



Background

Schools of pharmacy endeavor to find the perfect combination of admission variables to select applicants who are most likely to be successful in pharmacy school and ultimately pass the North American Pharmacists Licensure Examination (NAPLEX) and Multistate Pharmacy Jurisprudence Examination (MPJE) licensing exams. Several recent studies identified various predictors of success on the NAPLEX, which may indicate that such predictors are school-specific based on the pool of applicants a given school attracts due to factors such as demographics and location. However, despite the facts that a thorough understanding of pharmacy laws is as essential to good practice as comprehensive clinical training, and that almost every state uses the MPJE as part of the licensing examination process, a literature search was unable to find any published research related to MPJE predictors of success.

Objective

The objective of this project was to explore the patterns and drivers for better scores on the NAPLEX and MPJE.

Methods

We collected Pharmacy school admission data including final GPA and final grade in the pharmacy law course, and scores on the NAPLEX and on the MPJE on 383 PharmD students who graduated from University of Maryland School of Pharmacy between 2011 and 2013. This study was reviewed and approved by the University of Maryland's Institutional Review Board.

Using ordinary least squares regression, we evaluated the following factors considered to be associated with higher scores on the two examinations:

- 1) Factors predicting success in pharmacy school: pre-admission criteria such as PCAT composite and subtest scores, undergraduate cumulative GPA, and type of degree earned from the institution prior to pharmacy school, if any;
- 2) Undergraduate institution characteristics: geographic location, school concentration, ownership, size, and nationwide ranking;
- 3) Pharmacy school performance: cumulative GPA at the completion of the PharmD program and academic grade in pharmacy law; and
- 4) Other individual-level characteristics: age, race, gender, early decision, legacy, and geographic location at the time of application to pharmacy school.

Results

Table 1. Selected baseline characteristics - whole cohort of PharmD students at University of Maryland School of Pharmacy 2011-13.

	NAPLEX Score N=383		MPJE Scores N=338	
	n	Mean	n	Mean
Passing percentage, %		97.4%		86.1%
Campus				
Baltimore	289	104.8	249	80.1
Shady Grove	94	103.5	89	79.6
Graduation Year				
2011	121	107.2	115	80.3
2012	145	102.9	122	79.9
2013	116	103.7	100	79.8
Duration of study				
4 years	371	104.5	327	80.0
>4 years	12	103.4	11	80.8
Race				
Asian	134	100.5	110	79.3
Black	34	94.2	31	77.2
White	147	110.3	132	81.0
Unknown	37	106.5	37	80.4
Other	27	101.2	24	79.9
Gender				
Female	261	104.9	231	80.2
Male	120	103.3	105	79.4
Early Decision				
No	119	101.8	96	79.6
Yes	23	104.9	22	80.6
Undergraduate GPA				
GPA<=3.0	64	99.9	51	78.9
3.0<GPA<=3.25	83	102.5	70	78.9
3.25<GPA<=3.5	66	104.5	62	81.1
3.50<GPA<=3.75	86	105.4	81	80.3
GPA>3.75	79	108.5	69	80.3
Final PharmD GPA				
GPA<=3.0	25	95.6	22	78.3
3.0<GPA<=3.25	76	95.9	71	78.2
3.25<GPA<=3.5	106	101.2	91	79.2
3.50<GPA<=3.75	95	108.3	88	80.7
GPA>3.75	79	115.7	64	83.0
Law Grade				
A	64	113.5	57	82.2
B	201	104.4	177	79.9
C	100	99.7	88	78.9
D	13	99.2	11	78.6

