

Co-calibrating scores from two dermatology-specific patient reported outcome measures

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Objectives

- To co-calibrate scores from two different dermatology-specific outcome measures:
 - Psoriasis Quality of Life Scale (PSORIQoL)
 - Quality of Life in Atopic Dermatitis (QoLIAD)

Introduction

- Some interventions may be used for more than one disease
- Dermatology studies frequently combine together patients with different kinds of skin conditions
- Generic outcome measures traditionally used in these circumstances (e.g. SF-36/NHP)

Generic outcome measures

Pros	Cons
Thought to be able to compare across diseases	May miss important issues
No need to develop separate scales for each disease	Less sensitive than disease-specific measures
	Older scales often have poor measurement properties
	Evidence of DIF by disease

Dermatology Life Quality Index (DLQI)

- Generic dermatology measure used in a large number of skin conditions
- Evidence of poor fit to Rasch model
 - Overall misfit
 - Poor measurement range
 - Disordered response thresholds
 - Several items showed DIF by disease (psoriasis vs. atopic dermatitis)

Aims

- To assess whether it is possible to compare scores from two dermatology-specific outcome measures
 - Psoriasis Quality of Life Scale (PSORIQoL)
 - Quality of Life in Atopic Dermatitis (QoLIAD)

Methods

- Analyses conducted using RUMM2030
- The two scales were analysed separately for fit to the Rasch model
- Problems were resolved
- The two scales were co-calibrated using a common item design
- Item pool analysed for fit to the Rasch model
- Common items analysed for DIF by disease

Questionnaire comparison

- PsoriQoL – psoriasis-specific QoL measure
- QoLIAD – atopic dermatitis QoL measure
- Both employed the needs-based model of QoL
- Content for both from patient interviews
- Both developed using Rasch analysis
- 25 items in each
- Yes/no response format in each
- 5 common items

Common Items

- I have no self confidence
- I just want to shut myself away
- I worry that other people will not accept me
- I am embarrassed about my appearance
- I can't bear anyone touching me

Sample

	Psoriasis (n = 146)	Atopic Dermatitis (n = 146)
Gender (%)		
Male	73 (50)	73 (50)
Female	73 (50)	73 (50)
Age (Years)		
Mean (SD)	44.4 (14.7)	45.5 (16.6)
Range	66 (17-83)	62 (20-82)
Duration (years)		
Mean (SD)	20.9 (13.5)	28.2 (17.5)
Range	67 (2-69)	76 (0-76)

Fit to the Rasch model

	Item-Trait Interaction Chi ²	PSI	Item-Person interaction				Unidimensionality (CI)
			Items		Persons		
			Mean	SD	Mean	SD	
PSORIQoL	0.25	0.94	-0.22	1.12	-0.36	0.82	0.045 (0.008 - 0.082)
QoLIAD	0.28	0.91	-0.25	1.12	-0.162	0.54	0.095 (0.057 - 0.133)

Residual correlations

- Evidence of local dependency in QoLIAD between:

Item 4: 'I get embarrassed when I am with people I don't know very well'

Item 6: 'I feel tense all the time'

Item 17: 'I can't concentrate on anything else'

- Item 4 was removed improving model fit statistics

Additional fit statistics

- One item in each scale removed due to a high fit residual
 - PsoriQoL item 17 (fit residual = 2.84)
'It interferes with my close relationships'
 - QoLIAD item 16 (fit residual = 3.15)
'I find it hard to relax'
- Minimal evidence of DIF by age or gender
- Items had good logit coverage in each scale

