

# Measurement properties of mental health measures in the British birth cohorts

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MRC Unit for Lifelong Health and Ageing at UCL : LHA  
&  
MRC National Survey of Health and Development : NSHD



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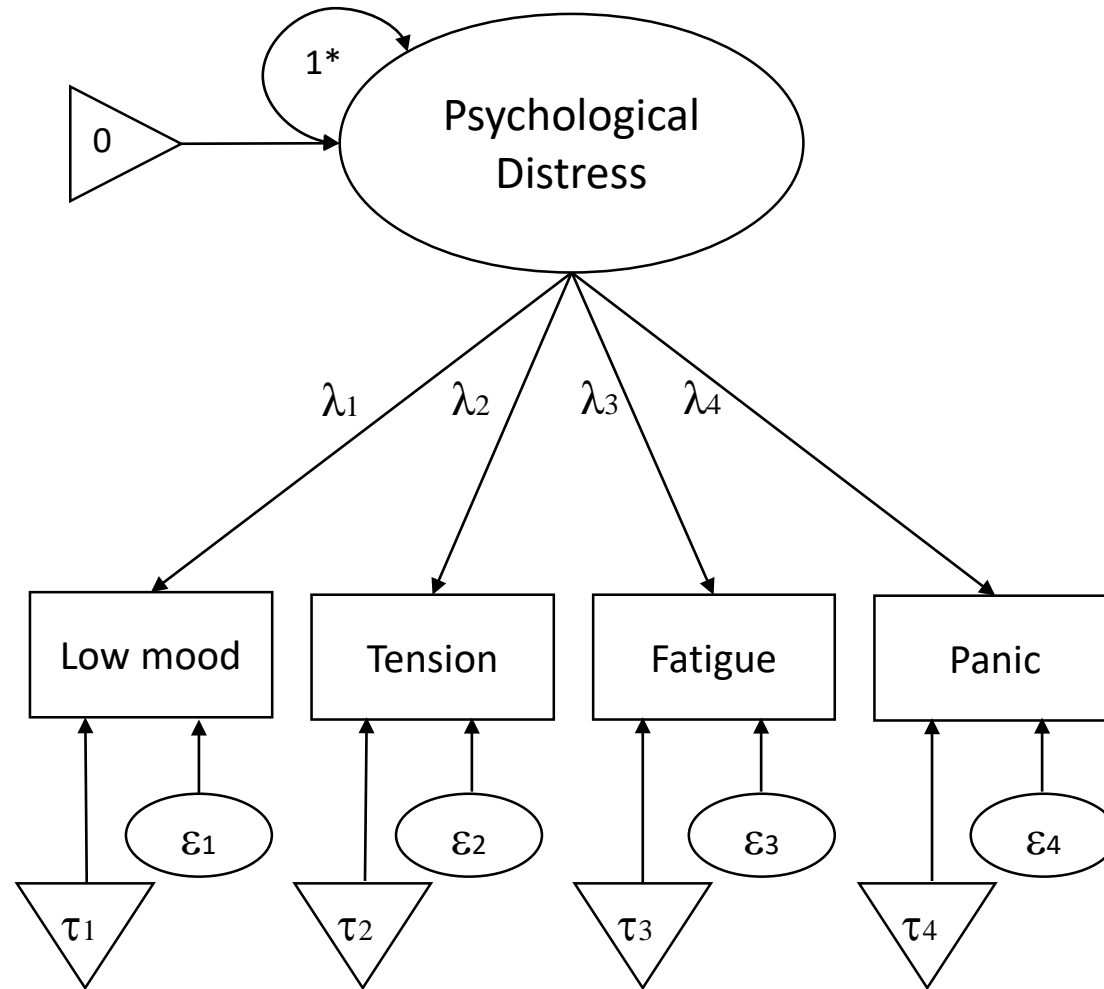
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# Aim

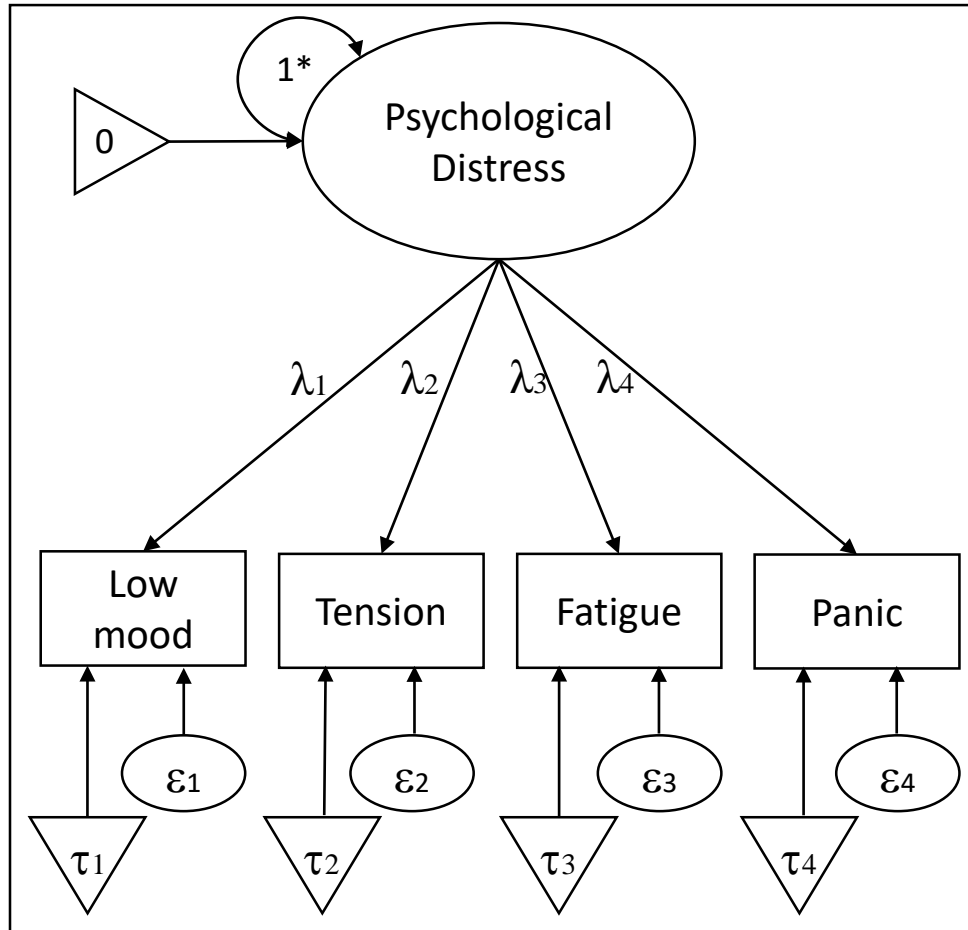
- Explore and document measurement properties of scales in original format
- Examine comparability of scales administered in different sweeps/cohorts
- Explore and document measurement properties of harmonised scales
- Examine comparability of harmonised scales

