

The current state of quantitative psychology: Dude, where's my field?

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Today's Topics

- Aiken et al. (1990)
- Aiken et al. (2008)
- APA Quant Task Force Report
- My \$0.02

How I got here

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Unfortunately for all of you, Leona is off galvanting across Europe, so you're stuck with me.

A word of caution

Much of what I'm talking about today comes from other peoples' work. The views expressed in this talk (whether intended or otherwise) are my own, and not necessarily those of Leona and her co-authors, the other members of the Task Force, or APA.

What we know

The bulk of what we know about quantitative training in the field of Psychology comes from two studies done by Leona and colleagues. One was published in 1990 (but conducted in 1986) and the other was published in January of this year (but conducted in 1998).

In 1986 surveys were sent to the chairs of all 222 psychology departments identified as offering PhD's. 186 responded, for a completion rate of 84%. The surveys contained a number of questions about the quantitative training offered at those programs.

What follows is a brief review of the high points (or low points, as the case may be) of the survey results.

Survey Structure

The survey covered (among other things) 4 primary areas:

- Curriculum Offerings
- Required Stats and Measurement Courses
- Topical Content of Intro Stats Sequence
- Judged Competencies of Graduates

Curriculum Offerings

The survey found that among psychology departments:

- Over 1/3 had no measurement courses
- Nearly 1/4 had no coverage of quasi-experimental designs
- Over 1/4 had neither a general or specific methods course

Curriculum Offerings

The survey found that among psychology departments:

Technique	1986	
	partial course	full course
Regression	68%	36%
Test Theory	45%	31%
SEM	18%	14%

Required Stats and Measurement Courses

The average length of the required stats/measurement courses was 1.2 years. 63% of such courses had in-depth coverage of regression, while 73% had in-depth coverage of ANOVA.

Judged Competencies - Statistics

Technique	1986	
	most or all	few or none
Regression	58%	6%
Outlier Detection	8%	68%
CFA	3%	72%
SEM	2%	81%

Judged Competencies - Measurement

Technique	1986	
	most or all	few or none
Classical Test Theory	19%	53%
EFA	12%	45%
IRT	6%	76%

“The thinking underlying training in methodology, design, and statistics may be just as important as the content that is conveyed.”

Five Conclusions from the 1986 Data

- 1 Current training is lab, rather than field, based.
- 2 Supplemental training is required.
- 3 Very little measurement in the curriculum.
- 4 Training in new techniques generally unavailable within psych departments.
- 5 Lack of awareness of resources outside department.

Quantitative resources

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The median age of all Division 5 members of APA was 51.

In 1998 surveys were sent to the chairs of all 234 psychology departments identified as offering PhD's. 201 responded, for a completion rate of 86%.

Curriculum Offerings

The 1998 study found that among psychology departments:

Technique	1986		1998	
	partial course	full course	partial course	full course
Regression	68%	36%	76%	56%
Test Theory	45%	31%	36%	24%
SEM	18%	14%	47%	42%

Required Stats and Measurement Courses

The average length of the required stats/measurement courses was still 1.2 years. 78% of such courses had in-depth coverage of regression (vs. 63% in 1986), while 80% had in-depth coverage of ANOVA (vs. 73%).

Judged Competencies - Statistics

Technique	1986		1998	
	most or all	few or none	most or all	few or none
Regression	58%	6%	85%	4%
Outlier Detection	8%	68%	23%	45%
CFA	3%	72%	-	-
SEM	2%	81%	10%	50%

Judged Competencies - Measurement

Technique	1986		1998	
	most or all	few or none	most or all	few or none
Classical Test Theory	19%	53%	30%	36%
EFA	12%	45%	-	-
IRT	6%	76%	8%	60%

Some Interesting Facts

“Median years of course work actually taken hovered at about 1.6. Given that the introductory sequence was 1 year in length in 70% of the programs, the typical PhD student took slightly over half a year more of statistics and measurement beyond the first year sequence.”

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“The measurement requirement was brief, with a median of 0.15 years or about 4.5 weeks across all areas.”

