



Science Is Only as Good
as Its Measures:
Testing the Psychometric
Properties of Four Scales
For Use With Latino
Youth

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Introduction

Why Is Culture Important to Measurement?

- Culture affects
 - Respondent responses
 - Test givers and test instructions
 - Interpretation of results
- Reliability vs. Validity

Methods used to assess cultural equivalence:

- Classical test theory (EFA and CFA)
- Tests of invariance
- Item response theory

Introduction

Measures validated:

- Fear of Deportation – two versions
- Snyder's Children's Hope Scale
- Promise Pediatric Stress Scale
- 2 of 5 C's of Positive Youth Development (Lerner)
 - Caring
 - Character:
 - Social Consciousness (subscale)
 - Personal Values (subscale)

Sample Characteristics

Across Measures

- Participants: 1st & 2nd-generation Latino immigrant youth (7th – 8th grade) in a South-Central U.S state
- 50% ~ 54% female
- 50% ~ 75% youth born in the U.S.
- >70% parents born outside the U.S.

Individual Measures

	Fear of Deportation	Hope	Stress	Caring	Character
Sample size (<i>N</i>)	145(1), 107(2)	236	286	229	229
Reliability	×	×	×	×	×
Exploratory Factor Analysis		×			
Confirmatory Factor Analysis	×	×	×	×	×
Item Response Theory	×	×	×	×	×
Criterion-Related Validity	×	×		×	×
Measurement Invariance		Time, Gender	Acculturation	Time	Time

Fear of Deportation



A new scale for measuring Fear of Deportation.

Main Idea

- To Develop a new scale for measuring **Fear of Deportation.**
 - Study 1: a binary version of FoD scale
 - Study 2: a polytomous-item version of FoD scale
-

Fear of Deportation.

Study 1 – CFA Results

Items	Loading
<i>Loadings for Each Item</i>	
3. gone without the medical attention you need?	.54
4. limited your travel around the city or town where you live?	.57
5. stopped doing something important or that you or they enjoyed doing?	.92
6. become so anxious that you had trouble thinking straight?	.54
8. Did you ever not participate in an after-school activity?	.31

Model fit indices

$\chi^2 = 7.09$, $df = 5$, $p\text{-value} = .21$;

$RMSEA = .04$, $CFI = .98$, $TLI = .96$, $SRMR = .05$

Fear of Deportation.

Study 1 – Summary and IRT Statistics

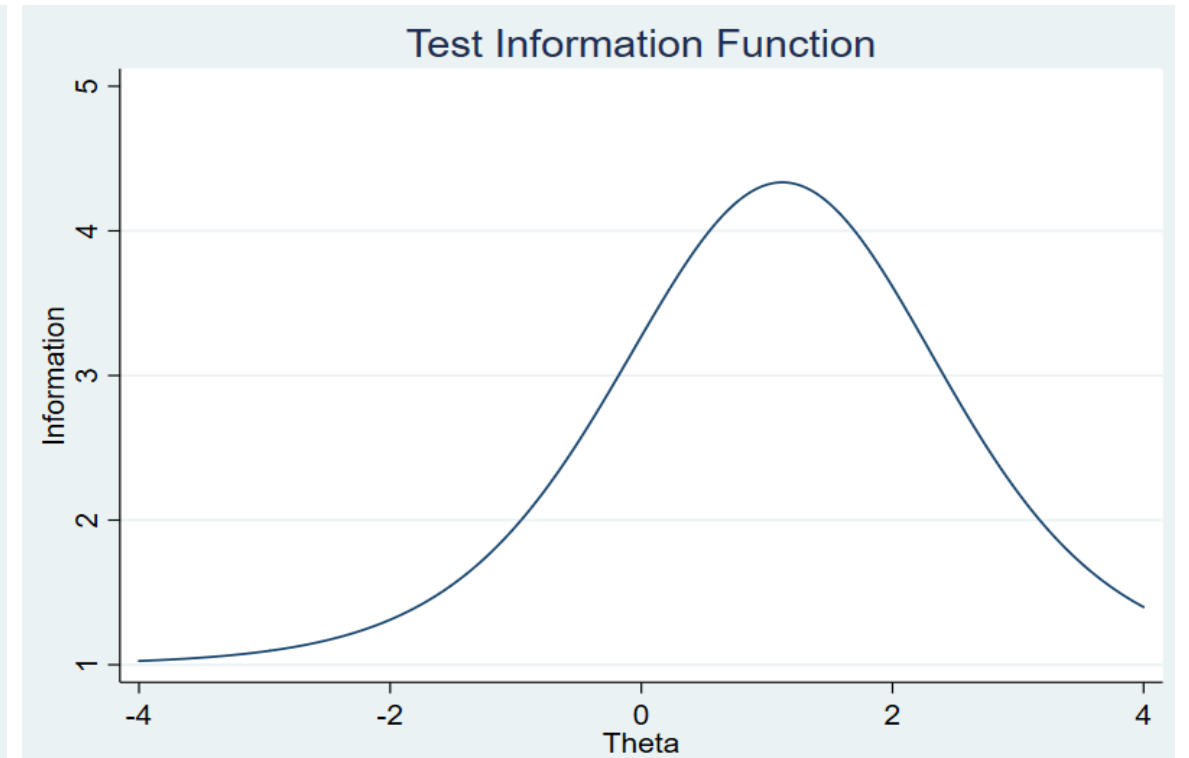
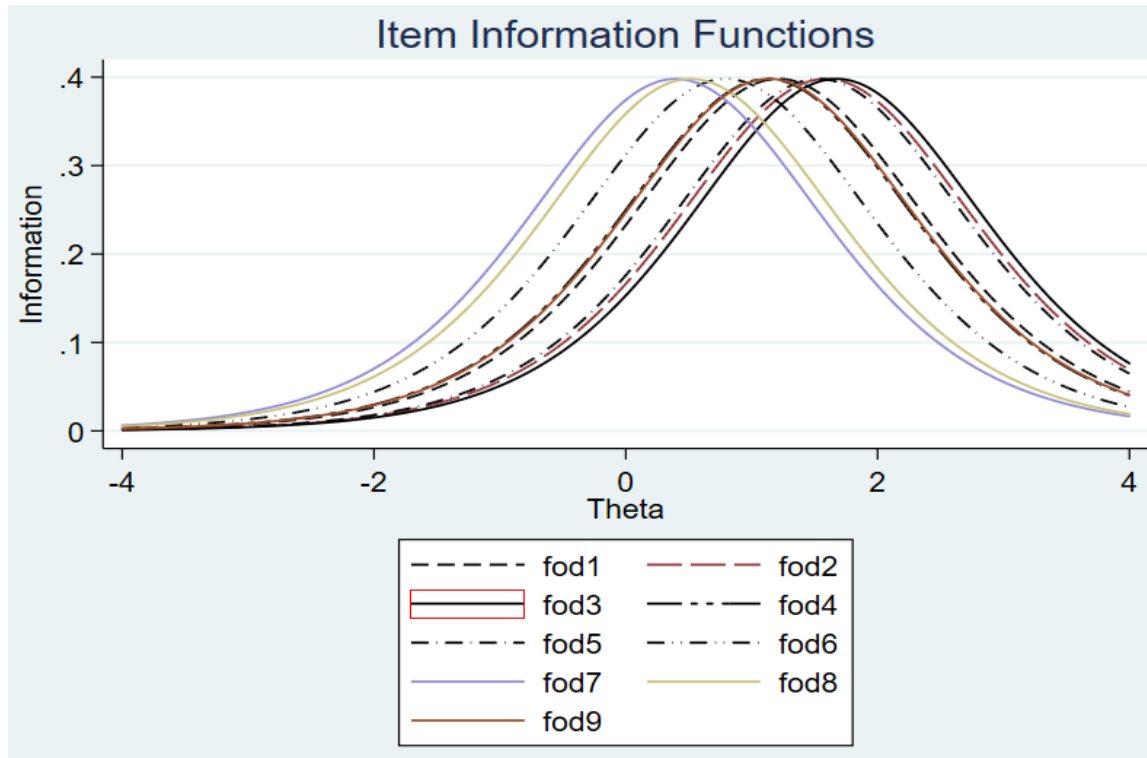
Mean, Standard Deviation, and Item Difficulty for Each Item in Study 1

