Characteristics of PCSAS Students Applying for Internship and Predictors of Match Outcomes:
Report from the PCSAS Review Committee
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- Background. The Review Committee (RC) of the Psychological Clinical Science Accreditation System (PCSAS) frequently is asked whether normative data are available for characteristics of PCSAS-accredited programs, their current students, their graduates, and their faculty. One of the most common requests is for normative data at the time of internship application, including students' clinical hours, productivity, etc. Thus, as a part of the Annual Report process in the fall of 2022, the RC asked DCTs to provide the clinical hours and CVs of all students applying for internship. In the spring of 2023, the RC asked DCTs to provide outcome information for these applicants. We recognize that DCTs are already overworked and often underappreciated, and we greatly appreciate their taking time to respond to these requests. We hope that our characterization below of this information is helpful to faculty and students at PCSAS programs, to doctoral programs trying to determine whether to apply for PCSAS accreditation, to internship programs that are a critical part of the predoctoral training continuum for clinical science students, and to the RC's evaluation of PCSAS programs. Our overarching goals are listed below.
    1. Describe students in PCSAS-accredited programs at the time of internship application: publication of journal articles and chapters, receipt of federally funded and competitive national fellowships or grants, intervention and assessment hours, and years in the program.
    2. Characterize three aspects of internship outcomes for PCSAS-accredited programs: match rate, percent matching at an APCS site (as a very rough proxy for a clinical-science internship), and student ranking of the site at which they matched.
    3. Examine several potential correlates of these three aspects of internship outcomes for PCSAS-accredited programs: publication of journal articles and chapters; receipt of federally funded and competitive national fellowships or grants; intervention, assessment, and total direct-contact hours; and years in the program.
- Overview of data collection
    - As a part of completing their programs' Annual Reports for PCSAS, DCTs of PCSAS-accredited programs were asked to provide the following information in the fall of 2022 for all students who entered the APPIC match: their CVs, and their assessment and intervention hours.
    - DCTs from 45 of 46 programs provided APPIC hours for 217 students and CVs for 184 students.
    - In the spring of 2023, DCTs were asked to provide the following information: the outcome of the matching process for each student (i.e., Phase I match, Phase II match, no match, withdrew or didn't submit rankings); the program and track to which the student matched; and the student's ranking of the site at which they matched (if they matched in Phase I).
    - DCTs from 38 of 45 programs provided the matching information, and DCTs from 35 of 38 programs provided the ranking information (i.e., a subset of DCTs provided information in the spring of 2023). DCTs were given the opportunity to submit deidentified information if they or their students preferred to do so; in this case, DCTs were asked to provide publication information from the students' CVs.
- Descriptive Statistics

- Match rates (provided for 198 of 217 students (91.2%)). Almost all students (98.0%) matched to an internship site: 95.0% matched in Phase I; 3.0% matched in Phase II; 1.5% did not match; and .5% withdrew or didn't submit rankings. Match rates for Clinical PhD students who were not in PCSAS-accredited programs were obtained from 2023 match rates provided by APPIC and are presented in the table below (https://www.appic.org/Internships/Match/Match-Statistics/Match-Statistics-2023-Phase-I#summary; https://www.appic.org/Internships/Match/Match-Statistics/Match-Statistics-2023-Combined).

Internship match outcomes (2023)

	Applicants	
	Clinical PhD Students minus PCSAS Students (n = 1227)	**PCSAS Students (n = 198)**
Phase I Match	87.3%	95.0%
Phase II Match	7.1%	3.0%
Did Not Match, Withdrew, or Didn't Submit Rankings	5.6%	2.0%

https://www.appic.org/Internships/Match/Match-Statistics/Match-Statistics-2023-Phase-I#summary
https://www.appic.org/Internships/Match/Match-Statistics/Match-Statistics-2023-Combined

