

WPI-II

Workplace Personality Inventory™-II

*Report on the Results of the Professional Skills Assessment Study:
Using the WPI-II with Pharmacy Schools*



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Introduction

The American Association of Colleges of Pharmacy (AACP) PCAT Advisory Committee has for several years been exploring ways to supplement the academic and cognitive elements of the PCAT with a measurement of non-cognitive skills that are related to performance in pharmacy school and in professional practice.

A 2012 AACP Argus Report identified the need for new assessment tools that could inform pharmacy school admissions decisions by evaluating candidates' non-academic abilities, or "habits of mind" (i.e., non-academic characteristics, twenty-first-century skills), such as inquisitiveness, innovation, self-reflective abilities, problem-solving skills, etc. The AACP explored the possibility of using a situational judgment test (SJT) currently under development for use in conjunction with the Medical College Admission Test (MCAT), but decided that they would prefer to develop an SJT of their own that would specifically reflect the characteristics deemed important for success in pharmacy school and in subsequent professional practice.

Since then, Pearson staff have been engaged in conversations with the AACP PCAT Advisory Committee about ways to measure the non-cognitive skills that the Argus Report suggested. In 2013, the AACP PCAT Advisory Committee identified six characteristics that seem most important for pharmacy school candidates to have: commitment to care, critical thinking, ethical reasoning/integrity, interpersonal skills, teamwork, and inquisitiveness/intellectual curiosity. In the course of these discussions, the suggestion was made to use the Pearson Workplace Personality Inventory-II (WPI-II) as a way to verify some of these desired characteristics and as an interim tool that schools could use until a new SJT could be developed.

The WPI-II is a personality assessment published by Pearson Talent Assessment that measures 16 work styles directly tied to the U.S. Department of Labor's occupational database of key work styles that are relevant across a wide range of jobs (O*Net). The instrument includes 192 nonthreatening, nonclinical, work-relevant questions and takes about 20 minutes to complete.

The WPI-II measures sixteen work styles (personal characteristics, each with a separate score), six domains (work style categories, each based on a combined score for the 2–3 work styles within the category), and Unlikely Virtues (item responses that seem to reflect a deliberate attempt to portray oneself favorably in an excessively positive way). Each work style consists of 11–12 items, and each item is scored by assigning numerical values to response options ranging from "Strongly Agree" to "Strongly Disagree."

In 2014, the AACP PCAT Advisory Committee decided to collaborate with Pearson on a pilot project using the WPI-II to examine student work styles and professional behaviors. The intention of this study was to help the Committee better understand which work styles are most relevant to successful performance that could inform the eventual development of an SJT and to determine whether the WPI-II would be a suitable tool for pharmacy schools to evaluate the non-cognitive characteristics of applicants to professional pharmacy programs.

Purposes for the Study

Because there is currently no appropriate WPI-II normative group that can be used to rank pharmacy students' performances, the PCAT Advisory Committee agreed on a plan to collect data from pharmacy students in their final year of study (referred to in this document as P4 students) and from professional pharmacists in order to create norms appropriate for using the WPI-II by pharmacy schools in admission decisions. To implement this plan, Pearson collected WPI-II data from both pharmacy students and professional pharmacists recruited in response to requests by the AACP to pharmacy schools and to professional pharmacist organizations.

The goals of this study were thus as follows:

1. To use the WPI-II to evaluate the degree to which P4 students exhibit customer-oriented characteristics identified by the PCAT Advisory Committee as desirable for pharmacy school and subsequent work as a professional pharmacist
2. To collect WPI-II normative data appropriate for use to assess the non-cognitive characteristics of applicants to pharmacy school

3. To collect data to validate the norms determined most appropriate for use with pharmacy school applicants, including preceptor ratings from pharmacy educators who observed the P4 sample students' experiential work

Methods of Data Collection

Data for this study was collected in three phases. Phase I was an initial pilot study in which a sample of P4 students at the University of Southern California (USC) took the WPI-II during the fall of 2014, and some preceptor data was also collected.

Phase II began in March 2015, when a letter was sent from the AACP to deans and admission officers at member institutions requesting participation in the collection of WPI-II data on pharmacy students currently in experiential education (P4) at the institution. Representatives of 32 schools and colleges of pharmacy indicated interest in participating. In early June 2015, Pearson Clinical Field Research staff sent email letters to individuals at all of these schools with specific instructions and information needed to conduct the study. This information included specifics needed for IRB approvals, instructions for student and preceptor participants, a link to a secure online Performance Assessment Network (PAN) site where students took the WPI-II, and a link to a secure PAN site where preceptors completed an "Observation Rating Form."

Phase II data collection then began in the fall of 2015. Students who completed the assessment received a complimentary eight-page "Development Report" interpreting their scores and explaining how work styles identified as needing improvement can be developed for professional growth. Preceptors were to have completed the secure electronic "Observation Rating Form" with rating responses that were to be used to correlate with student WPI-II responses.