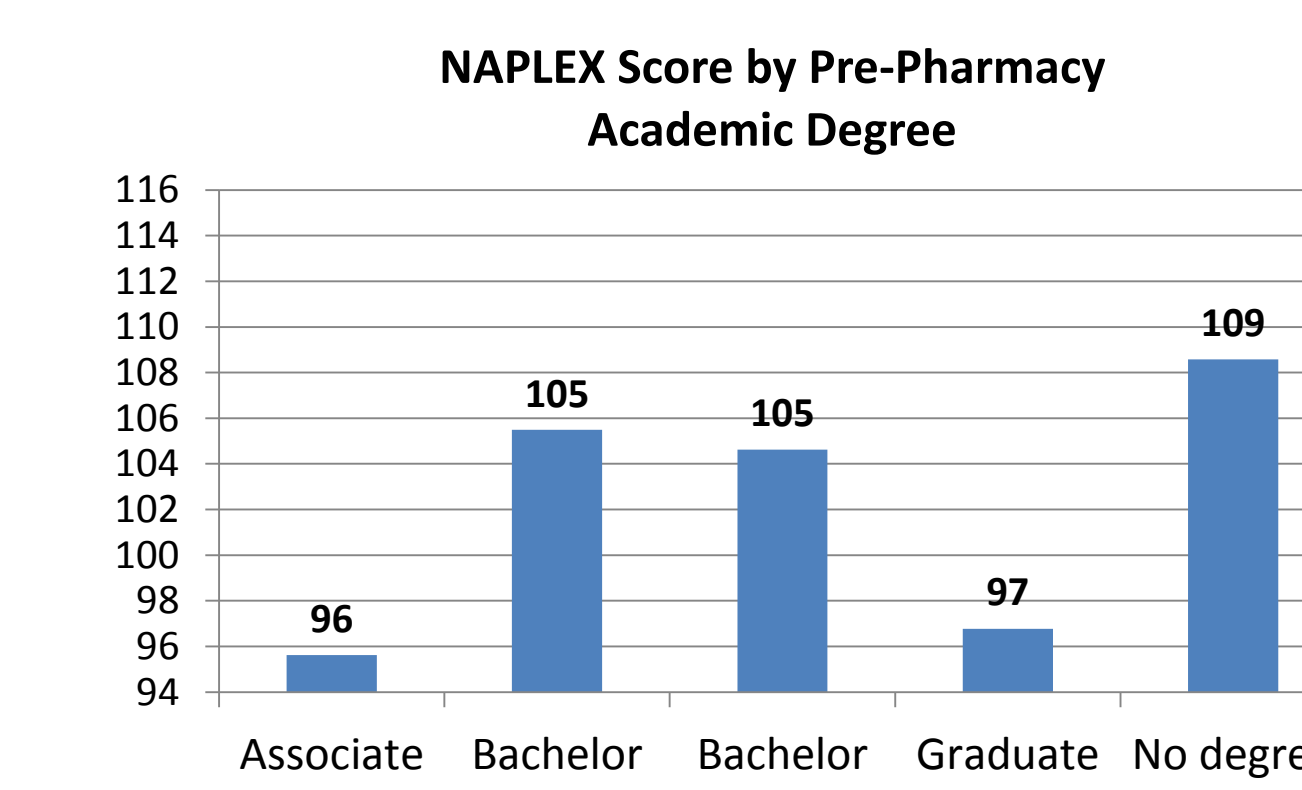
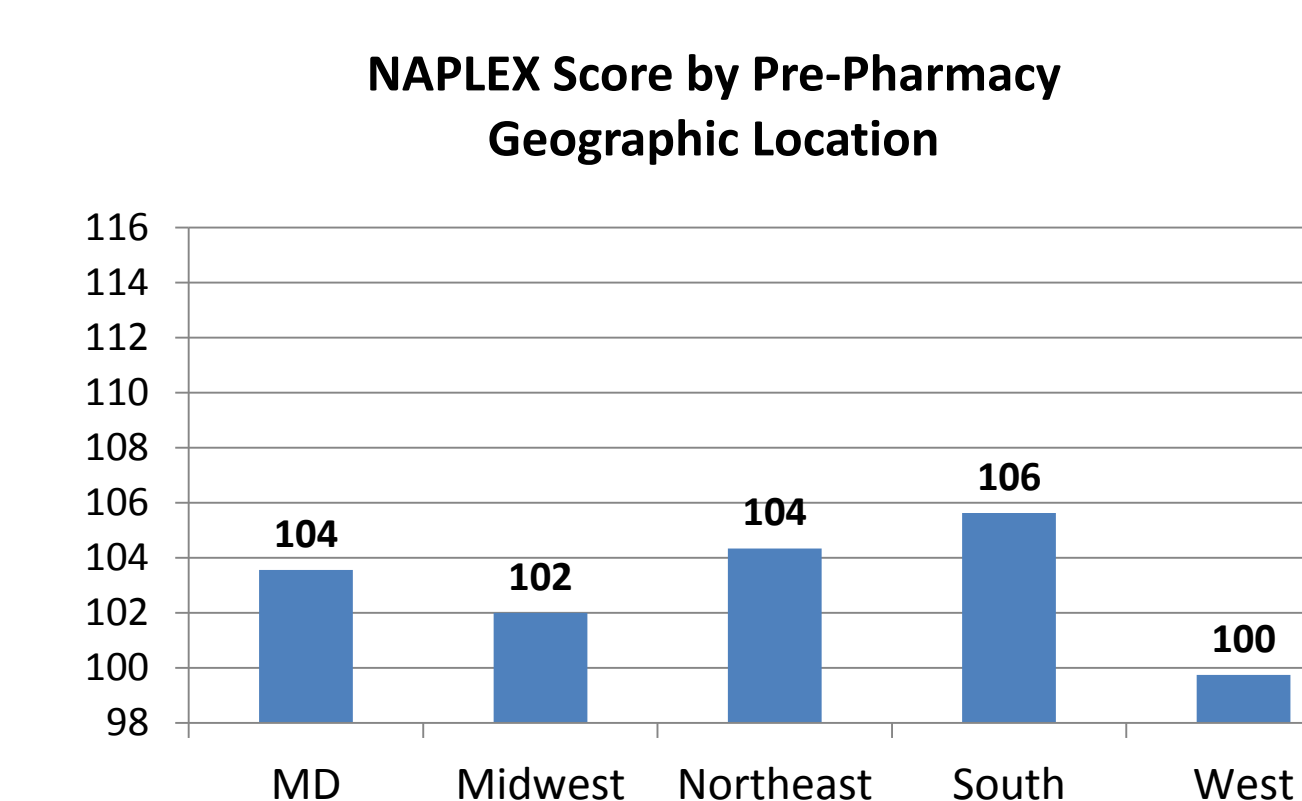
