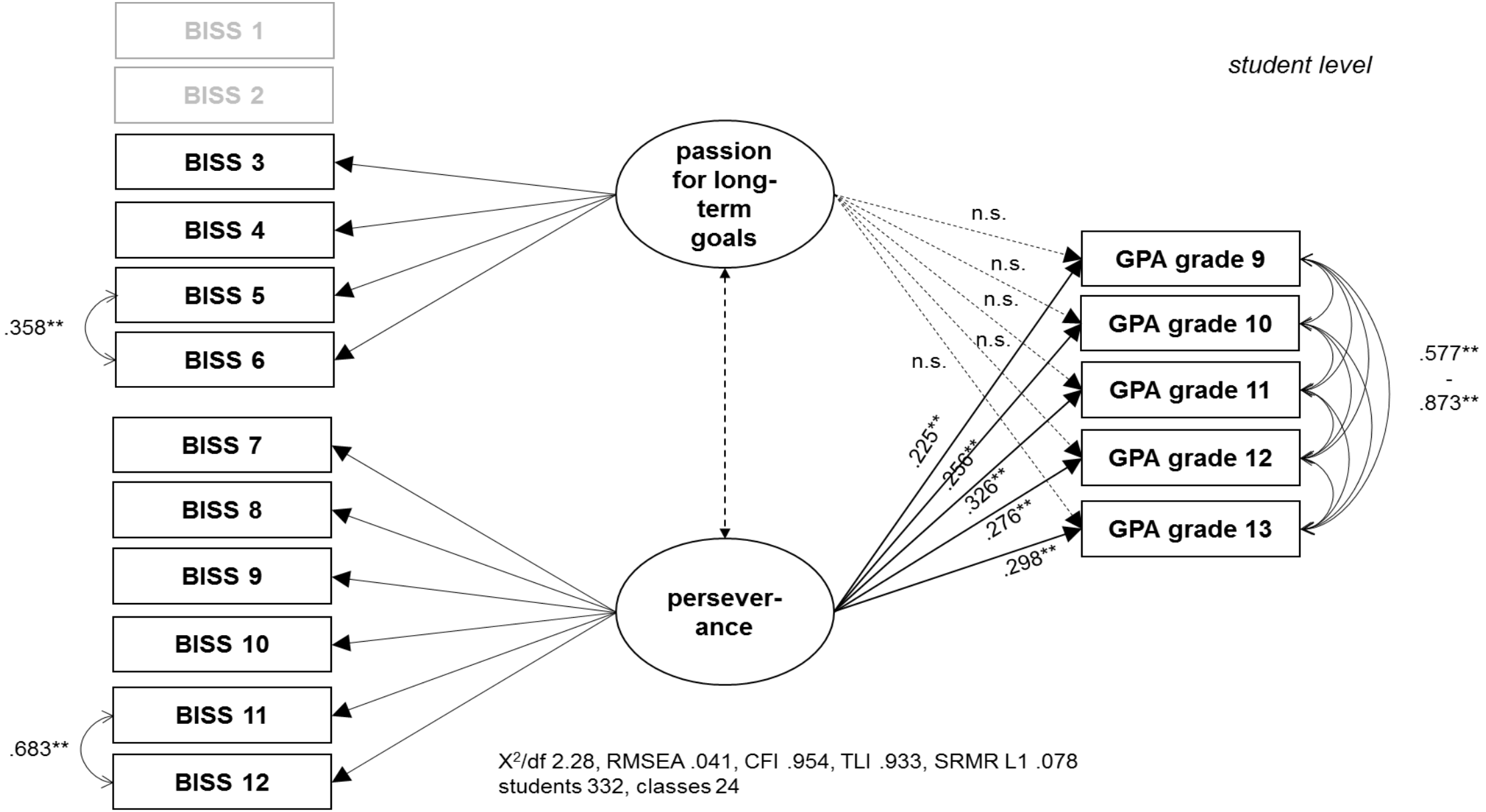
Missing data: FIML in Mplus

SOME DESCRIPTIVE CORRELATIONS

- With regard to school we expect that gritty students…
  - **engage harder,** invest more time in learning and homework, etc.
  - possess **higher self-concepts** and more favourable attribution patterns
  - have **higher intrinsic motivation**
  - are more self-regluated in their learning
  - experience more often success
  - …

