

Psychometric Properties of the Tampa Scale for Kinesiophobia (TSK-11)

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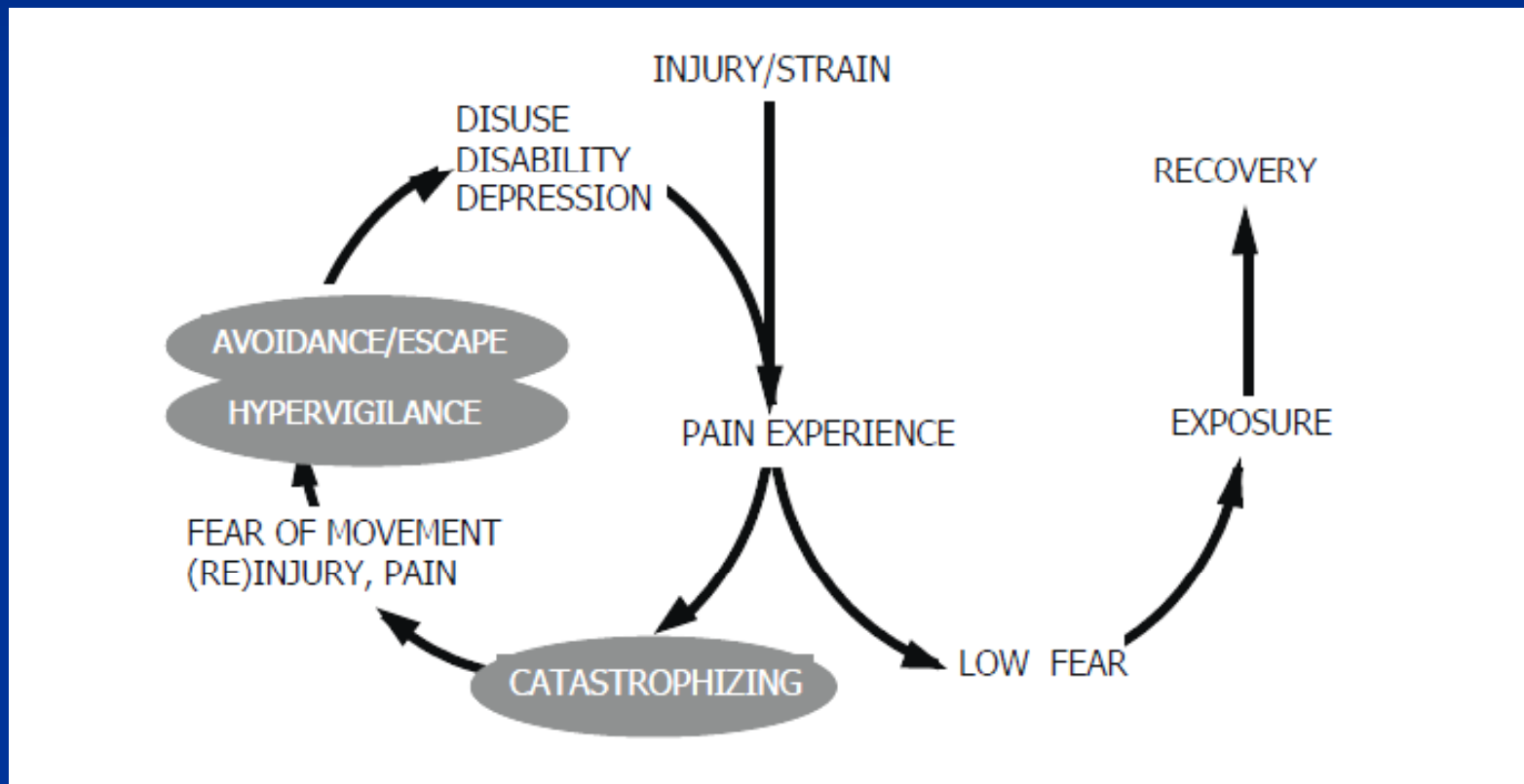
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Overview

- Fear Avoidance Model
- Review of TSK Literature
- CFA of TSK
- Reliability
- Validity
- Conclusions

Fear Avoidance Model (Vlaeyen & Linton, 2000)

(See also Asmundson, Norton, & Vlaeyen, 2004)



Tampa Scale for Kinesiophobia (TSK)