Noted Areas of Need

Respondents were asked to name the three top areas of need in their quantitative curriculum. The top three were:

- topics in measurement (20.5%)
- topics in multilevel modeling (17%)
- topics in structural equation modeling (14%)

Five Conclusions from the 1998 Data

The five conclusions from the 1998 study were, sadly, mostly unchanged from the 1986 study.

Quantitative resources circa 1998

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There were only 47 first year students, down from 108 in 1986.

Some Background

In 2005, Division 5 of APA proposed the creation of a Task Force to study the issue of the shortage of quantitative psychologists.

In early 2006, the APA Council and Board of Directors allocated funds for two meetings of that Task Force.

These meetings occurred in July and November of 2006.

Some Background

The Task Force for Increasing the Number of Quantitative Psychology (hereafter referred to as QTF) was chaired by Leona Aiken. Other members included: Herman Aguinis, Mark Appelbaum, Gwyn Boodoo, me, Rich Gonzalez, Glenn Milewski, Abigail Panter, Debra Park, Thanos Patelis, Marianne Ernesto, and Paul Nelson.

Some Background

The charge to the task force had two primary elements:

- 1 Assess the resources to train a notably increased number of quantitative psychology PhD students
- 2 Develop strategies to increase the number of students with appropriate backgrounds who seek to enter doctoral training in quantitative psychology

Some Background

For the purposes of today's talk, I'm going to re-cast the QTF report as follows:

- Where we are now.
- How we got here.
- Can we grow?
- Where to find new students.
- How new students can find us.

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We identified 23 such programs.

The 23*

ASU	Indiana	Ohio State
U of BC	Kansas	Oklahoma
UC-Davis	McGill	Purdue
UCLA	Minnesota	Rhode Island
UC-Irvine	Missouri	Simon Fraser
Fordham	New Mexico	USC
Georgia Tech	UNC	Vanderbilt
UIUC	Notre Dame	UVA
		Western Ontario

The Current Pipeline - Faculty

As of Fall 2006, there were approximately 85 FTE faculty in the 23 quant programs (median = 3.3, mean = 3.7). 76 of these FTE faculty were involved in training quantitative students and 50 of them also served as mentors to students outside quantitative.

The Current Pipeline - Students

Also as of Fall 2006, there were a total of 173 students enrolled in these 23 programs (median = 5.3, mean = 7.5).

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The 2006-2007 entering class had 39 students (median = 1.1, mean = 1.7)

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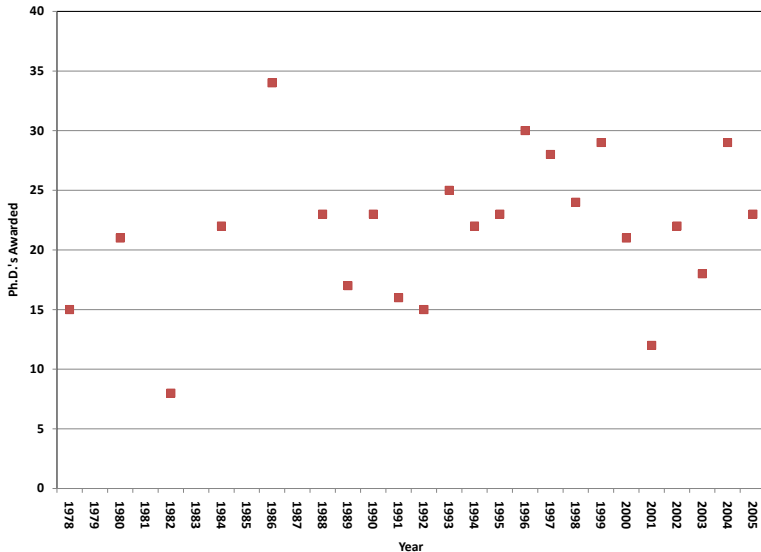
The 2006 QTF survey found 39 first year students.