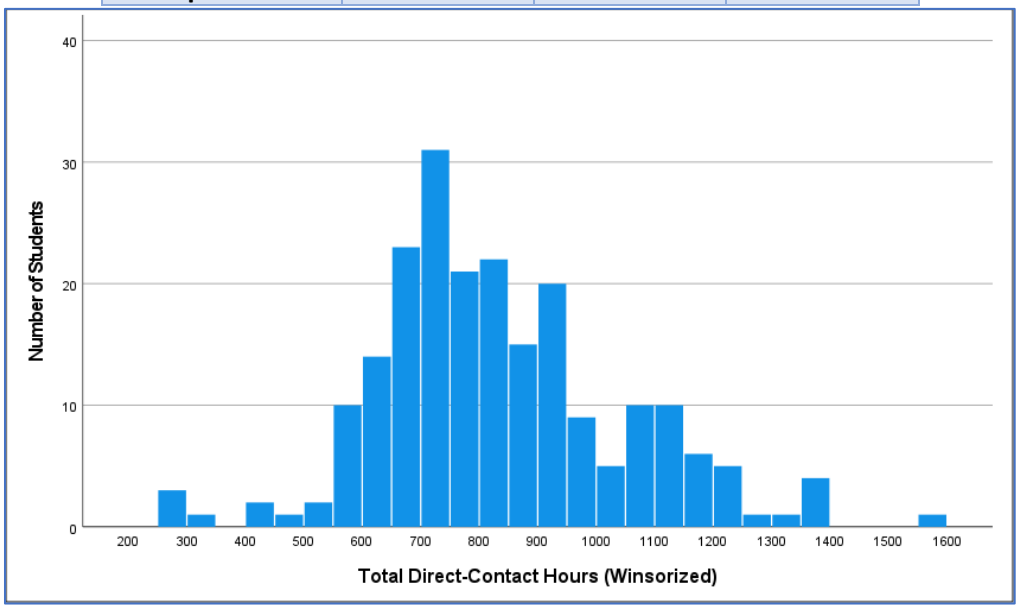
The list of sites at which 3 or more students from PCSAS programs matched is provided below, as this provides one data-driven approach to the identification of potential clinical science internships. Three important caveats should be noted, however: excellent clinical science internships with a smaller census would be less likely to make it onto the list, we do not have internship match information for 19 PCSAS students, and this list provides only a single-year snapshot of the programs at which PCSAS students match.

Internship Programs at Which Three or More Students from PCSAS Programs Matched	
Albert Einstein College/Montefiore Med Center (4)	University of New Mexico Health Sciences Center (3)
Alpert Medical School of Brown University (7)	University of North Carolina School of Medicine – Clinical Psychology (3)
Charleston Consortium Internship (7)	University of Pennsylvania Department of Psychiatry (4)
Children's Hospital Los Angeles (3)	University of Washington - Psychiatry (3)
Children's Hospital of Philadelphia (4)	VA Ann Arbor Healthcare System (3)
Harvard Medical School/Massachusetts General Hospital (9)	VA Boston Healthcare System (3)
Harvard Medical School/McLean Hospital (4)	VA Connecticut Healthcare System - West Haven Campus (3)
New York Presbyterian Hosp/Weill-Cornell Medical Center (3)	VA Maryland Health Care System/University of Maryland (4)
Ohio State University-Behavioral Health (3)	VA Palo Alto Health Care System (3)
Rush University Medical Center (3)	VA Puget Sound, Seattle (9)
UCLA - Semel Institute for Neuroscience & Human Behavior (5)	VA San Diego / University of California, San Diego (3)

University of California, San Francisco/Clinical Psychology (3)	Yale University School of Medicine - Psychiatry (3)

- Intervention, assessment, and total direct-contact hours (provided for 217 students (100%)). Median intervention, assessment, and total direct-contact hours were 613, 170, and 802, respectively. Only 3.2% (n = 7) reported total direct-contact hours ≤ 500, and only 8.8% (n = 19) reported total direct-contact hours ≤ 600. Note that we do not know how these hours compare to students from non-PCSAS clinical programs or from all students participating in the internship match because APPIC has not reported these data.

Statistic	Intervention	Assessment	Total
Mean	629.75	207.97	837.72
Median	613.00	170.00	802.00
SD	229.92	131.89	239.22
25th percentile	505.00	117.00	688.50
75th percentile	728.00	248.50	945.13



- Productivity (coded from available CVs for 184/217 students (84.8%)). Median peer-reviewed journal articles and first-author peer-reviewed journal articles were 8.00 and 2.00, respectively.