Also in the fall of 2015, Pearson contracted with the online survey platform Qualtrics to recruit working professional pharmacists to take the WPI-II. By the end of October, an adequate number of individuals had completed the WPI-II (212) so that reliable pharmacist norms could be created.

By the spring of 2016, enough data had also been collected from P4 students (242 cases from seven professional pharmacy programs) to use to create

WPI-II norms for this group. However, too few preceptors had participated for reliable correlation analyses to be performed.

Phase III was initiated by the PCAT Advisory Committee in anticipation of questions that admissions committees and student advisors might have regarding the appropriateness of the P4 group as a normative sample for assessing incoming students. The specific concerns of admission committees and student advisors includes whether an assessment tool can indicate individual strengths, raise red flags, or suggest possible areas of remediation needed. Phase III thus involved collecting WPI-II data from students in their first year of study (referred to in this document as P1 students) to compare with P4 and pharmacist data.

Phase III invitations and participation information were sent in the summer of 2016 to the seven programs that participated in Phase II, plus two additional programs suggested by the PCAT Advisory Committee. P1 student WPI-II data collection proceeded during the fall term, and 166 P1 students from three programs completed the WPI-II for the study by the end of 2016.

Data Analyses

All P1 and P4 student WPI-II data and all professional pharmacist WPI-II data collected from 2014 through 2016 were exported into spreadsheets, which included demographic information and WPI-II raw scores (summed values of responses) and percentile ranks (using the existing "Manager" norms because there were no pharmacist norms at the time). The student demographic data allowed the tabulation of case numbers per participating school and a more detailed comparison of the three samples than score data alone would allow. All data analyses were conducted with individuals' identifying information excluded.

After the data collection was completed, the following analyses of the demographic information and WPI-II scores for the three study samples were conducted:

- A distribution of P1 and P4 student participants by professional pharmacy school (see Table 1)
- WPI-II domain raw score means for each relevant category of demographic information collected for the P1 and P4 students and the professional pharmacists (see Tables 2-5)

- Distributions of WPI-II raw score means and standard deviations for each of the 16 work styles, 6 domains, and Unlikely Virtues for the three study sample groups, plus two existing WPI-II norm groups for comparison (see Table 7)
- WPI-II mean raw score standard differences for P1 students, P4 students, and professional pharmacists indicating effect sizes for raw score differences between these three samples (see Table 8)

Raw-score-to-percentile-rank tables were also created for each of the study samples for possible use as WPI-II norm groups by pharmacy schools to assess applicants and by human resources departments to assess prospective employees. These tables were done for internal Pearson use only and are not included in this report.

Results

Nine pharmacy schools participated in this study, with one school (Samford University in Alabama) participating in the collection of data from both P1 and P4 students. As shown in Table 1, WPI-II data was collected from 166 P1 students attending three schools and from 242 P4 students attending seven schools distributed across the country from the University of Southern California to Husson University in Maine.

The pharmacist participants were asked to indicate all the states where they are licensed to practice. Because many were licensed in multiple states, the geographical distribution for this sample was impossible to determine accurately.

Tables 2–5 provide demographic information collected from student and pharmacist participants. Because much of this information was voluntary, fewer than the total number for each sample may have responded to a given demographic item.

Tables 2–4 show mean WPI-II domain score data for all three samples by age group, sex, race/ethnicity, and highest level of education completed for the individual taking the WPI-II. For obvious reasons, the largest proportion of P1 students were in a younger age group than the P4 students (Table 2, ages 21–24 at 60.9%; and Table 3, ages 25–29 at 59.3%, respectively), and over 70% of the professional pharmacists were over 40 years of age (Table 4). Each of the three samples includes a greater proportion of females than males, with differences ranging from 2.8% for the professional pharmacists to 17.5% for the P1 students and 22.4% for the P4 students.

Pharmacy School	n	
	P1	P4
Cedarville University	1	
Concordia University Wisconsin		12
Husson University		3
Ohio Northern University		12
Samford University	20	10
State University of New York College at Buffalo		4
University of Missouri—Kansas City	145	
University of Southern California		154
West Virginia University		47
Total	166	242