# Methods

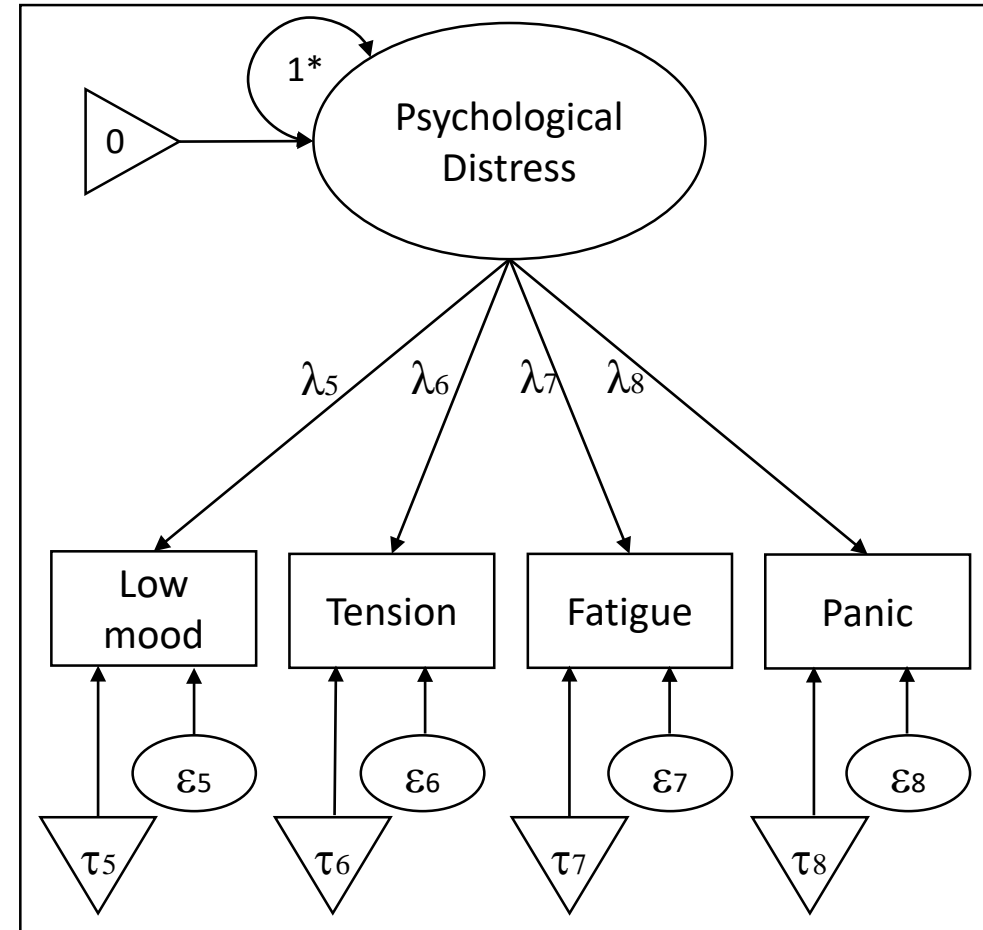


# Methods

Cohort 1

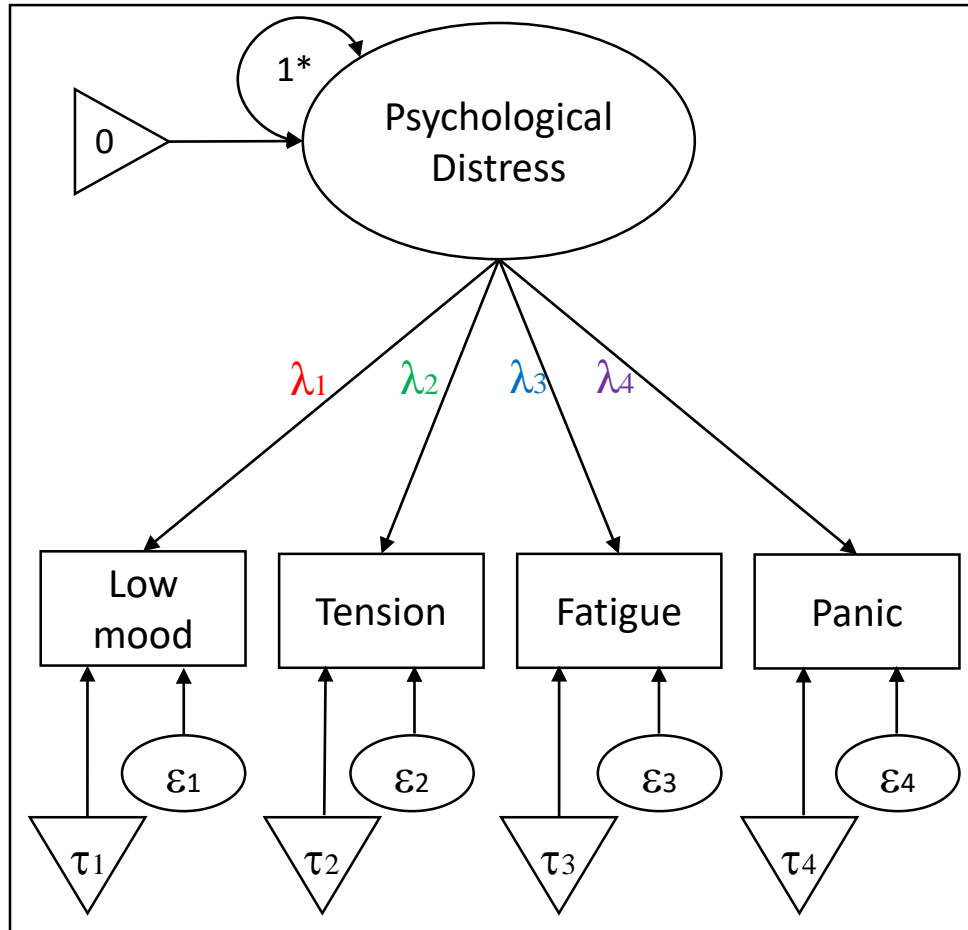


Cohort 2

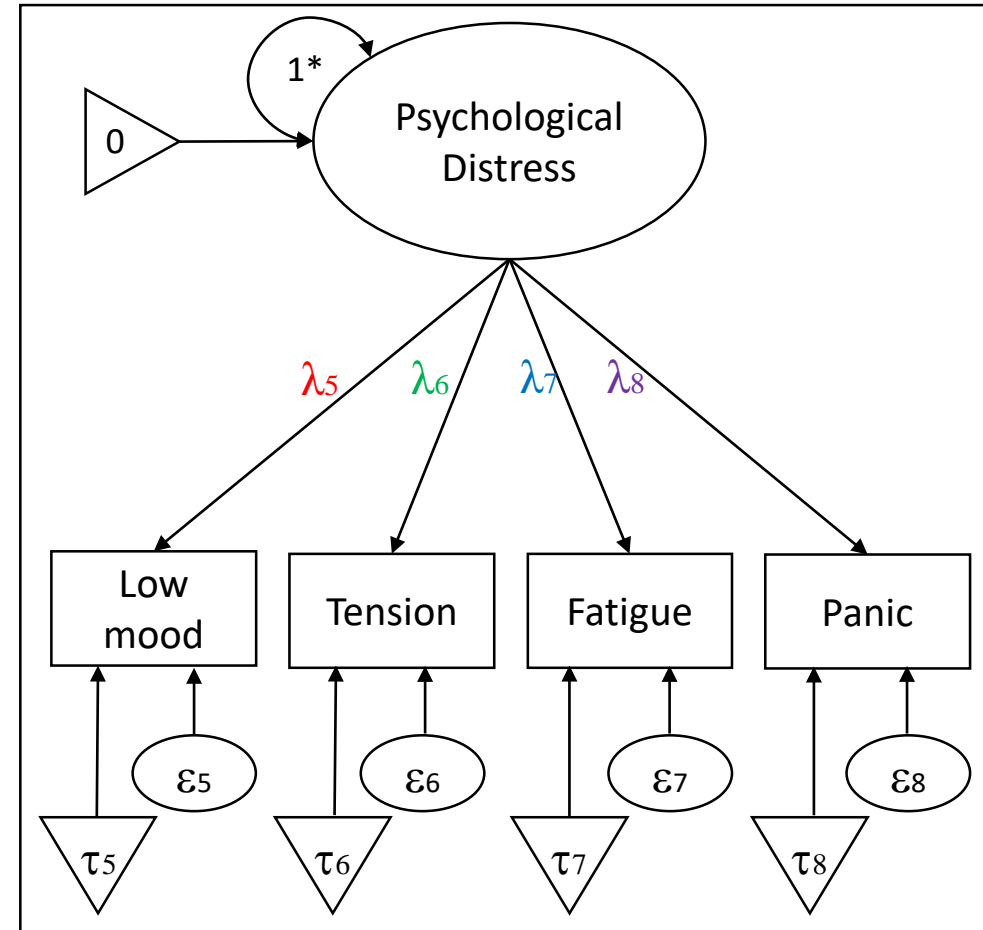


# Methods

Cohort 1



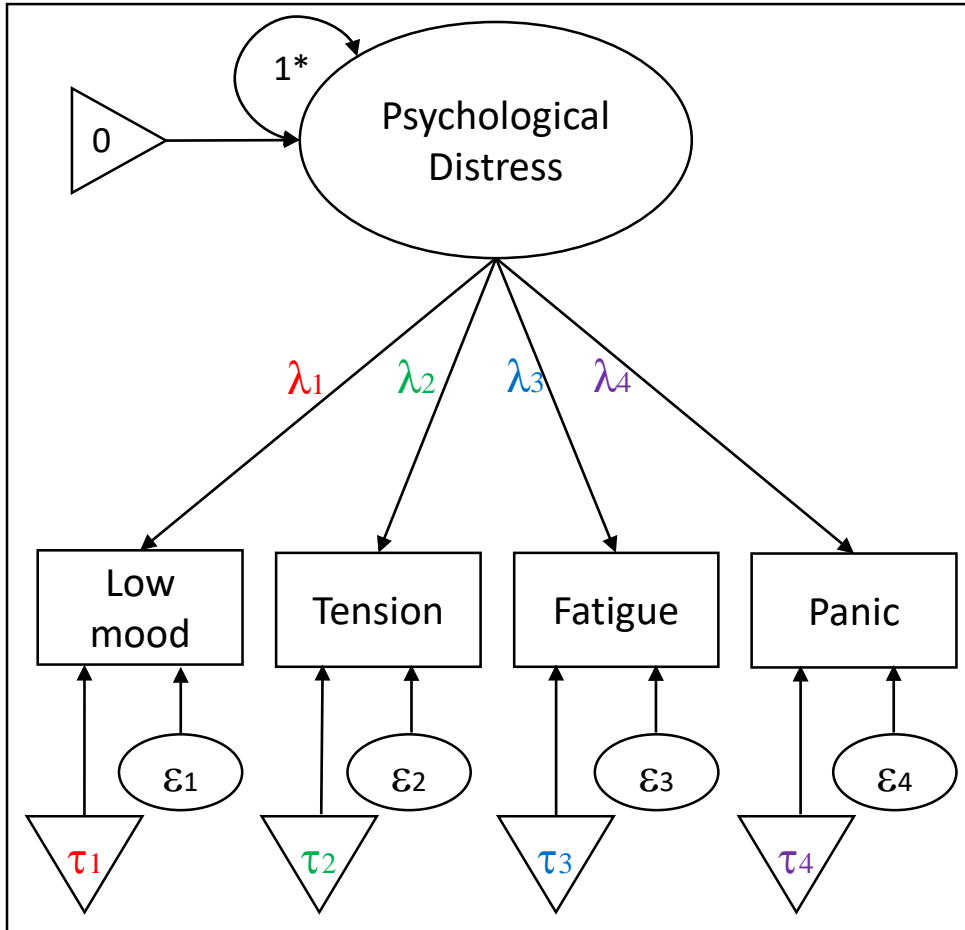
Cohort 2



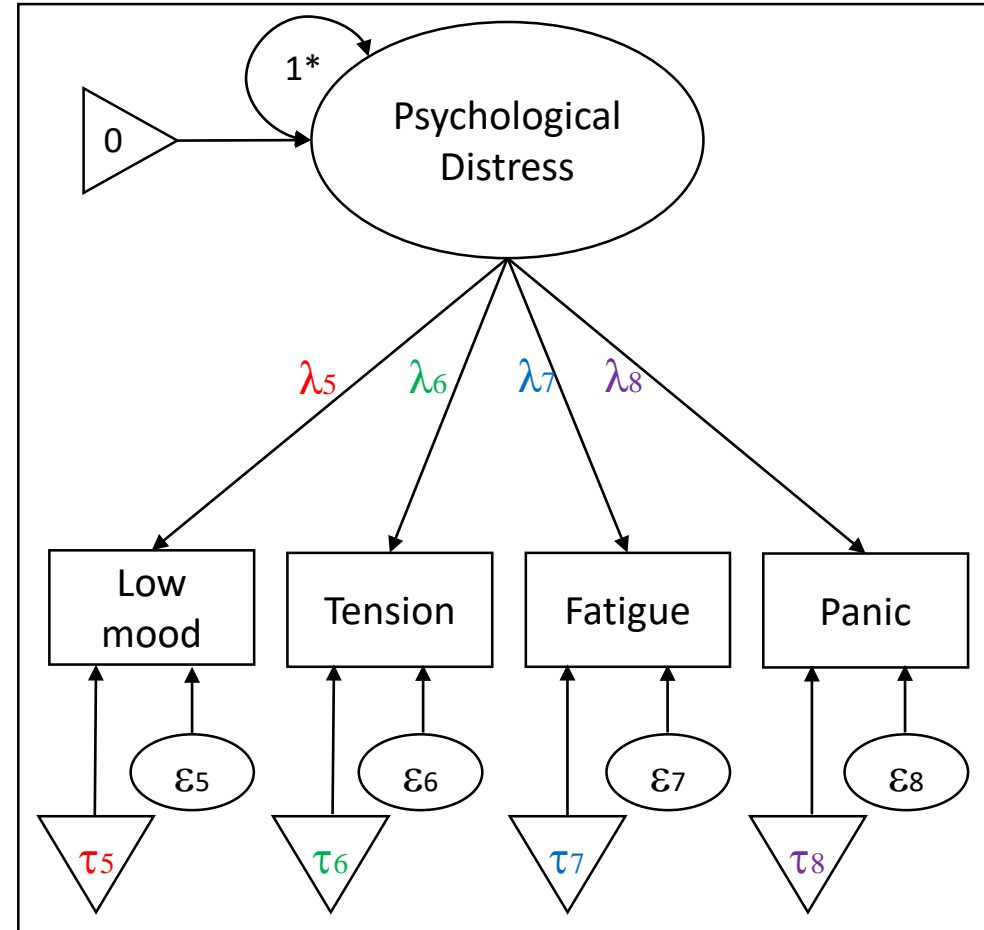
Metric invariance

# Methods

Cohort 1



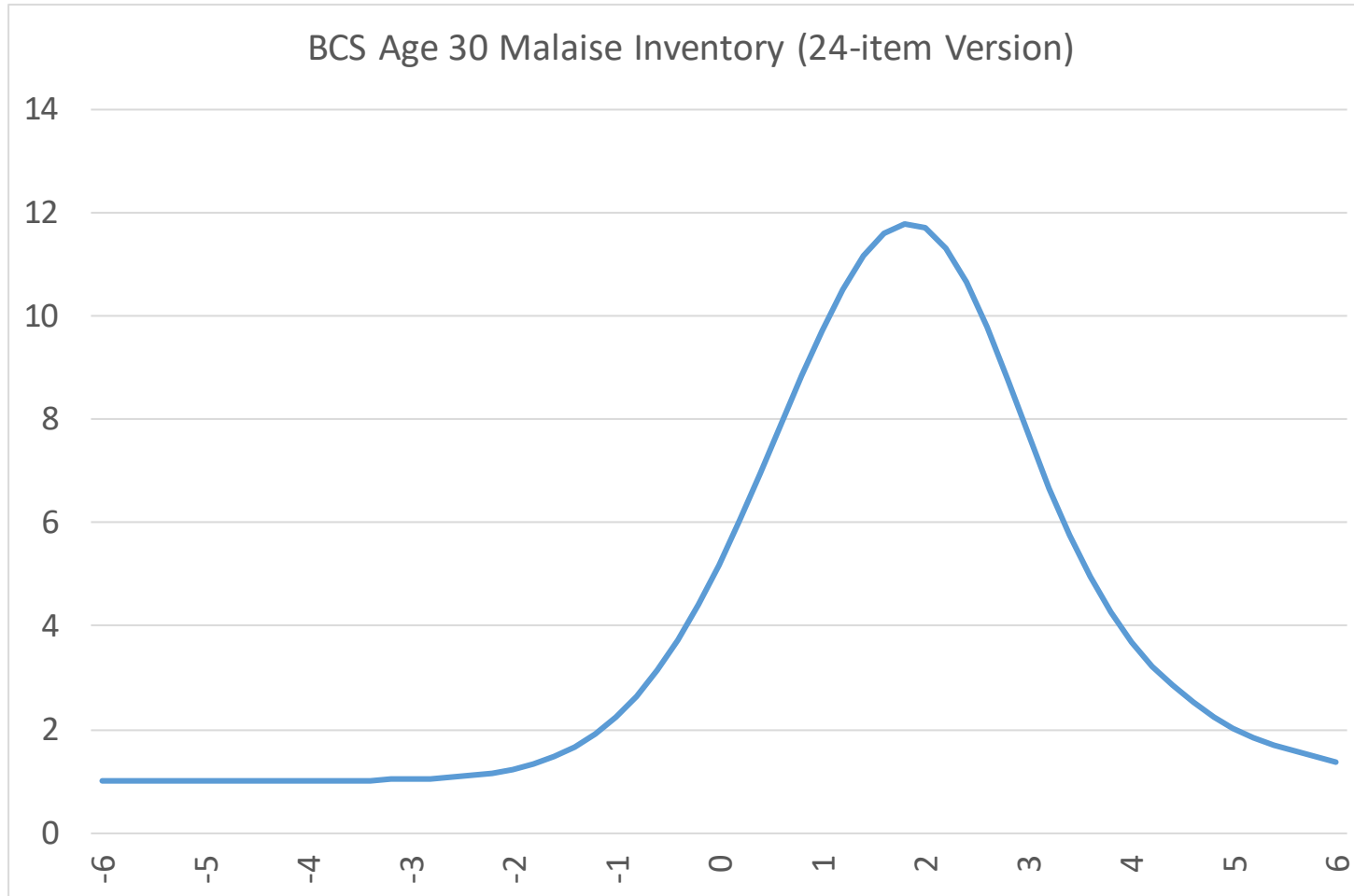
Cohort 2



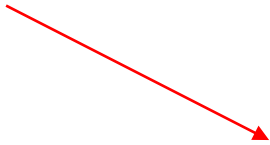
Metric invariance

Scalar invariance

# Methods



Fisher information



Level of the latent trait  
(SD)



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# Results – Fit

Table 5. Fit statistics for mental health measures in MCS

Age	Measure	Model	N	$\chi^2$	DF	RMSEA	CFI	TLI
3	SDQ	1-factor (distress)	14836	9635.322	170	0.061	0.797	0.774
		5-factor	14836	8142.602	265	0.045	0.860	0.841
5	SDQ	1-factor (distress)	14773	9261.052	170	0.060	0.820	0.798
		5-factor	14773	5696.481	265	0.037	0.914	0.902
7	SDQ	1-factor (distress)	13489	9911.518	170	0.065	0.834	0.815
		5-factor	13489	5162.176	265	0.037	0.929	0.920
11	SDQ	1-factor (distress)	12821	9704.616	170	0.066	0.817	0.795
		5-factor	12821	4454.660	265	0.035	0.925	0.915
14	SDQ	1-factor (distress)	11267	22095.521	275	0.084	0.755	0.733
		5-factor	11267	7971.206	265	0.051	0.913	0.902