	Intrinsic Motivation			**Acad. Self-concept**			**Achievement Motivation**		
Grade:	*10*	*11*	*12*	*8*	*10*	*11*	*8*	*10*	*11*
Passion	-.08	-.16	-.04	-.09	-.08	-.09	-.08	-.05	-.08
Perseverance	.18	.25	.33	.23	.30	.32	.31	.40	.39

RESULTS: GRIT & GPA


student level
BISS 1
BISS 2
BISS 3
BISS 4
BISS 5
BISS 6
BISS 7
BISS 8
BISS 9
BISS 10
BISS 11
BISS 12
.358**
.683**
passion for long-term goals
persever-ance
n.s.
n.s.
n.s.
n.s.
n.s.
.225**
.256**
.326**
.276**
.298**
GPA grade 9
GPA grade 10
GPA grade 11
GPA grade 12
GPA grade 13
.577**
-
.873**
X2/df 2.28, RMSEA .041, CFI .954, TLI .933, SRMR L1 .078
students 332, classes 24

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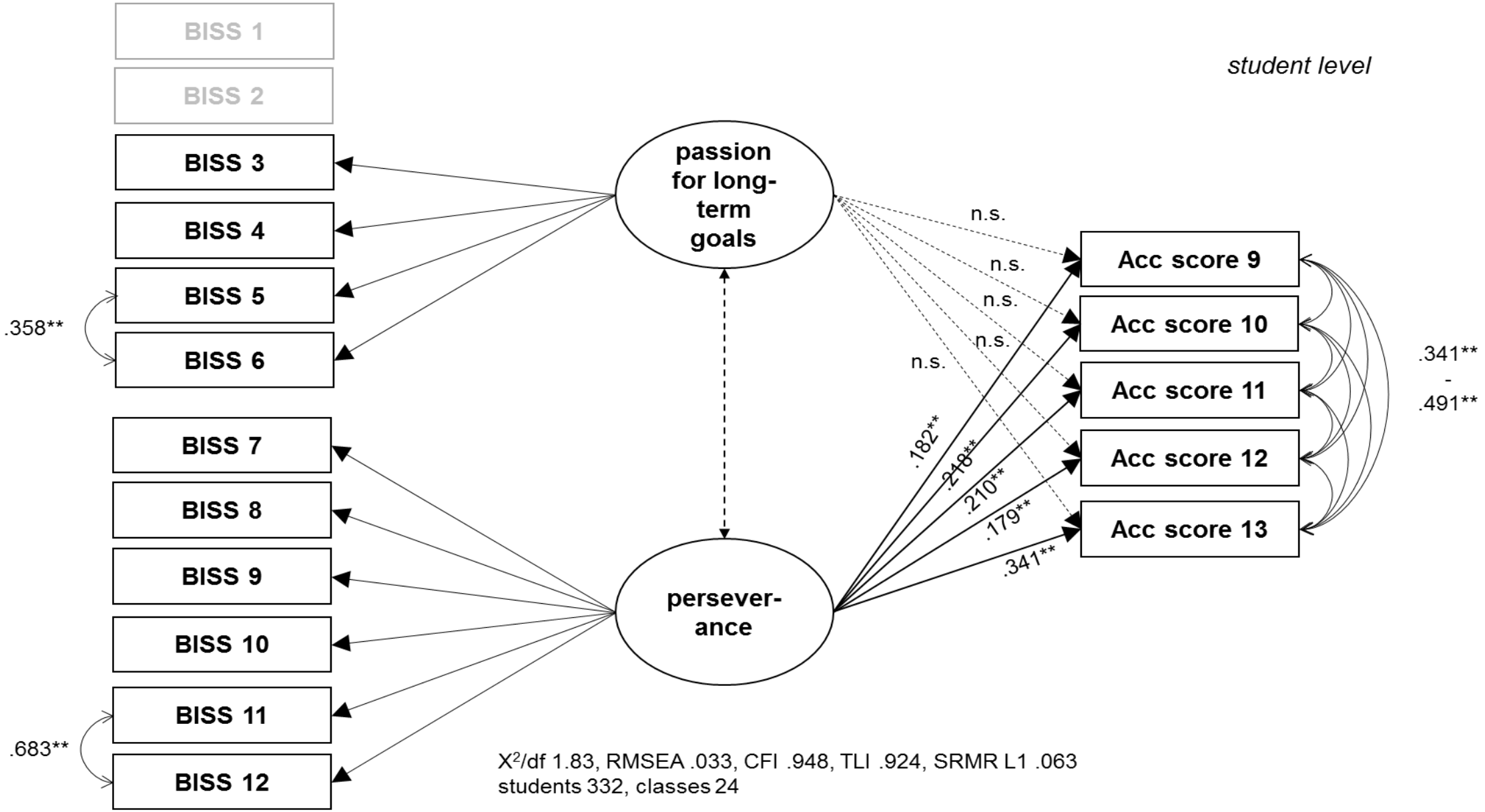
RESULTS: GRIT & ACCOUNTING TEST SCORES


