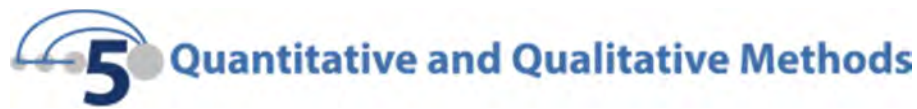


The Score



DIVISION 5 PERIODICAL VOLUME 46 ISSUE 4

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*Keith McNulty*

THE THREE MOST COMMON STATISTICAL TESTS YOU SHOULD DEEPLY UNDERSTAND

Keith McNulty, Ph.D.

Hypothesis testing is one of the most fundamental elements of inferential statistics. In modern languages like Python and R, these tests are easy to conduct — often with a single line of code. But it never fails to puzzle me how few people use them or understand how they work. In this article I want to use an example to show three common hypothesis tests and how they work under the hood, as well as showing how to run them in R and Python and to understand the results.

The general principles and process of hypothesis testing

Hypothesis testing exists because it is almost never the case that we can observe an entire population when trying to make a conclusion or inference about it. Almost always, we are trying to make that inference on the basis of a sample of data from that population.

Given that we only ever have a sample, we can never be 100% certain about the inference we want to make. We can be 90%, 95%, 99%, 99.999% certain, but never 100%.

Hypothesis testing is essentially about calculating how certain we can be about an inference based on our sample. The most common process for calculating this has several steps:

1. Assume the inference is *not true* on the population — this is called the *null hypothesis*
2. Calculate the statistic of the inference on the sample
3. Understand the expected distribution of the sampling error around that statistic
4. Use that distribution to understand the maximum likelihood of your sample statistic being consistent with the null hypothesis
5. Use a chosen ‘likelihood cutoff’ — known as *alpha* — to make a binary decision on whether to accept the null hypothesis or reject it. The most commonly used value of alpha is 0.05. That is, we usually reject a null hypothesis if it renders the maximum likelihood of our sample statistic to be less than 1 in 20.

The salespeople data set

To illustrate some common hypothesis tests in this article I will use the `salespeople` dataset which can be found at <http://peopleanalytics-regression-book.org/data/salespeople.csv>. Let's download it in R and take a quick look at the first few rows.

```
url <- "http://peopleanalytics-regression-book.org/data/salespeople.csv"
salespeople <- read.csv(url) head(salespeople)
```

##	promoted	sales	customer_rate	performance
## 1	0	594	3.94	2
## 2	0	446	4.06	3
## 3	1	674	3.83	4
## 4	0	525	3.62	2
## 5	1	657	4.40	3
## 6	1	918	4.54	2

We see four columns of data:

1. `promoted` — a binary value indicating if the salesperson was promoted or not in the recent promotion round
2. `sales` — the recent sales made by the salesperson in thousands of dollars
3. `customer_rate` — the recent average rating by customers of the salesperson on a scale of 1 to 5
4. `performance` — the most recent performance rating of the salesperson where a rating of 1 is the lowest and 4 is the highest.

Example 1 — Welch's t-test

Welch's *t*-test is a hypothesis test for determining if two populations have different means. There are a number of varieties of this test, but we will look at the *two sample* version and we will ask if high performing salespeople generate higher sales than low performing salespeople in the population.

We start by assuming our null hypothesis which is that the difference in mean sales between high performers and low performers in the population is *zero or less*. Now we calculate our difference in means statistic for our sample.

```
library(dplyr)

# data for high performers
high_sales <- salespeople |>
  filter(performance == 4) |>
  pull(sales)

# data for low performers
low_sales <- salespeople |>
  filter(performance == 1) |>
  pull(sales)

# difference
```

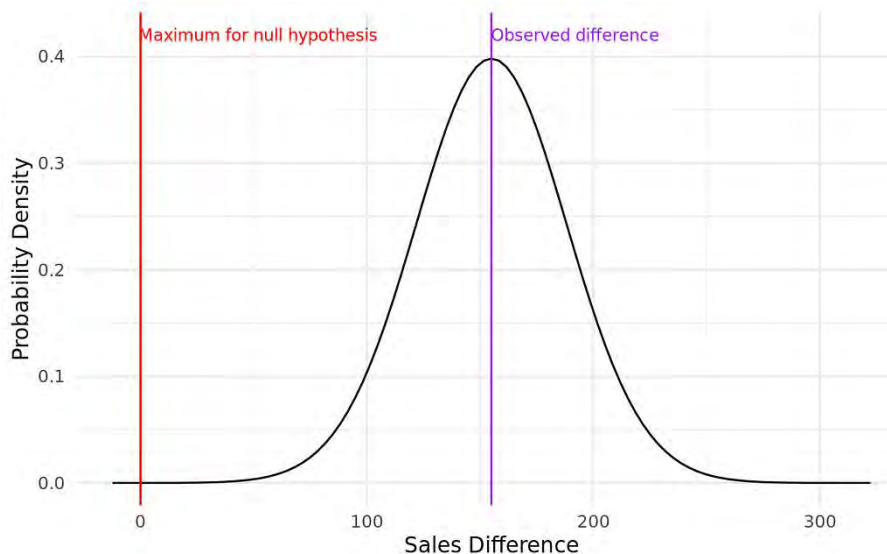
```
(mean_diff <- mean(high_sales) - mean(low_sales))

## [1] 154.9742
```

So, we see that in our sample, high performers generate around \$155k more in sales than low performers.