Items	<i>M</i>	<i>SD</i>	<i>Difficulty</i>
1. not reported a crime to the police?	.23	.43	1.21
2. not talked to someone in authority about a concern you had?	.17	.38	1.59
3. gone without the medical attention you need?	.16	.37	1.68
4. limited your travel around the city or town where you live?	.25	.43	1.12
5. stopped doing something important or that you or they enjoyed doing?	.18	.39	1.53
6. become so anxious that you had trouble thinking straight?	.32	.46	.80
7. talked to you about what to do if one of them were deported?	.40	.49	.40
8. Not participate in an after-school activity?	.38	.49	.52
9. one of your parents ever not gone to your school?	.25	.43	1.14

Note: $N = 145$. Ratings were made on 2-point scale: 1 = yes, 0 = No.

Fear of Deportation.

Study 1 – IRT Information



Fear of Deportation.

Study 2 – CFA results

Items	Loading
<i>Loadings for Each Item</i>	
3. gone without the medical attention they needed?	.57
5. changed their behavior after hearing of someone being deported?	.70
6. become so anxious that they had trouble thinking straight?	.78
11. missed work or school?	.58
<i>Model fit index</i>	
χ^2	.95
Df	2
p-value	.62
RMSEA	0
CFI	1.00
TLI	1.00
SRMR	.02

Fear of Deportation.