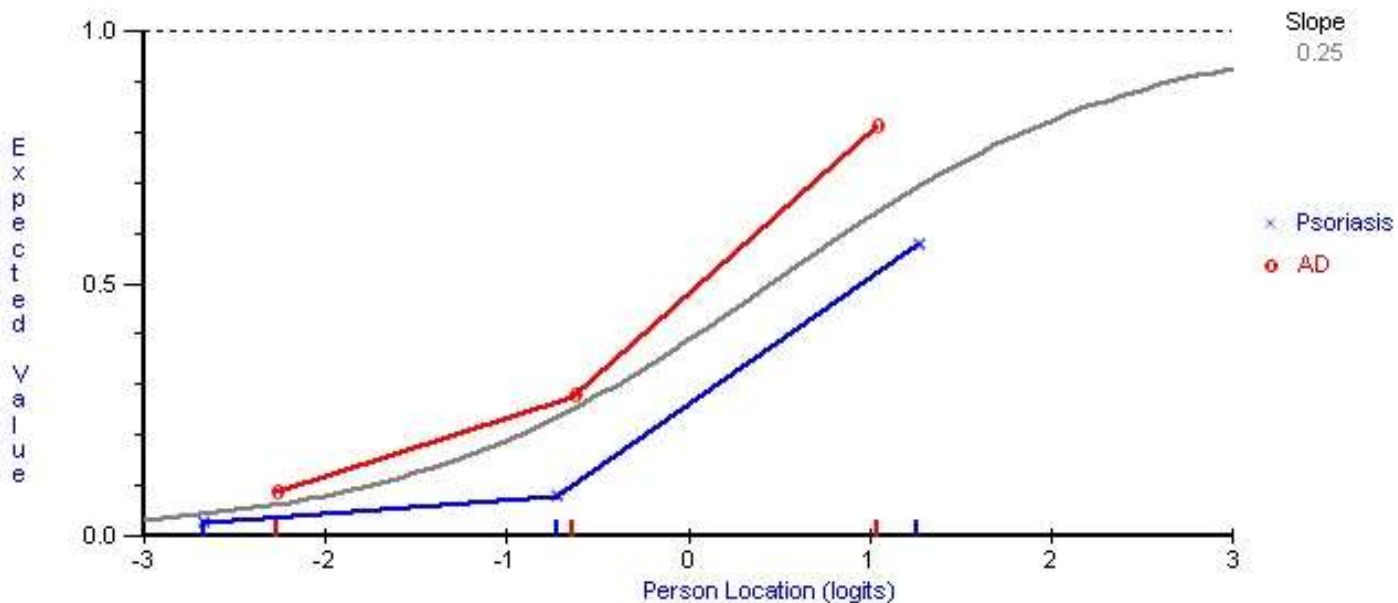
Fit to the Rasch model – combined items

	Item-Trait Interaction Chi ²	PSI	Item-Person interaction			
			Items		Persons	
			Mean	SD	Mean	SD
Combined	0.056	0.88	-0.28	0.98	-0.27	0.67

DIF analysis of common items

- One of the 5 common items showed DIF by disease ($p = 0.00098$)

'I worry that people will not accept me'



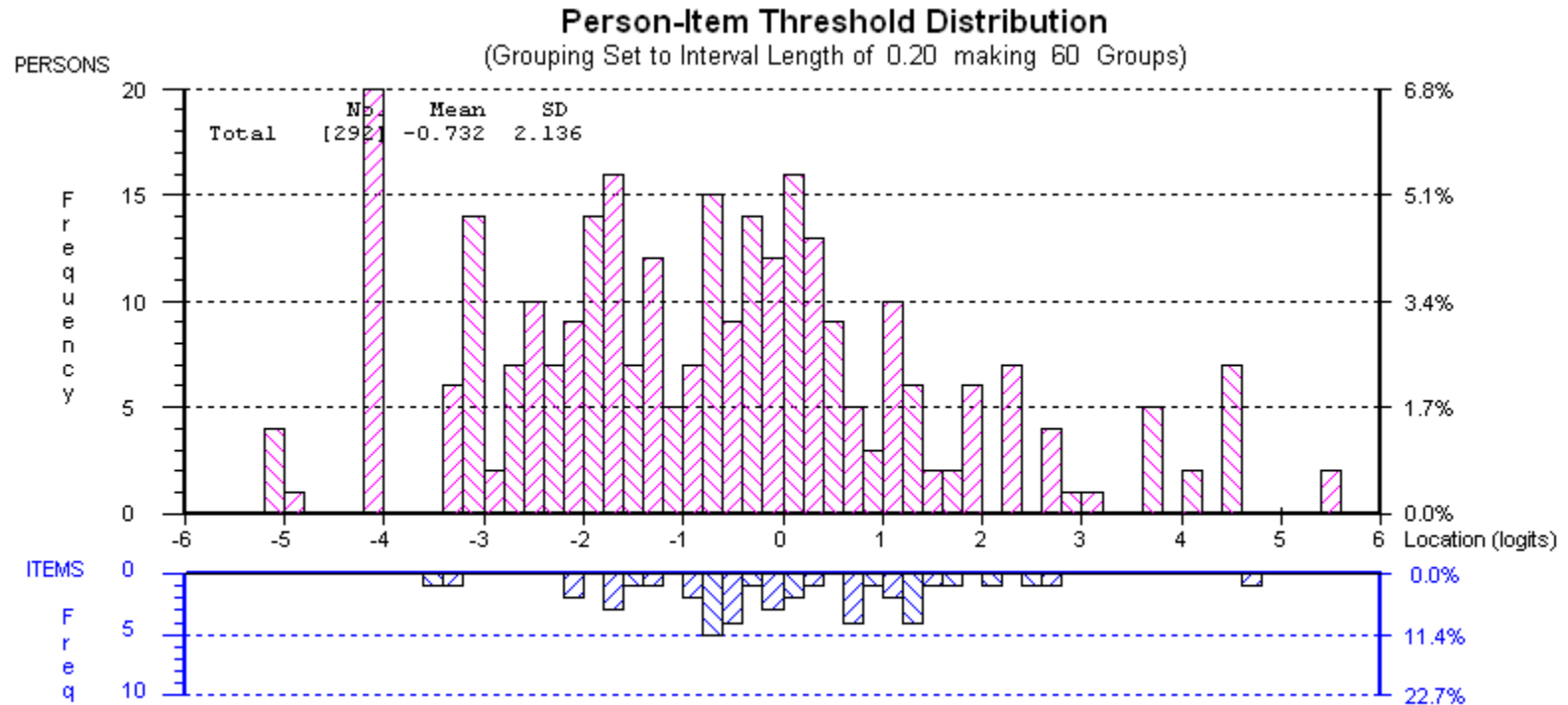
Logit position of common items

Item	Logit position
I just want to shut myself away	2.51
I can't bear anyone touching me	2.03
I have no self confidence	1.23
I worry that other people will not accept me	0.42
I am embarrassed about my appearance	-0.85

Final fit to the Rasch model – combined items

	Item-Trait Interaction Chi ²	PSI	Item-Person interaction			
			Items		Persons	
			Mean	SD	Mean	SD
Final items	0.123	0.89	-0.271	1.01	-0.27	0.66

Final combined data – Targeting of items



Conclusions

- Items were successfully co-calibrated
- This study moves the debate about disease-specific vs. generic outcome measures forward
- Over 25 disease-specific measures available based on the needs-based model of QoL

Discussion

- Diseases studied are quite similar – would it work for conditions that are less similar?
- Are four items enough to co-calibrate the scales?
- Were the logit positions of the common items sufficient for the co-calibration?

References

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