Statistic	First-author peer-reviewed journal articles	Peer-reviewed journal articles	First-author chapters	Chapters
Mean	3.13	9.36	0.19	0.62
Median	2.00	8.00	0.00	0.00
SD	3.12	6.60	0.47	0.97
25th percentile	1.00	5.00	0.00	0.00
75th percentile	4.00	12.75	0.00	1.00

- Federal fellowships (coded from available CVs for 184/217 students (84.8%)). Approximately one-fifth of students received a federal fellowship (21.2%; 10.9% received an NSF or Canadian version of NSF; 10.9% received an NRSA).
- Years in program (coded from available CVs for 184/217 students (84.8%)). Students' average years in the program at the time they applied for internship were 5.57 (SD = 0.66,

median = 5.00) years, with 2.7% in their 4th year, 54.3% in their 5th year, 36.4% in their 6th year, and 6.5% in their 7th year.

- Student rank of matched program (reported for 176/217 students (81.1%)). Students' median ranking of the program to which they matched in Phase I was 1.0 (mean = 2.07; SD = 2.00. Over half of the students matched at their first choice (56.3%), 19.3% matched at their second choice, 10.8% matched at their third choice, 6.3% matched at their fourth choice, and 7.4% matched at their fifth or lower choice.
- Match with APCS internship program (coded for 184/217 students for whom we had site at which they matched (91.2%)). Approximately a fifth of students (21.7%) matched at one of the eleven APCS internship sites (https://www.acadpsychclinicalscience.org/internship-programs.html), which represents a rough proxy for a clinical science internship site (i.e., many other internship programs also provide excellent clinical science training).

- Bivariate correlates of three aspects of internship outcomes for PCSAS-accredited programs. Mplus was used to evaluate bootstrapped bivariate correlations of internship outcomes (5000 bootstrapped iterations) while taking program-related clustering in the data into account, using FIML to address missing data, and treating non-normal dependent variables appropriately. Almost all variables were Winsorized at 3 SDs above the mean to reduce skew: first-author peer-reviewed journal articles, peer-reviewed journal articles; intervention, assessment, and total direct-contact hours; and student rankings. Both first-author chapters and chapters were discretized, with chapters dummy-coded and first-author chapters coded as 0, 1, or 2+.
  - Whether matched. We had planned to examine correlates of student matching (or matching in Phase I), but the match rate was so high (98.0% overall, and 95.0% in Phase I) that it was not feasible to proceed given both statistical and confidentiality issues.
  - Whether matched at APCS internship (as a rough proxy for a clinical science internship). Inspection of the 95% bootstrapped confidence intervals indicates that none of the variables listed below emerged as a statistically significant correlate of whether students matched at an APCS internship, including number of publications or receipt of a federally funded fellowship.

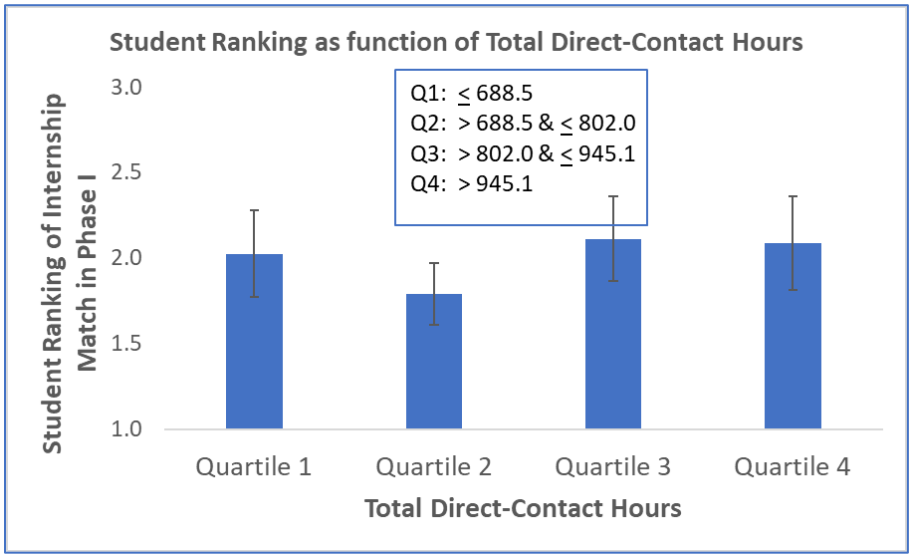
Variable	Correlation	Bootstrapped 95% CI
Intervention hours	-.033	[-.146 – .093]
Assessment hours	.000	[-.121 – .131]
Total direct-contact hours	-.026	[-.165 – .134]
Years in program	-.021	[-.170 – .115]
Federally funded fellowships/grants	.123	[-.098 – .335]
Number of first-author journal articles	.063	[-.070 – .214]
Number of journal articles	.038	[-.090 – .192]
Number of first-author chapters	-.120	[-.229 – .048]
Number of chapters	-.142	[-.284 – .013]