Table 2: WPI-II Study Raw Score Means by Demographic Category for P1 Students (n = 166)									
Demographic categories	n	%	WPI-II domain raw score means						
			Achiev. Ori.	Self Adj.	Consci.	Interp. Ori.	Pract. Intell.	Soc. Infl.	Uni. Virt.
Age	161	100%							
16–20 years	37	23.0%	111.3	93.6	107.1	76.8	91.2	60.1	25.1
21–24 years	98	60.9%	109.8	94.1	107.0	76.2	92.8	57.4	25.2
25–29 years	17	10.6%	110.5	94.2	104.2	76.8	97.1	63.0	25.1
30–49 years	9	5.6%	117.2	99.7	110.8	77.8	100.4	62.3	27.0
Sex	160	100%							
Female	94	58.8%	110.1	91.9	108.5	77.2	90.8	58.1	25.0
Male	66	41.3%	110.7	97.4	104.4	75.4	96.6	59.6	25.6
Race/ethnicity	161	100%							
Asian/Pacific Islander	17	10.6%	110.8	94.2	106.1	77.1	95.1	60.8	26.9
White (non-Hispanic)	130	80.7%	110.2	93.5	106.8	76.0	92.9	58.6	24.8
Other/multi-racial	14	8.7%	112.6	99.1	108.2	80.4	94.1	58.6	27.1
Highest level of Ed. completed	159	100%							
≤ 2 years of college/associate degree	57	35.8%	110.6	94.1	106.5	76.0	92.2	58.6	25.7
3–4 years of college	51	32.1%	109.2	92.8	106.7	76.3	93.3	58.4	24.6
Bachelor’s degree or higher	51	32.1%	112.2	96.1	107.7	77.1	94.6	59.2	25.5

Notes: *Achiev. Ori.* = Achievement Orientation. *Self Adj.* = Self Adjustment. *Consci.* = Conscientiousness. *Interp. Ori.* = Interpersonal Orientation. *Pract. Intell.* = Practical Intelligence. *Soc. Infl.* = Social Influence. *Uni. Virt.* = Unlikely Virtues.

Table 3: WPI-II Study Raw Score Means by Demographic Category for P4 Students (n = 242)

Demographic categories	n	%	WPI-II domain raw score means						
			Achiev. Ori.	Self Adj.	Consci.	Interp. Ori.	Pract. Intell.	Soc. Infl.	Uni. Virt.
Age	204	100%							
≤ 24 years	61	29.9%	106.5	89.4	104.6	74.0	91.3	58.0	24.2
25–29 years	121	59.3%	104.8	88.5	101.1	73.1	92.3	57.9	24.2
30–49 years	17	8.3%	104.7	88.9	98.6	73.3	92.7	57.9	22.5
35–49 years	5	2.5%	109.0	95.2	99.6	73.6	103.0	58.8	23.4
Sex	206	100%							
Female	126	61.2%	105.4	88.0	103.2	74.3	90.8	56.5	24.3
Male	80	38.8%	105.3	90.1	99.5	72.0	94.6	60.3	23.6
Race/ethnicity	161	100%							
Asian/Pacific Islander	83	40.5%	102.0	85.9	97.7	72.0	91.2	55.4	23.4
White (non-Hispanic)	102	49.8%	107.6	90.8	104.7	74.2	93.4	59.8	24.3
Other/multi-racial	20	9.8%	107.7	90.8	104.2	75.4	91.2	58.7	24.8
Highest level of Ed. completed	159	100%							
≤ 2 years of college/associate degree	7	3.5%	103.6	88.9	104.1	76.7	83.0	56.9	23.3
3–4 years of college	11	5.4%	112.7	93.3	109.3	74.5	94.9	57.0	24.6
Bachelor's degree or higher	184	91.1%	105.0	88.6	101.3	73.1	92.5	58.0	24.1

Notes: *Achiev. Ori.* = Achievement Orientation. *Self Adj.* = Self Adjustment. *Consci.* = Conscientiousness. *Interp. Ori.* = Interpersonal Orientation. *Pract. Intell.* = Practical Intelligence. *Soc. Infl.* = Social Influence. *Uni. Virt.* = Unlikely Virtues.

Table 4: WPI-II Study Raw Score Means by Demographic Category for Professional Pharmacists (n = 212)

Demographic categories	n	%	WPI-II domain raw score means						
			Achiev. Ori.	Self Adj.	Consci.	Interp. Ori.	Pract. Intell.	Soc. Infl.	Uni. Virt.
Age	212	100%							
25–29 years	17	8.0%	104.6	88.2	103.2	73.4	93.4	55.1	24.1
30–34 years	25	11.8%	101.6	86.4	101.4	69.5	94.6	55.3	22.5
35–39 years	19	9.0%	102.1	89.4	98.8	64.3	93.7	56.7	25.1
40–49 years	44	20.8%	99.5	83.1	99.8	68.1	91.5	55.2	22.8
50–59 years	62	29.9%	100.9	84.8	100.7	68.7	94.0	56.7	23.6
60–69 years	36	17.0%	103.7	88.4	101.6	71.2	95.4	58.1	24.1
70 years or over	9	4.2%	107.0	88.8	100.6	70.2	95.4	63.2	25.0
Sex	212	100%							
Female	109	51.4%	100.8	83.8	101.5	70.4	92.6	54.7	23.3
Male	103	48.6%	102.9	88.5	100.0	67.7	95.1	58.6	24.0
Race/ethnicity	212	100%							
Asian/Pacific Islander	28	13.2%	99.1	87.0	99.4	68.7	92.4	56.1	24.6
White (non-Hispanic)	174	82.1%	102.3	86.1	101.2	69.3	93.9	56.6	23.6
Other/multi-racial	10	4.7%	101.7	83.5	97.1	67.7	95.1	58.6	24.0
Highest level of Ed. completed	212	100%							
Bachelor's degree	86	40.6%	101.0	85.2	100.7	69.8	92.5	56.9	23.7
Master's degree	25	11.8%	104.0	88.9	102.5	69.2	98.1	58.4	24.0
Doctorate	101	47.6%	101.9	86.2	100.4	68.5	93.8	55.9	23.5

