

# PSYKISK OHÄLSA HOS UNGDOMAR

## Tidstrender och validering av självskattningskalor

Ida Blomqvist  
ST-läkare BUP Örnsköldsvik  
Med. dr, Barn- och Ungdomspsykiatri enheten,  
Institutionen för klinisk vetenskap



UMEÅ UNIVERSITET

Clinical Science, Child -  
and Adolescent Psychiatry  
Umeå University, SE-901 87 Umeå  
www.umu.se

Ida Blomqvist

Adolescent mental health - Time trends and validity of self-report measures

Umeå University



# Adolescent mental health

Time trends and validity of  
self-report measures



UMEÅ UNIVERSITET

# AIMS OF THE THESIS

Aim:

Address two research gaps:

- the lack of population-based repeated-measures studies of mental health in adolescents
- the need to enhance the measures used in Swedish CAP



UMEÅ UNIVERSITET

# STUDIES I-IV

- I. **Blomqvist, I.**, Henje Blom, E., Hägglöf, B., & Hammarström, A. (2019). Increase of internalized mental health symptoms among adolescents during the last three decades. *European Journal of Public Health*. doi:10.1093/eurpub/ckzo28
- II. **Blomqvist, I.**, Ekbäck, E., Dennhag, I., & Henje, E. (2021). Validation of the Swedish version of the Reynolds Adolescent Depression Scale second edition (RADSD-2) in a normative sample. *Nordic Journal of Psychiatry*, 75(4), 292-300. doi:10.1080/08039488.2020.1850858
- III. **Blomqvist, I.**, Chaplin JE, Nilsson E, Henje E, Dennhag I. Swedish translation and cross-cultural adaptation of eight pediatric item banks from the Patient-Reported Outcomes Measurement Information System (PROMIS). *Journal of patient-reported outcomes*. 2021;5(1):80-.
- IV. **Blomqvist, I.**, Chaplin, J.E., Henje, E., Dennhag, I. Item response theory validation of the Swedish pediatric PROMIS item banks of anxiety and depressive symptoms in clinical and community samples. Manuscript.



# STUDY I

**Blomqvist, I.**, Henje Blom, E., Hägglöf, B., & Hammarström, A. (2019). Increase of internalized mental health symptoms among adolescents during the last three decades. *European Journal of Public Health*. doi:10.1093/eurpub/ckzo28



## ADOLESCENT MENTAL HEALTH TIME TRENDS

- Increase of mental health symptoms globally, especially internalizing symptoms in girls, the development among boys less clear (*Bor, Dean, Najman & Hayatbakhsh 2014; Collishaw 2015*).
- A minor increasing trend of internalized mental symptoms among young people (age 10-19 years) from 1980 to 2000. (*Potrebny, Wiium & Lundegard, 2017*).
- Increase in depressive, anxiety and psychosomatic symptoms among 15 year old's, predominantly girls since the mid 80 's to today (*Health Behaviour in School-aged Children (HBSC), results from Sweden of the WHO study, 2017*)
- There seems be an increase in depression and anxiety symptoms in children and adolescents during the last decades. (*Petersen et al., 2010; The Royal Swedish Academy of Sciences, 2010*).



# STUDY 1 - AIM

to measure possible changes of self-reported mental health symptoms (internalized symptoms and conduct problems) in two samples of grade 9 students (about 15 years old), from 1981 and 2014, in the same geographical area of Northern Sweden



# STUDY POPULATION



## SAMPLE



## LULEÅ MUNICIPALITY

All students in ninth grade.

### 1. 1981

n=1083  
506 girls  
577 boys

**99,7%**  
Response  
rate

### 2. 2014

n=682  
338 girls  
344 boys

**98,3%**  
Response  
rate



UMEÅ UNIVERSITET



# STUDY I – MATERIALS AND METHOD

- Assessment of symptoms:
  - A detailed youth adapted mental health questionnaire was developed.
  - Four sub-scales:
    1. Depressive symptoms,
    2. Anxiety symptoms
    3. Functional somatic symptoms
    4. Conduct problems