# Results – Fit

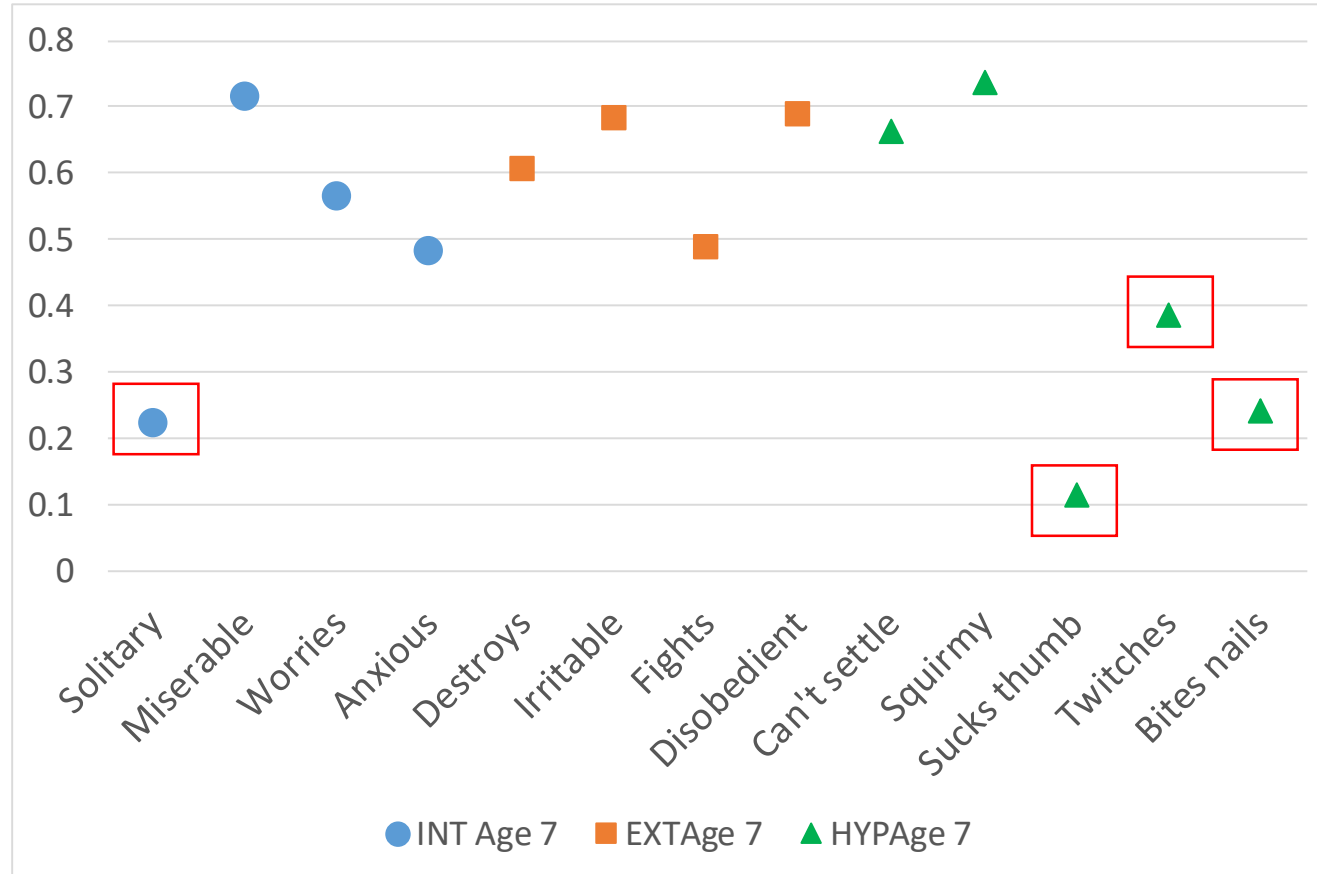


Figure 1. Standardised factor loadings from Rutter Behaviour Scale (parent report) at age 7 in NCDS

# Results – Precision of measurement

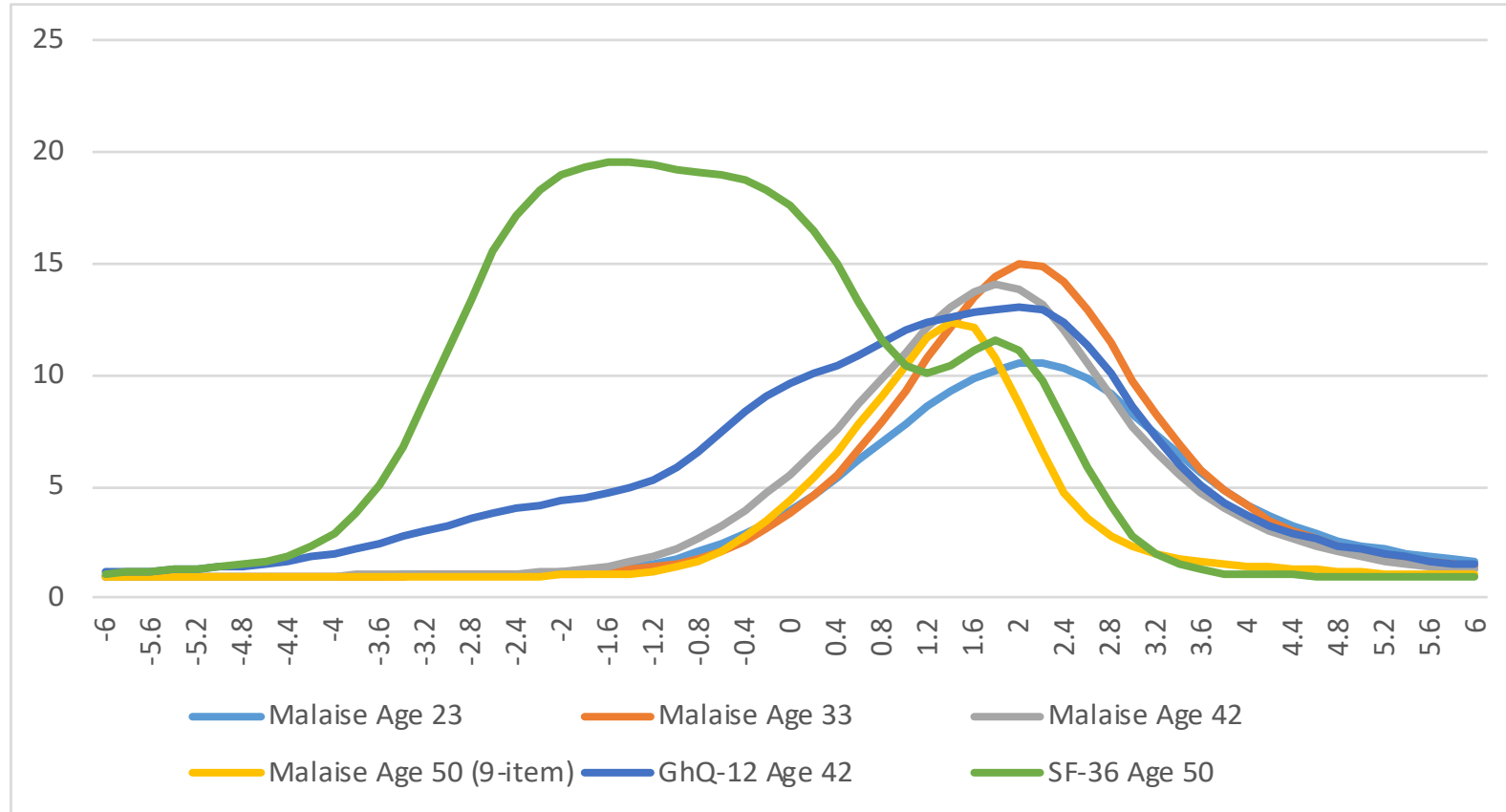
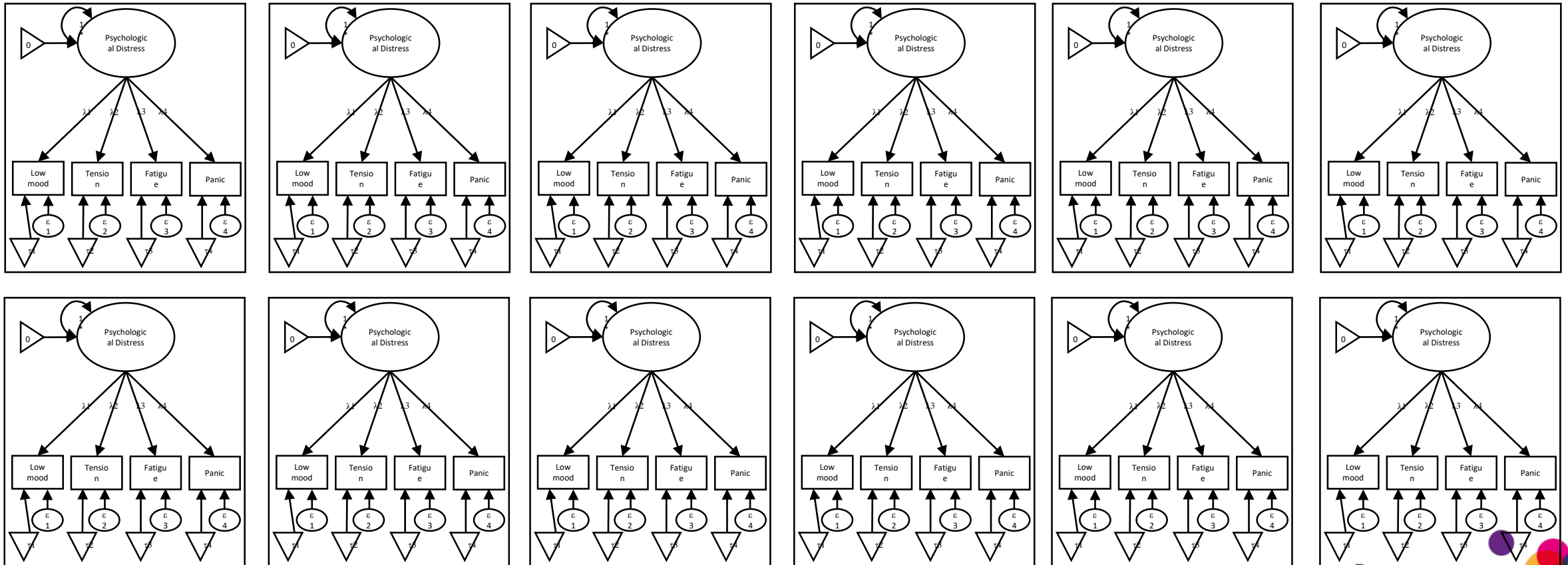


