Noret, Nathalie ORCID logoORCID:
https://orcid.org/0000-0003-4393-1887, Hunter, Simon and
Rasmussen, Susan (2019) The measurement invariance of the
Personal Experiences Checklist (PECK) over time and across
gender. In: World Anti-Bullying Forum 2019, 4th-7th June 2019,
University College Dublin, Ireland.

# RaY

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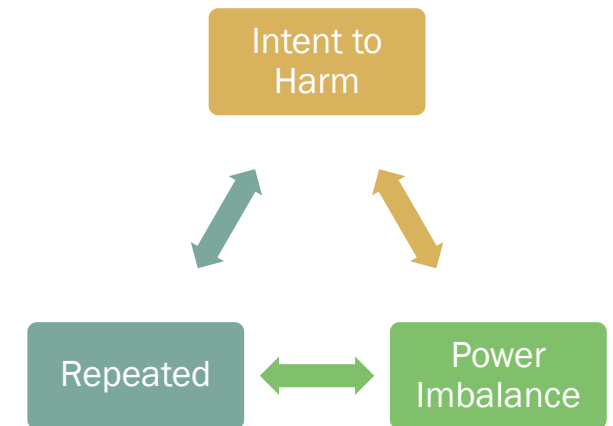# The measurement invariance of the Personal Experiences Checklist (PECK) over time and across gender.

Nathalie Noret[1,2], Dr Simon Hunter[2], & Dr Susan Rassmussen[2]

[1]York St John University, [2]University of Strathclyde

# Background

- Bullying is a form of aggressive behaviour (verbal, physical, social/ indirect, cyber).
  - Where there is an intent to cause harm, purposeful activity.
  - The behaviour is experienced repeatedly over time.
  - There is a power imbalance between the person perpetrating the bullying, and the target.

- Large scale surveys suggest prevalence of victimisation ranges between 9 and 32%.

- The relationship between being bullied and poor mental health is well established in the literature:
  - Higher levels of depression, and anxiety.
  - Poorer self-esteem.
  - Higher levels of school withdrawal/ absenteeism.

Intent to Harm

Repeated

Power Imbalance

(Hawker & Boulton 2000, Hopkins et al 2013, Kochenderfer & Ladd 1996, Olweus, 1978; Sharp & Smith, 1994; Rejintes, Kamphuis, Prinzie, & Telch, 2010; Stassen Berger, 2007).

# Measuring Bullying

- Wealth of bullying/ peer-victimisation measures are available.
  - Diversity in the measures used.
  - Can make drawing comparisons across studies difficult.

- Many of these scales provide reliable data.
  - The validity of the tools?
  - Are measures invariant (equivalent) across conditions?

- The importance of validity and invariance (measurement equivalence):
  - Required to ensure our research findings are valid.
  - Evaluate interventions appropriately.
  - Be confident that our measure has the same meaning across conditions (e.g. across age groups, across time)

(Bowen & Masa, 2017; Volk, Veenstra & Espelage 2017)

# Background:

## The Personal Experiences Checklist (PECK)

- Developed between 2004 and 2012.
  - Scale development involved two samples of Australian children (Sample 1, N=647, and sample 2, N=218).
  - Validity of the measure in relation to other bullying measures was established with sample 2.

- A 32 item scale was developed consisting of 32 items which map onto four factors:
  - Relational-verbal bullying (11 items) ($\alpha$ =0.91).
  - Cyberbullying (8 items) ($\alpha$ =0.90).
  - Physical bullying (9 items) ($\alpha$ =0.91).
  - Bullying on the basis of culture (4 items) ($\alpha$ =0.78).

- The four factor structure was confirmed through confirmatory factor analysis

- Adequate test-retest reliability was reported (r=0.61 to 0.86).

(Hunt, Peters, & Rapee, 2012)

# Background:

## The short version of the Personal Experiences Checklist (PECK)

Thinking about the last month or so at school, how often do the following things happen to you?