# STUDY 1: RESULTS

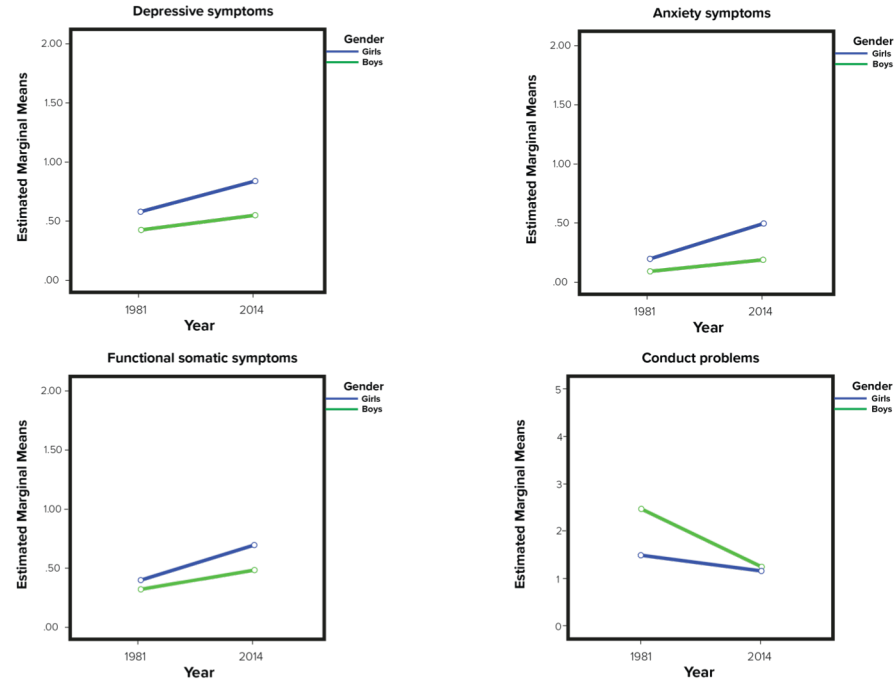
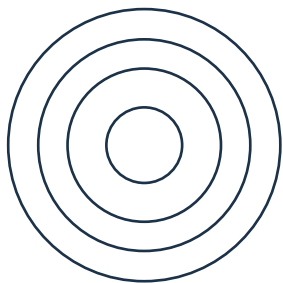


Figure 1 Estimated marginal means (adjusted for parents' occupational classification, parent's country of origin, parents' unemployment and the adolescents living arrangements) for year (1981 and 2014) in girls and boys for depressive and anxiety symptoms, FSSs and conduct problems. The interaction effect between gender and year was significant in all cases at  $p < 0.001$ .





# URIE BRONFENBRENNER

- Micro-
- Meso-
- Exo-
- Macro-
- Chronosystem



UMEÅ UNIVERSITET

## **STUDY 1: CONCLUSIONS**

Supports the research concerning increase of internalized mental health symptoms especially among girls

Argues for a contextual approach to understanding trends in mental health



# STUDY II

**Blomqvist, I., Ekbäck, E., Dennhag, I., & Henje, E. (2021).** Validation of the Swedish version of the Reynolds Adolescent Depression Scale second edition (RADs-2) in a normative sample. *Nordic Journal of Psychiatry*, 75(4), 292-300.  
doi:10.1080/08039488.2020.1850858



## MEASURES OF MENTAL SYMPTOMS IN ADOLESCENTS

- Mental health symptoms such as anxiety or depressive symptoms can be measured by clinical assessment, self-report and/or parent/teacher report.
- In general, for internalizing symptoms in adolescent self-report measurements are considered more valid than parent or teacher report (*Jensen et al. 1999; Smith, 2007*).
- Many different instruments are in use in Child and Adolescent Psychiatry (CAP)
- About half of the instruments have not been investigated regarding psychometric properties in their Swedish versions
- Some instruments are direct translations of adult depression self-rating scales



# CLASSICAL TEST THEORY (CTT)

True score theory:  $\text{Observed score} = \text{True score} + \text{Error}$

Standard error of measurement for whole scale

Dependent on sample

Reliability

Validity



# STUDY II - AIM

- to test the psychometric properties of the Swedish version of Reynolds Adolescent Depression Scale second edition (RADs-2) in a school sample





# STUDY II – MATERIALS AND METHOD

- Study population:
  - $n = 637$  students ( $n=389$  girls and  $n=248$  boys), mean age 15.73 (SD = 1.76); 12-20 years.
  - Test-retest sample,  $n = 338$  ( $n=230$  girls and  $n=108$  boys), mean age was 15.4 years (SD = 1.68).