Figure 2. Scale Information Functions for Mental Health Measures in NCDS

# Results – Comparisons across waves and cohorts

	NCDS	BCS
Age 23	Malaise Inventory (24 items)	
Age 26		Malaise Inventory (24 items)
Age 30		Malaise Inventory (24 items)
Age 33	Malaise Inventory (24 items)	
Age 34		Malaise (9 items)
Age 42	Malaise Inventory (24 items)	Malaise (9 items)
Age 46		Malaise (9 items)
Age 50	Malaise Inventory (9 item)	

# Results – Comparisons across waves and cohorts



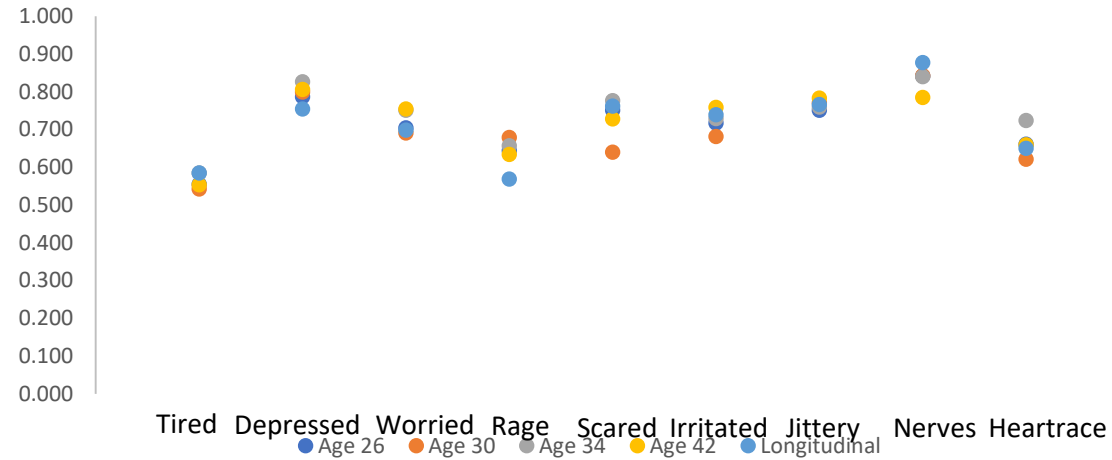
# Results – Comparisons across waves and cohorts

Goodness of fit criteria									
			Chi-square (d.f.)	RMSEA	CFI	TLI	$\Delta$ RMSEA A	$\Delta$ CFI	$\Delta$ TLI
	NCDS 23, 33, 42, 50	Configural	1500.483 (216)	0.033 (0.031 to 0.034)	0.988	0.984			
		Scalar	2482.448 (265)	0.039 (0.037 to 0.040)	0.979	0.977	0.006	0.009	0.007
	BCS70 26, 30, 34, 42	Configural	1686.303 (216)	0.038 (0.036 to 0.039)	0.985	0.980			
		Scalar	2127.081 (265)	0.038 (0.037 to 0.040)	0.981	0.979	0.003	0.004	0.001
	NCDS & BCS70	Configural	2354.305 (324)	0.035 (0.033 to 0.036)	0.986	0.981			
		Scalar	3775.376 (401)	0.040 (0.039 to 0.041)	0.976	0.974	0.005	0.010	0.007

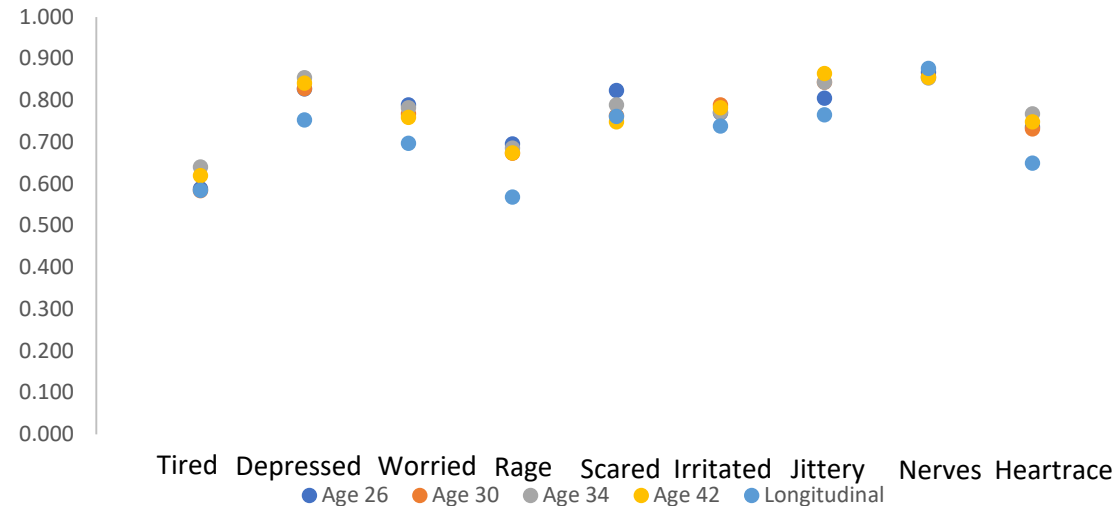
(Ploubidis, McElroy & Moreira, manuscript accepted)

# Results – Comparisons across waves and cohorts

**Graph 4a.** Standardized factor loadings – BCS70 Men



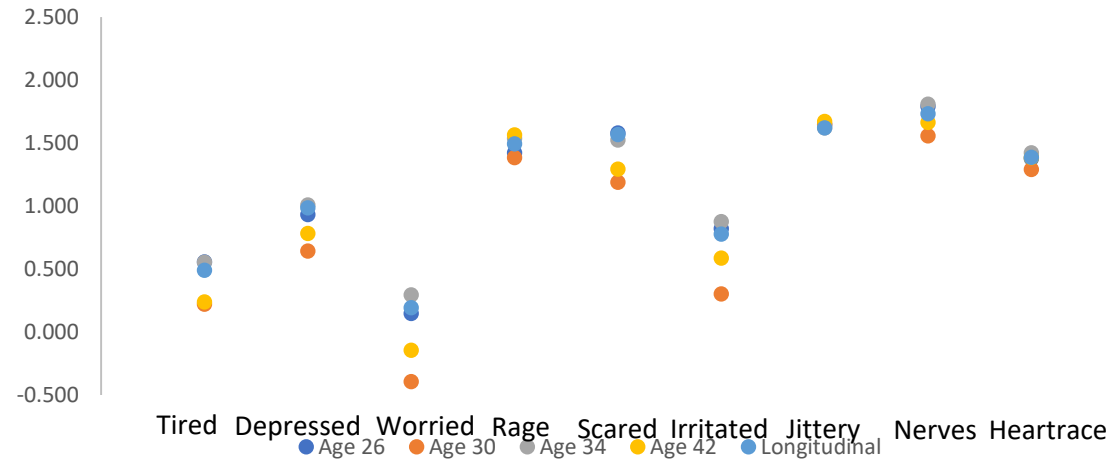
**Graph 4b.** Standardized factor loadings – BCS70 Women



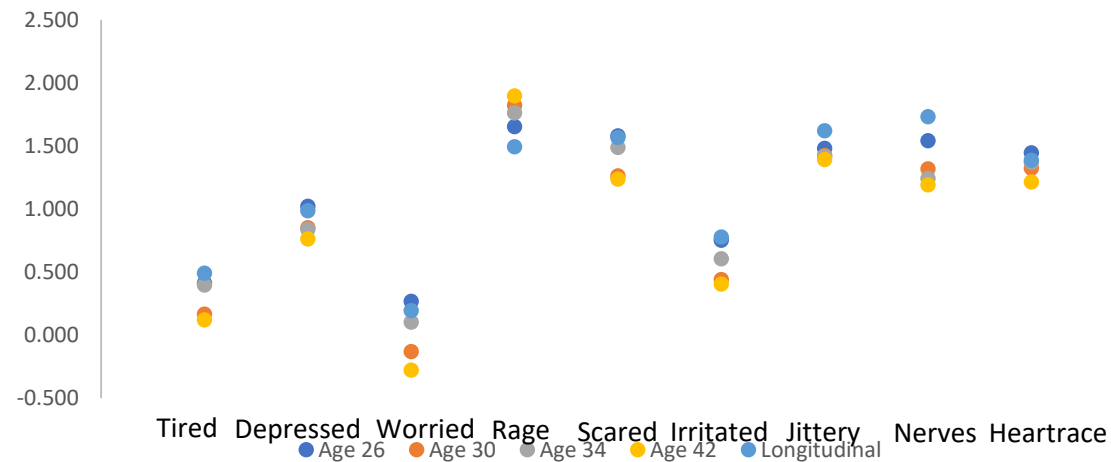
(Ploubidis, McElroy & Moreira, manuscript accepted)

