Validation of a Measure of Intention to Stay in Academia for Physician Assistant Faculty

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INTRODUCTION

Physician Assistant (PA) Faculty Retention

- A challenge for PA education and administrators of PA programs[1, 2]
- Importance of the issue
  - High market demand for PAs[3]
  - Growth in PA education
    - From 100 programs in 1996 to 173 programs in 2013[4]
  - Large numbers of faculty new to academia
    - 43.9% of PA faculty in current position for $\leq$ 3 years[5]
- Little is known currently about PA faculty retention

"Intention to Stay" in the Higher Education Literature

- Only a few studies operationalized a similar variable
  - Hagedorn[6] used a 3-item scale for the variable "intent to remain in academe"
  - Buckley et al.[7] and Cranford[8] used a single question to attempt to quantify the variable
  - These studies focused on statistical analyses – correlations and predictions – rather than on "true" measurement

Literature Review Conclusions

- Limitations of existing measurement of intention to stay or leave
  - Inadequacy of a single question to capture a state of mind
  - Lack of predictive validity
  - Lack of proper interval variable measurement
    - Inappropriate mathematical operations on Likert response scale data (e.g., adding ordinal data or treating as a continuous variable)
- Conclusion: no precedent in literature for proper measurement of intention to stay

Measurement of Psychological Constructs

- “Intention to stay in academia” is a psychological construct
  - Cannot be directly measured or perfectly predicted[9]
- Observable indicators identified in construct theory
- Probabilistic inference from discrete observations[10]
- Measurement possible only if an interval structure can be discovered
  - Standard for measurement in the physical sciences

Purpose of this Study

- To validate a newly developed measure of “intention to stay in academia” for PA faculty
  - To determine ***if*** “intention to stay in academia” could be meaningfully measured
  - To develop a stable frame of reference that would assist administrators and PA education leadership in the retention of PA faculty by allowing for inferences regarding PA faculty intention to stay

*Note: “intention to stay in academia” was defined as the anticipation or willingness to continue in an academia role

METHODS

Methodological Framework

- Rasch method
  - Construction of linear scales of additive, equal interval units of measurements from raw scores or observations
  - In other words, ordinal data from individual responses to items that are conceptualized to be indicators of the psychological construct of interest are converted into an interval scale, expressed in units called logits[11]

Methodological Framework, cont.

- Rasch Terminology
  - Person ability [person measure] = estimate (on the logit scale) of the revelation of the construct in a person
    - In this study, higher person measures should reflect more "intention to stay in academia"
  - Item difficulty [item measure] = estimate (on the logit scale) of the revelation of the construct in an item
    - In this study, items that are more difficult to endorse should reflect more "intention to stay in academia"

Validation Framework

- Based on Wolfe and Smith's[12] interpretation of Messick's definition of validity[13]
- Evidence of six different types of validity sought in this investigation in order to make an evaluative judgment about the overall quality and meaningfulness of the developed measure at the conclusion of the research
- Handout provided (if interested)

Instrument Development Steps

- Construct conceptualization
  - Health professions faculty literature review
  - Qualitative investigation of 15 experienced PA faculty
  - Composite conceptualization: 79 potential observable indicators of intention to stay in academia
- Survey development
  - 114 survey items developed and reviewed by 6 expert PA educators for item quality, construct relevance, and difficulty ranking
- Pilot testing
  - Convenience sample of 53 PA faculty from 9 programs
  - 75% response rate
  - Minor adjustments made to survey based on pilot data analysis and participant comments

Methods

- Study approved by the University of Toledo Department for Human Research Protections Social, Behavioral, and Educational Institutional Review Board
- Participants (n=1002)
  - All current PA program faculty with PA credentials
  - Email addresses obtained from the PAEA
- Instrument
  - Developed as described on previous slide
  - 69 items with 4-point Likert response scale of “strongly agree” to “strongly disagree”

Methods, cont.