# STUDY II – MATERIALS AND METHOD

Reynolds Adolescent Depression Scale second edition, RADS-2

- 30 brief self-statements
- 4-point scale
- ‘Almost never’ to ‘Most of the time’.
- Four subscales/dimensions:
  1. Dysphoric mood
  2. Anhedonia/negative affect
  3. Negative self-evaluation
  4. Somatic complaints



# STUDY II – MATERIALS AND METHOD

Instruments used for validation

The Beck Youth Inventories of Emotional and Social Impairment subscales of Depression (BYI-D) and Anger (BYI-A),

The World Health Organization Wellness Index (WHO-5) consists of 5 salutogenic self-statements.

The Patient Reported Outcome Measurement Information System (PROMIS) Anxiety and Peer relationships (PROMIS Friend)



## STUDY II: RESULTS

Main findings:

- Good reliability - Cronbach's alpha ranged from acceptable to excellent for the subscales and total scale
- Concurrent validity with Beck depression scale.
- Test-retest: good reliability for RADS-2 total scale.
- The confirmatory factor analysis supported the 4-factor structure
- Measurement invariance: For sex (girls, boys) and age groups (12–15 years, 16–20 years)



## **STUDY II: CONCLUSIONS**

The Swedish version of RADS-2 showed acceptable reliability and validity in a Swedish normative sample.



UMEÅ UNIVERSITET

# STUDY IV

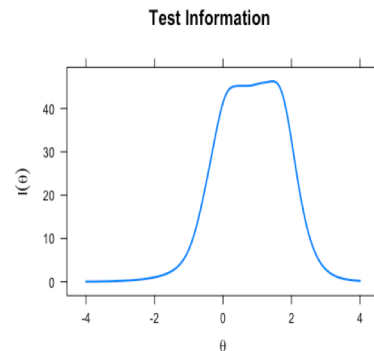
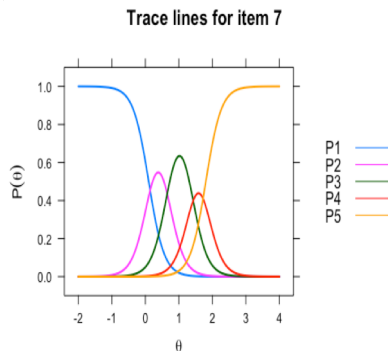
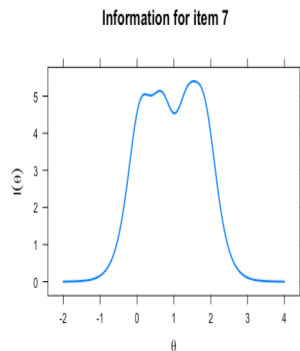
Blomqvist, I., Chaplin, J.E., Henje, E., Dennhag, I. Item response theory validation of the Swedish pediatric PROMIS item banks of anxiety and depressive symptoms in clinical and community samples. Manuscript.



# ITEM RESPONSE THEORY

Underlying latent trait

An item has a certain level of difficulty and an answer gives information about a person's underlying ability or trait



# STUDY IV - AIM

- to validate the Swedish PROMIS pediatric item banks of anxiety and depressive symptoms in a school and patient sample.





# STUDY IV – MATERIALS AND METHOD

## Participants

➤ 637 students, mean age 15.73 (SD = 1.76) 61.1 % female, 38.9 % male

➤ 291 patients, mean age 15.64 (SD = 1.61), 71.4 % female, 28.6 % male



# STUDY IV – MATERIALS AND METHOD

PROMIS Pediatric Item Bank v2.0 Anxiety, 15 items

PROMIS Pediatric Item Bank v2.0 - Depressive Symptoms, 14 items

- Five-point response option
- 'Never' to 'almost always'
- 7-day recall period

The symptom severity of the respondents is given in theta ( $\theta$ )  
 $(\theta * 10) + 50 = \text{T-score}$



# STUDY IV – MATERIALS AND METHOD

Assumptions:

- Unidimensionality
- Local independence
- Monotonicity

Graded response model (GRM)

Differential item functioning

CAT simulation



## **STUDY IV: RESULTS – IRT ASSUMPTIONS**

Assumptions:

Could be established after removal of 2 anxiety and 3 depressive symptoms items due to local dependence.