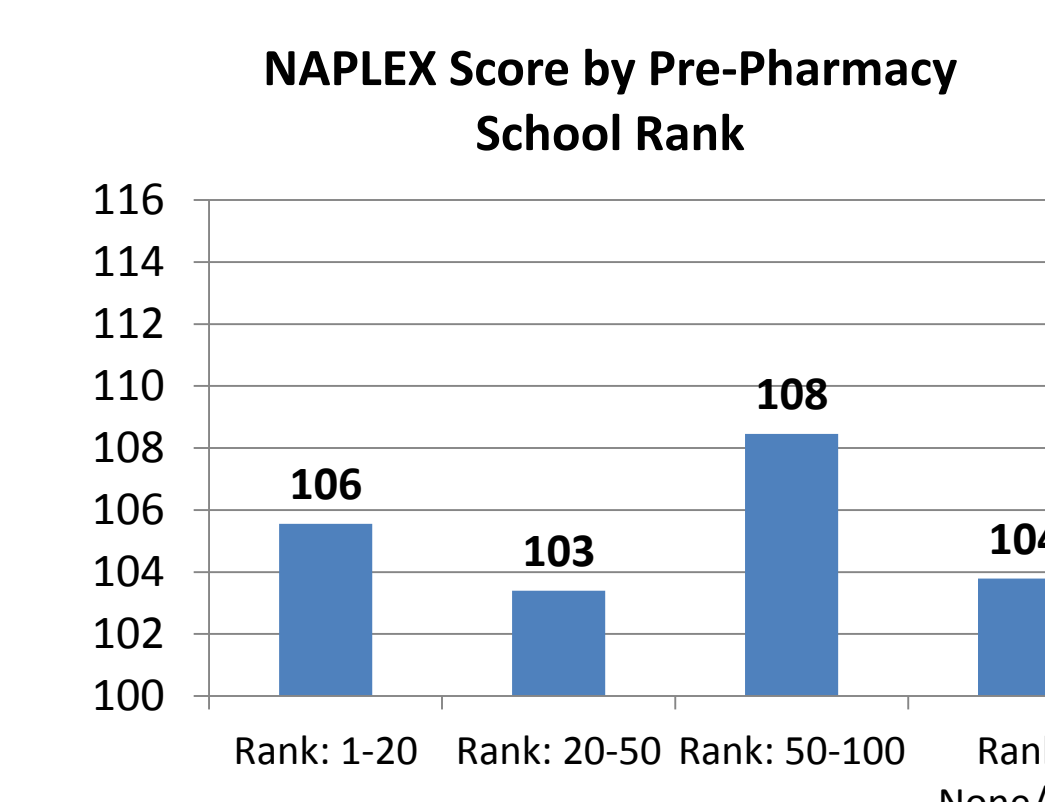
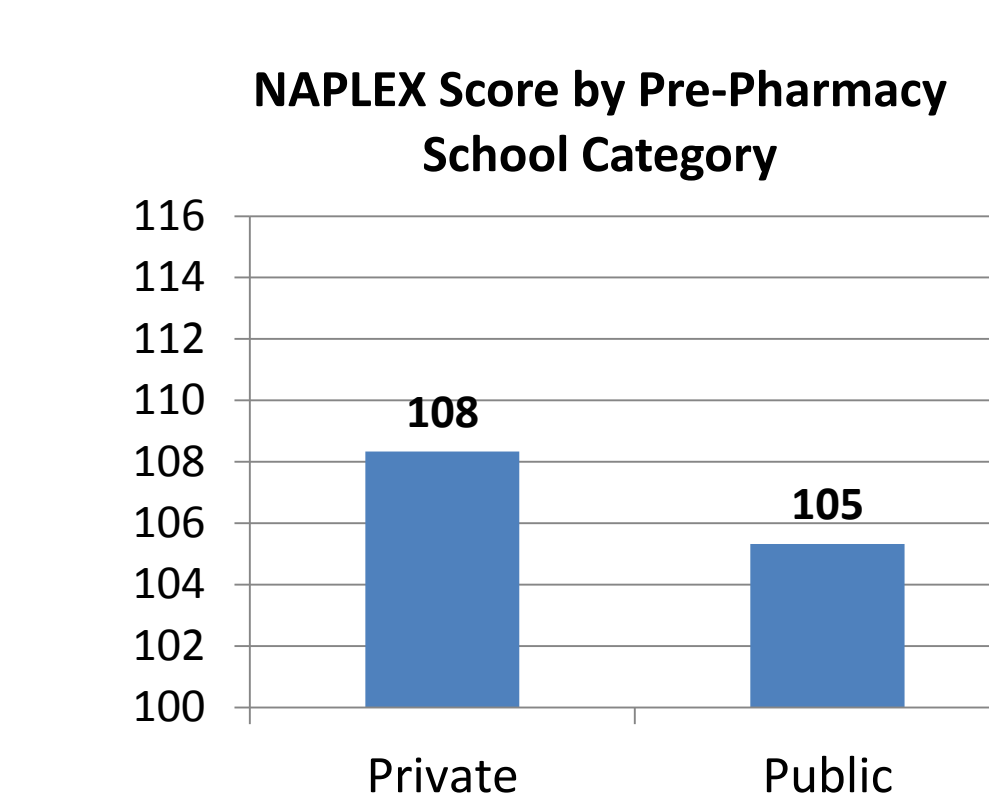