Now, we are assuming that sales is a random variable — that is, that the sales of one salesperson is independent of another. Therefore, we expect the difference in mean sales between the two groups to also be a random variable. So we expect the true population difference to be on a t-distribution centered around our sample statistic, which is an estimate of a normal distribution based on our sample. To get the precise t-distribution, we need the *degrees of freedom* — which can be determined based on the [Welch-Satterthwaite equation](#) (100.98 in this case). We also need to know the standard deviation of the mean difference, which we call the *standard error* which we can calculate to be 33.48. See [here](#) for more details on these calculations.

Knowing these parameters, we can create a graph of the t-distribution around our sample statistic.



t-distribution around sample statistic (Author generated)

We can now see the expected probability distribution for our true population statistic. We can also mark the maximum position on this distribution that represents a difference of zero or less — which is our null hypothesis statement. By taking the area under this distribution to the left of the red line, we calculate the *maximum probability* of this sample statistic occurring if the null hypothesis were true. Usually this is calculated by working out the number of standard errors that are needed to get to the red line — known as the *t-statistic*. In this case it would be

```
# standard error
se <- 33.48

t_statistic <- (0 - mean_diff)/se
round(t_statistic, 2)
```

```
## [1] -4.63
```

So, our red line is 4.63 standard errors away from the sample statistic. We can use some built-in functions in R to calculate the associated area under the curve for this t-statistic on a t-distribution with 100.98 degrees of freedom. This represents the maximum probability of our sample statistic occurring under the null hypothesis, and is known as the *p-value* of the hypothesis test.

```
p_value <- pt(-4.63, 100.98)
round(p_value, 6)

## [1] 5e-06
```

We determine that the maximum probability of our sample statistic occurring under the null hypothesis is 0.000005 — much less than even a very stringent alpha. In most cases this would be considered too unlikely to accept the null hypothesis and we will reject it in favour of the *alternative* hypothesis — that high performing salespeople generate higher sales than low performing salespeople.

To run this two sample t-test in R, you use the `t.test` function with an alternative hypothesis of "greater". In the output below you'll see the various statistics that we discussed above.

```
t.test(high_sales, low_sales, alternative = "greater")

## Welch Two Sample t-test
##
## data: high_sales and low_sales
## t = 4.6295, df = 100.98, p-value = 5.466e-06
## alternative hypothesis: true difference in means is greater than ## 0
## 95 percent confidence interval:
## 99.40204      Inf
## sample estimates:
## mean of x mean of y
## 619.8909 464.9167
```

To run this two sample t-test in Python you can use `scipy.stats` version 1.6.0 or later.

```
import pandas as pd
from scipy import stats

# get data
url = "http://peopleanalytics-regression-book.org/data/salespeople.csv"
salespeople = pd.read_csv(url)
```

```
# get sales for top and bottom performers
perf1 = salespeople[salespeople.performance == 1].sales
perf4 = salespeople[salespeople.performance == 4].sales

# welch's independent t-test with unequal variance
ttest = stats.ttest_ind(perf4, perf1, equal_var=False, alternative = "greater")
print(ttest)

## Ttest_indResult(statistic=4.629477606844271, pvalue=5.466221730788519e-06)
```

Example 2 — Correlation test

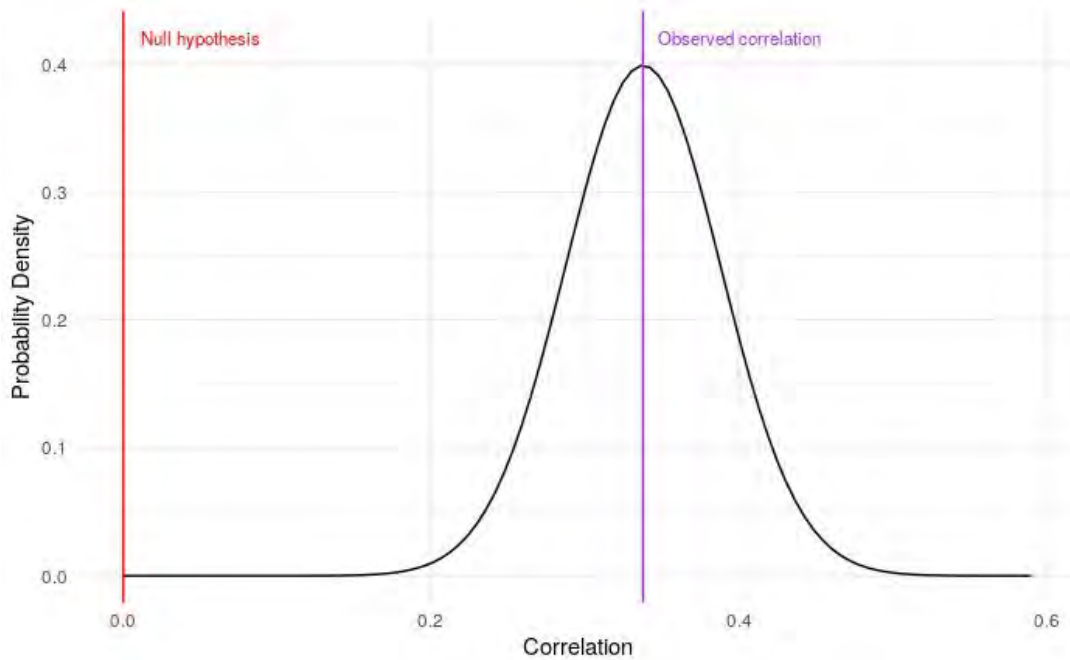
Another common hypothesis test is a test that two numeric variables have a non-zero correlation.