## STUDY IV: RESULTS IRT MODEL

- Acceptable discriminative values
  - Anxiety item bank: 1.44 (item 6) - 3.56 (item 2)
  - Depressive symptoms item bank: 1.74 (item 11) to 3.99 (item 7)
- All items had non-significant  $X^2$  values indicating that the items fit the model
- No DIF was found for sex (girls, boys), age groups (12-15, 16-20 years), or type of sample (school, patient)



# STUDY IV: RESULTS - CAT

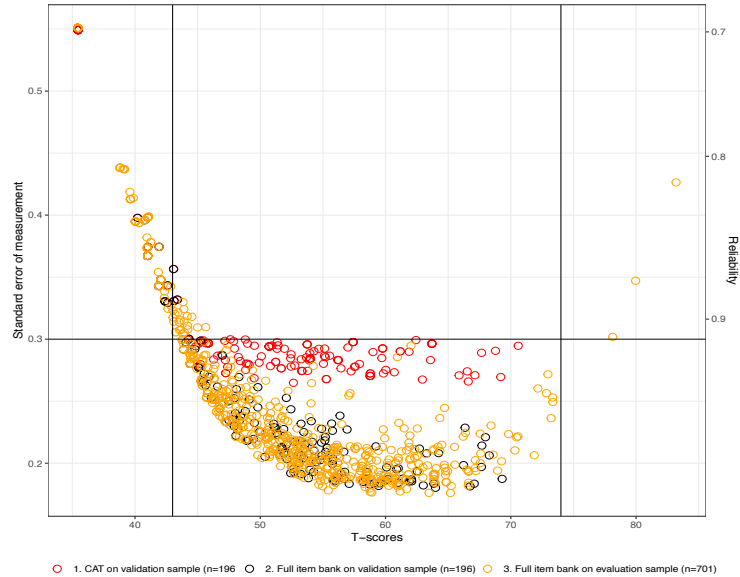


Figure 2

Reliability of the Swedish pediatric PROMIS anxiety item bank comparing CAT with full item banks on the validation and evaluation samples.



UMEÅ UNIVERSITET

# STUDY IV: RESULTS - CAT

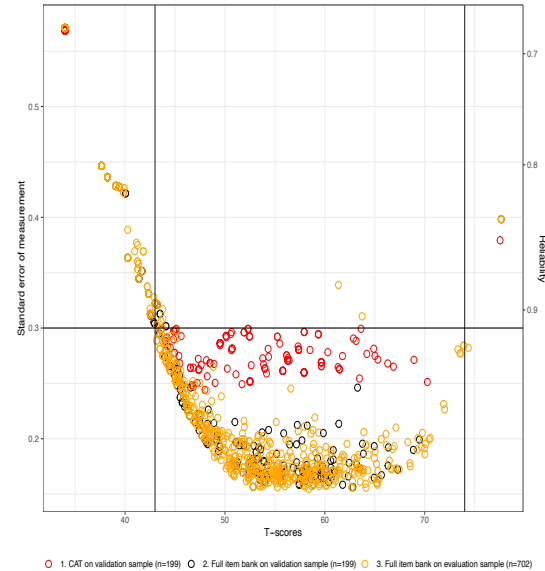


Figure 3  
Reliability of the Swedish pediatric PROMIS depressive symptoms item bank comparing CAT with full item banks on the validation and evaluation samples.



## STUDY IV: CONCLUSIONS

Swedish PROMIS pediatric item banks of anxiety and depressive symptoms

- After removal of 2 anxiety and 3 depressive symptoms items
- Acceptable unidimensionality, local independence, monotonicity was achieved
- GRM showed adequate item fit for all items
- No DIF was found for sex, age groups, or type of sample
- Both item banks had excellent reliability from normal to severe levels of anxiety and depressive symptoms
- Computer adaptive testing (CAT) simulations indicate that the item banks are appropriate for CAT





# AVSLUTNINGSVIS

- Klassisk test teori – generalisera ej utöver stickprovet som är mätt på
- Validering är en pågående process – behöver upprepas
- Tolka kvalitativt
- Jonna Bornemark – hög tilltro till mätningar i vår samtid

