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**REVOLUTION**

2009 AACP Annual Meeting and Seminars

**July 18–22 • Boston**

Westin Boston Waterfront Hotel

American Association of  
Colleges of Pharmacy

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**AACP**

# Touro University College of Pharmacy Triple Jump Examination (TJE)



# Need for TJE

TU-COP has novel 2+2 curriculum

2 years of classroom training and Introductory Pharmacy Practice Experience (IPPEs)

2 years of Advanced Pharmacy Practice Experiences (APPEs)

TU-COP Students begin APPE after 2 years of foundational studies (3 years at most COPs)

No established national benchmark examination (e.g., COMLEX-1 or USMLE-1)



# Goal Behind TJE

Create a Progress examination to:

Inform students early on about weaknesses that may not be captured in traditional course grades

Assess students' readiness for advanced pharmacy practice experiences (APPEs)

Communication

Thinking

Attitudes

Decision Making

# TJE Format

## 1) Closed Book Case-Base Written Exam

Short Answer

90 minutes

## 2) Open Book Case-Based Written Exam

Short Answer

180 minutes

## 3) OSCE

2 patient actor cases (Yes/No)

30 Minutes per case (60 minutes total)

TJE Administered at end of four classroom semesters



# TJE Broad Competencies

## 1) Closed Book Exam

Ability to analyze a case and integrate knowledge  
Written communication skills

## 2) Open Book Exam (more complex)

Research (books, internet) and  
problem solving skills

Ability to organize and communicate information

## 3) OSCE

Integration of Knowledge

Communication and Professionalism



# TJE Grading Criteria

## Closed and Open Book Sessions

- 1) Knowledge and comprehension
- 2) Analysis and synthesis
- 3) Organization and clarity

## OSCEs

- 1) Knowledge and comprehension
- 2) Professionalism
- 3) Communication



# TJE Grading Performance

- 1) Insufficient
- 2) Approaching proficient
- 3) Proficient
- 4) Outstanding

“Proficient” level that should be attained *toward the end* of APPE rotations.

Passing=2.5 or above (half-way between approaching proficient and proficient).



# Sample TJE Report Card

## Touro College of Pharmacy TJE Assesment

For technical support contact  
mitchell.barnett@touro.edu

### Student

Student ID  Last Name  First Name  MI  Class of

	Fall #1		Spring #1		Fall #2		Spring #2	
	Closed	Open	Closed	Open	Closed	Open	Closed	Open
<b>Track 1</b>								
Knowledge and Comprehension	<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="3"/>
Analysis and Synthesis	<input type="text" value="2"/>	<input type="text" value="3"/>	<input type="text" value="2"/>	<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="4"/>
Organization and Clarity	<input type="text" value="2"/>	<input type="text" value="4"/>	<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="3"/>	<input type="text" value="2"/>	<input type="text" value="3"/>
<b>Track 2</b>								
Knowledge and Comprehension	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="2"/>	<input type="text" value="4"/>	<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="4"/>
Analysis and Synthesis	<input type="text" value="2"/>	<input type="text" value="3"/>	<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="4"/>	<input type="text" value="4"/>	<input type="text" value="4"/>
Organization and Clarity	<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="4"/>	<input type="text" value="4"/>	<input type="text" value="4"/>
<b>Track 3</b>								
Knowledge and Comprehension	<input type="text" value="2"/>	<input type="text" value="1"/>	<input type="text" value="2"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="2"/>
Analysis and Synthesis	<input type="text" value="2"/>	<input type="text" value="1"/>	<input type="text" value="2"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="2"/>	<input type="text" value="3"/>	<input type="text" value="2"/>
Organization and Clarity	<input type="text" value="3"/>	<input type="text" value="1"/>	<input type="text" value="3"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="2"/>
<b>Track 4</b>								
Knowledge and Comprehension	<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="2"/>	<input type="text" value="3"/>	<input type="text" value="2"/>	<input type="text" value="4"/>	<input type="text" value="4"/>
Analysis and Synthesis	<input type="text" value="4"/>	<input type="text" value="2"/>	<input type="text" value="4"/>	<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="4"/>
Organization and Clarity	<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="2"/>	<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="4"/>
Remediation Required (If yes, check box.)	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Remediation Completed (If yes, check box.)	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
<b>OSCE ASSESSMENT</b>								
Knowledge and Comprehension	<input type="text" value="2"/>	<input type="text" value="0"/>	<input type="text" value="3"/>	<input type="text" value="0"/>	<input type="text" value="3"/>	<input type="text" value="0"/>	<input type="text" value="2.5"/>	<input type="text" value="0"/>
Professionalism	<input type="text" value="4"/>	<input type="text" value="0"/>	<input type="text" value="4"/>	<input type="text" value="0"/>	<input type="text" value="4"/>	<input type="text" value="0"/>	<input type="text" value="4"/>	<input type="text" value="0"/>
Communication	<input type="text" value="4"/>	<input type="text" value="0"/>	<input type="text" value="4"/>	<input type="text" value="0"/>	<input type="text" value="4"/>	<input type="text" value="0"/>	<input type="text" value="4"/>	<input type="text" value="0"/>
OSCE Remediation Required, (checkbox.)	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
OSCE Remediation Completed	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
<b>WEIGHTED SEMESTER SCORE</b>	<input type="text" value="2.70"/>		<input type="text" value="2.74"/>		<input type="text" value="2.77"/>		<input type="text" value="2.98"/>	