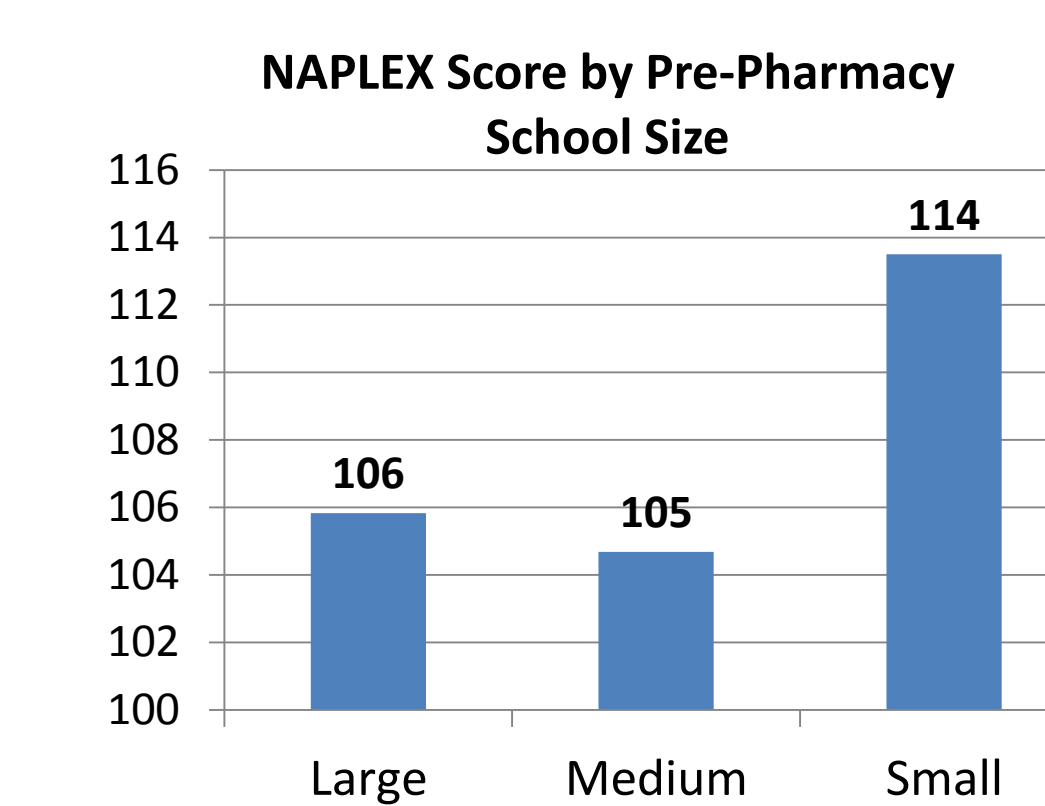
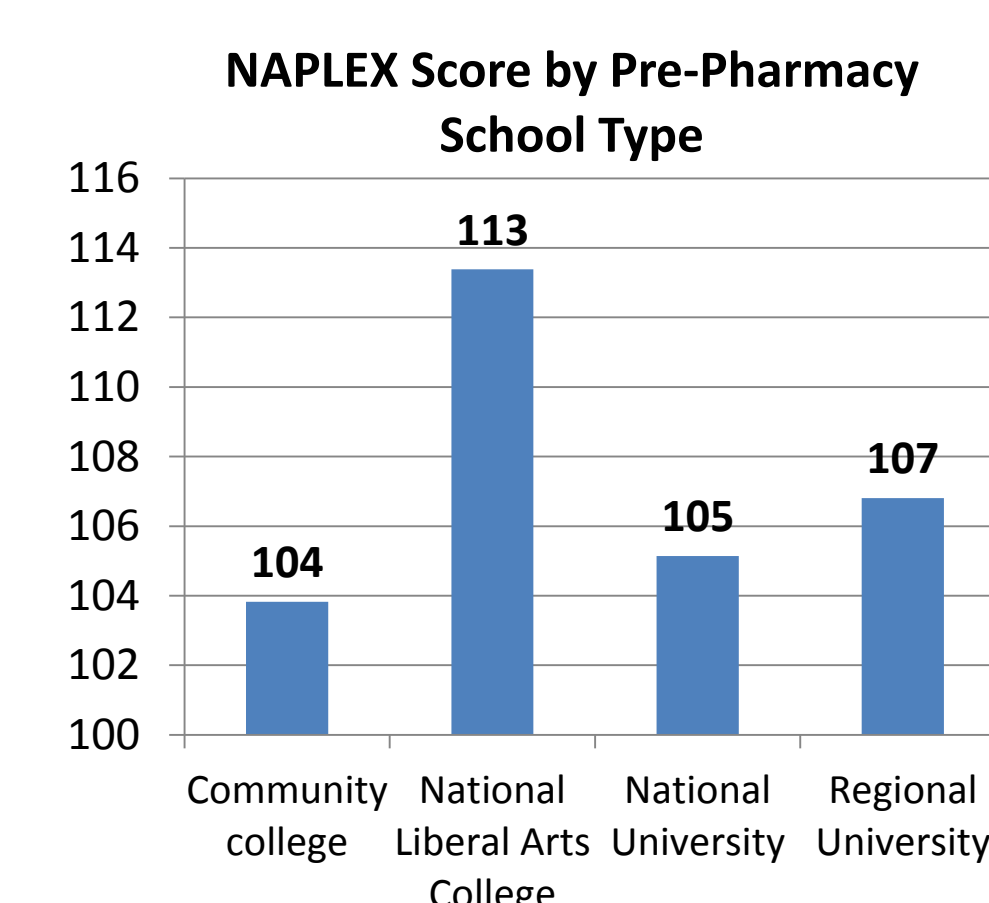