Let's ask if there is a non-zero correlation between `sales` and `customer_rate` in our `salespeople` data set. As usual we assume the null hypothesis — that there is a zero correlation between these variables. We then calculate the sample correlation:

```
(sample_cor <- cor(
  salespeople$sales,
  salespeople$customer_rate, use = "pairwise.complete.obs"
))

## [1] 0.337805
```

Again, we expect the true population correlation to lie in a distribution around this sample statistic. A simple correlation like this is expected to observe a t-distribution with $n-2$ degrees of freedom (348 in this case) and the standard error is approximately 0.05. As before we can graph this and position our null hypothesis red line:



t-distribution for correlation between sales and customer ratings (Author generated)

We see that the red line lies more than 6 standard errors away from the observed statistic and we can this calculate the p-value, which we again expect to be extremely small. Thus we can again reject the null hypothesis.

To run this in R:

```
cor.test(
  salespeople$sales,
  salespeople$customer_rate,
  use = "pairwise.complete.obs"
)

## Pearson's product-moment correlation
## data: salespeople$sales and salespeople$customer_rate
## t = 6.6952, df = 348, p-value = 8.648e-11
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
## 0.2415282 0.4274964
## sample estimates:
## cor
## 0.337805
```

To run this in Python:

```
import numpy as np
```

```
# calculate correlation and p-value
sales = salespeople.sales[~np.isnan(salespeople.sales)]
cust_rate = salespeople.customer_rate[~np.isnan(salespeople.customer_rate)]
cor = stats.pearsonr(sales, cust_rate)
print(cor)

## (0.33780504485867796, 8.647952212091035e-11)
```

Example 3 — Chi-square test of difference in proportion

Unlike the previous two examples, data scientists often have to deal with categorical variables. A common question is whether there is a difference in proportion across different categories of a such a variable. A *chi-square test* is a hypothesis test designed for this purpose.

Let's ask the question: is there a difference in the proportion of salespeople who are promoted between the different performance categories?

Again, we assume the null hypothesis, that the proportion of salespeople who are promoted is the same across all the performance categories.

Let's look at the proportion of salespeople who were promoted in each performance category by creating a *contingency table* or *cross table* for performance and promotion.

```
(contingency <- table(salespeople$promoted, salespeople$performance))

##      1  2  3  4
## 0 50 85 77 25
## 1 10 25 48 30
```

Now let's assume that there was perfect equality across the categories. We do this by calculating the overall proportion of promoted salespeople and then applying this proportion to the number of salespeople in each category. This would give us the following expected theoretical contingency table:

```
##      1      2      3      4
## 0 40.62857 74.48571 84.64286 37.24286
## 1 19.37143 35.51429 40.35714 17.75714
```

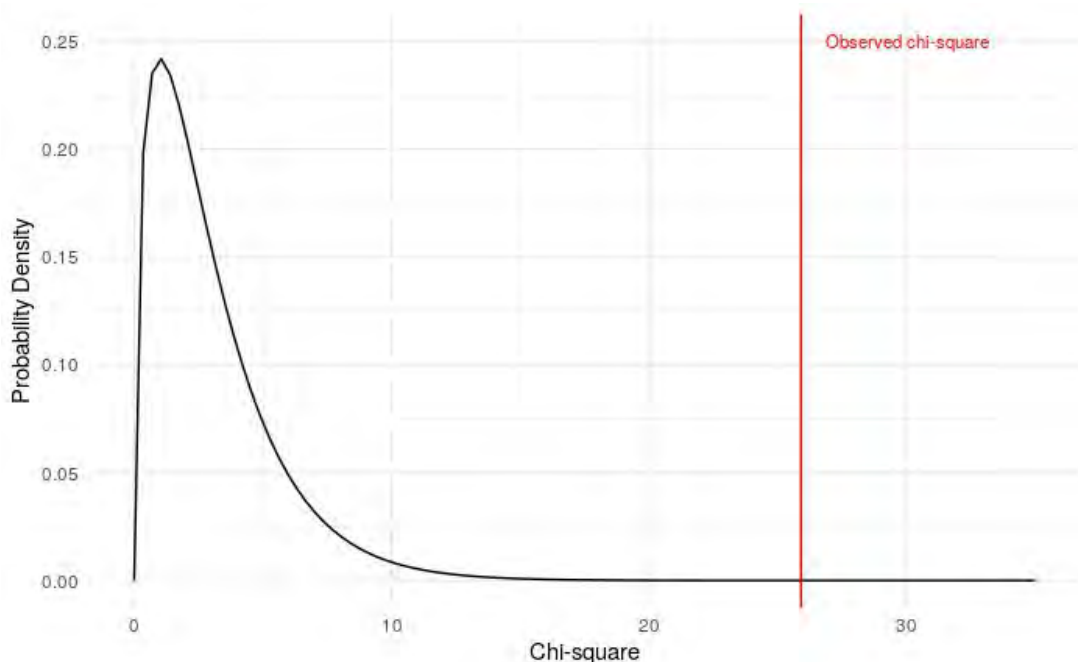
We then use this formula on each entry of the observed and expected contingency tables and sum up the results to form a statistic known as the *chi-square statistic*.

$$\frac{(\text{observed} - \text{expected})^2}{\text{expected}}$$

In this case the chi-square statistic is calculated to be 25.895.

As with our t-statistic earlier, the chi-square statistic has an expected distribution which is dependent on the degrees of freedom. The degrees of freedom are calculated by subtracting one from the number of rows and the number of columns of the contingency table and multiplying them together — in this case the degrees of freedom is 3.

So, as before, we can graph our chi-square distribution with 3 degrees of freedom, mark where our chi-square statistic falls in that distribution and calculate the area under the distribution curve to the right of that point to find the associated p-value.