student level
BISS 1
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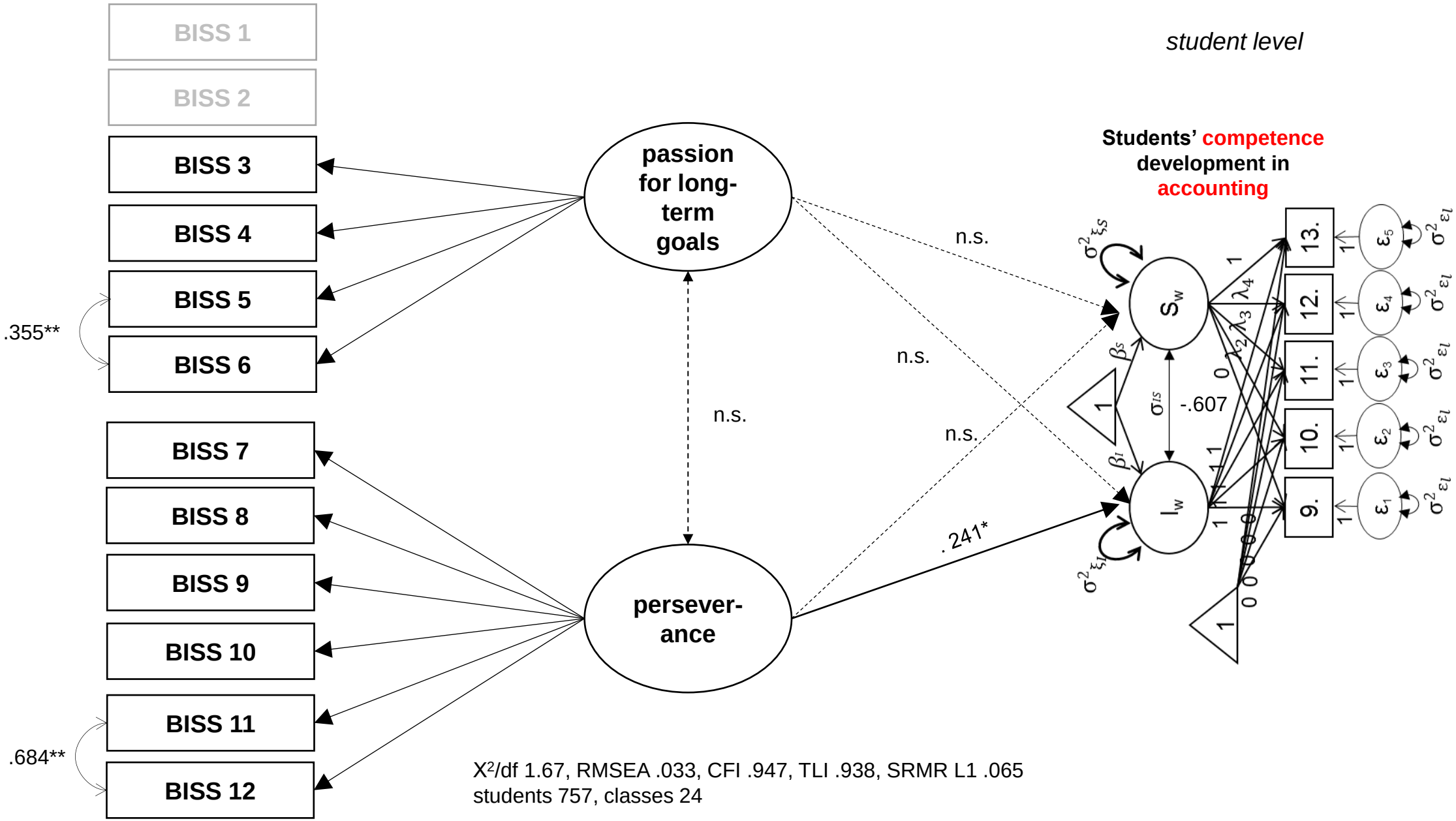
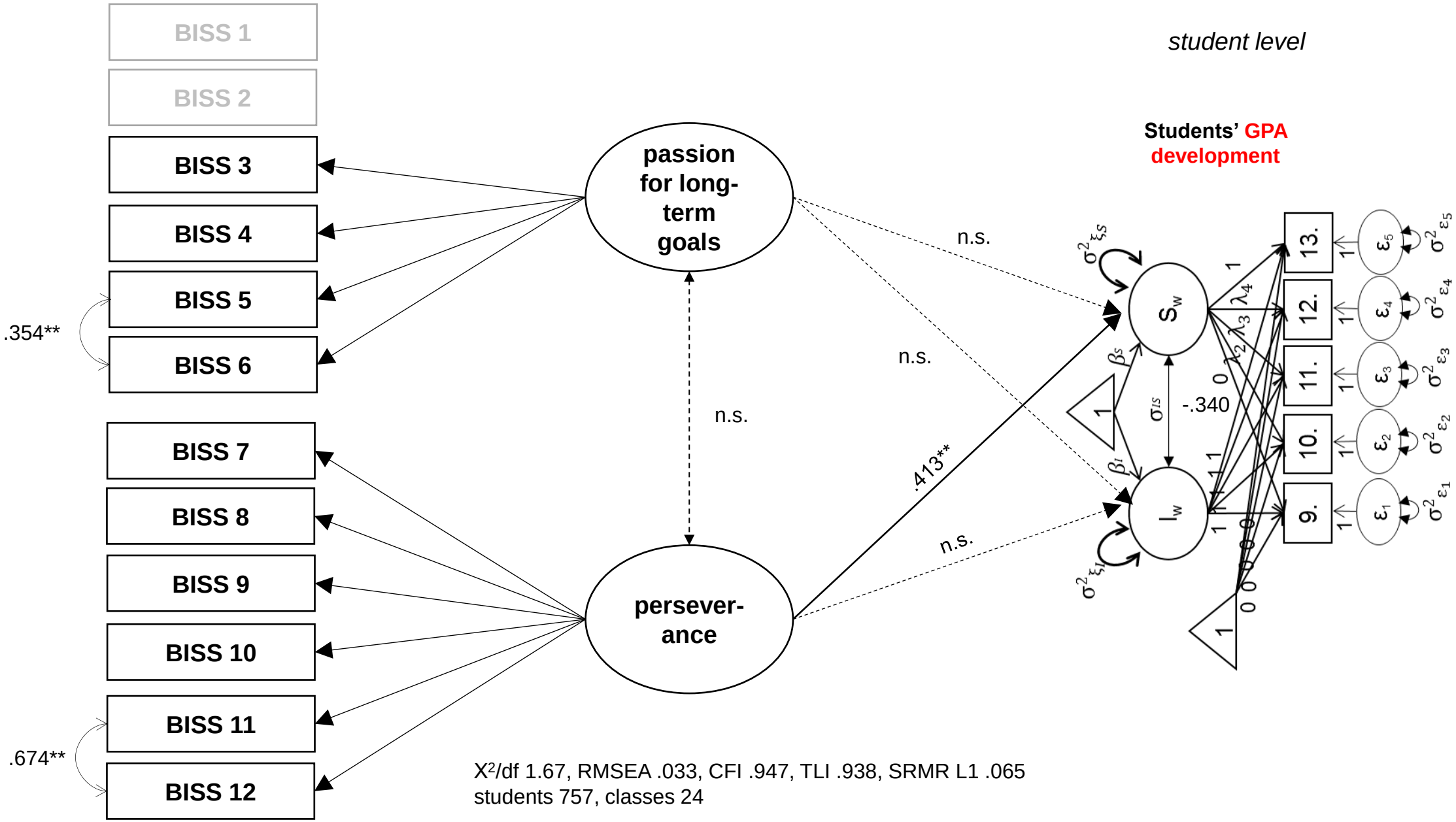
BISS 6
BISS 7
BISS 8
BISS 9
BISS 10
BISS 11
BISS 12
.358**
.683**
passion for long-term goals
persever-ance
n.s.
n.s.
n.s.
n.s.
n.s.
.182**
.218**
.210**
.179**
.341**
Acc score 9
Acc score 10
Acc score 11
Acc score 12
Acc score 13
.341**
-
.491**
X2/df 1.83, RMSEA .033, CFI .948, TLI .924, SRMR L1 .063
students 332, classes 24