# Results – Comparisons across waves and cohorts

**Graph 5a.** Standardized thresholds – BCS70 Men



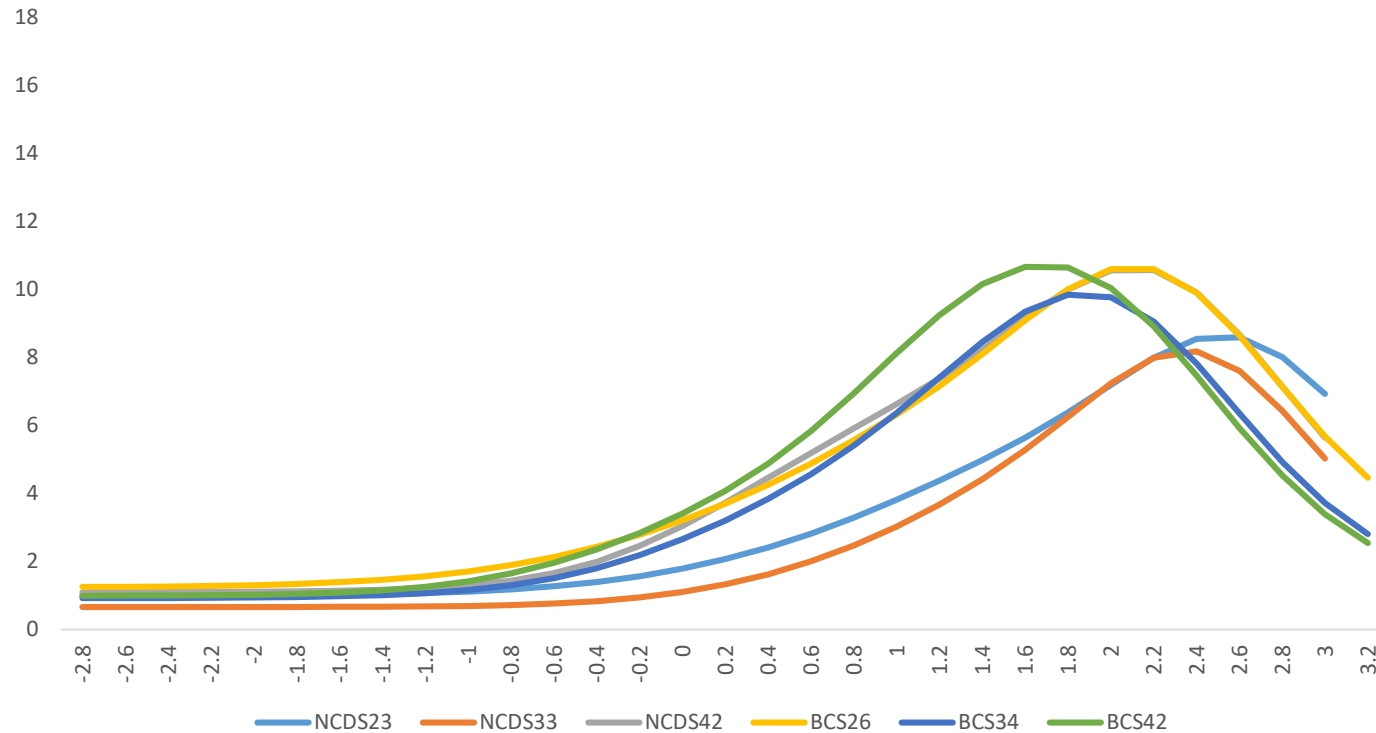
**Graph 5b.** Standardized thresholds – BCS70 Women



(Ploubidis, McElroy & Moreira, manuscript accepted)

# Results – Comparisons across waves and cohorts

**Graph 6a.** Scale information functions for both cohorts – Men



(Ploubidis, McElroy & Moreira, manuscript accepted)



# Results – Comparisons across waves and cohorts

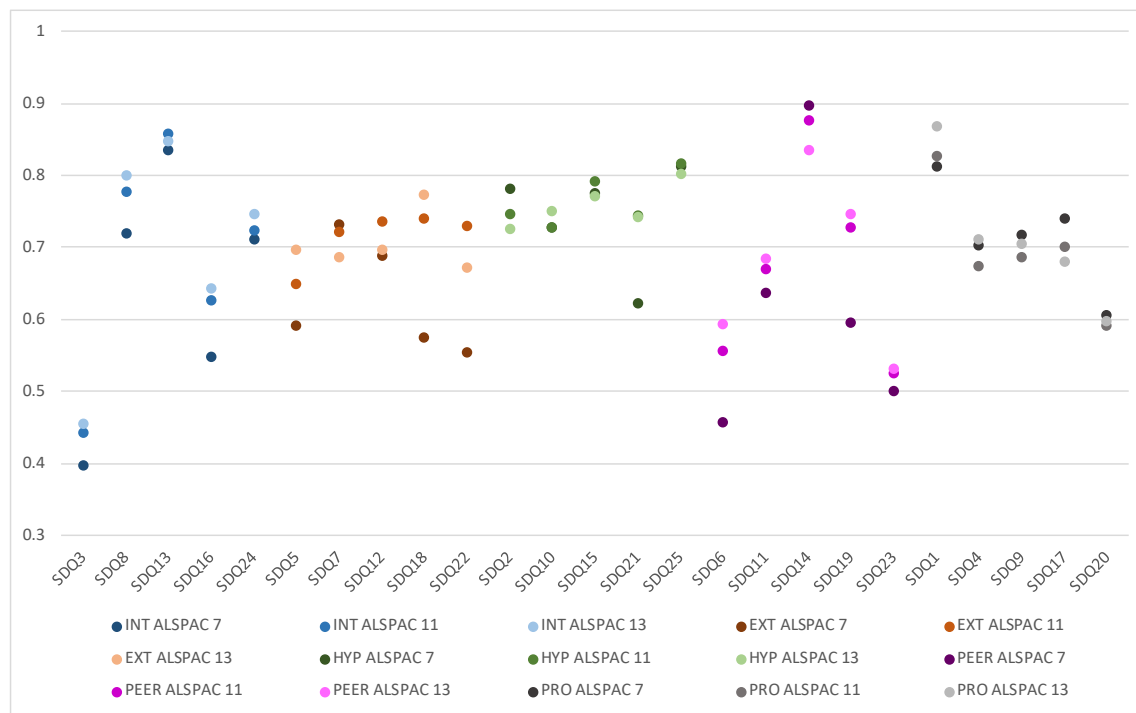
	ALSPAC	MCS
Age 3		SDQ
Age 5		SDQ
Age 7	SDQ	SDQ
Age 9	SDQ	
Age 10	SDQ	
Age 11		SDQ
Age 13	SDQ	
Age 14		SDQ

# Results – Comparisons across waves and cohorts

Goodness of fit criteria									
			Chi-square (d.f.)	RMSEA	CFI	TLI	$\Delta$ RMSEA	$\Delta$ CFI	$\Delta$ TLI
	Model	Configural	52582.334 (1590)	0.056	0.907	0.895			
		Scalar	43167.537 (1690)	0.053	0.902	0.908	0.003	0.005	0.013

