



The UiL-scales and their validation

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Why UiL?

- A tool that can make a difference at:
 - The individual level
 - Eg. What is a child's current level of self-regulation?
 - How has s/he developed self-efficacy over the last half year?
 - Bandura's social learning theory
 - The societal level
 - Want children who have empathy, can collaborate, are resilient, think critically
 - What is the relation between these constructs and academic performance?
- A basis for unique international research
 - How do these constructs predict long term health, educational, employment outcomes
 - How does development in these constructs predict "''''''''".

Development of UiL

1. Identified the most relevant constructs to measure
 1. Statement of purpose Danish Act of Primary and Lower Secondary School
2. Research Review: Identified the most relevant existing scales and research for each construct
 1. Broadly used/validated scale
 2. Short
 3. Relevant for Danish school children population
3. Items were adapted or developed for the Danish culture
4. The items were then reviewed by the panel of experts and then
 1. Proofread by civil servants and pedagogical consultants from the municipalities for content, item relevance, language, and spelling
 2. Evaluated in a small pilot with twenty-five 5th grade students in one of the target schools
 3. Revised following student feedback on word and sentence difficulty and length of survey by the research group
 4. Added to a questionnaire with a 5-point Likert scale that ranged from “completely agree” to “completely disagree”.

Study 1

- 1560 students (50.4% boys) between 4th and 9th grades from eight different elementary schools
- Assessed reliability and validity with Rasch model analyses (PCM; Masters 1982).

Scale	Source/reference/inspiration	# items	Changes
1. Intrinsic motivation	Pintrich et al. (1991)	6	No change
2. Self-efficacy	Pintrich et al. (1991)	6	No change
3. Self-regulation	Tangney et al. (2004)	8	1 deleted, 1 new
4. Perseverance	Duckworth & Quinn (2009)	6	No change
5. Conscientiousness	John & Srivastava (1999)	7	2 deleted, 1 new
6. Cooperation	Orchard et al. (2012)	6	1 deleted
7. Resilience	Martin & Marsh (2008)	4	No change
8. Attention	Derryberry & Reed (2002)	9	3 deleted
9. Extrinsic motivation	Pintrich et al. (1991)	5	1 deleted, 2 new
10. Proactive behavior/drive	Porath & Bateman (2006)	5	No change
11. Critical thinking	Pintrich et al. (1991)	6	1 deleted
12. Creativity/openness	John & Srivastava (1999)	6	2 deleted, 1 new
13. Engagement	Fredricks et al. (2005)	7	Divided into 3 sub-scales
14. Well-being	Liddle & Carter (2015)	8	1 deleted
15. Self-esteem	Rosenberg (1965)	7	5 deleted, 4 new
16. Outcome expectations	Lent et al. (1994)	12	1 deleted, 1 new
17. Empathy	Jolliffe & Farrington (2006)	10	6 deleted, 3 new

Study 2

- The sample consisted of 1373 students (48.6% boys) from 4th (N = 206), 5th (N = 200), 6th (N = 249), 7th (N = 192), 8th (N = 302), and 9th (N = 224) grades.
- Assessed construct validity with Confirmatory Factor Analysis The results showed a good fit to the model (RMSEA = 0.04; CFI = 0.90; TLI = 0.90).
- Assessed reliability and validity with PCM

Results

Scale	Reliability		Fit			
	Alpha	PSI	Unidim.	LD	Item fit	DIF
Intrinsic motivation	.81	.76	5.03%	OK	OK	3
Self-efficacy	.89	.86	5.24%	OK	5 (-)	4,6
Self-regulation	.69	.70	8.38%	1 LD	OK	OK
Perseverance	.79	.73	3.06%	OK	OK	4,6
Conscientiousness	.78	.75	4.01%	OK	OK	OK
Engagement-Behavioral	.81	.76	5.46%	OK	OK	4
Engagement-Cognitive	.82	.80	4.88%	OK	OK	1,5
Engagement-Emotional	.87	.82	5.46%	OK	OK	OK
Cooperation	.83	.75	3.50%	OK	OK	OK
Resilience	.77	.72	4.95%	OK	OK	1,4
Attention	.81	.79	5.17%	OK	OK	4
Extrinsic motivation	.77	.75	4.66%	OK	5 (+)	1,5
Drive	.79	.78	5.17%	OK	OK	1
Critical thinking	.73	.70	2.77%	OK	OK	OK
Creativity	.84	.81	4.15%	OK	OK	OK
Well-being	.88	.73	1.24%	OK	OK	5,6
Self-esteem	.91	.83	4.44%	OK	OK	1,6
Empathy	.82	.75	3.93%	OK	2 (+), 6 (-)	7
Outcome expectations	.90	.79	4.95%	4 LD	7(-), 12(+)	2,6,8

Conclusions

- We have a psychometrically strong battery that can be used to measure 19 non-cognitive constructs
- The scales can be used to accurately measure 19 constructs in line with international research
- We will continue to develop the scales and ensure validity and measurement invariance
 - This may require new items that tap into the construct for a particular age group
- We have written a paper about the development and validation of the UiL and will submit it to the European Journal of Psychological Assessment this week.
- Now we just need to use the UiL and get some practical experience and identify new needs

Thak you!!!!