  - Student ranking of site at which matched in Phase I. Only one of the variables listed below emerged as a statistically significant correlate of the ranking of the site at which students matched. The number of first-author journal articles correlated positively and to a small degree with student ranking, *r* = .155, such that those who published more first-author articles matched at a somewhat less-preferred site.

Variable	Correlation	Bootstrapped 95% CI
Intervention hours	.000	[-.143 – .141]
Assessment hours	.019	[-.107 – .165]
Total direct-contact hours	.007	[-.184 – .176]

Years in program	-.130	[-.298 – .038]
Federally funded fellowships/grants	-.099	[-.240 – .117]
Number of first-author journal articles	.155	[.005 – .313]
Number of journal articles	.027	[-.127 – .172]
Number of first-author chapters	.121	[-.050 – .285]
Number of chapters	-.069	[-.210 – .078]

Given particular interest in the potential association between number of total direct-contact hours and student rankings, we also depict below the average student ranking and standard error for those in the first, second, third, and fourth quartile of total direct-contact hours. It is evident in the graph that those in the first quartile, who have the fewest direct-contact hours, are just as likely as their colleagues to match to a preferred site.



- Predicting three aspects of internship outcomes for PCSAS-accredited programs from number of publications and total direct-contact hours simultaneously. Mplus was used to evaluate bootstrapped prediction of internship outcomes (5000 iterations) while taking program-related clustering in the data into account, using FIML to address missing data, and treating non-normal dependent variables appropriately. Note that results were the same regardless of whether number of publications or number of first-authored publications was included as a predictor in the model.
    - Predicting whether matched. The match rate was too high to examine predictors of student matching (98.0%).
    - Predicting matching at APCS site. Matching at an APCS internship was modeled as a binary variable. The 95% bootstrapped confidence intervals indicated that neither number of journal articles nor total direct-contact hours emerged as a statistically significant predictor, and the overall variability accounted for in APCS matching was very low (R^2 = .001).

Variables	Standardized estimate	Bootstrapped 95% CI
Number of journal articles	-0.082	[-0.112 – 0.243]
Total hours	-0.196	[-0.227 – 0.180]

    - Predicting student ranking. Ordinal regression was used to evaluate the two potential predictors of student ranking of the site to which they matched in Phase I. All ranking values from 5 to 9 (7.4%) were re-classified as 5, so that there would be at least 10 observations in each ordinal category. The 95% bootstrapped confidence intervals indicated that neither number of journal articles nor total direct-contact hours emerged as a statistically significant

predictor, and the overall variability accounted for in student rankings was very low (R^2 = .001). Note that the findings were highly similar when logistic regression was used to evaluate predictors of whether a student matched at their top-ranked site or not.