Notes: *Achiev. Ori.* = Achievement Orientation. *Self Adj.* = Self Adjustment. *Consci.* = Conscientiousness. *Interp. Ori.* = Interpersonal Orientation. *Pract. Intell.* = Practical Intelligence. *Soc. Infl.* = Social Influence. *Unl. Virt.* = Unlikely Virtues.

In the race/ethnicity category, clear differences in the samples are apparent, particularly for the White (non-Hispanic) and Asian/Pacific Islander items: 80.7% of the P1 students identified themselves as White and 10.6% as Asian/Pacific Islander; 49.8% of the P4 students identified as White and 40.5% as Asian/Pacific Islander; and 82.1% of the professional pharmacists identified as White and 13.2% as Asian/Pacific Islander. Also, because so few identified as Black/African American, Hispanic/Latino, Native American, or multiracial, we combined all these groups into one Other/multiracial category.

Table 5 shows professional demographic information for the pharmacist sample that was not relevant to collect from the P1 and P4 student participants. These data show that the greatest proportion of pharmacist participants held a staff pharmacist position (57.5%), more than half had worked in their current job for at least 15 years (54.7%), and the greatest proportion considered their work to be “usually fulfilling” (41.1%).

Table 5: WPI-II Study Raw Score Means by Professional Demographic Category for Professional Pharmacists (n = 212)

Professional demographics	n	%	WPI-II domain raw score means						
			Achiev. Ori.	Self Adj.	Consci.	Interp. Ori.	Pract. Intell.	Soc. Infl.	Uni. Virt.
Current position/level	212	100%							
Director of pharmacy (or higher)	17	8.0%	104.6	88.2	103.2	73.4	93.4	55.1	24.1
Managing pharmacist	25	11.8%	101.6	86.4	101.4	69.5	94.6	55.3	22.5
Staff pharmacist	19	9.0%	102.1	89.4	98.8	64.3	93.7	56.7	25.1
Other pharmacy/internist/residency	44	20.8%	99.5	83.1	99.8	68.1	91.5	55.2	22.8
Years in current/most recent job	212	100%							
Less than 1 year	2	0.9%	107.5	91.0	98.5	72.5	103.0	63.0	25.5
1 year to less than 2 years	4	1.9%	103.8	82.5	102.3	67.0	95.8	56.3	21.8
2 years to less than 4 years	22	10.4%	104.5	86.2	102.6	70.3	93.2	55.2	23.5
4 years to less than 7 years	25	11.8%	101.7	88.6	100.4	70.4	94.7	57.8	23.4
7 years to less than 10 years	17	8.0%	103.7	87.5	101.8	70.3	95.1	55.8	23.8
10 years to less than 15 years	26	12.3%	98.5	83.7	97.6	65.0	91.4	56.9	23.9
15 years or more	116	54.7%	101.6	85.9	101.0	69.4	93.8	56.6	23.7
Job satisfaction	202	100%							
I've lost all motivation	7	3.5%	94.1	78.6	99.6	67.1	89.1	52.0	23.9
I usually look forward to this work	25	12.4%	101.1	78.7	102.7	69.1	93.4	52.2	22.7
I'm sufficiently motivated at work	59	29.2%	99.7	84.6	99.7	68.3	91.8	55.5	23.3
This work is usually fulfilling	83	41.1%	101.5	88.9	99.5	68.4	93.2	57.3	23.8
I love this work	28	13.9%	110.0	92.3	104.9	73.7	101.5	63.5	25.1

Notes: *Achiev. Ori.* = Achievement Orientation. *Self Adj.* = Self Adjustment. *Consci.* = Conscientiousness. *Interp. Ori.* = Interpersonal Orientation. *Pract. Intell.* = Practical Intelligence. *Soc. Infl.* = Social Influence. *Unl. Virt.* = Unlikely Virtues.