Study 2 – Summary and IRT Statistics

Descriptive Statistics and IRT Parameters for Item in Study 2

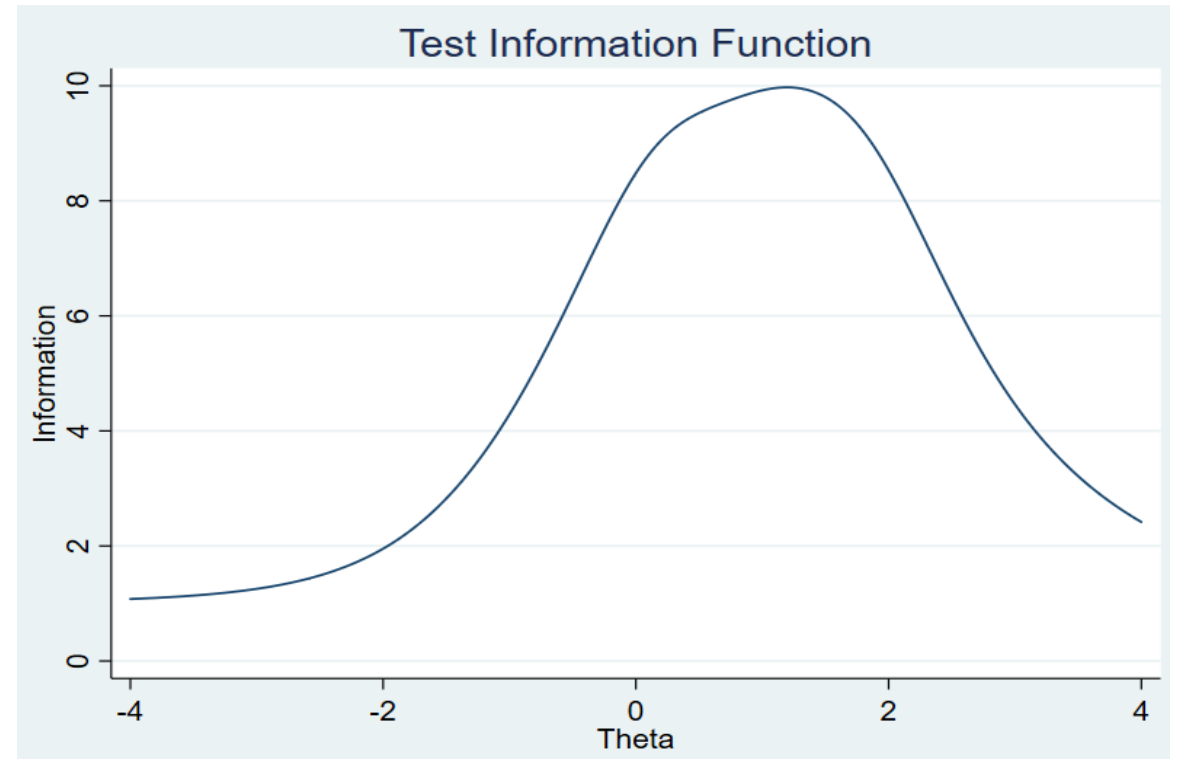
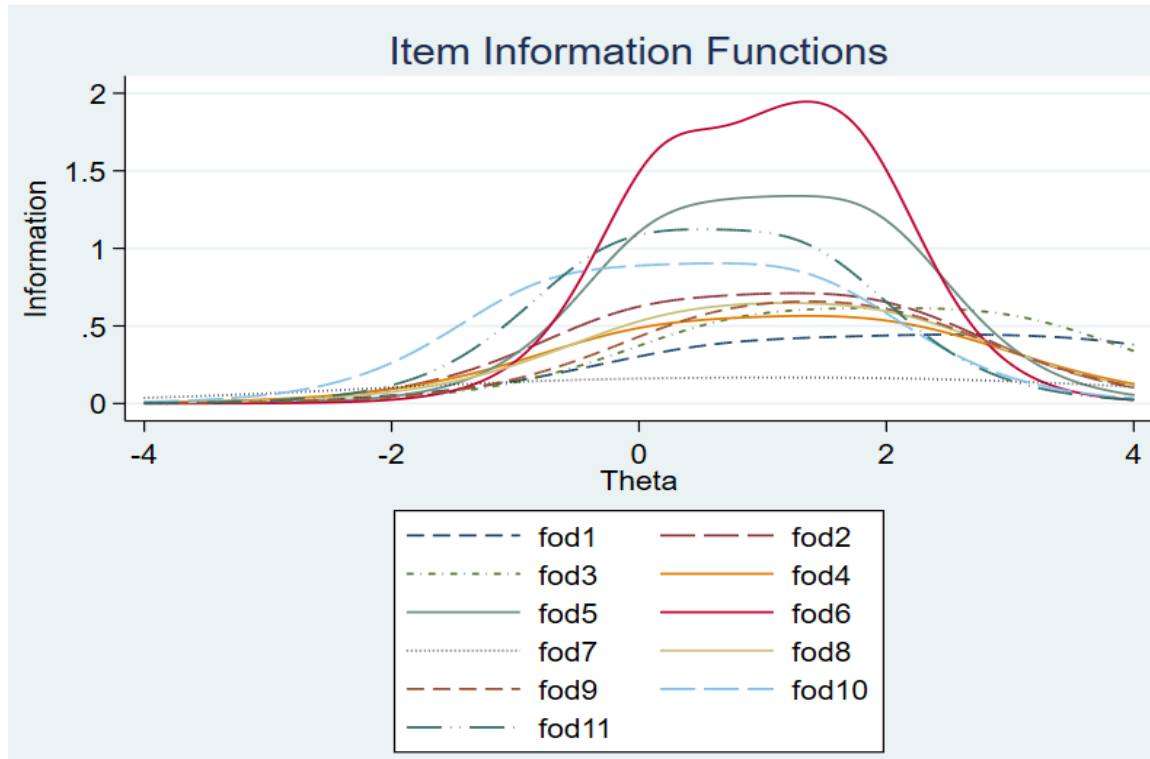
Items	Descriptive Statistic			IRT Parameters				
	<i>M</i>	<i>SD</i>	<i>Skewness</i>	<i>a</i>	<i>b</i> ₁	<i>b</i> ₂	<i>b</i> ₃	<i>b</i> ₄
1. not reported a crime to the police?	.52	.90	2.00	1.18	.70	2.09	2.79	3.81
2. not talked to someone about a concern they had?	.95	1.28	1.29	1.50	.04	1.06	1.72	2.02
3. gone without the medical attention they needed?	.53	.97	1.97	1.40	.79	1.58	2.51	3.09
4. talked to a neighbor or friend about places to avoid?	.98	1.32	1.25	1.34	.12	1.25	1.80	2.14
5. changed their behavior after hearing of someone being deported?	.88	1.23	1.34	2.07	.17	.92	1.62	1.91
6. become so anxious that they had trouble thinking straight?	.81	1.21	1.53	2.49	.22	1.09	1.51	1.76
7. talked to you about what to do if someone in the family were deported?	1.36	1.47	.68	.73	-.54	.76	1.78	2.65
8. not participated in a child's after-school activity?	1.01	1.38	1.12	1.42	.26	.99	1.54	2.06
9. not gone to a child's school?	.73	1.27	1.67	1.45	.66	1.32	1.88	2.04
10. become upset?	1.56	1.44	.51	1.70	-.71	.20	.99	1.41
11. missed work or school?	1.36	1.49	.71	1.90	-.23	.38	1.15	1.37