- “Fear of Movement Related to Painful (Re)Injury” (Kori et al., 1990)
- TSK-17 items (Kori et al., 1990)
 - 4-point Likert scale “strongly disagree” to “strongly agree”
 - Contained 4 reverse scored items
- TSK-DV (Vlaeyen et al., 1995)
 - Translated into Dutch but inexplicably reordered the items
 - EFA 4 Factor Model – internal consistency reliabilities of total scale and subscales were poor and intercorrelations among the factors were low

Tampa Scale for Kinesiophobia (TSK)

- Clark et al. (1996) using original version, 4 reverse scored items had small correlations with total score
 - EFA 2 Factor Model: "Pathological" Somatic Focus, Activity Avoidance (TSK-13)
 - Confirmed using original (Geisser et al., 2000) and Dutch Versions (Goubert et al., 2004; Roelofs et al., 2004)
- TSK-12 items (Cohen et al., 2003)
 - Gironde et al. (2003) CFA 2 Factor Model (unpublished abstract)
- Woby et al. (2005)
 - Used Dutch reordering translated back to English
 - Removed 6 of the 17 items due to poor psychometrics
 - CFA TSK-11 2 Factor Model using Dutch reordering in Dutch, Swedish, and Canadian samples (Roelofs et al. 2007)

Aims

- To study the psychometric properties of the TSK using the original version predominantly used in North America
- To test three competing two-factor models: 13-item (Clark et al. 1996), 12-item (Cohen et al. 2003), and 11-item (Woby et al. 2006) to identify the best fitting factor structure
- To evaluate internal consistency reliability, construct, concurrent, and predictive validity of the items making up the best fitting factor structure

Procedure

- Study approved by Behavioral Research Ethics Board (University of Saskatchewan)
- Participants entered treatment at a multidisciplinary pain centre in Saskatoon
- Informed Consent Obtained
- Participants completed questionnaire package including TSK-13 prior to treatment
- Data screened to ensure CFA assumptions met
- EQS 6.1 software (Bentler & Wu, 2005)
 - CFA and Post-hoc model fitting

Participants

- n = 276
- Mean age: 47.76 years (12.35)
- 65% female
- Mean Pain Duration: 8.5 years (11.73)
- Pain Type: 78% musculoskeletal, 12% neuropathic, 5% headache, 4% abdominal/pelvic, 1% other
- Education: 22% University, 42% Trade, 28% High School, 8% < High School

Measures

- Tampa Scale for Kinesiophobia (TSK-13)
 - Original item order (Clark et al., 1996)
- Chronic Pain Acceptance Questionnaire
- Multidimensional Pain Inventory (Pain Severity, Interference)
- Beck Depression Inventory-II
- 1-Minute Sit to Stand
- 1-Minute Stair Climb

TSK-13 (Clark et al., 1996)

■ Somatic Focus Factor (5 items)

1. People aren't taking my medical condition seriously enough
2. My body is telling me I have something dangerously wrong.
3. My condition has put my body at risk for the rest of my life
7. I wouldn't have this much pain if there weren't something potentially dangerous going on in my body.
8. Pain always means I have injured my body.

■ Activity Avoidance Factor (8 items)

4. *I am afraid that I might injure myself accidentally.
5. If I were to try to overcome it, my pain would increase.
6. Simply being careful that I do not make any unnecessary movements is the safest thing I can do to prevent my pain from worsening.
9. Pain let's me know when to stop exercising so that I don't injure myself.
10. *It's really not safe for a person with a condition like mine to be physically active.
11. I'm afraid that I might injure myself if I exercise.
12. I can't do all the things normal people do because it's too easy for me to get injured.
13. No one should have to exercise when she/he is in pain.

Table 1. Goodness-of-fit statistics of TSK models

Model	χ^2	df	CFI	RMSEA	90% RMSEA CI	SRMR
1. 13 items (Clark et al., 1996)	170.25	64	.89	.08	.06, .09	.07
2. 12 items (Cohen et al., 2003)	161.66	53	.89	.09	.07, .10	.07
3. 11 items (Woby et al., 2005)	113.50	43	.90	.08	.06, .09	.06