# TJE Exam Preparation

Clinical Sciences Dept creates closed and open book cases at mid-semester

(patient presentation, complaints, signs & symptoms, laboratory values).

Individual questions for each case are written by each Dept (Biological, Pharmaceutical, Social-Behavioral and Clinical Sciences).

Two OSCEs are created by Clinical Sciences Department for each class (P1 & P2).



# TJE: Formative and Summative

## Early TJEs: Formative

- Informs students of weaknesses

- Indicate need for help (tutoring)

- Less weighty (10-20%), still provides motivation to perform well on TJE

## Cumulative score: Summative

- Students have to achieve the passing score (2.5) in addition to satisfying traditional course requirements to progress to APPE training.



# TJE Cumulative Score Weighting

Cumulative weighted score:

$$CS1 = TJE1 \times 1$$

$$CS2 = [(TJE1 \times 1) + (TJE2 \times 2)] / 3$$

$$CS3 = [(TJE1 \times 1) + (TJE2 \times 2) + (TJE3 \times 3)] / 6$$

$$CS4 = [(TJE1 \times 1) + (TJE2 \times 2) + (TJE3 \times 3) + + (TJE4 \times 4)] / 10$$

Cumulative grade weighted as  
10%, 20%, 30%, 40%=100%



# TJE Scores Class of 2009 (N=63)

<b>Mean ± sd</b>	<b>Sem I</b>	<b>Sem II</b>	<b>Sem III</b>	<b>Sem IV</b>
<b>Closed Book</b>	2.7 ± 0.4	2.4 ± 0.4	2.6 ± 0.5	2.5 ± 0.4
<b>Open Book</b>	2.7 ± 0.4	2.7 ± 0.3	2.9 ± 0.3	3.3 ± 0.3
<b>OSCE</b>	3.2 ± 0.4	3.4 ± 0.3	3.3 ± 0.4	3.4 ± 0.4
<b>TJE Total</b>	2.8 ± 0.3	2.7 ± 0.5	2.9 ± 0.3	3.0 ± 0.2
<b>Weighted TJE</b>	<b>2.8 ± 0.3</b>	<b>2.8 ± 0.2</b>	<b>2.8 ± 0.2</b>	<b>2.9 ± 0.2</b>
<b>Number (%) &lt; 2.5 Weighted</b>	<b>5 (7.9%)</b>	<b>3 (4.8%)</b>	<b>4 (8.3%)</b>	<b>2 (3.2%)</b>



# Class 2009 Average APPE Grade Overall Average and by Site (n=61)

<b>Site (n=324 rotations)</b>	<b>Mean Grade</b>	<b>Standard Deviation</b>
<b>Community Two</b>	<b>96.1</b>	<b>± 4.0</b>
<b>Institutional</b>	<b>94.5</b>	<b>± 6.9</b>
<b>Ambulatory Care One</b>	<b>88.5</b>	<b>± 7.6</b>
<b>Ambulatory Care Two</b>	<b>88.0</b>	<b>±14.2</b>
<b>Acute Care One</b>	<b>92.2</b>	<b>± 9.0</b>
<b>Acute Care Two</b>	<b>95.7</b>	<b>± 3.4</b>
<b>Average</b>	<b>91.6</b>	<b>± 3.8</b>

# TJE Predictive Validity (n=61)

Does TJE measure readiness for rotations?