Note: N = 107. Responses are based on a 5-point Likert-type: 0 = Never, 1 = Once, 2 = Twice, 3 = Three times, 4 = Four or more times.

a = Item discrimination parameter. *b*_{*i*} = Item difficulty thresholds.

Fear of Deportation.

Study 2 IRT Information



Fear of Deportation.

Reliability and Criterion

Variable	Study 1	Study 2
Model fit	$\chi^2 = 7.09, df = 5, p\text{-value} = .21;$ $RMSEA = .04,$ $CFI = .98,$ $TLI = .96,$ $SRMR = .05$	$\chi^2 = .95, df = 2, p\text{-value} = .62;$ $RMSEA = .00,$ $CFI = 1.00,$ $TLI = 1.00,$ $SRMR = .02$
Reliability	KR20 = .62	Cronbach alpha = .75
r with stress	.30**	.32***
r with EBF	.26**	.38***
r with CF	.26**	.32***

*** $p < .001$

Hope



Children's Hope

Main Idea

Validation for Snyder's **Children's Hope** scale in immigrant Latino Youth.

Using Factor Analysis (EFA and CFA), Item Response Theory, and Measurement Invariance.

Children's Hope

Detail: Summary Statistics

Means, Standardized Deviation, and Range for Each Item in Children's Hope Scale

	Total		Girls		Boys	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1. doing pretty well	3.63	.89	3.53	.82	3.73	.95
2. can think of ways to get things in life	3.58	.94	3.53	.85	3.62	1.03
3. as well as other kids	3.58	.99	3.57	.97	3.59	1.01
4. can come up ways to solve problems	3.46	1.02	3.25	1.07	3.66	.94
5. past will help future	3.61	1.07	3.50	1.15	3.73	1.01
6. can find ways to solve problem but not quit	3.70	.93	3.60	.88	3.79	.98

Note: N = 236 (51% Girls). Responses are based on a 5-point Likert-type: 1 = None of the time, 2 = A little of the time, 3 = Some of the time, 4 = Most of the time, 5 = All of the time.

Children's Hope

Detail: EFA

EFA for Comparing One-Factor Solution and Two-Factor Solution in Children's Hope Scale

Items	One factor	Two factors	
	1	1	2
<i>Loadings for Each Item</i>			
1. doing pretty well	.71	-.10	.85
2. can think of ways to get things in life	.70	.26	.49
3. as well as other kids	.76	.07	.78
4. can come up ways to solve problems	.69	.24	.50
5. past will help future	.69	.32	.43
6. find ways to solve problem but not quit	.67	.88	.00
<i>Model fit index</i>			
χ^2	25.64	5.11	
<i>df</i>	9	4	
<i>p</i> -value	.002	.28	
RMSEA	.09	.03	
CFI	.97	1.00	
TLI	.95	.99	
SRMR	.03	.01	
<i>χ^2 Difference Test: <i>p</i>-value</i>			
Two-factor vs One-factor	.001		