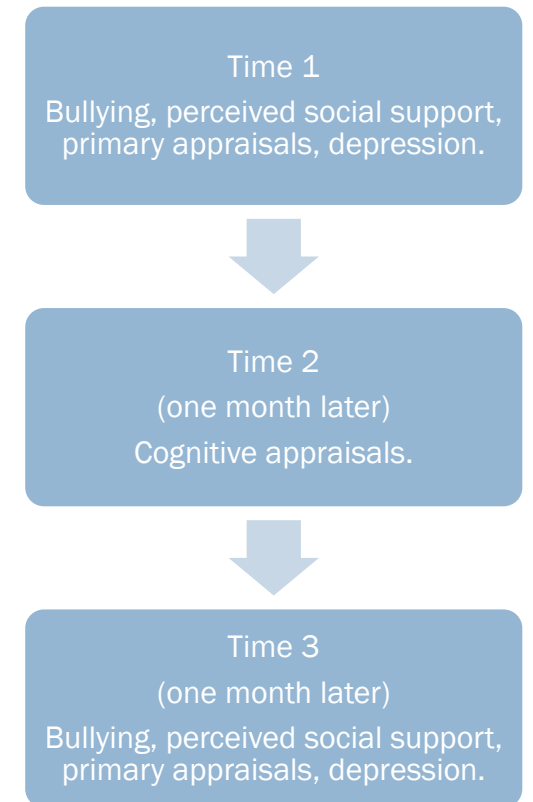| | | Never | Rarely | Sometimes | Most Days | Everyday |
|---|---|---|---|---|---|---|
| 1 | The other kids ignore me on purpose. | | | | | |
| 2 | The other kids make fun of my language. | | | | | |
| 3 | The other kids tease me about things that aren't true. | | | | | |
| 4 | The other kids threaten me over the phone. | | | | | |
| 5 | Other kids tell people not to hang around with me. | | | | | |
| 6 | Other kids won't talk to me because of where I'm from. | | | | | |
| 7 | Other kids say nasty things to me by texting. | | | | | |
| 8 | Other kids tell people to hit me. | | | | | |
| 9 | Other kids send me nasty e-mails. | | | | | |
| 10 | Other kids say mean things behind my back. | | | | | |
| 11 | Other kids shove me. | | | | | |
| 12 | Other kids say nasty things about me online. | | | | | |
| 13 | Other kids tell people to make fun of me. | | | | | |
| 14 | Other kids hit me. | | | | | |

# The current study

- The aim of the current study is to focus on the short version of the scale. To test for:
    - Invariance over time.
    - Invariance across boys and girls.

- Aim to test:
    1. Simple Confirmatory Factor Analysis (CFA).
        - Is a one factor solution a good fit?
    2. A configural model.
        - Is the pattern of factor loadings the same across time?
        - Is the pattern of factor loadings the same for boys and girls?
    3. A weak invariance model.
        - Are the factor loadings statistically equivalent over time?
        - Are the factor loadings statistically equivalent for boys and girls?
    4. A strong invariance model.
        - Are the intercepts/ thresholds the same across time?
        - Are the intercepts/ thresholds the same for boys and girls?
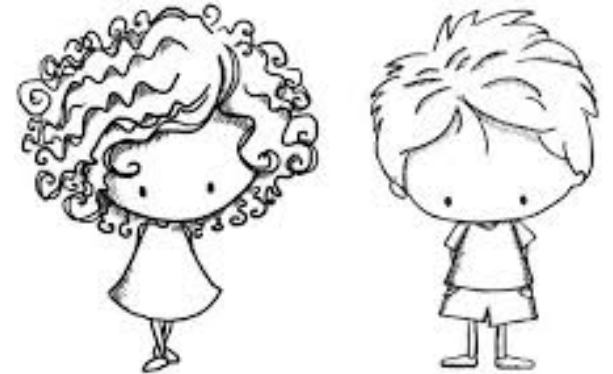
# Method

- Part of a three wave longitudinal study.
  - The PECK was used at time 1 and time 3.

- Analysis was based on the participants who completed the survey at time 1 (N=744) and time 3 (N=333, 44.76%), from four schools.
  - 342 (46%) were male.
  - 366 (49.2%) were female.
  - 28 (3.8%) reported that they preferred not to say.
  - 8 (1.1%) did not answer the question.

- School Year
  - 258 (34.7%) were from Year 7 (S1) (aged 11 and 12).
  - 288 (38.7%) were from Year 8 (S2) (aged 12 and 13).
  - 189 (25.4%) were from Year 9 (S3) (aged 13 and 14).

- Participant ages
  - Mean age at time 1 = 12.72 (sd=0.84).
  - Mean age at time 3 = 12.82 (sd=0.89).

Time 1
Bullying, perceived social support, primary appraisals, depression.

Time 2
(one month later)
Cognitive appraisals.

Time 3
(one month later)
Bullying, perceived social support, primary appraisals, depression.

# Data Analysis

## Steps for testing invariance

1. An initial confirmatory factor analysis for the PECK at time 1, to confirm a one factor solution.
2. Test a configural model.
3. Test of weak invariance.
4. Test of strong invariance.

## Analysis conducted in MPLUS

- Indicators were treated as categorical (ordinal) data).
- Items were skewed and kurtosed.
- Paths were estimated with the WLMSV estimator.
- To test for strong invariance we tested for equivalence in thresholds.

## Identifying invariance

- Chi-square change should be non-significant.
  - However sensitive to sample size.