Variables	Standardized estimate	Bootstrapped 95% CI
Number of journal articles	0.000	[-0.179 – 0.157]
Total hours	0.024	[-0.141 - 0.194]

- Comments
  - At the time of internship application, students in PCSAS-accredited programs on average are exhibiting impressive productivity, with a median of 8 peer-reviewed publications and 2 first-authored peer-reviewed publications. Significant publishing was even evident at the 25th percentile, with 5 peer-reviewed publications and 1 first-authored peer-reviewed publication. Publication of chapters, in contrast, was relatively infrequent, particularly first-authored chapters. These norms are fully consistent with the clinical science orientation of PCSAS programs.
  - It is impressive that approximately 20% of students in PCSAS programs have received a federally funded grant, given how competitive they are. Not surprisingly, additional analyses revealed that receipt of a federally funded grant correlated to a small to moderate degree with both number of publications, *r* = .18, 95% bootstrapped CI: [.064, .314]., and number of first-author publications, *r* = .25, 95% bootstrapped CI: [.118, .357]. In our experience, programs vary significantly in the proportion of their students who receive federally funded grants and in the extent to which they invest programmatically in supporting these application efforts. Thus, there may be potential to increase student fellowship support within some programs.
  - At the time of internship application, students in PCSAS-accredited programs have accumulated a very high number of direct-contact hours, with 802 total direct-contact hours at the median and 689 at the 25th percentile. Notably, this does not include the substantial time that students spend on clinical support activities, such as session preparation, note-writing, supervision, etc. Receipt of high-quality clinical training is central to the clinical science training model, but this historically has been accomplished with far fewer direct-contact hours. The data suggest that having fewer hours does not adversely affect the match rate. For example, even students in the lowest quartile of direct-contact hours have a comparable match rate to their peers (96%, 96%, 100%, 96%, in order from first to fourth quartile). Moreover, students in the lowest quartile of direct-contact hours match to their top choice at similar rates to their peers (58%, 60%, 50%, 57%, in order from first to fourth quartile).
  - At internship application, a majority of students were in their 4th or 5th year (57.0%), and program year was unrelated to student ranking of their match or to matching at an APCS internship, suggesting the adequacy of six-year training programs (including internship). Programs with average time-to-degree greater than 7 years may want to consider trimming the length of their program, so that students can move forward in their career paths more quickly and more students can be trained for a diverse array of clinical science careers. Reducing the number of direct-contact hours and support hours is one means by which this might be accomplished.
  - Almost all students in PCSAS-accredited programs match (98.0%), whereas 94.4% of students in other Clinical programs match. Additionally, the majority of students in PCSAS-accredited programs matched at their top choice site, 93.6% matched at one of their top four sites, and a fifth of students (21.7%) matched at an APCS internship site. Thus, there is

limited support for students' common concerns about not matching to an internship site or not matching to a more preferred site, except under unusual circumstances (e.g., several geographical constraints, far weaker readiness for internship, etc.). APCS internships likely will remain extremely competitive, but of course there are a number of other strong clinical science internship programs that are not currently members of APCS. Moreover, it is important to note that matching at an APCS internship is not associated with students' publication or grant records. Thus, we should be cautious about advising students not to apply to APCS internships on this basis.

- No bivariate correlates of matching at an APCS program or of student ranking of their matched site emerged, with one exception. The number of first-authored publications was weakly associated with matching at a less-preferred internship site (r = .155), and the variability in student rankings accounted for by the number of first-authored publications was only 2.4%. Of course, it is difficult to interpret this association in the absence of additional information that we unfortunately do not have. For example, students with more publications may have applied to or ranked more highly more competitive internship sites (i.e., the relationship between applicant characteristics and outcomes may be influenced by selection effects).
- Importantly, in logistic and ordinal regression models examining number of publications and total number of direct-contact hours as simultaneous predictors of the two internship outcome variables, no statistically significant findings emerged. Thus, there is not compelling evidence in the linear multivariate analyses conducted here consistent with assumptions that either number of direct-contact hours or number of publications increases or decreases the likelihood of matching, matching at a more preferred site, or matching at an APCS site.
- In conclusion, we hope that these data will help to dispel some of the anxiety students often experience about matching at internship sites as well as myths about the importance of the number of direct-contact hours at the time of internship application. We urge students, faculty, and internship training directors to consider working together to reduce the number of direct-contact hours well below the median of 800 when the pursuit of hours is driven by concerns about obtaining an internship rather than gaining training that is consistent with and will advance the student's career goals. Finally, we would like to thank the DCTs again for taking the time to provide this information.