Chi-square distribution with df = 3 (Author generated)

Again, we can see that this area is extremely small indicating that we are likely to reject the null hypothesis and confirm the alternative hypothesis that there is a difference in promotion rates between promotion categories.

To run this in R after calculating your contingency table:

```
chisq.test(contingency)

## Pearson's Chi-squared test
##
## data:  contingency
## X-squared = 25.895, df = 3, p-value = 1.003e-05
```

To run this in Python — the first three entries in the result represent the chi-square statistic, the p-value and the degrees of freedom respectively:

```
# create contingency table for promoted versus performance
contingency = pd.crosstab(salespeople.promoted, salespeople.performance)

# perform chi-square test
chi2_test = stats.chi2_contingency(contingency)
print(chi2_test)

## (25.895405268094862, 1.0030629464566802e-05, 3, array([[40.62857143, 74.48571429,
84.64285714, 37.24285714],
##          [19.37142857, 35.51428571, 40.35714286, 17.75714286]]))
```

I hope that you found these explanations and demonstrations useful. If you are interested in diving deeper into some of the underlying method and calculations of these tests, or to learn about other hypothesis tests, please visit my recent [Handbook of Regression Modeling](#), where Chapter 3 focuses on foundational statistics.



Qiwei He

CONGRATULATIONS TO DIVISION 5 AWARDEES IN 2024

Qiwei He, Ph.D.

APA Division 5 is honored to grant eight annual awards in 2024, recognizing the outstanding contributions of its members to quantitative and qualitative methods in psychology. The awardees were celebrated at the awards ceremony organized by Division 5, held in conjunction with the APA 2024 Annual Convention in August 2024 at Seattle, WA. As the Chair of the Awards Committee, I extend my heartfelt congratulations to all the 2024 awardees. I also wish to express my gratitude to all the candidates and nominators who participated in the award application process. Additionally, I deeply appreciate the tremendous efforts made by the Awards Committee, which comprises both quantitative and qualitative award panel, and support from the APA Division 5 President Dr. Frederick Wertz Sr.

Quantitative Awards

Quantitative Award Panel: Emily Shaw (chair), Amy Schmidt, and Qiwei He

Anne Anastasi Dissertation Award

Winner: Dr. Mark Himmelstein, Georgia Institute of Technology

Nominator: Dr. David Budescu, Fordham University

This award recognizes distinguished dissertations that address a topic in the field of quantitative research methods (assessment, evaluation, measurement, statistics). Mark Himmelstein received his Ph.D. in 2023 from Fordham University in Psychometrics and Quantitative Psychology. His dissertation is titled, *Measuring Persuasion Without Measuring a Prior Belief: A New Application of Planned Missing Data Techniques*. Mark's dissertation developed a new way of formulating the Judge Advisor System (JAS) paradigm, with a clever design that allows the estimation of the effect of advice by "imputing" the judge's (predicted) original judgement. This is done by implementing various algorithms designed to impute missing data, on the basis of the relations between the various observed / measured responses. His dissertation demonstrates innovative research designs and accompanying modeling techniques for eliminating measurement reactivity, which has applications beyond advice-taking, as these methods could be applied to any pretest-posttest research design. In addition, the results reveal new, more ecologically valid theoretical insights regarding how people take advice when their prior beliefs are not explicitly elicited.



Dr. Mark Himmelstein (middle) received Anna Anastasi Dissertation Award from the APA Division 5 President, Frederick Wertz Sr. (left) and Award Committee Chair, Qiwei He (right) at the APA Division 5 Award Ceremony at APA Convention 2024.

Anne Anastasi Distinguished Early Career Contributions Award

Winner: Dr. Qian Zhang, Florida State University

Nominator: Dr. Lijuan (Peggy) Wang, University of Notre Dame

This award recognizes an early career individual who has made outstanding contributions to quantitative research methods. Dr. Zhang received her Ph.D. in 2015 in Quantitative Psychology from Notre Dame University. She is currently an Associate Professor of Educational Psychology and Learning Systems, at Florida State University. Her research portfolio encompasses a breadth of topics within quantitative psychology, ranging from (causal) mediation analysis, data synthesis approaches, to missing data handling techniques and more recently, venturing into machine learning applications. Dr. Zhang has developed longitudinal mediation modeling approaches, addressing the temporal order of variables in potential causal chains. Her multilevel longitudinal mediation model, accommodating varying mediation effects across individuals, has been pivotal in studying diverse scenarios, from adolescent-mother relationships to the impact of teachers' pedagogical knowledge on student outcomes. Dr. Zhang stands as the 5th most published author in APA Division 5's flagship journal *Psychological Methods* since 2020. She also has a broad variety of collaboration with non-methodologists to enable them to incorporate state-of-the-art methodologies (e.g., longitudinal analysis, mediation analysis, and hierarchical linear modeling) to address novel research questions.



Dr. Qian Zhang (middle) received Anne Anastasi Distinguished Early Career Contributions Award from the APA Division 5 President, Frederick Wertz Sr. (left) and Award Committee Chair, Qiwei He (right) at the APA Division 5 Award Ceremony at APA Convention 2024.