- Procedures
  - Email invitation contained purpose of research, statement of informed consent, and survey link
  - Survey delivered electronically via SurveyMonkey®
  - 3 reminder emails
- Data Analysis conducted using Winsteps® software[14] using the Rasch Andrich rating scale model

RESULTS

Results

- 48% overall response rate
- Participants representative of entire PA faculty population in terms of age, tenure track status, and gender.
- Rating scale functioned appropriately

Category Label	Observed Count	Average Measure
1, “strongly disagree”	2866	-2.55
2, “disagree”	7086	-0.85
3, “agree”	13632	+0.74
4, “strongly agree”	8117	+2.74

Participant Characteristic	N (percentage)
Male	168 (35%)
Female	294 (61.2%)
Age <40	106 (22%)
Age 40-59	305 (63.5%)
Age ≥60	58 (12%)
Years of Faculty Experience	
0-2	78 (16.2%)
3-10	203 (42.9%)
>10	145 (30.2%)
Tenured	47 (9.8%)
Tenure track	78 (16.2%)
Non-tenure track	334 (69.6%)
Have a doctoral degree	95 (19.8%)
Pursuing or planning to pursue a doctoral degree	195 (40.6%)
Not planning to pursue a doctoral degree	171 (35.6%)

Results, cont.

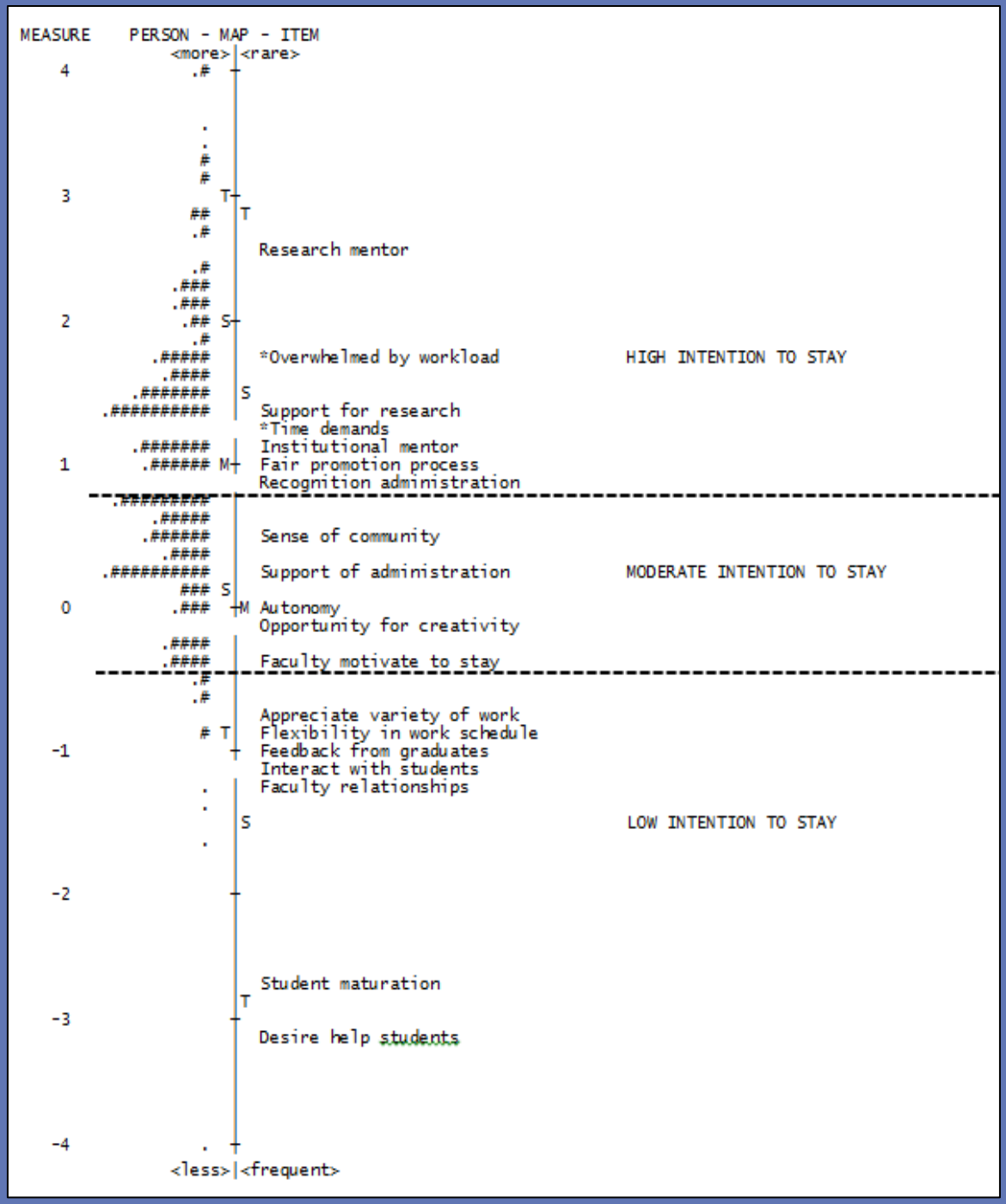
- Internal reliability estimates
  - Person reliability 0.86
  - Item reliability 0.99
- 61 of the 69 items had positive item-measure correlations and appropriate fit statistics
- Person strata index of 3.62
- No differential item functioning (DIF) by doctoral status on 66 items
- Adequate construct coverage
- Actual item hierarchy reflected the theoretical item hierarchy
- Only 36.5% of variance in the data explained by the measure; strength of first contrast 5.2 eigenvalues