Also examined changed in fit indices
- Change in CFI should be <0.010
  - $\geq$-0.010 evidence of non-invariance
- RMSEA
  - Point estimate of preceding model should be included in the 90% CIs of the new model.
- Change in RMSEA should be >0.015
  - change in RMSEA that is $\leq$0.015 is evidence of non-invariance.

(Bowen & Masa 2015 Chen 2007, Cheung and Rensvold 2002, Putnick & Bornstein 2016, Xing and Hall, 2015.)

# Results

| | Total Sample | Males | Females |
|---|---|---|---|
| **PECK time 1** | | | |
| Alpha | 0.90 | 0.90 | 0.83 |
| Scores | 14 - 70 | 14-70 | 14-49 |
| Mean (sd) | 19.44 (6.98) | 18.22 (6.25) | 19.96 (5.76) |
| **PECK time 3** | | | |
| Alpha | 0.93 | 0.95 | 0.88 |
| Scores | 14-70 | 14-70 | 14-43 |
| Mean (sd) | 19.20 (7.79) | 18.94 (8.27) | 19.01 (6.15) |

# Results

- Most frequently experienced behaviour at time 1 and time 3 was *other kids say mean things behind my back.*
- Least frequently experienced behaviours at time 1 was *other kids won't talk to me because of where I'm from* and at time 3 *other kids send me nasty emails.*
- The proportion of participants at time 1 who reported experiencing the 14 behaviours *most days* or *every day* ranged between 8.2% (N=61) and 0.9% (N=7).
- The proportion of participants at time 1 who reported experiencing the 14 behaviours *most days* or *every day* ranged between 0.3% (N=1) and 10.7% (N=35).
- Three items at time 3 had low frequencies for *most days* and *everyday.*

|  | Never | Rarely | Sometimes | Most days | Everyday |
|---|---|---|---|---|---|
| T3 PECK 6: Other kids won't talk to me because of where I'm from. | 314 (95.2%) | 10 (3%) | 5 (1.5%) | 0 | 1 (0.3%) |
| T3 PECK 8: Other kids tell people to hit me. | 292 (88.8%) | 30 (9%) | 9 (2.7%) | 0 | 1 (0.3%) |
| T3 PECK 9: Other kids send me nasty e-mails. | 318 (95.8%) | 8 (2.4%) | 5 (1.5%) | 0 | 1 (0.3%) |

# Results: invariance over time

| | $\chi^2$ | Diff test $\chi^2$ | RMSEA | $\triangle$RMSEA | CFI | $\triangle$CFI |
|---|---|---|---|---|---|---|
| CFA Time 1 | 460.65, df=78, p<0.001 | | 0.082 (0.075: 0.089) | | 0.955 | |
| Configural Model | 826.98, df=337, p<0.001 | | 0.044 (0.041:0.048) | | 0.966 | |
| Weak (Metric) invariance | 814.68, df=350, p<0.001 | 57.01, df=13, p<0.001 | 0.043 (0.039:0.046) | -0.001 | 0.968 | +0.002 |
| Strong (Scalar) invariance* | 1,118.00, df=402, p<0.001 | 567.21, df=52, p<0.001 | 0.049 (0.046:0.053) | +0.006 | 0.951 | -0.017 |

*Excluding threshold 4 for PECK 6, 8, and 9

# Results: invariance across gender

| | Most days | | Everyday | |
|---|---|---|---|---|
| | Male | Female | Male | Female |
| T1 PECK 4: The other kids threaten me over the phone. | 3 (%) | 1 (%) | 3 (%) | 0 |
| T1 PECK 5: Other kids tell people not to hang around with me. | 3 (%) | 8 (%) | 2 (%) | 0 |
| T1 PECK 6: Other kids won't talk to me because of where I'm from. | 0 | 2 (%) | 2 (%) | 0 |
| T1 PECK 7: Other kids say nasty things to me by texting. | 0 | 8 (%) | 4 (%) | 0 |
| T1 PECK 8: Other kids tell people to hit me. | 2 (%) | 0 | 3 (%) | 0 |
| T1 PECK 9: Other kids send me nasty e-mails. | 1 (%) | 1 (%) | 1 (%) | 0 |

# Discussion

**Key findings**
    Confirm a one factor structure for the short scale
    Confirm that the factor loadings have the same pattern of loadings (configural) and the factor loadings are statistically equivalent (weak).
✗  Cannot confirm strong invariance.
✗  Cannot confirm the equivalence of the measure for boys and girls.

- When using the short version of the PECK to test for gender differences in experiences of bullying, or changes in experiences of bullying over time, need to interpret findings with caution.

**Evaluation**
- Good sample size at time 1, but attrition at time 3 (~45%).
- Proportion of participants who reported frequent experiences of some of the behaviours.
    - A reflection of the items?
    - Highlights the need for a larger sample, but how large?
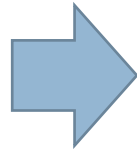
**Next steps**
- Gather more longitudinal data using the short version of the PECK to further test for invariance across time and gender.
- Examine some of the problematic items, consider changing for other items from the original PECK.