With regard to the race/ethnicity demographics shown in Tables 2–4, differences in sample proportions particularly stand out when considered relative to the fall 2015 AACP enrollment data shown in Table 6. For the P1 and P4 samples, these differences may reflect the much greater sample size for the AACP data, which suggests that the three study samples are less representative with regard to ethnicity than the AACP data, which represents the entire population of PharmD candidates pursuing a first professional degree. For the professional

pharmacist sample, the demographic characteristics for the national data for 2014 are similar to those for the study sample, suggesting that the study's pharmacist sample is closely representative of the population. The difference in recruitment methods between the student and pharmacist study samples may also account for much of the observed demographic differences, with the relatively small and less representative n-counts for most participating schools.

Table 6: Selected National Demographic Data for Students Enrolled for a PharmD Program for Fall 2015 and Licensed Pharmacists in the United States in 2014

Demographic categories	Enrolled students		Licensed pharmacists	
	n	%	n	%
Sex	63,460	100.0%	2,298	100.0%
Female	38,984	61.4%	1,212	52.7%
Male	24,476	38.6%	1,086	47.3%
Race/ethnicity	63,460	100.0%	1,670	100.0%
Asian/Pacific Islander	16,304	25.7%	142	8.5%
Black, African American	5,031	7.9%	39.0	2.3%
Hispanic, Latino	3,185	5.0%		
International/foreign	1,947	3.1%		
Multiracial	1,491	2.3%		
Native Am. (Aleutian/Am. Ind.)	194	0.3%		
White (non-Hispanic)	32,777	51.6%	1,421	85.1%
Unknown/other	2,531	4.0%	68	4.1%

Notes: Student and pharmacist data from the AACP website:
 AACP. (April 2016). Profile of Pharmacy Students Fall 2015. American Association of Colleges of Pharmacy. Alexandria, VA. <http://www.aacp.org/resources/research/institutionalresearch/Documents/Enrollments.pdf>
 Midwest Pharmacy Workforce Research Consortium (April 8, 2015) National Pharmacist Workforce Study 2014. Minneapolis, MN. <http://www.aacp.org/resources/research/pharmacyworkforcecenter/Documents/FinalReportOfTheNationalPharmacistWorkforceStudy2014.pdf>

Table 7 provides side-by-side lists of WPI-II raw score means and standard deviations for all 16 work styles, 6 domains, and Unlikely Virtues for the three study samples, plus two existing WPI-II normative sample groups for comparison: Managers, the norm group used to determine percentile ranks on the Development Report provided to each study participant, and all working adults in the United States, a norm group

combining all other WPI-II American adult norm groups. These data show that the mean scores for the P1 sample are more similar to the scores for managers and all working adults than to either the P4 sample or the professional pharmacist sample. Table 7 also shows that the P4 sample means are closer to the pharmacists' scores than to the P1 sample or to the norm groups for managers or all working adults.

Table 7: WPI-II Mean and Standard Deviation (SD) Raw Score Comparisons for P1 Students (n = 166), P4 Students (n = 242), Professional Pharmacists (n = 212), Managers (n = 1,343), and Working Adults in the U.S. (n = 8,041)

WPI-II domain/ work style	Students				Pharmacists		Managers		All working adults	
	P1		P2		Mean	SD	Mean	SD	Mean	SD
	Mean	SD	Mean	SD						
Achievement Orientation	110.3	10.6	104.8	10.4	101.8	9.8	110.8	9.7	110.0	9.7
Achievement/Effort	37.5	3.6	35.6	3.7	33.7	4.0	36.8	3.6	36.6	3.7
Initiative	35.9	4.4	33.9	4.4	32.9	4.2	38.0	3.8	37.6	4.0
Persistence	36.9	4.1	35.4	3.8	35.2	3.7	36.1	3.9	35.7	3.8
Conscientiousness	106.7	9.0	101.3	9.4	100.8	7.8	103.0	10.5	102.9	10.7
Attention to Detail	33.9	3.6	32.1	4.2	33.3	3.2	32.2	4.2	32.3	4.2
Dependability	37.3	3.4	36.2	3.7	35.2	3.4	36.3	3.8	36.3	4.2
Rule-Following	35.6	4.0	33.1	4.1	32.3	3.5	34.5	4.6	34.3	4.8
Interpersonal Orientation	76.3	7.8	73.2	7.2	69.1	7.6	72.5	6.7	72.7	6.8
Analytical Thinking	34.0	3.6	32.9	3.9	33.2	3.8	33.8	3.8	33.9	4.0
Independence	27.8	3.5	28.3	3.7	29.6	3.6	31.0	3.7	30.2	4.0
Innovation	31.4	4.9	31.0	4.9	31.0	4.0	34.1	4.2	34.2	4.3
Self Adjustment	94.2	11.4	88.9	10.1	86.1	10.6	96.2	9.8	97.0	9.6
Adaptability/Flexibility	31.6	4.4	30.1	4.3	29.2	4.2	33.6	4.0	33.6	4.1
Self Control	33.3	4.5	31.2	4.4	29.5	4.1	31.7	4.0	31.9	3.9
Stress Tolerance	29.3	5.1	27.5	4.5	27.4	4.7	31.0	4.1	31.5	4.2
Social Influence	58.8	8.1	57.4	8.7	56.6	7.7	63.3	6.6	62.6	6.9
Leadership Orientation	37.8	4.2	27.2	4.7	28.0	4.1	31.3	3.8	30.6	4.1
Social Orientation	30.9	5.2	30.2	5.2	28.6	4.7	32.1	3.9	32.0	3.9
Unlikely Virtues	25.3	4.2	24.0	3.4	23.6	3.5	24.7	4.3	25.7	4.8