# Results – Comparisons across waves and cohorts

## ALSPAC



## MCS

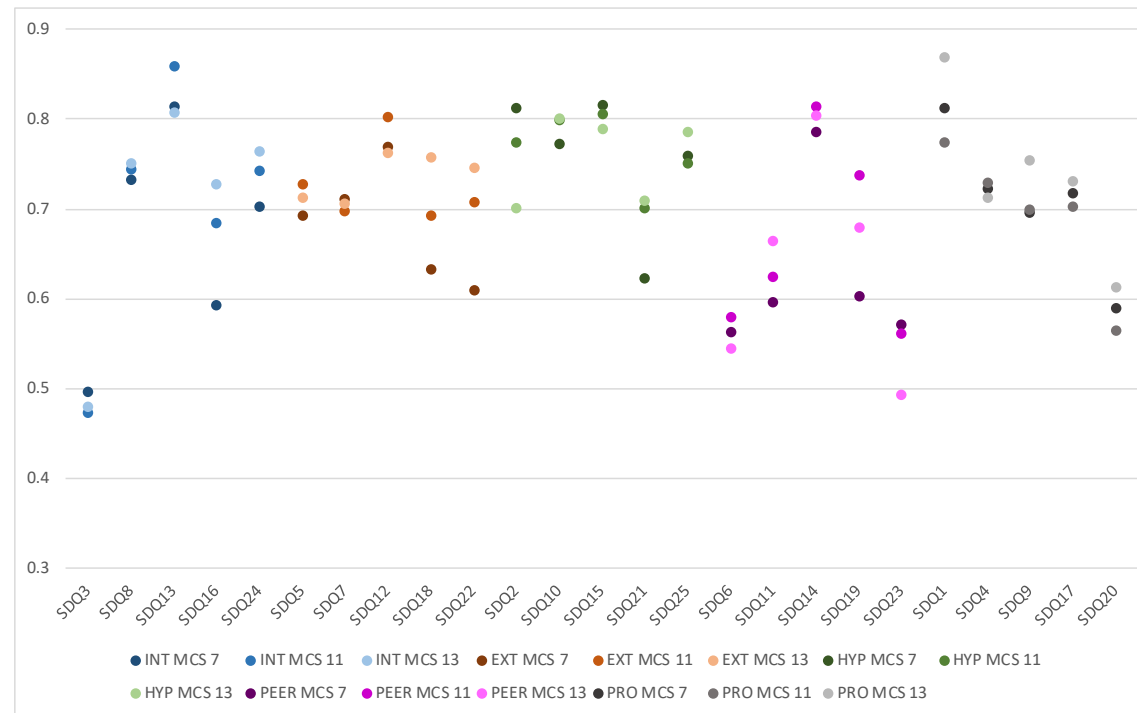


Figure 2. Standardised factor loadings across cohorts and sweeps

# Results – Comparisons across waves and cohorts

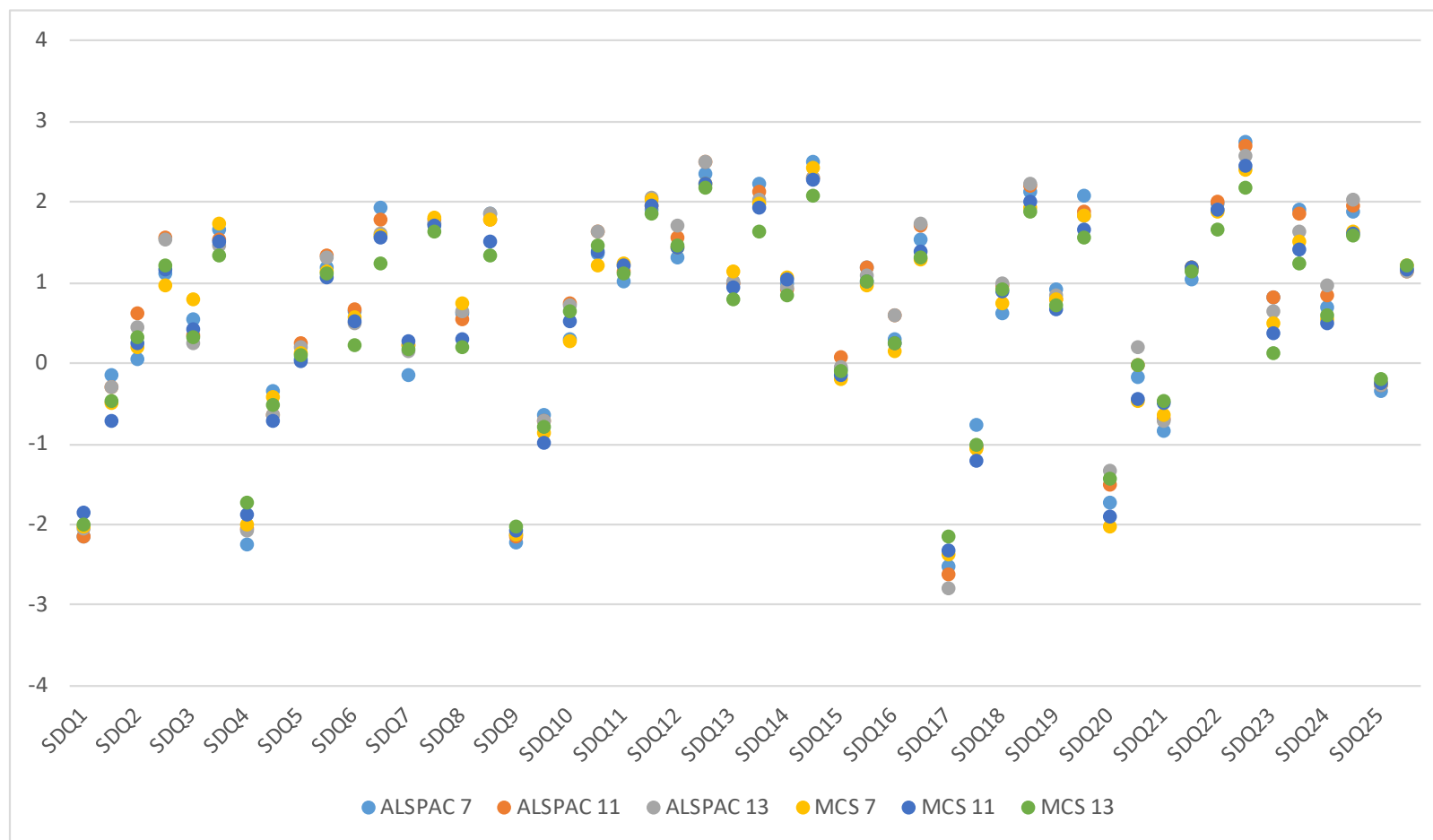


Figure 3. Standardised thresholds across cohorts and sweeps

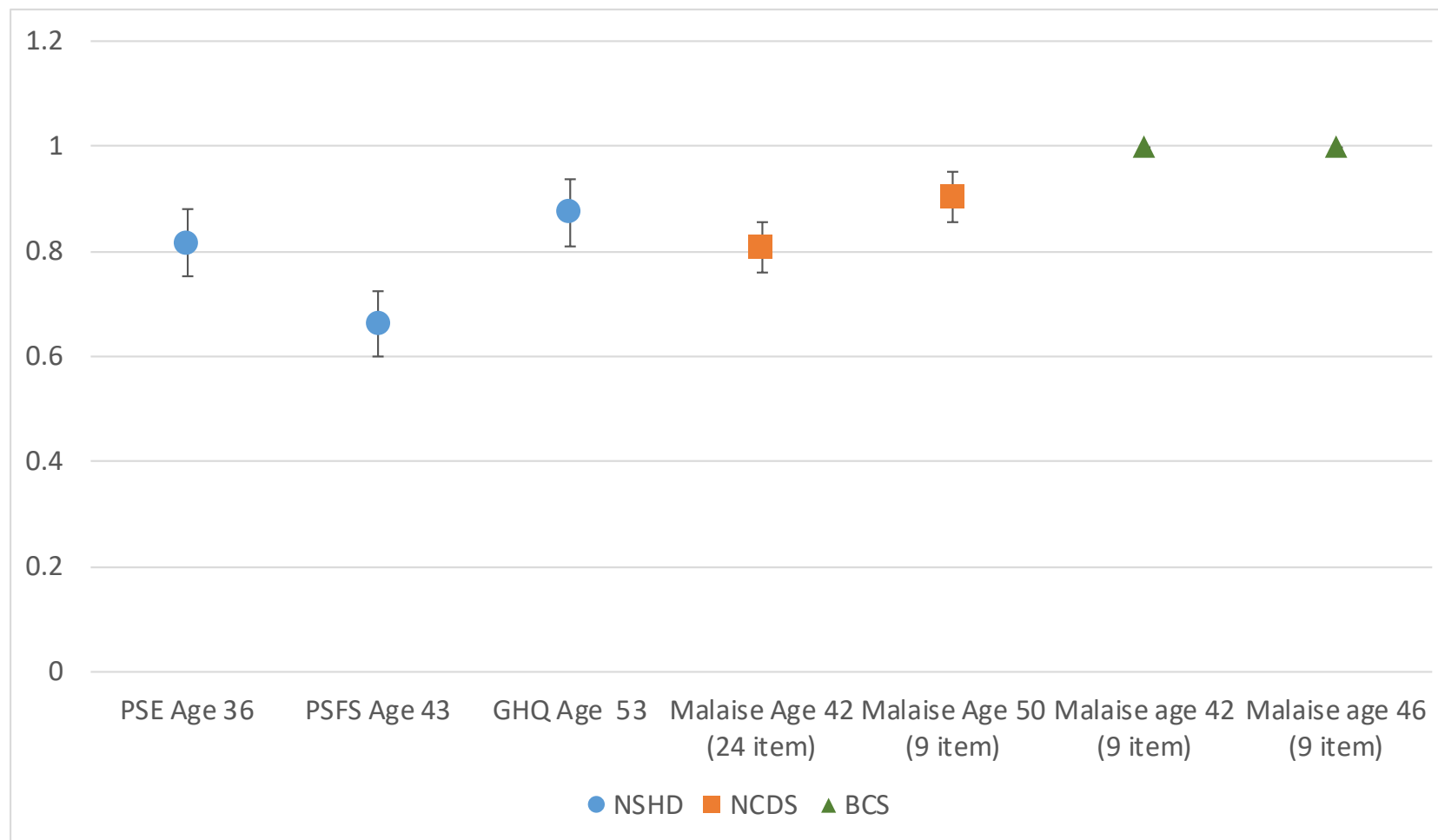
# Results – Harmonised items across waves and cohorts