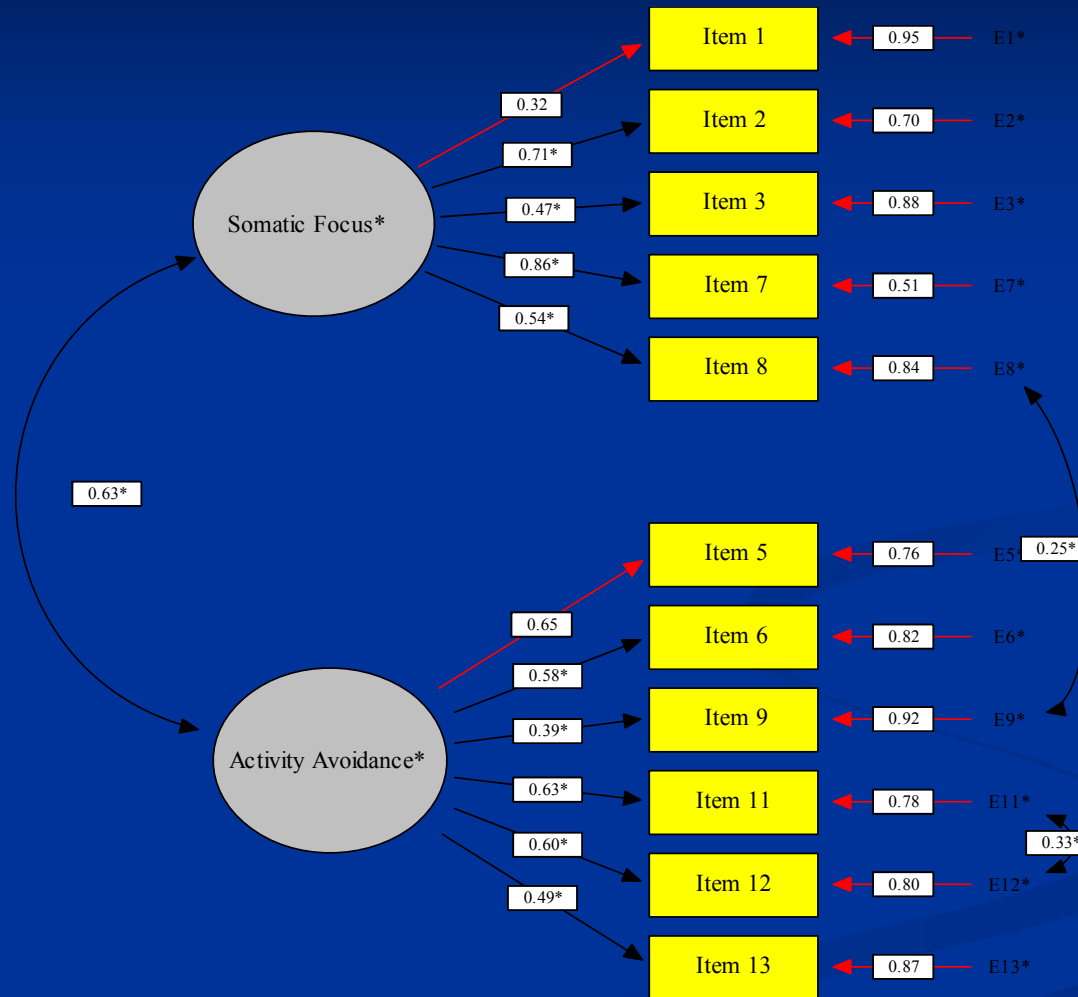
χ^2 = chi-square likelihood ratio statistic; CFI = comparative fit index;
RMSEA = root mean square error of approximation;
CI = confidence interval; SRMR = standard root mean squared residual