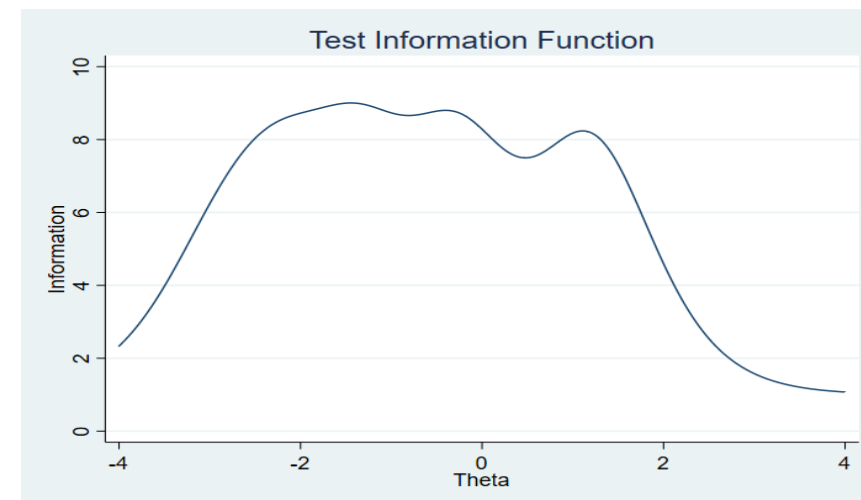
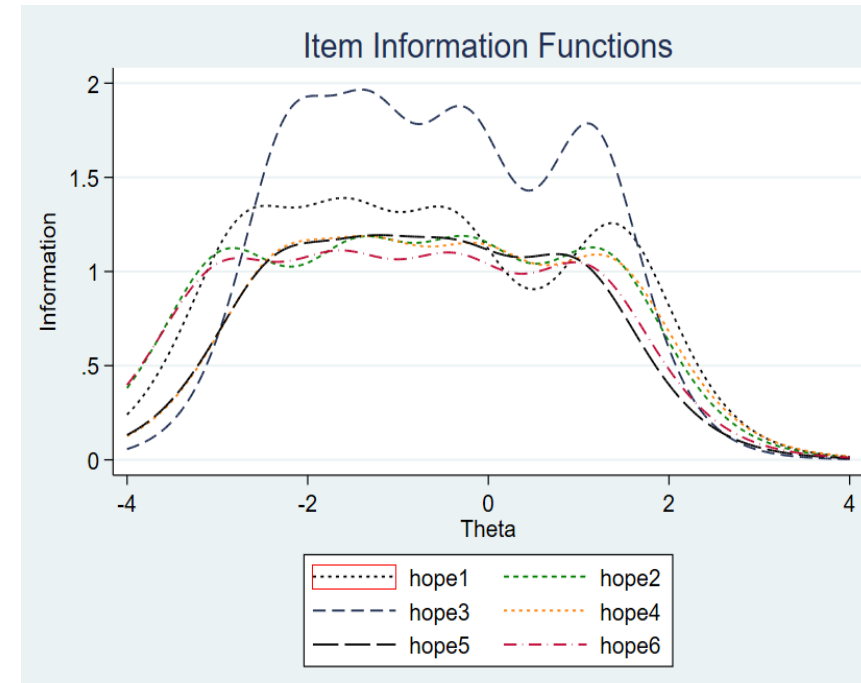
Children's Hope

CFA Results

Items	Original	Final
<i>Loadings for Each Item</i>		
1. doing pretty well	.72	.71
2. can think of ways to get things in life	.76	.68
3. as well as other kids	.70	.78
4. can come up ways to solve problems	.69	.67
5. past will help future	.69	.66
6. find ways to solve problem but not quit	.67	
<i>Model fit index</i>		
χ^2	25.64	7.40
df	9	5
p-value	0.002	0.19
RMSEA	0.09	0.05
CFI	0.97	0.99
TLI	0.95	0.99
SRMR	0.04	0.02
AIC	3459	2927
Reliability	.85	.84
r with stress	-.31***	-.34***

***p < .001

IRT Results



Children's Hope

Measurement invariance

Model Fit Using Models 5 to Test Gender and Time Invariance of Children's Hope Scale

Parameters	Configural	Weak	Strong	Strict
Gender invariance				
<i>Model fit index</i>				
χ^2	11.11	19.19	42.43	
<i>Df</i>	9	13	17	
p-value	.27	.12	.001	
RMSEA	.05	.09	.15	
CFI	1.00	.98	.92	
TLI	.99	.97	.90	
SRMR	.03	.10	.14	
<i>Test for Model Comparison (p-value)</i>				
Configural	–	.09	<.001	
Weak	–	–		
Time Invariance				
<i>Model fit index</i>				
χ^2	15.51	19.33	23.94	35.87
<i>Df</i>	10	14	17	22
p-value	.11	.15	.12	.03
RMSEA	.05	.05	.05	.07
CFI	.99	.99	.99	.98
TLI	.98	.99	.99	.98
SRMR	.02	.05	.05	.09
<i>χ^2 Difference Test for Model Comparison (p-value)</i>				
Configural	–	.43	–	–
Weak	–	–	.20	–
Strong	–	–	–	.04

Note: $N = 236$. Model 5 = item 6 was eliminated. For gender invariance, item 1 was correlated to item 3 for boys. For time invariance, item 1 was correlated to Item 3 at time 2.

RMSEA = root mean square error of approximation; CFI = Comparative Fit Index;

TLI = Tucker-Lewis Index; SRMR = standardized root mean square residual.

Stress



Pediatric Psychological Stress

Main Idea

Both eight-item & four-item PPSM scales are valid for use with Latino immigrant youth across different levels of acculturation.

However, the four-item PPSM is preferred for several reasons:

Pediatric Psychological Stress

Details: CFA

<i>Item</i>	<i>Factor Loadings</i>	<i>SE</i>	<i>p-value</i>
I felt stressed (PPSM-8/PPSM-4).	.78/.79	.03/.03	<.001
I felt that my problems kept piling up (PPSM-8/ PPSM-4).	.85/.89	.02/.02	<.001
I felt overwhelmed (PPSM-8/PPSM-4).	.84/.85	.03/.03	<.001
I felt unable to manage things in my life (PPSM-8/ PPSM-4).	.84/.80	.02/.03	<.001
Everything bothered me (PPSM-8).	.75	.03	<.001
I felt under pressure (PPSM-8).	.78	.03	<.001
I had trouble concentrating (PPSM-8).	.73	.03	<.001
I felt I had too much going on (PPSM-8).	.79	.03	<.001
<i>Confirmatory factor model fit</i>	<i>PPSM-8</i>	<i>PPSM-4</i>	
χ^2 (df)	31.75* (20)	1.52 (2)	-
CFI/FLI	.98/.98	1.00/1.00	-
RMSEA	.05	.00	-
SRMR	.02	.00	-
AIC	5567.18	2861.63	