As an indication of whether the score differences between samples shown in Table 7 are significant, Table 8 shows standard differences for three different comparisons: P1 compared to P4, P1 compared to professional pharmacists, and P4 compared to pharmacists. The differences shown in Table 8 are in the form of effect sizes, also known as Cohen's d, a statistical measure of the estimated magnitude of differences

between sample mean scores. The greater the effect size value (either positive or negative), the greater the magnitude of the score difference, with positive values indicating higher scores for the first of the two sample groups listed in a column heading and negative values indicating higher scores for the second of the two groups.

Table 8: WPI-II Mean Raw Score Standard Differences for P1 Students (n = 166), P4 Students (n = 242), and Professional Pharmacists (n = 212)

WPI-II domain/work style	Standard differences		
	P1 students compared to P4 students	P1 students compared to pharmacists	P4 students compared to pharmacists
Achievement Orientation	0.53	0.84	0.30
Achievement/Effort	0.52	1.00	0.49
Initiative	0.47	0.70	0.23
Persistence	0.38	0.43	0.04
Conscientiousness	0.59	0.71	0.06
Attention to Detail	16,304	25.7%	
Dependability	5,031	7.9%	
Rule-Following	3,185	5.0%	
Interpersonal Orientation	0.42	0.94	0.56
Concern for Others	0.36	0.81	0.46
Cooperation	0.41	0.95	0.57
Practical Intelligence	0.11	-0.06	-0.17
Analytical Thinking	0.28	0.22	-0.07
Independence	-0.13	-0.51	-0.37
Innovation	0.09	0.10	0.00
Self Adjustment	0.50	0.74	0.27
Adaptability/Flexibility	0.33	0.56	0.23
Self Control	0.47	0.88	0.39
Stress Tolerance	0.38	0.39	0.03
Social Influence	0.16	0.27	0.10
Leadership Orientation	0.14	-0.04	-0.18
Social Orientation	0.14	0.47	0.32
Unlikely Virtues	0.34	0.43	0.11

Notes: Standard differences = effect sizes, Cohen's d: Cohen, J. (1988). Statistical Power Analysis for the Behavioral Sciences (2nd ed.). Hillsdale, NJ: Lawrence Earlbaum Associates.

The effect sizes shown in Table 8 are commonly interpreted as follows: <0.20 = negligible effect size; 0.20–0.49 = small effect size; 0.50–0.79 = medium effect size; ≥0.80 = large effect size.

For the comparison of P1 students to pharmacists, Table 8 shows large effect sizes for two domain and five work style score differences and medium effect sizes for two domain and four work style score differences. For P4 students compared to pharmacists, the data show the fewest number of medium or large effect sizes, with only one medium effect size for the Interpersonal Orientation domain and one for the Cooperation work style.

Conclusions and Recommendations

The first goal of this study was to determine whether the WPI-II identifies the same customer-oriented characteristics identified by the AACP PCAT Advisory Committee. Addressing this goal requires to first determine whether the domains and work styles measured by the WPI-II match the same customer-oriented characteristics identified by the PCAT Advisory Committee. Table 9 represents a response to this question by comparing the WPI-II work styles and their descriptions to possible matches with the desired AACP customer-oriented characteristics.

Table 9: WPI-II Domains and Work Styles Compared to Customer-Oriented Characteristics Identified by the PCAT Advisory Committee		
WPI-II		AACP customer-oriented characteristics
Domain/work style	Description of work style behaviors	
Achievement Orientation		
Achievement/Effort	Establishes challenging goals; maintains goals; exerts effort toward task mastery	
Initiative	Takes on job responsibilities without being told to do so; volunteers for new job responsibilities; volunteers for new job challenges	
Persistence	Persists in the face of obstacles on the job	Commitment to care
Conscientiousness		
Attention to Detail	Completes work tasks thoroughly; is careful about details	
Dependability	Fulfills obligations reliably	
Rule-Following	Avoids unethical behavior; follows rules and regulations	
Interpersonal Orientation		
Concern for Others	Demonstrates sensitivity to the needs and feelings of others; demonstrates understanding of others/empathy	Commitment to care
Cooperation	Is pleasant/good-natured with others on the job; encourages people to work together; helps others with tasks	Interpersonal skills; Teamwork
Practical Intelligence		
Analytical Thinking	Uses logic to address work-related issues; produces high quality, useful information	Critical thinking
Independence	Relies mainly on self to get things done; develops own way of doing things	
Innovation	Generates new ideas to address work issues and problems	Inquisitiveness/intellectual curiosity
Self Adjustment		
Adaptability/Flexibility	Adapts to change in the workplace; deals effectively with ambiguity; demonstrates openness to considerable variety in the workplace	
Self Control	Keeps emotions in check even in very difficult situations	Interpersonal skills
Stress Tolerance	Accepts criticism; shows tolerance of stress caused by other people or situations	
Social Influence		
Leadership Orientation	Demonstrates a willingness to lead/take charge; demonstrates a willingness to offer opinions	
Social Orientation	Shows a preference for working with others; develops personal connections with work colleagues	