Table 2. Goodness-of-fit and comparative statistics of the TSK-11 models

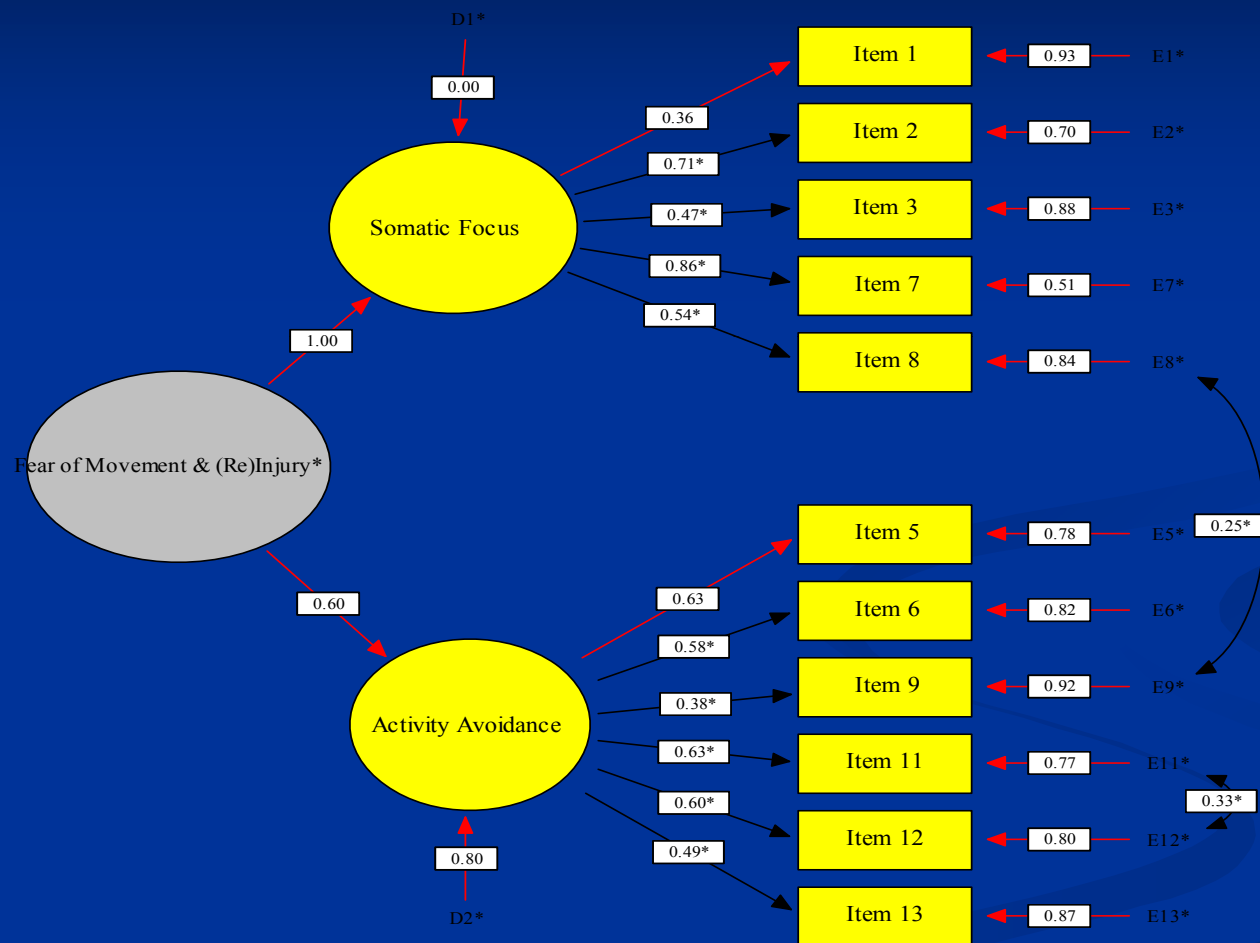
Model	χ^2	df	$\Delta\chi^2$	Δdf	CFI	RMSEA	90% RMSEA CI	SRMR
1. TSK-11	113.50	43	-----	----	.90	.08	.06, .09	.06
2. Correlated error (items 11 & 12)	95.23	42	18.27***	1	.93	.07	.05, .09	.05
3. Correlated error (items 8 & 9)	80.18	41	33.32	2	.95	.06	.04, .08	.05

χ^2 = chi-square likelihood ratio statistic; CFI = comparative fit index; RMSEA = root mean square error of approximation; CI = confidence interval; SRMR = standard root mean squared residual

Two Factor Model TSK-11



2nd Order Equivalent Model TSK-11



Reliability

- Internal Consistency

Item-Total Correlations

TSK-11 $r = 0.28 - r = 0.61$ (mean $r = 0.46$)

TSK-11-SF $r = 0.30 - r = 0.64$ (mean $r = 0.48$)

TSK-11-AA $r = 0.35 - r = 0.61$ (mean $r = 0.58$)