Correlation of TJE cumulative scores with  
preceptor grades in 3<sup>rd</sup> year (P3) APPEs

$$r = 0.60$$

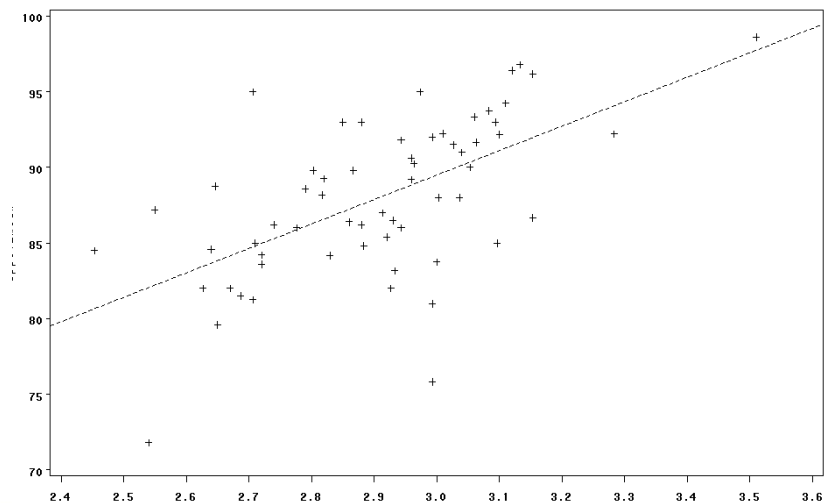
$$r^2 = 0.36$$

$$p < 0.001$$

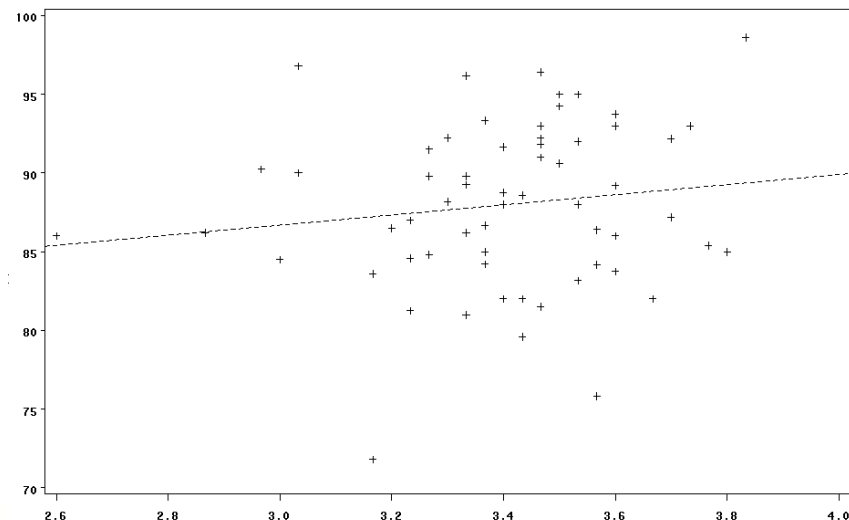


# APPEs and Weighted TJE Components

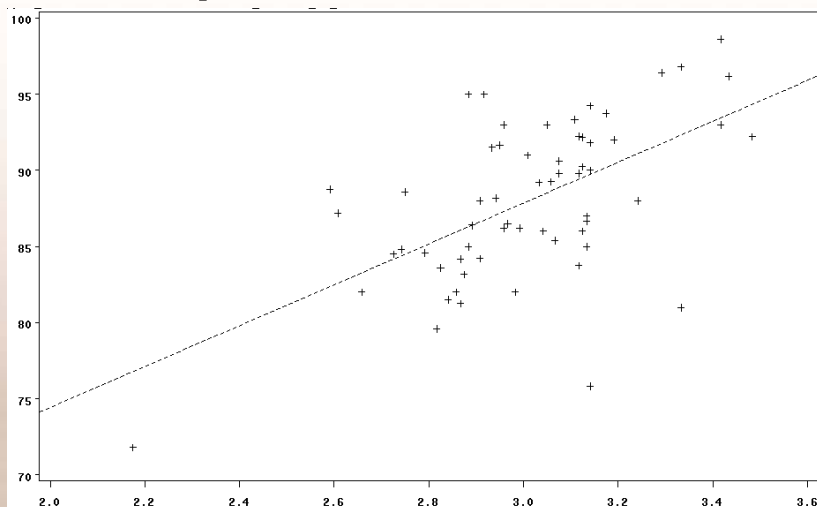
## Cumulative TJE Scores



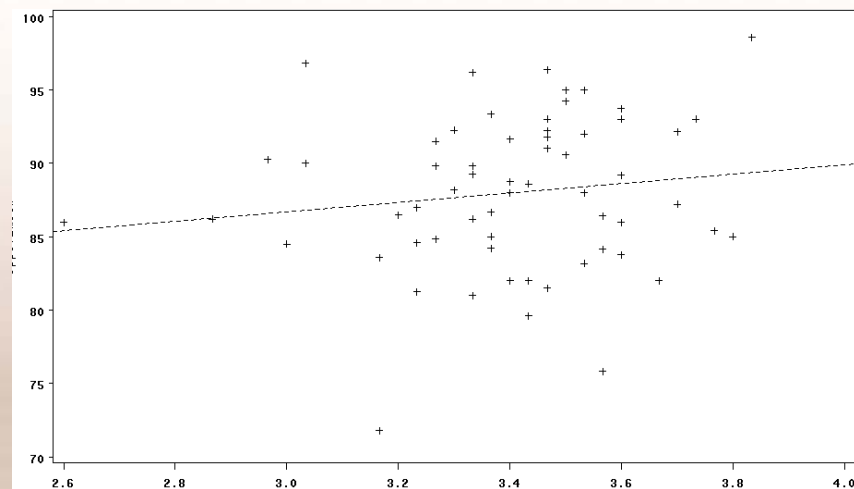
## Closed Book TJE Scores



## Open Book TJE Scores

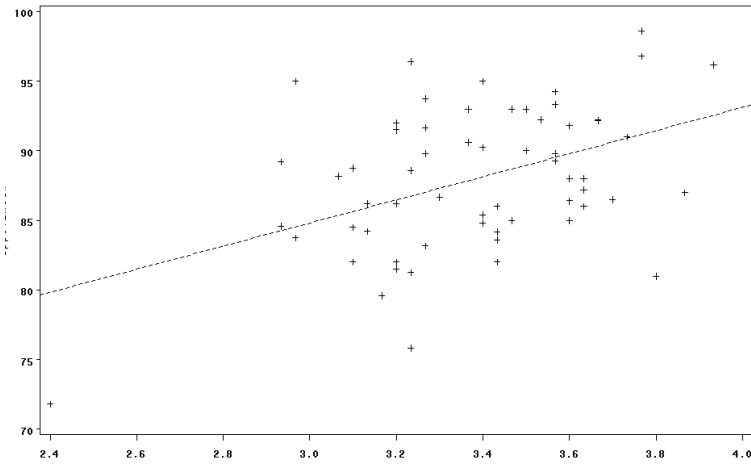


## OSCE TJE Scores

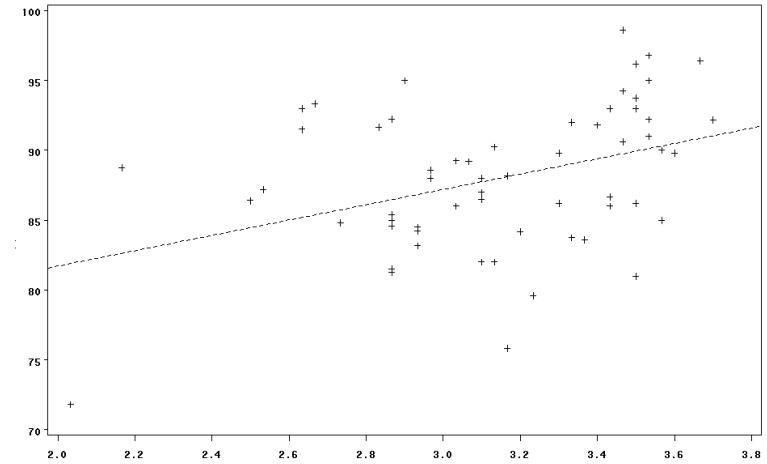


# APPE and Weighted Open Book TJE

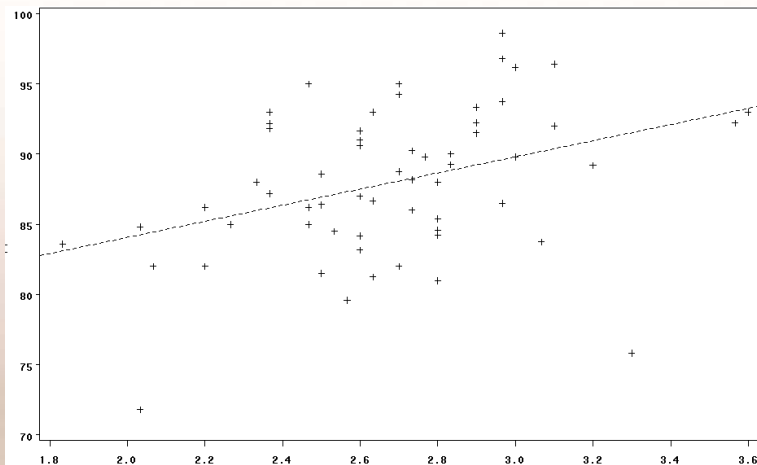
## Biological Sciences



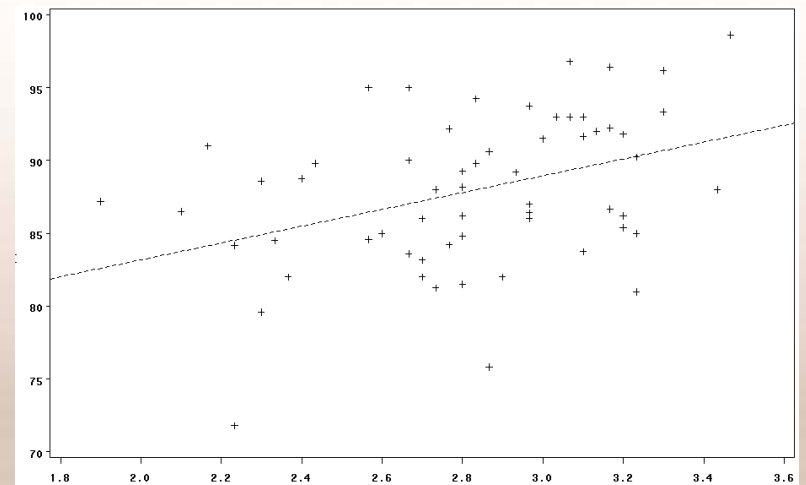
## Pharmaceutical Sciences



## Soc & Adm Sciences



## Clinical Sciences



# Correlation of TJE's with Different APPE Rotation Grades (P3)

	Students (n)	Rotations (n)	Correlation (r) with TJE
<b>Community</b>	<b>61</b>	<b>105</b>	<b>0.21</b>
<b>Institutional</b>	<b>56</b>	<b>56</b>	<b>0.39</b>
<b>Ambulatory</b>	<b>44</b>	<b>82</b>	<b>0.48</b>
<b>Acute Care</b>	<b>42</b>	<b>81</b>	<b>0.57</b>