Notes: The WPI-II Description of behaviors are from Workplace Personality Inventory—II Technical Manual and User's Guide (June 2013, NCS Pearson).

As shown in Table 9, five of the six customer-oriented characteristics identified by the AACP PCAT Advisory Committee seem to correspond with WPI-II workstyles (not “ethical reasoning/integrity”), especially “interpersonal skills” and “commitment to care.” The second goal of this study was to determine an appropriate normative sample for use with applicants to pharmacy school. To address this goal, it was necessary to see how the study sample students performed on the characteristics that match with WPI-II work styles.

To address this question, Table 10 shows WPI-II raw score means and corresponding percentile ranks for both the P1 and P4 student samples. For this analysis, the professional pharmacist study sample was used as the norm group. Including percentile ranks provides a way to show how the raw scores rank in relation to a comparison group—in this case, the new WPI-II pharmacists norm group—that suggests what the raw scores mean in a way that simply comparing them does not.

Table 10: WPI-II P1 and P4 Raw Scores Means and Professional Pharmacist Percentile Ranks (PR) with AACP Customer-Oriented Characteristics					
WPI-II domain/work style	P1		P2		AACP customer-oriented characteristics
	Mean	PR	Mean	PR	
Achievement Orientation	110.3	80	104.8	66	
Achievement/Effort	37.5	84	35.6	70	
Initiative	35.9	77	33.9	60	
Persistence	36.9	70	35.4	49	Commitment to care
Conscientiousness	106.7	78	101.3	53	
Attention to Detail	16,304	25.7%	142	8.5%	
Dependability	5,031	7.9%	39.0	2.3%	
Rule-Following	3,185	5.0%			
Interpersonal Orientation	76.3	81	73.2	70	
Concern for Others	36.4	77	34.9	70	Commitment to care
Cooperation	39.9	83	38.4	69	Interpersonal skills; Teamwork
Practical Intelligence	93.2	50	92.2	46	
Analytical Thinking	34.0	65	32.9	54	Critical thinking
Independence	27.8	29	28.3	29	
Innovation	31.4	53	31.0	53	Inquisitiveness/intellectual curiosity
Self Adjustment	94.2	80	88.9	62	
Adaptability/Flexibility	31.6	77	30.1	57	
Self Control	33.3	83	31.2	66	Interpersonal skills
Stress Tolerance	29.3	63	27.5	55	
Social Influence	58.8	58	57.4	49	
Leadership Orientation	27.8	45	27.2	37	
Social Orientation	30.9	71	30.2	62	
Unlikely Virtues	25.3	67	24.0	54	

Data in Table 10 indicate that the P1 students ranked above the 50th percentile on all the work styles associated with a customer-oriented characteristic. The highest PR for the P1 students was 83 for the work styles identified with the “interpersonal skills” (Cooperation and Self Control) and “teamwork” (Cooperation) characteristics. The next highest PRs for the P1 students were for the two work styles associated with “commitment to care” (Persistence and Concern for Others) with PRs above 70. The lowest ranking scores were for the works styles associate with the “critical thinking” (Analytical Thinking) and “inquisitiveness/ intellectual curiosity” (Innovation) characteristics, both with PRs above 50.

The P4 students also ranked above the 50th PR on all but one of the work styles associated with a customer-oriented characteristic. The highest PR for the P4

students was one of the work styles identified with “commitment to care” (Concern for Others) with a PR of 70, followed by one of the work styles associated with “interpersonal skills” and with “teamwork” (Cooperation) with a PR of 69. The next highest matched characteristic was the second “interpersonal skills” work style (Self Control) with a PR of 66. The P4 students ranked lowest for the work style associated with the second “commitment to care” characteristic (Persistence) with a PR of 49.

The differences in percentile rank performances between the P1 and P4 samples shown in Table 10 may be the result of differences in demographic characteristics. These differences are apparent in Table 11, especially for the “race/ethnicity” categories. Table 11 is a compilation of demographic data from Tables 2–4 for the study samples and Tables 5–6 for the national samples.