# Discussion

## Items in italics are in the current short scale

PECK 6:
Other kids won't talk to me because of where I'm from.

**Bullying based on culture**
*Other kids make fun of my language*
Other kids make fun of my culture
Other kids tease me about my voice
*Other kids won't talk to me because of where I'm from*

T3 PECK 8:
Other kids tell people to hit me.

**Physical bullying**
*Other kids hit me*
Other kids punch me
Other kids kick me
*Other kids shove me*
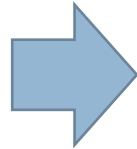Other kids trip me over
*Other kids tell people to hit me*
Other kids say they'll hurt me if I don't do things for them
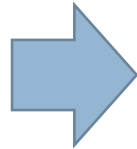Other kids wreck my things
Other kids play practical jokes on me

# Discussion

PECK 9:
Other kids send me nasty e-mails.

➡

**Cyberbullying**
*Other kids say nasty things to me by SMS*
*Other kids threaten me over the phone*
*Other kids send me nasty e-mails*
Other kids harass me over the phone
*Other kids say nasty things about me on websites*
Other kids send me computer viruses on purpose
Other kids say nasty things about me on an instant messenger or chat room
Other kids make prank calls to me

# Thank you for listening.

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# References

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# Results: CFA

| | Unstandardised | Standardised |
|---|---|---|
| T1 PECK 1: The other kids ignore me on purpose. | 1.00 | 0.74 |
| T1 PECK 2: The other kids make fun of my language. | 0.52 | 0.50 |
| T1 PECK 3: The other kids tease me about things that aren't true. | 0.90 | 0.71 |
| T1 PECK 4: The other kids threaten me over the phone. | 1.25 | 0.81 |
| T1 PECK 5: Other kids tell people not to hang around with me. | 1.24 | 0.81 |
| T1 PECK 6: Other kids won't talk to me because of where I'm from. | 1.36 | 0.83 |
| T1 PECK 7: Other kids say nasty things to me by texting. | 1.25 | 0.81 |
| T1 PECK 8: Other kids tell people to hit me. | 1.33 | 0.83 |
| T1 PECK 9: Other kids send me nasty e-mails. | 1.09 | 0.75 |
| T1 PECK 10: Other kids say mean things behind my back. | 1.38 | 0.84 |
| T1 PECK 11: Other kids shove me. | 0.94 | 0.72 |
| T1 PECK 12: Other kids say nasty things about me online. | 1.44 | 0.85 |
| T1 PECK 13: Other kids tell people to make fun of me. | 1.19 | 0.80 |
| T1 PECK 14: Other kids hit me. | 0.92 | 0.71 |

# Results: invariance over time

| | Time 1 | | Time 3 | |
|---|---|---|---|---|
| | Unstandardised | Standardised | Unstandardised | Standardised |
| T1 PECK 1:  The other kids ignore me on purpose. | 1.00 | 0.71 | 1.00 | 0.71 |
| T1 PECK 2:  The other kids make fun of my language. | 0.56 | 0.49 | 0.58 | 0.49 |
| T1 PECK 3: The other kids tease me about things that aren't true. | 1.02 | 0.72 | 1.71 | 0.72 |
| T1 PECK 4: The other kids threaten me over the phone. | 1.46 | 0.83 | 1.97 | 0.83 |
| T1 PECK 5: Other kids tell people not to hang around with me. | 1.41 | 0.82 | 1.61 | 0.82 |
| T1 PECK 6: Other kids won't talk to me because of where I'm from. | 1.50 | 0.83 | 1.71 | 0.83 |
| T1 PECK 7: Other kids say nasty things to me by texting. | 1.53 | 0.84 | 2.22 | 0.84 |
| T1 PECK 8: Other kids tell people to hit me. | 1.41 | 0.82 | 1.45 | 0.82 |
| T1 PECK 9: Other kids send me nasty e-mails. | 1.06 | 0.73 | 1.61 | 0.73 |
| T1 PECK 10: Other kids say mean things behind my back. | 1.43 | 0.82 | 2.28 | 0.82 |
| T1 PECK 11: Other kids shove me. | 1.05 | 0.72 | 1.63 | 0.72 |
| T1 PECK 12: Other kids say nasty things about me online. | 1.62 | 0.85 | 1.97 | 0.85 |
| T1 PECK 13: Other kids tell people to make fun of me. | 1.33 | 0.80 | 1.65 | 0.80 |
| T1 PECK 14:  Other kids hit me. | 1.04 | 0.72 | 1.09 | 0.72 |