Jacob Cohen Distinguished Contributions to Teaching and Mentoring Award

Winner: Dr. Zhiyong Zhang, University of Notre Dame

Nominator: Dr. Xin Cynthia Tong, University of Virginia

This award recognizes demonstrated excellence in teaching and mentoring within the field of quantitative research methods. Dr. Johnny Zhang is Professor of Quantitative Psychology at the University of Notre Dame. He has taught 7 different undergraduate and graduate courses a total of 59 times. Dr. Zhang is dedicated to stimulating student learning and improving their knowledge of statistics, designing his classes such that students not only successfully learn the required materials, but also gain the confidence necessary to conduct data analyses in their future career development. Dr. Zhang also developed his course lectures and related extensive materials into online courseware (<https://advstats.psychstat.org/>) that not only saves students the cost of buying textbooks but provides them an environment to conduct statistical data analysis using R online. In the past 12 months, this only courseware has close to 100,000 users. Dr. Zhang has advised numerous graduate students from different areas in Psychology and across the university. Students have commented that Dr. Zhang “cares about the quality of experience for students when pursuing a degree”, has a “tremendous impact on their academic achievement, motivation, and confidence to become a quantitative researcher”, and “his mentorship extends beyond mere research, encompassing holistic career development”. In addition to his regular teaching duties, Dr. Zhang is also committed to educating the APA community through various avenues. He has taught 9 workshops with a total of over 500 trainees on various topics, including Deep Learning using R, Power Analysis, Bayesian Longitudinal Data Modeling, Data Mining Methods for Education and Psychology, Robust SEM using WebSEM, etc.



Dr. Zhiyong Zhang (middle) received Jacob Cohen Distinguished Contributions to Teaching and Mentoring Award from the APA Division 5 President, Frederick Wertz Sr. (left) and Award Committee Chair, Qiwei He (right) at the APA Division 5 Award Ceremony at APA Convention 2024.

Samuel J. Messick Award for Distinguished Scientific Contributions

Winner: Dr. Hua-hua Chang, Purdue University

Nominator: Dr. Chun Wang, University of Washington

This award honors an individual who has a long and distinguished history of scientific contributions within the field of quantitative research methods. Dr. Hua-hua Chang is the Charles R. Hicks Chair Professor of Purdue University. As a professor in measurement, a past president of the Psychometric Society and an elected fellow of both the American Statistical Association and the American Educational Research Association, Dr. Hua-Hua Chang has been actively conducting pioneering research and mentoring students in the educational measurement, psychometrics, and statistics fields for over 30 years. In particular, he has made significant and seminal advances in the areas of computer adaptive testing (CAT), cognitive diagnosis modeling (CDM), multi-stage testing with an overarching aim to increase test reliability, validity and security. Having transitioned from a practitioner in the testing industry to a professor in 2001, Dr. Chang brought a wealth of industry experience to his academic pursuits. Dr. Chang has had over a hundred publications and hundreds of invited presentations. His publications have become foundational in the field, cited extensively by scholars and researchers globally. Dr. Chang has also provided guidance and co-advised over 40 Ph.D. students, actively participating in more than 80 doctoral thesis committees. A significant number of his direct advisees have secured faculty positions in prestigious universities immediately upon earning their Ph.D., while others have successfully pursued careers as data scientists, psychometricians, and statisticians at prominent testing companies, government institutions, and research organizations in the U.S., China, South Korea, Taiwan, and Singapore.



Dr. Hua-hua Chang (middle) received Samuel J. Messick Award for Distinguished Scientific Contributions from the APA Division 5 President, Frederick Wertz Sr. (left) and Award Committee Chair, Qiwei He (right) at the APA Division 5 Award Ceremony at APA Convention 2024.

Qualitative Awards

Qualitative Award Panel: Deborah Tolman (chair), Pani Farvid, and Leeat Granek

Distinguished Dissertation in Qualitative Inquiry Award

Winner: Dr. José Giovanni Luigi-Hernández, University of Puerto Rico

Nominator: Dr. Leswin Laubscher, Duquesne University

This award recognizes distinguished dissertations that addressed a topic in the field of qualitative research methods. Dr. Jose Luigi-Hernández received his Ph.D. degree in Clinical Psychology from Duquesne University in 2023. His dissertation is entitled “*Hoping as a Transformational Imperative in Puerto Rico: A Phenomenological and Grounded Theory Study within Colonized Space.*” Anchoring his inquiry in the colonized space of Puerto Rico after the disastrous hurricanes is both urgent and compelling. His focus on hope is a response to the limits of psychological research and policy assuming victimhood and suffering in the face of catastrophes and thus has produced limited scholarship. Each aspect of his design, analysis and findings is a model of robust qualitative inquiry. Dr. Hernández’s use of critical phenomenology paired with grounded theory is precisely what his question required. Dr. Hernández developed a powerful collectivist theory of hope and hopelessness within the colonized space of Puerto Rico. Rather than individual hopelessness paralyzing people as individuals, he excavated how community transforms hopelessness into hope. By meaningfully attending to context, locality and cultural values of connection and collectivity, he demonstrated how community strength, resilience and resources generated the hope that then fueled Puerto Ricans’ refusal to accept colonial neglect and failure. In his outstanding dissertation, Dr. Luigi-Hernandez exemplified the power of linking multifaceted qualitative inquiry and criticality.



Dr. José Giovanni Luiggi-Hernández (middle) received Distinguished Dissertation in Qualitative Inquiry Award from the APA Division 5 President, Frederick Wertz Sr. (left) and Award Committee Chair, Qiwei He (right) at the APA Division 5 Award Ceremony at APA Convention 2024.