# Correlation of Predictors with APPE Grades (P3)

\*n=54

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## Undergrad GPA

Correlation Coefficient ( $r^2$ )

0.09 (0.01)

P Value

p < 0.50

## PCOA Standardized Score\*

Correlation Coefficient ( $r^2$ )

0.35 (0.12)

P Value

p < 0.01

## P1/P2 GPA

Correlation Coefficient ( $r^2$ )

0.43 (0.18)

P Value

p < <0.01

## Cumulative Weighted TJE

Correlation Coefficient ( $r^2$ )

0.60 (0.36)

P Value

p < 0.01

# Regression Models to Predict APPE Rotation Grades

Models	$r^2$	Adjusted $r^2$	N	P Value
Model 1	0.112	0.001	(n=61)	--
Model 2	0.183	0.154	(n=61)	<0.01
Model 3	0.245	0.199	(n=54)	=0.89
Model 4	0.453	0.406	(n=54)	<0.01

Model 1: Constant, Undergrad GPA

Model 2: Constant, Undergrad GPA, Touro P1/P2 GPA

Model 3: Constant, Undergrad GPA, Touro P1/P2 GPA, PCOA

Model 4: Constant, Undergrad GPA, Touro P1/P2 GPA, PCOA, TJE

# Summary

Distinguishing features of the TJE are:

- Wide range of competencies tested

- Longitudinal dynamics of the program

- Ability to predict students' subsequent APPE performance

Other positives:

- Foster faculty collaboration

- Students made aware of the synthesis type skills needed in APPEs, and provided early support for development of these skills.



# Previous Work

## USMLE-Step I and FM clerkship scores

n=258 (2001-04)

$r^2=0.03$ ;  $p=0.006$

## McCall

n=424 (1996-2001)

prepharmacy GPA, PCAT, age

$r^2=0.21$ ;  $p<0.001$

## Lobb

n=405 (1997-2002)

prepharmacy math/science GPA, PCAT percentile

$r^2=0.34$ ;  $p<0.001$



# TJE Limitations

Relatively resource intensive.

Small initial sample.

Exams not consistent from year-to-year, making cohort assessments difficult.

No NAPLEX results (to date).



# Conclusions

Current ACPE guidelines emphasize need for comprehensive formative and summative evaluations.

The TJE serves these aims during the P1-P2 (classroom) years through early feedback.

Strong correlation between preceptor grades and weighted cumulative TJE scores suggest it's a valid tool for gauging APPE readiness.



# Progress Examination for Assessing Student Readiness for Advanced Pharmacy Practice Experiences

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