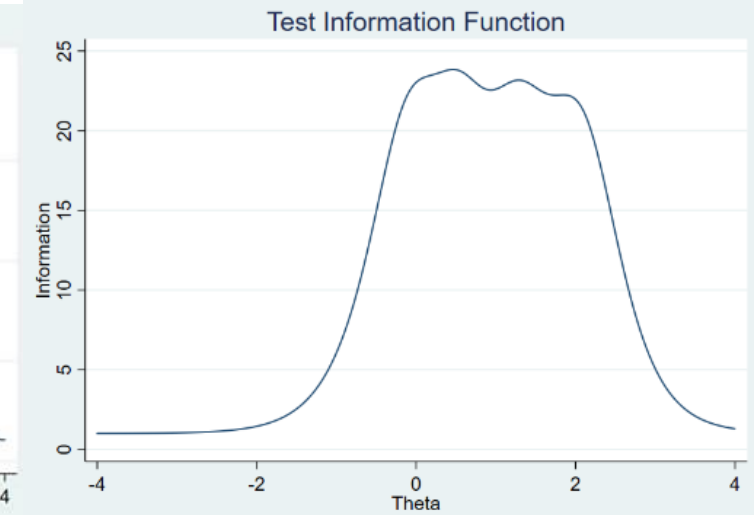
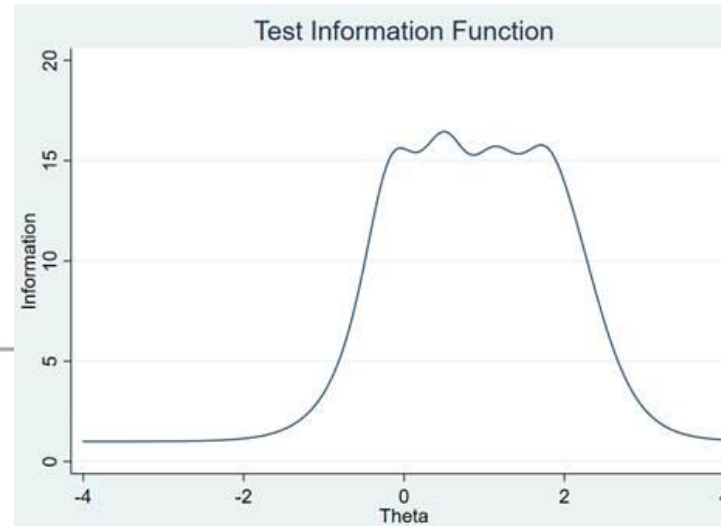
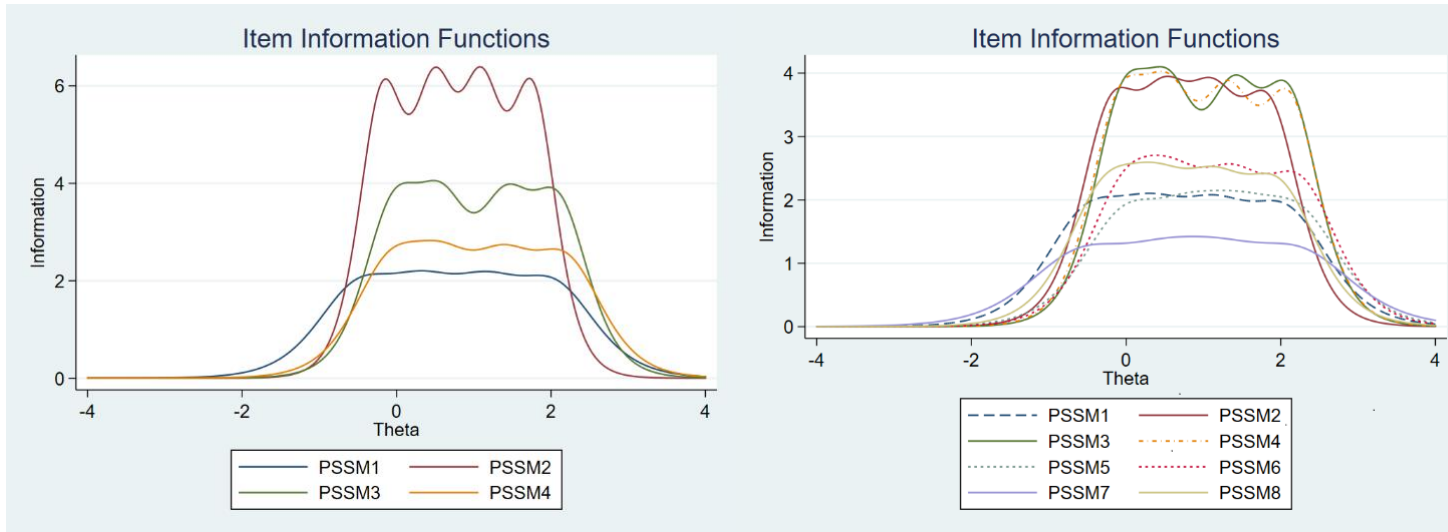
Pediatric Psychological Stress