Distinguished Early Career Contributions in Qualitative Inquiry Award

Winner: Dr. Gabriel Mateo Velez, Marquette University

Nominator: Dr. Frederick J. Wertz, Fordham University

This award recognizes an early career individual who has made outstanding contributions to qualitative research methods. The award committee recommend Dr. Gabriel Mateo Velez for his exceptional early career accomplishments. Dr. Velez's scholarship lies at the intersections of adolescence and emerging adult development, peace education, restorative justice and human rights. Only five years after earning his PhD, he has over forty peer-reviewed articles and book chapters on research in which he uses an array of qualitative methods. He has secured a contract with Cambridge University Press for his single-authored book. The plethora of grants he has secured and awards he has been given are especially noteworthy. Dr. exemplifies public science, publishing editorials and blog posts, as well as appearing often in popular media. In addition to a cornucopia of conference presentations, he has reached out to a range of audiences, including school principals and universities in South America. His work responds to urgent questions in our social worlds, for instance the effects of Covid-19 on young people's health and well-being, reflecting his commitment to social justice and demonstrating the power of qualitative inquiry for producing psychological knowledge within and beyond the academy.



Dr. Gabriel Mateo Velez (middle) received Distinguished Early Career Contributions in Qualitative Inquiry Award from the APA Division 5 President, Frederick Wertz Sr. (left) and Award Committee Chair, Qiwei He (right) at the APA Division 5 Award Ceremony at APA Convention 2024.

Distinguished Contributions to Teaching and Mentoring in Qualitative Inquiry Award

Winner: Dr. Jessica Nina Lester, University of Indiana

Nominator: Dr. Michelle O'Reilly, University of Leicester

This award recognizes demonstrated excellence in teaching and mentoring within the field of qualitative inquiry. Dr. Jessica Nina Lester is Professor and Department Chair of Applied Psychology in Education and Research Methodology at School of Education in Indiana University Bloomington. Her talent and commitment can be measured quantitatively: she has taught seven qualitative inquiry courses, has received eight times of awards for teaching including one for “excellence in extraordinary teaching”, co-authored 24 papers with students, chaired 80 doctoral student dissertations, and host 41 podcasts in *Qualitative Conversations* that she created. Dr. Lester’s student remarked: as a teacher, “she practices what she preaches, treating students as co-learners and co-participations in knowledge construction and analysis...She consistently encouraged us to do the difficult intellectual work of sitting with ideas for months, years, and often longer than expected so that we could learn deeply... In no uncertain terms, Dr. Lester’s mentorship has played a critical role in my past and current successes.”



Dr. Jessica Nina Lester, University of Indiana

Distinguished Contributions in Qualitative Inquiry Award

Winner: Dr. Kenneth Gergen, The Taos Institute, and Dr. Mark Freeman, College of the Holy Cross

Nomination: Society for Qualitative Inquiry in Psychology

This award honors an individual who has a long and distinguished history of scientific contributions within the field of qualitative research methods. The Society for Qualitative Inquiry in Psychology (SQIP) recommends that Dr. Kenneth Gergen and Dr. Mark Freeman jointly receive the Distinguished Contributions to Qualitative Inquiry Award in 2024. Dr. Gergen and Dr. Freeman are both monumental figures in qualitative inquiry, and their history of working together to form and lead SQIP have earned them this joint award many times over. They have published scores of books and papers, given a plethora of invited talks, and created and taught a wide range of courses in qualitative inquiry in psychology and its epistemological roots. Each of them is a Distinguished Professor of Psychology. Dr. Gergen's work on social construction can be understood as the bread and butter of qualitative inquiry, even as it was met with hostility in some quarters in the US. Dr. Freeman has been a leader in narrative psychology and in developing the qualitative approaches necessary for narrative research, providing methodological pathways to create knowledge through collection and analysis of life stories, memoirs, and biographies. Both Dr. Gergen's and Dr. Freeman's work has had global reach. This award recognizes how they have created and grown the professional infrastructure for qualitative inquiry in psychology. Dr. Gergen in partnership with Ruthellen Josselson established SQIP as a section of Division 5. Dr. Freeman was its first president. They were instrumental in working together with Division 5 leadership to rename it "Quantitative and Qualitative Methods." Their critically important leadership as scholars and in launching SQIP has paved the way for new generations of scholars to pursue qualitative research with creativity, empathy, and an open mind, fostering a discipline that is more inclusive, reflective, and impactful.



Dr. Kenneth J. Gergen (right) and Dr. Mark P. Freeman (middle) received the Distinguished Contributions in Qualitative Inquiry Award from Qualitative Award Panel Chair, Dr. Deborah L. Tolman (left) at the Society for Qualitative Inquiry in Psychology Conference in Boston in 2024.

Division 5 is Seeking Award Nominations

September 19, 2024

On behalf of the Division 5: Quantitative and Qualitative Methods ([Quantitative and Qualitative Methods \(apadivisions.org\)](http://apadivisions.org)), the Division 5 Awards Committee is pleased to share the call for nominations for the 2025 APA Division 5 Awards.

For a description of the awards, please visit the [Division 5 awards web site](#). Please consider nominating yourself, colleagues, and students for these prestigious awards! For a list of previous winners, please visit the “Past Recipients” tabs of the awards website.

The Division 5 awards include:

Quantitative Methods

[Samuel J. Messick Award for Distinguished Scientific Contributions](#)
[Jacob Cohen Award for Distinguished Contributions to Teaching and Mentoring](#)
[Anne Anastasi Dissertation Award](#)
[Anne Anastasi Distinguished Early Career Contributions Award](#)

Qualitative Methods

[Distinguished Contributions in Qualitative Inquiry Award](#)
[Distinguished Contributions to Teaching and Mentoring in Qualitative Inquiry Award](#)
[Distinguished Early Career Contributions in Qualitative Inquiry Award](#)
[Distinguished Dissertation in Qualitative Inquiry Award](#)

New this year will also be a **Mixed Methods Award**.