	NSHD	NCDS	BCS70
<b>Age 36</b>	Present State Examination (selected items)		
<b>Age 42</b>		Malaise Inventory (24 items)	Malaise (9 items)
		General Health Questionnaire (12-item) (GHQ-12)	
<b>Age 43</b>	Psychiatric Symptom Frequency Scale (18 items)		
<b>Age 46</b>			Malaise (9 items)
			SF-36 (10 items)
			CES-D scale (Center for Epidemiologic Studies Depression) (10 items)
<b>Age 50</b>		Malaise Inventory (9 item)	
		SF36	
<b>Age 53</b>	General Health Questionnaire		
<b>Age 60-64</b>	General Health Questionnaire		
<b>Age 69</b>	General Health Questionnaire		

# Results – Harmonised items across waves and cohorts

	General Health Questionnaire (28-item) (GHQ-28)	Psychiatric Symptom Frequency Scale (18 items)	Present State Examination (selected items)	Malaise Inventory (9 item)
<b>Low Mood</b>	17. Been able to enjoy your normal day-to-day activities	2. have you been in low spirits or felt miserable	20. Do you keep reasonably cheerful or have you been very depressed or low spirited recently? Have you cried at all? (Rate depressed mood)	2. Do you often feel miserable or depressed?
<b>Fatigue</b>	2. Been feeling in need of a good tonic	14. have there been days when you tired out very easily?	3. Have you been exhausted and worn out during the day or evening even when you haven't been working very hard? (rate tiredness/exhaustion) (slightly doubtful about this one)	1. Do you feel tired most of the time?
<b>Tension</b>	16. Felt constantly under strain	1. have you felt on edge of keyed up or mentally tense	7. Do you often feel on edge, or keyed up, or mentally tense or strained? (rate nervous tension)	7. Are you constantly keyed up and jittery?
<b>Panic</b>	19. Been getting scared or panicky for no good reason	8. have you been in situations when you felt shaky or sweaty or your heart pounded or you could not get your breath?	11. Have you had times when you felt shaky or your heart pounded or you felt sweaty and you simply had to do something about it? (rate panic attacks)	9. Does your heart often race like mad?

# Results – Harmonised items across waves and cohorts

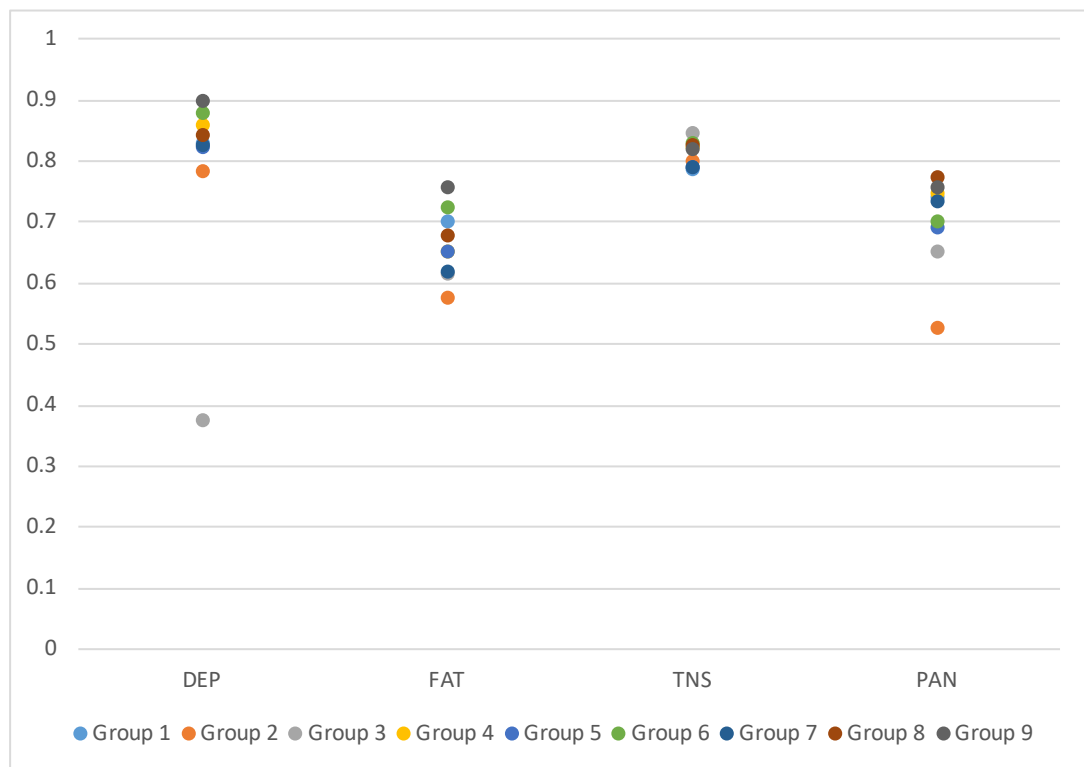


# Results – Harmonised items across waves and cohorts

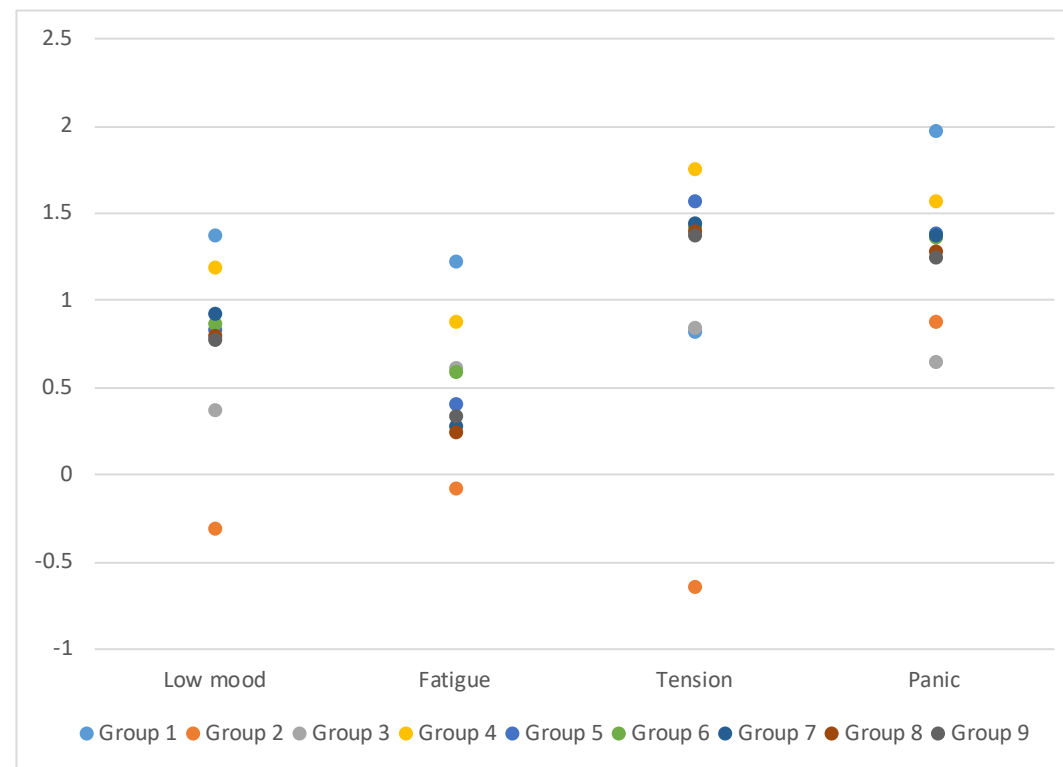
Goodness of fit criteria									
			Chi-square (d.f.)	RMSEA	CFI	TLI	$\Delta$ RMS EA	$\Delta$ CFI	$\Delta$ TLI
	Model	Configural	256.591 (18)	0.042	0.994	0.983			
		Metric	383.003 (42)	0.033	0.992	0.990	0.009	0.002	0.007
		Scalar	4576.551 (66)	0.095	0.896	0.915	0.053	0.098	0.068
		Partial Scalar	1835.781 (58)	0.064	0.959	0.962	0.022	0.035	0.021
		Partial Scalar 2	775.514 (50)	0.044	0.983	0.982	0.002	0.011	0.001



# Results – Harmonised items across waves and cohorts



Standardised Factor Loadings



Standardised Thresholds

# Outputs

## UK Data Service



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### Contents

Acknowledgements .....	6
1. Introduction .....	8
1.1 Aims .....	8
1.1.1 Measurement .....	8
1.1.2 Harmonisation .....	8
2. Methods .....	9
2.1 Measurement properties .....	9
2.2 Harmonisation .....	9
3. Measurement Properties in Childhood .....	10
3.1 NSHD .....	10
3.2 NCDS .....	11
3.3 BCS .....	12
3.4 ALSPAC .....	13
3.5 MCS .....	14
4. Measurement Properties in Adulthood .....	15
4.1 NSHD .....	15
4.2 NCDS .....	17
4.3 BCS .....	20
5. Harmonisation of Mental Health Measures in Childhood .....	22
5.1 Item selection and inter-rater agreement .....	22
6. Harmonisation of Mental Health Measures in Adulthood .....	23
6.1 Item selection and inter-rater agreement .....	23
7. Comparison of Mother and Teacher Reports of Mental Health in Childhood .....	26
7.1 Item selection and inter-rater agreement .....	26

Thank you



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