Details: Invariance

<i>Model</i>	χ^2 (<i>df</i>)	<i>CFI/TLI</i>	<i>RMSEA</i>	<i>SRMR</i>	<i>p-value</i> (χ^2 -diff test)
Eight-item PPSM					
Configural Invariance	55.57 (40)	.98/.98	.05	.03	-
Weak Factorial Invariance	63.71 (47)	.98/.98	.05	.04	.41
Strong Factorial Invariance	80.37*(54)	.97/.97	.06	.04	<.01
Strict Factorial Invariance	85.92*(62)	.98/.98	.05	.05	<.01
Four-item PPSM					
Configural Invariance	2.84 (4)	1.00/1.00	.00	.01	
Weak Factorial Invariance	6.03 (7)	1.00/1.00	.00	.03	.31
Strong Factorial Invariance	7.93 (10)	1.00/1.00	.00	.03	.60
Strict Factorial Invariance	10.56 (14)	1.00/1.00	.00	.03	.61

Pediatric Psychological Stress

Details: IRT



Caring & Character



Positive Youth Development: Caring &

Main Idea

Character

Caring:

- The 9 item scale does not work well.
- A 4 item scale does work well with CFA and Measurement invariance.
- But IRT shows that it only works best for those with low hope and the items are mostly redundant.

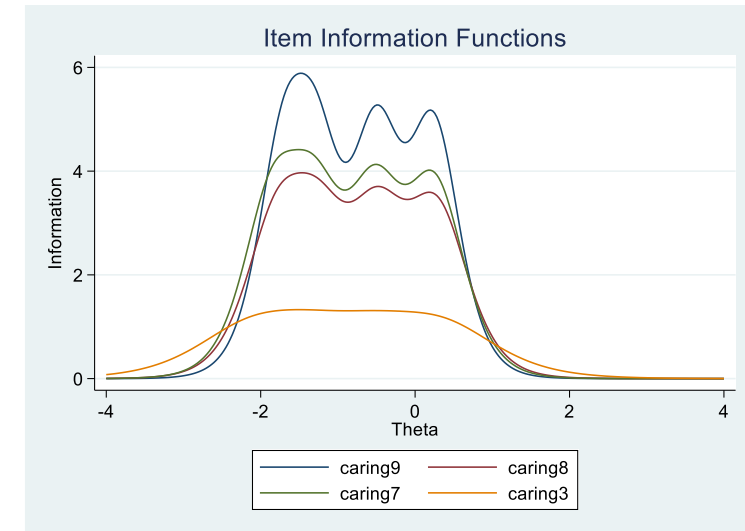
Character:

- Two Subscales work with only a few dropped items.
- Measurement Invariance across time
- IRT shows some unique information but mostly redundant.

Positive Youth Development: Caring

Details

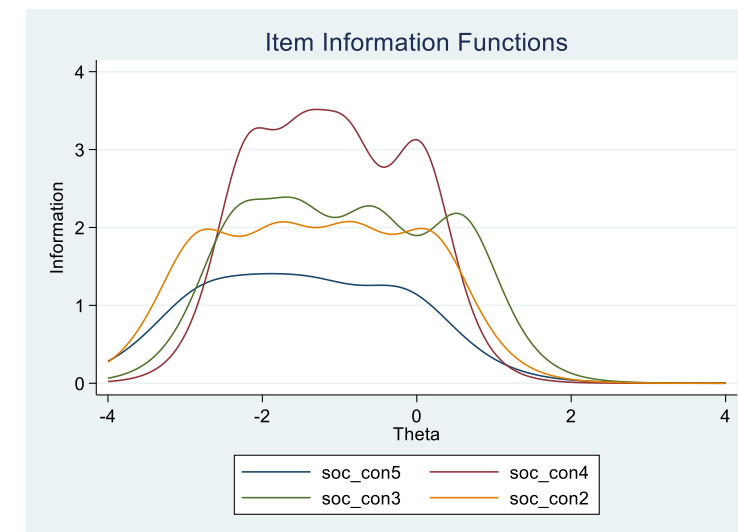
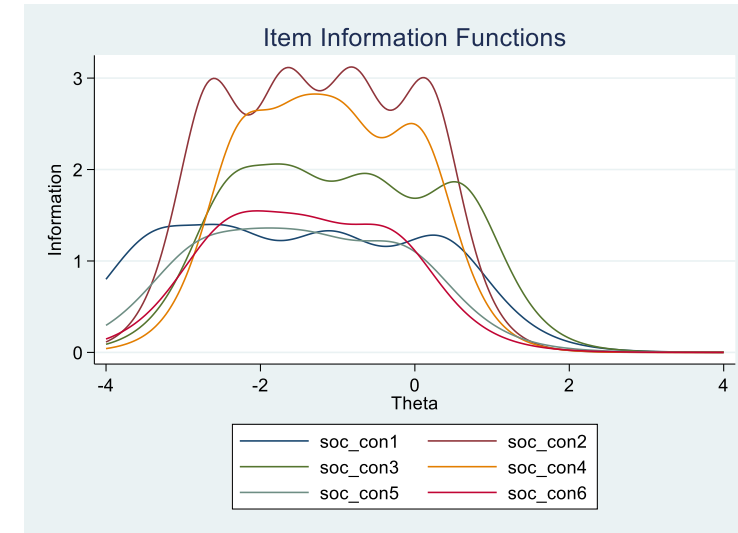
Items	Time 1			Time 2		
	Loading	SE	p-value	Loading	SE	p-value
1. It bothers me when bad things happen to good people.	.71	.05	.00	.70	.70	.00
2. When I see someone being picked on, I feel sorry for them.	.84	.04	.00	.88	.88	.00
3. It makes me sad to see a person who doesn't have friends.	.80	.04	.00	.83	.83	.00
4. When I see another person who is hurt or upset, I feel sorry for them.	.81	.05	.00	.89	.03	.00