The Sky is Falling

I ran across this on the Division 5 listserv from Bruce Thompson quoting a chapter by Fidler & Cumming:

“Norcross, Kohourt, and Wicherski (2005) reported data on the number of students commencing specialist PhD programs in quantitative psychology within U.S. university psychology departments. In 1992, there were 76 programs enrolling an average of 3.9 students each, but in 2003 there were only 17 programs enrolling an average of 1.9 students—that’s a drop from approximately 296 enrollments to just 32 in 10 years!”

Or Not - NSF Survey of Earned Doctorates



Sorting Things Out

It seems likely to me that the discrepancies we're seeing are a result of different informants and different coding schemes. I trust the most recent QTF data the most, since these are all actual quant programs and Leona directly contacted the area heads to get the data.

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If we believe the QTF data and the NSF data, then these things suggest that life in quant world has been remarkably stable over the past three decades. This also fits what we know about the demographics of our field.

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Of course there are other possible explanations/interpretations, but this seems to be one of the most parsimonious ones.

Can We Grow?

Short answer: Yes.

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Programs indicated the capacity to train 268 students (and increase of 95 students over the current levels) with an “ideal” target of 228 (an increase of 55).

Impediments to Growth

The median/mean number of faculty in quant programs is 3.3/3.7 (FTE). Programs indicated they would like to be 5.3/5.7.

The average number of students is 5.3/7.5. Programs indicated they would like 10.3/11.4

Across programs, the average number of students per FTE is about 2.

Impediments to Growth

As part of the QTF survey, programs were asked to rate different factors that limited their ability to train more students. The top two factors that were indicated as “very much a source of limitation” were:

- Lack of qualified applicants (39%)
- Lack of sufficient faculty (35%)

Impediments to Growth

The top two additional factors that were indicated as “somewhat a source of limitation” were:

- Heavy service teaching loads (57%)
- Resistance from other programs (44%)

Where to Find New Quant Students

- 1 Undergrad psych majors
- 2 Undergrad other majors
- 3 MA students
- 4 PhD poaching
- 5 Post-docs

How New Students Can Find Us

- 1 Update *APA Grad Study in Psych*
- 2 Create list of PhD programs
- 3 Quant website
- 4 Instructional materials
- 5 Articles
- 6 Short courses
- 7 Outreach
- 8 Intro to quant course



Google Custom Search

- Science Home
- Science A-Z
- About Us
- Contact Us

- Advanced Training Institutes
- Animal Research
- Applied Psychological Science
- Awards
- Careers in Psychology
- Decade of Behavior
- Funding
- Governance
- Library Research
- Research Ethics
- Responsible Conduct of Research
- Science Public Policy
- Students
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Quantitative Psychology



Definition of Quantitative Psychology

Quantitative psychology is the study of methods and techniques for the measurement of human attributes, the statistical and mathematical modeling of psychological processes, the design of research studies, and the analysis of psychological data.

Quantitative psychology is central to all aspects of psychology: science, education, public interest, and practice. This essential role of quantitative psychology is reflected in the fact that Division 5 - Evaluation, Measurement, and Statistics - is one of the Charter Divisions of the APA.

Quantitative psychology includes research and development in a number of broad areas: measurement, research design, and statistical analysis (see Aiken, West, Sechrest, & Reno, 1990), as well as mathematical and statistical modeling of psychological processes. Within each of these areas, quantitative psychologists develop new methodologies; they also evaluate existing methodologies to examine their behavior under conditions that exist in psychological data (e.g., with small samples). This work supports the substantive research of all areas within psychology.

[List of PhD Concentrations in Quantitative Psychology](#)

[How to Prepare for Doctoral Study in Quantitative Psychology](#)

[Mathematical Psychology, a Related Research Approach](#)

[Educational Psychology Programs in Quantitative Methodology](#)

[Links to Other Web Resources](#)

[Job Outlook for Quantitative Psychologists](#)

[Task Force for Increasing the Number of Quantitative Psychologists](#)

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- The volume of impending retirements will pose a serious challenge.
- I worry that the “twofer” model could be disastrous in the long term.
- Sometimes we are our own worst enemies.
- We can grow, it's just going to take some work.

The End

Thank you.
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