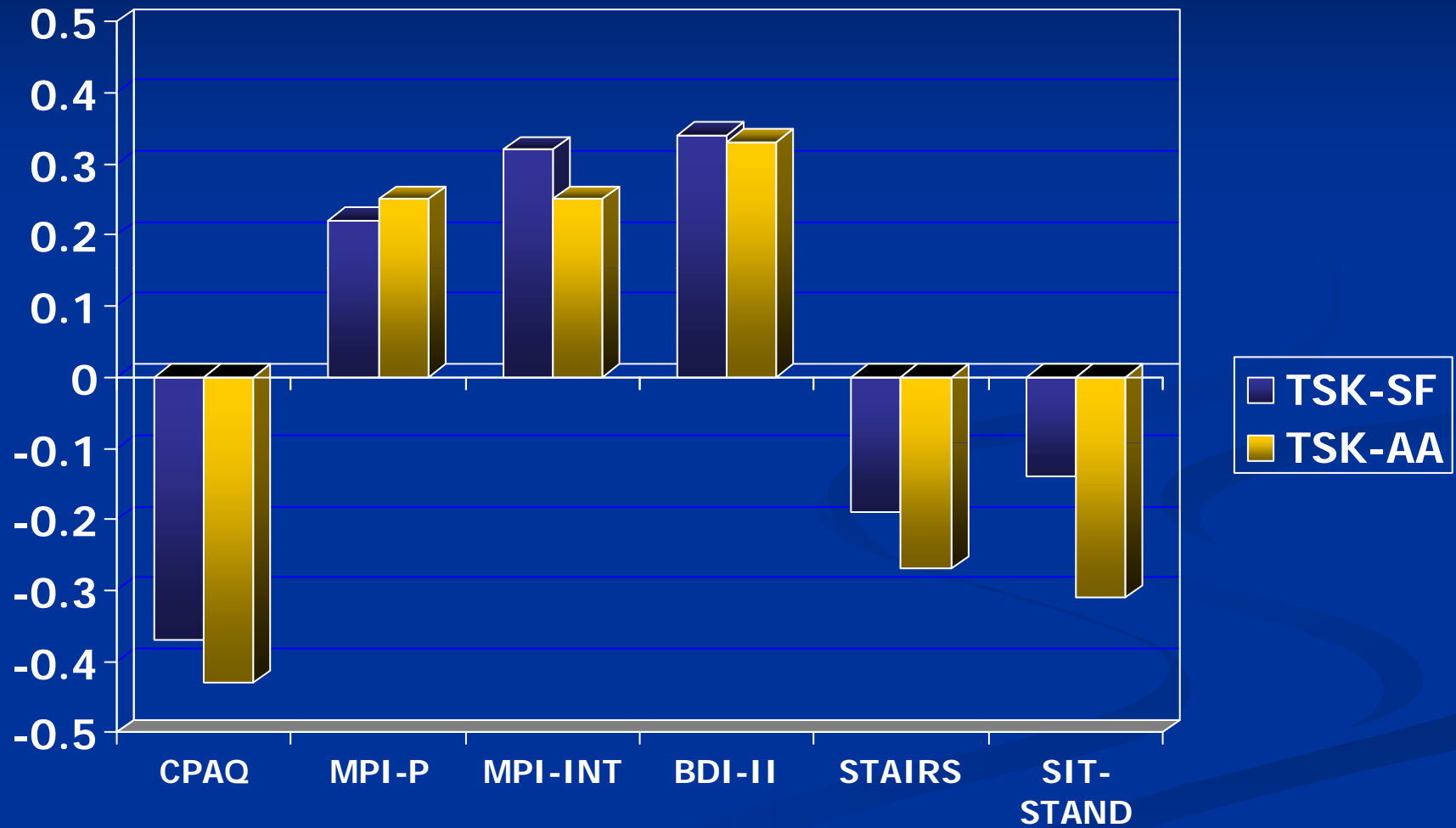
Cronbach's Alpha

TSK-11 $\alpha = 0.80$

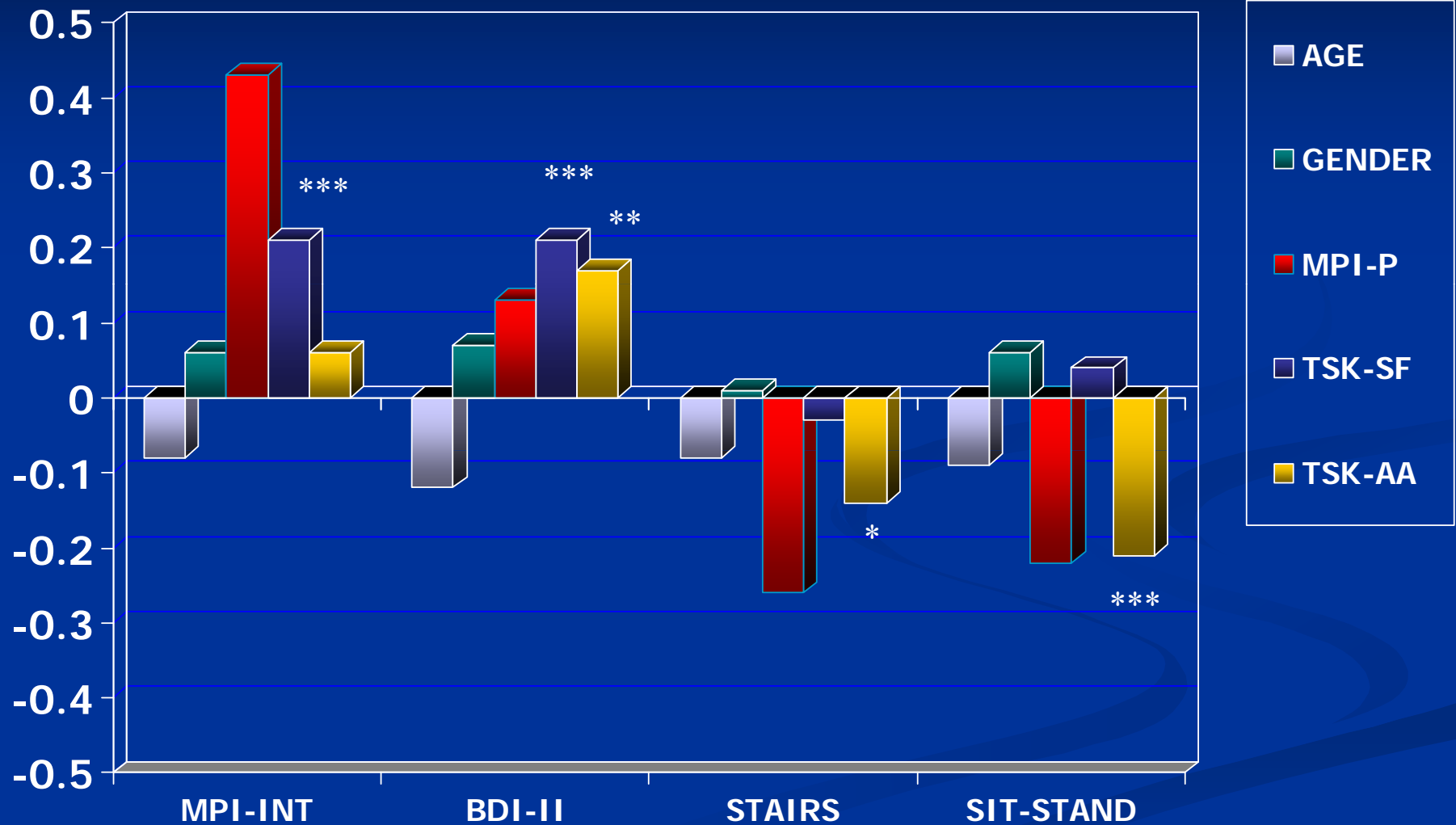
TSK-11-SF $\alpha = 0.71$

TSK-11-AA $\alpha = 0.75$

Validity: Correlations Among Study Measures



Hierarchical Multiple Regression: Partial Correlations



*** $p \leq 0.001$, ** $p \leq 0.01$, * $p \leq 0.05$

Conclusions

- TSK-11 was the best fitting 2 factor structure among three competing models
- The TSK-11 factors demonstrated adequate internal consistency and modest but significant levels of construct, concurrent, and predictive validity
- TSK-11 2 factor model appears to be adequate whether using the original ordering of items or the reordering consistent with the Dutch version
- TSK-11-SF was a stronger predictor of perceived pain-related interference and depression, while TSK-11-AA was a stronger predictor of actual physical performance

Conclusions

- The moderate correlation between the TSK-11-AA and TSK-11-SF scales suggests that they may be measuring somewhat divergent constructs
- However, the internal consistency reliabilities for the total scale remain adequate and clinicians and researchers may choose to continue using the total score on this basis
- The modest relationships among TSK-11 scales and measures of perceived disability and performance suggests that other psychosocial predictors be studied to provide a more complete understanding of the chronic pain experience