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Amanda Pallija
University of Dayton

Brian Bohman
University of Dayton

Paige Prenger
University of Dayton

Emely Richardson
University of Dayton

Joaquin Barrios
University of Dayton

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An Item-to-Total Analysis of the Foot Posture Index

Amanda Pallija SPT, Brian Bohman SPT, Paige Prenger SPT, Emely Richardson SPT, Joaquin Barrios, PT, DPT, PhD

Introduction

The Foot Posture Index (FPI) is a screening tool used by clinicians to assess if the foot is pronated, neutral or supinated³. It is intended to quantify foot position by assigning positive values to pronated attributes and negative values to supinated attributes³. Three hindfoot and 3 forefoot attributes are scored. Although the FPI is valid and reliable, individual component scores may skew the composite score.¹ Therefore, there lies a need to investigate the internal consistency of the FPI.

Purpose

The purposes of this study were to test the association of the FPI to sitting Arch Height Index (AHI), and to assess the internal consistency of the individual items on the FPI in healthy people who self-identify as having high arches.

Hypothesis

We hypothesized moderately strong correlations would be observed between the FPI and sitting AHI, as well as for the individual FPI to the composite FPI score. We expected weaker correlations would be observed between the individual items of the hindfoot and forefoot segments of the FPI.

Subjects

A total of 20 subjects participated in this study. All subjects were healthy females aged 19-26 who self-identified as having high arches. When sitting AHI was measured, subjects had an average score of 0.402 (referencing Powell et al., 0.377 identifies an individual as having high arches.)²

	Age	Height (cm)	Weight (kg)	BMI (kg/m ²)	Sitting AHI
Mean	22.9	164.25	62.03	23.12	0.402
SD	1.77	6.86	6.90	2.81	0.021

Methods

Sitting AHI and FPI were assessed by the same researcher. The right foot was examined. The six FPI sub-scores were totaled to determine if the foot was in pronation or supination. Pearson's correlations were used to related AHI to FPI, and Spearman's correlations were used to test the item-to-total relationships in SPSS.

	FACTOR	PLANE	SCORE 1	
			Left -2 to +2	Right -2 to +2
Rearfoot	Talar head palpation	Transverse		
	Curves above and below the lateral malleolus	Frontal/ transverse		
	Inversion/eversion of the calcaneus	Frontal		
Forefoot	Prominence in the region of the TNJ	Transverse		
	Congruence of the medial longitudinal arch	Sagittal		
	Abd/adduction forefoot on rearfoot	Transverse		
TOTAL				