Table 2. Multivariate ordinary least squares regression - predictors of higher NAPLEX and MPJE scores - best fit models.

	NAPLEX N=361, R-sq=0.34 Effect	MPJE N=319, R-sq=0.10 Effect
	Age	
18<=Age<22 yrs	Reference	Reference
22<=Age<25 yrs	0.3	-0.4
Age>=25 yrs	-3.2**	-1.25***
Shady Grove (vs. Baltimore)	1.0	0.20
Graduating Class		
2011	Reference	Reference
2012	-3.0*	-0.2
2013	-0.5	0.1
Male (vs. Female)	0.9	-0.3
Geographic location		
MD	Reference	Reference
Northeast	0.9	-0.32
Midwest	0.0	-1.15
West	-4.5*	-0.59
South	2.3	0.83
Degree		
Bachelor Science	Reference	Reference
Associate	-1.5	1.4
No degree	2.5	0.0
Bachelor Arts	-0.2	0.1
Graduate	-5.3**	0.7
PCAT Biology %	-0.01	0.01
PCAT Chemistry %	0.10*	0.02
PCAT Quantitative Ability %	0.02	0.00
PCAT Reading Comprehension %	0.07**	0.01
PCAT Verbal Ability %	0.08*	0.02
Undergrad Cumulative GPA	-0.78	-0.92
Final GPA	21.9*	5.40*