Table 11: Selected Comparative Demographic Characteristics

WPI-II domain/ work style	P1 student study sample		P4 student study sample		2015 Enrolled student population		Professional pharmacist study sample		2014 Licensed pharmacist national sample	
Sex	160	100.0%	206	100.0%	63,460	100.0%	212	100.0%	2,298	100.0%
Female	94	58.8%	126	61.2%	38,984	61.4%	109	51.4%	1,212	52.7%
Male	66	41.3%	80	38.8%	24,476	38.6%	103	48.6%	1,086	47.3%
Race/ethnicity	161	100.0%	205	100.0%	63,460	100.0%	212	100.0%	1,670	100.0%
Asian/Pacific Islander	17	10.6%	83	40.5%	16,304	25.7%	28	13.2%	142	8.5%
White (non-Hispanic)	130	80.7%	102	49.8%	32,777	51.6%	174	82.1%	1,421	85.1%
Other/multiracial	14	8.7%	20	9.8%	14,379	22.7%	10	4.7%	107	4.7%

Considering the demographic data in Table 11 along with information in Tables 9 and 10 and the comparative score data shown in Tables 7–8, it seems most appropriate to use the P4 students from this study as the normative sample for assessing pharmacy school applicants. One reason for this is that the demographic characteristics of the P4 student sample are more similar than either the P1 or the professional pharmacist samples to the demographics of the total population of enrolled pharmacy students. However, with 64% of the P4 sample consisting of data from the University of

Southern California, it cannot be ruled out that factors unique to this school could have biased the data, especially with the disproportionately high percentage of P4 students reporting Asian/Pacific Islander ethnicity. In addition, the observed similarities between the demographics of the P4 sample and the AACP national enrollment population could have occurred by chance. Nevertheless, in the absence of more cases and a more even geographical distribution, we must work with the data we have.

A second reason for using the P4 sample as the norm group is suggested by the score data shown in Table 7. Despite demographic characteristic differences, the P4 sample mean scores are most similar to the mean scores for the pharmacists, which is the professional group that pharmacy students are being prepared to join. The professional pharmacist sample can be used by Pearson to create a separate norm group for use by human resources departments in evaluating prospective pharmacists for hire or advancement, but the P4 group seems more appropriate for use with pharmacy school applicants.

The third goal of this study was to validate the score data for the group identified as the appropriate normative sample for use with applicants to professional pharmacy school programs. Even though the attempt to collect enough preceptor ratings of P4 students was unsuccessful, the same information that suggests the appropriateness of using the P4 study sample as the norm group also suggests the validity of the P4 data: the demographic similarity between the P4 sample and the population of pharmacy program enrollees; the close similarity between the raw score means for the P4 students and pharmacists; and the relatively few number of medium or large standard differences (effect sizes) between the scores for these two samples.

Nevertheless, if the WPI-II scales are to be used to evaluate applicants to a program, or with students in a program, it is important to determine which scales are actually related to success. One approach to understanding which characteristics are most important for success is based on the assumption that P4 students are those who have successfully made it to their final year of professional preparation, and that professional pharmacists are individuals who have successfully graduated. These two samples should thus be expected to score higher on the most relevant WPI-II scales.

However, the study found that the P1 students scored higher than both the P4 students and the pharmacists on the majority of comparisons, and the pharmacists scored lower than both student samples on most scales.

One possible explanation for this is that students are more likely to inflate their responses, which is suggested by the higher Unlikely Virtues scores for students than for pharmacists and by the P1 students (presumably less mature) scoring higher than the P4 students (presumably more mature). Demographic characteristics discussed in this report may also explain some of these differences. It is also interesting to note that pharmacists scored lower than the “All Working Adults” WPI-II normative sample on many of these characteristics.

While P4 students’ mean scores are more similar to the pharmacists’ scores than to the P1 students’ scores, there are significant differences, and it is not clear what this means about the importance of the characteristics associated with the scores for success as a pharmacist. For this reason, additional information about the relationships between WPI-II scales and relevant outcomes is needed to be able to suggest the use of the WPI-II by pharmacy schools with complete confidence. Nevertheless, it is entirely possible that some of the other WPI-II scales that do not correspond with the AACCP customer-oriented characteristics, such as Adaptability and Stress Tolerance, may also be relevant to success in pharmacy school and as a professional pharmacist.

For the reasons described above, we suggest that the WPI-II can provide useful information to pharmacy schools for applicants to professional pharmacy programs or with students already admitted to pharmacy school. Considering the findings of this study and conclusions drawn from these data, it seems reasonable to suggest that an appropriate norm group has been identified (P4 students) and that the content of some of the WPI-II scales do correspond to most of the customer-oriented characteristics that the AACCP Advisory Committee is interested in. However, one thing these results do not address is the extent to which WPI-II scales (and their related AACCP characteristics) are important for success in pharmacy school or as a professional pharmacist. This validation will have to await a future study.

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