19-item Supportive Environment Subscale

- Explained 53.2% of the variance in the data (strength of the first contrast was <3.0 eigenvalues)
- Item hierarchy represented a spectrum of support for PA faculty contained within an academic environment and consisted of 4 clusters of items: relationships, autonomy, institutional support, workload
- Stats
  - Person reliability 0.80
  - Item reliability 1.00
  - Person strata index 3.0
  - All fit indices <1.4
  - No statistically significant DIF by faculty characteristic

Supportive Environment subscale items

Item #	Item Label	Cluster
17	Faculty relationships	Relationships
18	Faculty motivate to stay	Relationships
24	Desire help students	Relationships
25	Student maturation	Relationships
48	Interact with students	Relationships
51	Feedback from graduates	Relationships
46	Opportunity for creativity	Autonomy
36	Autonomy	Autonomy
67	Appreciate variety of work	Autonomy
68	Flexibility in work schedule	Autonomy
28	Recognition administration	Institutional support
41	Sense of community	Institutional support
43	Fair promotion process	Institutional support
12	Institutional mentor	Institutional support
56	Support of administration	Institutional support
29	Support for research	Workload
30	*Time demands	Workload
33	*Overwhelmed by workload	Workload
14	Research mentor	Workload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3
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T
S
M
Research mentor
*Overwhelmed by workload
HIGH INTENTION TO STAY
Support for research
*Time demands
Institutional mentor
Fair promotion process
Recognition administration
Sense of community
Support of administration
MODERATE INTENTION TO STAY
Autonomy
Opportunity for creativity
Faculty motivate to stay
Appreciate variety of work
Flexibility in work schedule
Feedback from graduates
Interact with students
Faculty relationships
LOW INTENTION TO STAY
Student maturation
Desire help students

CONCLUSIONS

General Conclusions

- The construct of “intention to stay in academia” is measurable.
- The 19-item Supportive Environment subscale represents the best (so far) possible set of items that could be extracted from the developed instrument to capture PA faculty “intention to stay in academia.”
- Additional theoretical and empirical work is needed to improve the structural and substantive validity of the larger measure.

Implications for PA administrators

- In an effort to retain PA faculty, administrators need to cultivate the types of environments and experiences that support an intention to stay in academia.
  - Relationships (other faculty, students, graduates)
  - Autonomy
  - *Institutional support
  - Workload

Study Limitations and Delimitations

- Potential for gaps in construct theory
- Potential for non-response bias
- Limited ability to assess external validity
- Unknown if “intention to stay in academia” quantifiable at the onset

Future Research

- Further theoretical work needed
- Future iterations of the instrument
- What about PA faculty who have left academia?
- What about faculty in PA programs who are not PAs?
- Lots of data – open to ideas!

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QUESTIONS?