Positive Youth Development: Social

Details Conscience

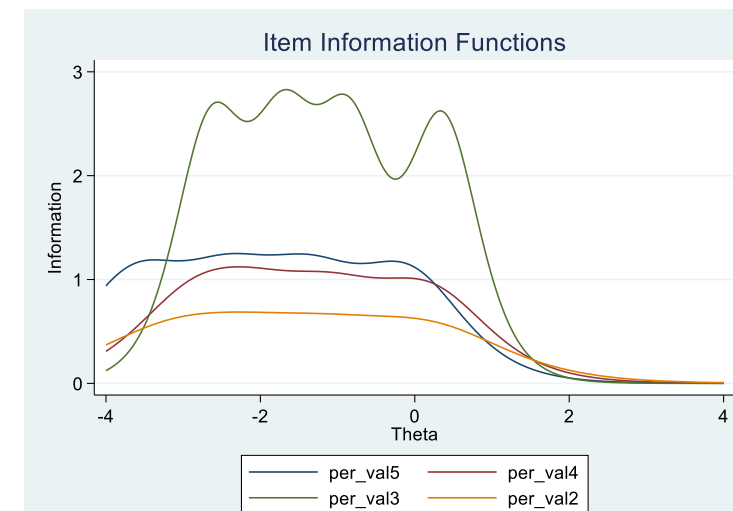
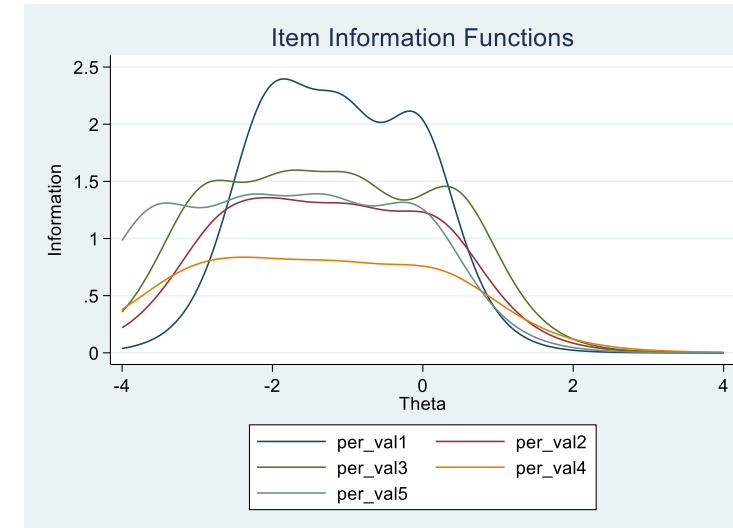
Label	Time 1			Time 2		
	Loading	SE	p	Loading	SE	p
Helping to make the world a better place to live in	0.79	0.03	0	0.82	0.04	0
Giving time and money to make life better for other people	0.73	0.06	0	0.75	0.04	0
Helping to reduce hunger and poverty in the world	0.84	0.04	0	0.88	0.03	0
Helping to make sure all people are treated fairly	0.67	0.04	0	0.68	0.04	0



Positive Youth Development: Personal

Details values

Label	Time 1			Time 2		
	Loading	SE	p	Loading	SE	p
Standing up for what I believe, even when it's unpopular to do	0.58	0.06	0	0.63	0.06	0
Telling the truth, even when it's not easy	0.8	0.04	0	0.76	0.05	0
Accepting responsibility for my actions when I make a mistake or get in trouble	0.72	0.04	0	0.75	0.05	0
Doing my best, even when I have a job I don't like	0.73	0.04	0	0.7	0.04	0



Positive Youth Development: Invariance

Details

Model	χ^2 (df)	CFI	RMSEA	DIFF TEST (p value)
Caring				
Configural model	1.085 (4)	1	0.045	
Metric model	4.756 (7)	1	0.065	4.80 (.19)
Scalar model	8.768 (10)	1	0.067	4.76 (.19)
Social conscience				
Configural model	1.156 (4)	1	0.048	
Metric model	3.149 (7)	1	0.043	1.97 (.58)
Scalar model	3.891 (10)	1	0.000	0.43 (.93)
Personal Values				
Configural model	5.073 (4)	0.997	0.113	
Metric model	6.176 (7)	1	0.077	1.10 (.78)
Scalar model	8.581 (10)	1	0.066	2.33 (.51)

Positive Youth Development: Criterion

Details Validity

	ATOD Attitudes				Leadership				School Attachment			
	B	SE	z	p	B	SE	z	p	B	SE	z	p
Caring	-0.15	0.05	-2.90	0.004	0.23	0.06	3.79	0.000	0.15	0.06	2.43	0.015
Social Conscience	-0.22	0.06	-3.87	0.000	0.25	0.07	3.89	0.000	0.12	0.08	1.51	0.131
Personal Values	-0.27	0.09	-3.16	0.002	0.42	0.08	5.01	0.000	0.33	0.09	3.63	0.000