RESULTS: GRIT & COMPETENCE DEVELOPMENT



X^2/df 1.67, RMSEA .033, CFI .947, TLI .938, SRMR L1 .065
students 757, classes 24



X^2/df 1.67, RMSEA .033, CFI .947, TLI .938, SRMR L1 .065
students 757, classes 24

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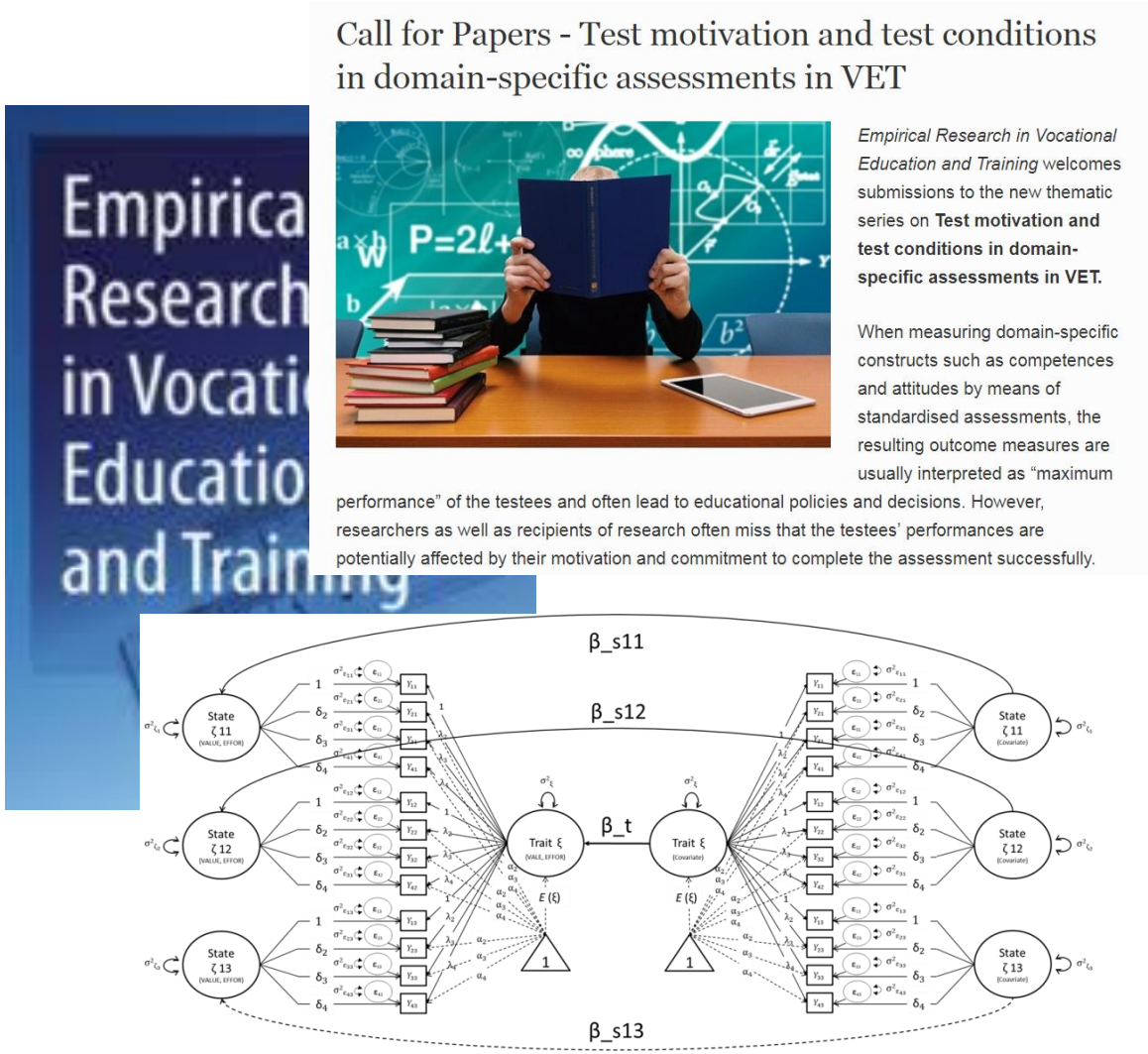
OUTLOOK: TEST MOTIVATION – A MEDIATOR?
(HELM & WARWAS UNDER REVIEW)