Figure 1: FPI Score Sheet

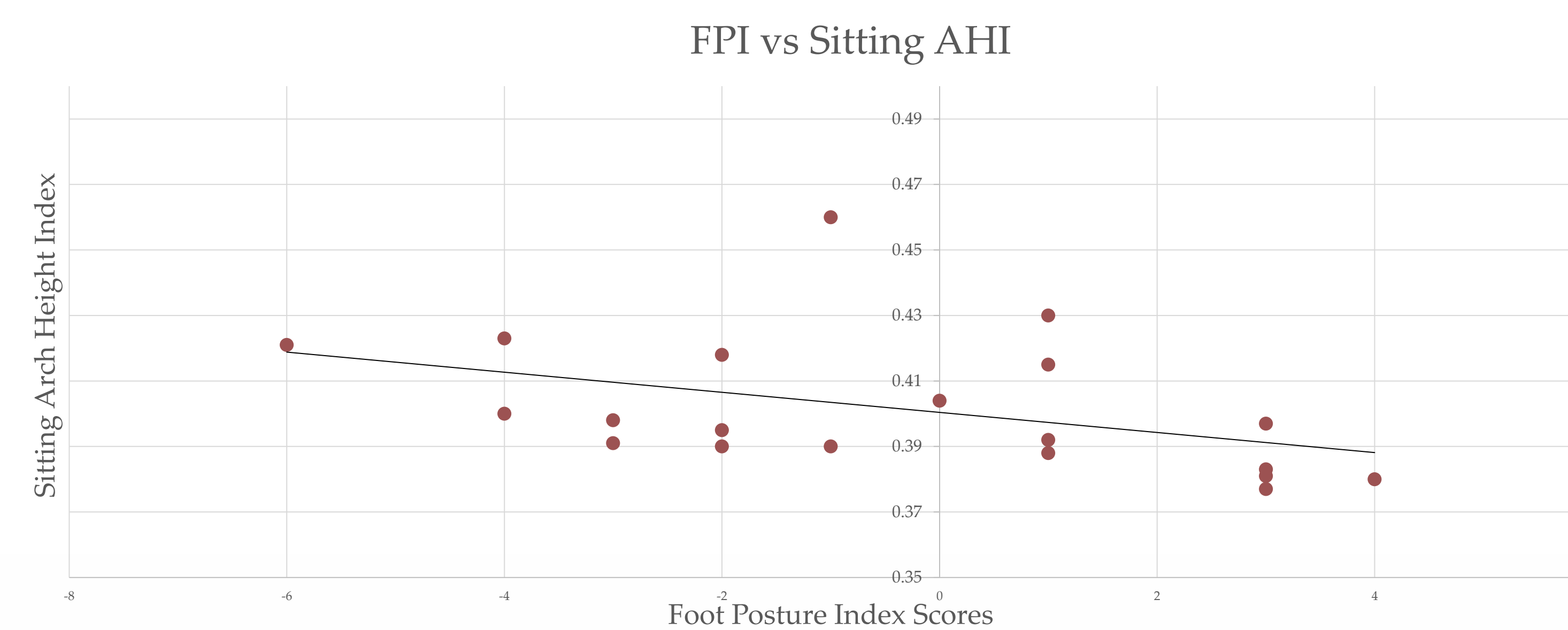


Figure 2. Subjects Foot Posture Index Score vs. Sitting Arch Height Index

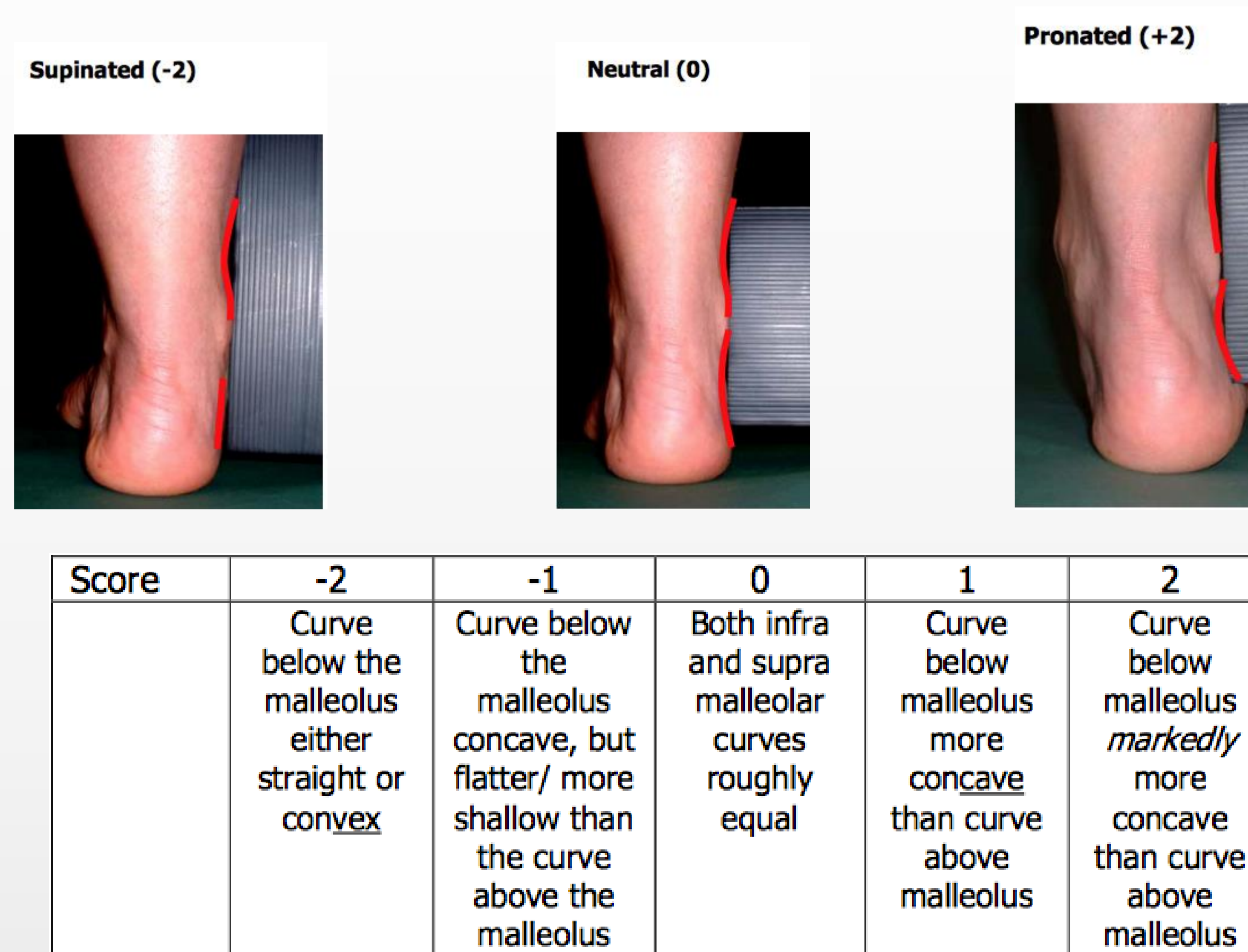


Figure 3. Item two: Supra and infra lateral malleolar curvature

	Talar Head Position	Supra and Infra Lateral Malleolar Curvature	Inversion/Eversion of the Calcaneus	Prominence in the Region of the TNJ	Congruence of the Medial Longitudinal Arch	Abd/adduction Forefoot on Rearfoot
P-value	0.013	0.699	0.255	0.585	0.162	0.007
R-value	0.543	-0.092	0.267	0.13	0.325	0.584

Figure 4. Item to Total-Item Correlations of Foot Posture Index Items

Results

The average total score on the FPI for the 20 subjects was -0.4. Supra and infra lateral malleolar curvature did not correlate to the overall total. A significant correlation was found between talar head position and the total FPI score minus that item. A significant correlation was also found between abduction/adduction of the forefoot on rearfoot and the total FPI score minus that item. When looking at the forefoot and hindfoot, prominence in the region of the TNJ is fairly correlated to the abduction/adduction forefoot on rearfoot. This was the only internal correlation found between the forefoot and hindfoot. Supra and infra lateral malleolar curvature was weakly correlated throughout data analyses.

Discussion

Talar head position and abduction/adduction of forefoot on rearfoot had the strongest relationships to foot type. These two items can be considered the most consistent elements of the tool. Due to the weak correlation of curves above and below the lateral malleolus, further investigation is needed to determine if this item should be removed from the FPI and replaced with another forefoot measure. A slightly negative average FPI score identifies subjects as overall having high arches in sitting. However, when relating findings to sitting AHI score, FPI does not consistently identify high arches (Figure 2).

Clinical Relevance

Improving the FPI may allow clinicians to improve the assessment of foot type. More accurate screening could lead to improved patient outcomes in the foot and ankle population.

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