* Significant at level of confidence $p<0.05$ ** Significant at level of confidence $p<0.10$
*** Significant at level of confidence $p<0.15$

The selection of predictors for best fit models excluded undergraduate institution characteristics, early decision, legacy, race, academic grade in pharmacy, PCAT essay score. Selected predictors explained a greater proportion of the variation in NAPLEX score (R-sq=0.34) compared to MPJE score (R-sq=0.10).

- **Final GPA** at completion of PharmD was associated with higher NAPLEX and MPJE scores
- Being **older than 25 years** was associated with lower scores for both exams
- Factors associated with higher NAPLEX scores, but **not** with higher MPJE scores, included
 - ❖ **PCAT chemistry**
 - ❖ **PCAT reading comprehension**
 - ❖ **PCAT verbal ability**

Implications

Programs should reinforce NAPLEX and MPJE success factors, such as verbal ability, in a holistic approach to curricula.

Adult students in the Maryland PharmD program may need additional monitoring and support to prepare for licensing exams. Hybrid and distance-based courses offer an attractive flexibility to allow adult students to fit education within the other demands of their lives; however, these courses are carefully structured to keep students on track throughout the program. During the post-graduation period for licensure preparation, the lack of a structured study environment may implicate lower performance of adult learners in NAPLEX and MPJE exams.