[Distinguished Contributions in Mixed Methods Award](#)

The Division is working with APA to update the Division website with the description of this exciting new award, so please check back at this [site](#) over the next few weeks for more information.

Nominations and due dates.

In the case of all the awards, neither the nominator nor nominee need be a current or former member of either APA or Division 5. Both self-nominations and nominations of others will be considered.

Nominations are due Monday, December 2, 2024.

Please feel free to reach out to [Emily Shaw](#), the Division 5 Awards Committee chair, with questions regarding award applications, eligibility or other issues.



Rachel Fouladi

DIVISION 5 HIGHLIGHTS OF SOME EVENTS ON INDIGENOUS METHODOLOGIES IN 2024

Rachel Tanya Fouladi, Ph.D.

In 2023, APA Council of Representatives voted to accept a Report on an Offer of Apology to First Peoples in the United States (<https://www.apa.org/pubs/reports/indigenous-apology.pdf>), which was delivered by APA leadership at the Society of Indian Psychologists Annual Convention in Utah in June. In part as a response to the calls to action which are part of apology but also because of the interest of the leadership of APA Division 5: Quantitative and Qualitative Methods, Indigenous methodologies have been at the forefront of a number of events initiated by the Division in 2024. Importantly, all of these events have involved some level of collaboration or co-sponsorship with APA Science Directorate, the Alaska Native/American Indian/Indigenous Women – Section 6 of APA Division 35; and/or the Society of Indian Psychologists (SIP). While foregrounding Indigenous methodologies, quantitative and qualitative methods in research, education, practice as pertains to measurement, statistics, evaluation and assessment have been part of the critical discussions. The Presidential Trio for the Division has been grateful to be able to have been able to engage in this collaborative programming in 2024 and the leadership team of the Division forward to further possibilities.

Of particular note was the March 2024, APA Science Training Seminar developed in collaboration with Division 5 and The Society of Indian Psychologists (SIP) which was titled *Indigenous Knowledges as Research Methodologies in Psychology: Anticolonial Applications of Indigenous Ways of Knowing by Native Psychologists*. With recommendations to the APA Science Directorate by Drs. Frederick Wertz and Deborah Bandalos, this session was organized and moderated by Dr. Joseph Gone, with early career psychologists, Drs. Maria C. Crouch, Emma Elliott, Jill Fish, and Haley Shea. There was tremendous interest in this session, with registration numbers in excess of 2500. Attendees learned about some of the work of these psychologists and, quoting from the long abstract, were introduced to the term Indigenous psychology as referring “to several related projects within disciplinary psychology, including the investigation of diverse psychologies expressed by Indigenous Peoples as well as consideration of the implications of Indigenous “ways of knowing” for knowledge production within the discipline”. The session was extremely well received by attendees. A recording of this session was made and is currently available as a Member Exclusive Recording from the APA Science Training website (<https://www.apa.org/education-career/training/science-training-sessions>).

Indigenous methodologies were also featured in different sessions at the APA 2024 Annual Convention in August 2024. These included but were not limited to some Division 5 events. With co-sponsorship by the Alaska Native/American Indian/Indigenous Women – Section 6 of APA Division 35: Society for the Psychology of Women, Rachel Fouladi organized two Division 5 Informal Programming sessions at the APA 2024 Annual Convention: *Indigenous Methodologies: A Conversation* and *Rubrics Methodologies Revisited, Rethought, Redone*. In addition to Rachel Fouladi who led both session, presenters for the sessions were Drs. Maria C. Crouch, Emma Elliott, Cerynn Desjarlais, Mark Standing Eagle Baez, Frederick Wertz; and Dr. Vernita Jones respectively. In the session on Indigenous Methodologies, presenters and attendees continued

the conversation from the March seminar about some of the different perspectives on what Indigenous Methodologies are, how they bring them into research and into pedagogical/work practices — with reference to how they came/come to these approaches. In the session on rubrics, discussion addressed rubrics methodologies as applied in review processes, including in Indigenized peer-review practice. The proposition that substantive changes in rubrics methodologies are needed for a more relevant and inclusive psychology.

The partnership of the Division with APA Science continues on November 14th, 2024 with the APA Science Training Session, *Indigenous Methodologies and Assessment*. In this session organized by Rachel Fouladi, researchers and practitioners will share perspectives and experience with regard to assessment methodological research and practice with and for Indigenous Peoples, and why consideration and use of Indigenous Methodologies are important. Presenters include Drs. B. J. Boyd, Maria Crouch, Mark Standing Eagle Baez, Royleen Ross, Vicky Lomay, and Rachel Fouladi. For more information on this collaboration of APA Science with Division 5; Alaska Native/American Indian/Indigenous Women – Section 6 of APA Division 35; and the Society of Indian Psychologists (SIP), please <https://www.apa.org/education-career/training/science-training-sessions>. Additional information on the presenters will be posted on the APA website and is expected to be distributed on the APA Division 5, 35, 45, and SIP listservs in coming weeks. The link to the Zoom registration page is: https://apa-org.zoom.us/webinar/register/WN_tjVLQfOPS3Gv4ORx56TJ6Q. Registration for the event is Free and open to APA members and non-members alike.

Please feel free to share information about these events widely within your networks as they address critical issues and topics that are not commonly addressed in most current psychology methodology and methods curriculum. If you are interested in advancing research, education, and practice of varied methodologies and methods in psychology and related fields, we encourage joining/maintaining membership in Division 5 (<https://www.apadivisions.org/division-5/membership>) and/or any of the other organizations (e.g., Section 6 of Division 35: <https://www.apadivisions.org/division-35/sections/section-six>; or SIP <https://www.nativepsychs.org/>) if appropriate, to hear about this and other related programming.