- *Bivariate* STMS analyses show that students' **grit,** conscientiousness, achievement motivation and behavioural regulation all predict the ***value*** dimension of students' test motivation. This pattern appears for the trait-like as well as for the state-like components of the respective constructs.
- However, a *multivariate* intercept-only growth model shows that (a) students' introjected predicts the value dimension and (b) students' identified behavioural regulation as well as their **grit (passion for long-term goals)** predict the **effort** dimension of test motivation.



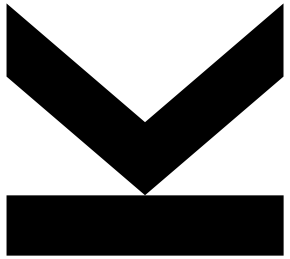
CONCLUSION

- First study to predict students **competence development** by grit. With regard to **GPA**, students development was significantly predicted by grit.
- The findings are **consistent over all grade levels** and clearly **support the assumption** that students' perseverance is related to their academic outcomes (in accounting).
- In contrast students' **passion for long-term goals is not related to** their **outcomes,** surprisingly.
  - First, the **scale** "passion for long-term goals" **did not work** as assumed: two items were excluded narrowing construct validity.
  - Second, moreover, the scale consists of items referring to students' experiences with project work. On the one hand **"project work" is an unfamiliar term** to students. On the other hand, project work is **not relevant to** (teaching and) learning in **accounting** – in contrast, being a diligent person is!
- In contrast to findings in mathematics (Duckworth et al., 2017) we could show that the **explanatory/predictive validity of grit** is not only limited to students' grades. Grit predicts objectively assessed **competencies** in accounting too.

CONCLUSION

- However, we **did not control for students characteristics** such as their cognitive abilities, their intrinsic motivation, or self-concept which seem strongly related to grit.
- Our findings also raise the question how teachers (as well as school authorities and school leaders) and parents can support students' perseverance. It is therefore necessary to investigate the **effects of learning contexts** (e.g., Datu, 2017) as well as teachers' and parents' behaviour on students' grit.

VIELEN DANK!



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