“Evaluation Essentials (Third Edition): From A to Z”

By Marvin C. Alkin, Anne T. Vo, and Christina A. Christie

Published October 2024 by Guilford Press (\$55.00 paperback; e-books also available)

This revised and updated text provides a wide range of information and advice about topics and recent developments in evaluation. Twenty-six chapters are presented as “sessions” and are geared toward creating foundational knowledge for students, applied researchers, and program evaluators alike. Topics covered include steps and sequences in evaluation research, formulating research questions, and collecting, analyzing, and reporting data. It also uniquely covers practical considerations, such as involvement of key decision makers and understanding program costs. There are exercise and case studies included to illustrate concepts, along with learning checks and further reading suggestions.

“Qualitative Data Analysis with NVivo (Fourth Edition)”

By Jenine Beekhuyzen and Patricia Bazeley

Published November 2024 by Sage College Publishing (available in hardback and paperback)

In this book, readers are both introduced to NVivo and challenged to engaged in deeper discussion about methodology, critical thinking, and one’s research practice. First, chapters provide the basics of coding qualitative research, with instructions and screenshots to develop familiarity with the software. Next, data types are discussed, along with how to code and visualize each to best support qualitative analysis. This latest edition includes a chapter on reporting data, as well as practical support for the most current version of the software, with videos and datasets to supplement learning alongside the use of this text.

“Data Visualization: A Handbook for Data Driven Design (Third Edition)”

By Andy Kirk

Published December 2024 by Sage College Publishing (available in hardback and paperback)

With his practical expertise as an applied visualization specialist and trainer, Kirk provides students, researchers, and professionals with a thorough toolkit to develop data visualizations. This book serves as a reference guide for a wide range of formats, with guidance about decision-making and a step-by-step process

for development. Chapters cover design features, such as color and composition, highlighting numerous examples to illustrate the different types of works and charts available. The book is accompanied by online resources and exercises to apply the knowledge from various chapters and practical skill-building with real data.

“gcimpute: A Package for Missing Data Imputation”

By Yuxuan Zhao and Madeleine Udell

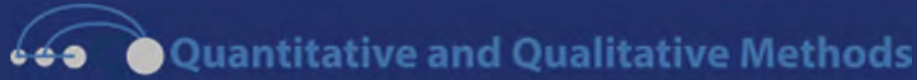
Published 2024 for Python

This new package offers missing data imputation solutions for a variety of data types, including continuous, binary, ordinal, and count variables. Features include the ability to learn the marginal distribution of each variable while accounting for interactions across variables, as well as confidence intervals, multiple imputation strategies, and the extended ability to handle large datasets. This article describes the methodology; package documentation is provided at no cost. See more at Zhao, Y., & Udell, M. (2024). gcimpute: A Package for Missing Data Imputation. *Journal of Statistical Software*, 108(4), 1–27. <https://doi.org/10.18637/jss.v108.i04>.

Guidelines for the “What’s New?” Column:

Have you published a new psychological test or testing product; a book on advanced statistics, qualitative or quantitative measurement, research methodology, assessment, or evaluation; an interesting website or other Internet group related to measurement, statistics, or evaluation; or a computer program useful to Division 5 membership? If so, we would like to include an announcement of about 100 words in the What’s New column. We would also appreciate any suggestions, or feedback, on how this section of the newsletter can better serve the Division 5 membership. Please take the opportunity to share information with colleagues through your contributions to this column. Please send announcements and/or product literature to *The Score* Associate Editor, Joanna Solomon: joanna.solomon@mhs.com.

LINKS TO RECENT PREVIOUS ISSUES OF “THE SCORE”

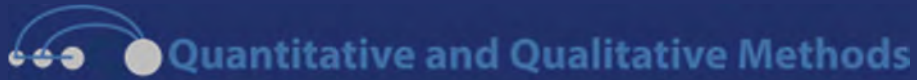


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<https://www.apadivisions.org/division-5/publications/score/issues>

DIVISION 5 MEMBERSHIP INFORMATION



Division 5 draws together specialists in the areas of quantitative and qualitative methods. Membership includes specialists in the fields of educational psychology, industrial-organizational psychology, individual assessment, measurement, program evaluation, psychometrics, qualitative inquiry, research interviewing, research methods and statistics. Division 5 provides the opportunity to participate in this critical aspect of professional development, and is a vibrant community that serves the core interests and needs of rigorous scientific inquiry in the social sciences. Those who are interested in joining the division or who would like more information should be referred to the Division 5 website:

<https://www.apadivisions.org/division-5/membership>

Advertising in *The Score*

The Score is the newsletter of the American Psychological Association's Division 5—Evaluation, Measurement, and Statistics. Division 5 is concerned with promoting high standards in both research and practical application of psychological assessment, evaluation, measurement, and statistics. Approximately half of the Division 5 members are university faculty members in quantitative psychology, psychometrics, educational psychology, or industrial organizational psychology and half are engaged in careers in industry, including the areas of individual and large-scale assessment. More than 1,000 Division 5 members receive The Score each quarter. Advertisements in The Score may be in the form of display advertisements or job announcements. Both types of ads can include graphics and other design features and can be submitted as text or camera-ready display art. Prices for advertisements and size requirements are provided in the accompanying table. Submission deadlines are 45 days prior to publication: February 15 for the April issue, May 15 for July, August 15 for October, and November 15 for January.

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