

CURRICULUM VITAE
Paul Kadane Crane, MD, MPH

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PERSONAL DATA

Born: Washington, D.C., USA.
Citizenship: USA
Date of Birth: January 18, 1971
Home address and phone: 8121 4th Ave. S.W.
Seattle, WA 98106
(206) 767-4210
Office address and phone: Harborview Medical Center
University of Washington
325 Ninth Avenue
Box 359780
Seattle, WA 98104
(206) 744-1831
Email address: pcrane@u.washington.edu
Fax number: (206) 744-9917

EDUCATION

Undergraduate

B.A. *summa cum laude*, Williams College, Williamstown, MA, 1989-1993.

Graduate

M.D., University of Washington School of Medicine, Seattle, WA, 1993-1997.

MPH, University of Washington School of Public Health and Community Medicine, Seattle, WA, 2001-2003.

POSTGRADUATE TRAINING

Internship

Internal Medicine, University of Washington Affiliated Hospitals, Seattle, WA, 1997-1998. Program Director: James Findlay Wallace, MD.

Residency training

Primary Care Internal Medicine, Barnes-Jewish Hospital, Washington University, St. Louis, MO, 1998-2000. Program Director: Megan Wren, MD.

Fellowship training

Division of Health Behavior Research, Washington University School of Medicine, St. Louis, MO, 2000-2001. Program Director: Edwin Fisher, PhD. Grant number: T32 HL 07456

NRSA General Internal Medicine Fellowship, University of Washington, Schools of Medicine and Public Health and Community Medicine, 2001-2003. Program Director: Eric Larson, MD, MPH. Grant number: 5 T32 HP10002

FACULTY POSITIONS HELD

Acting Instructor, Division of General Internal Medicine, Department of Internal Medicine, University of Washington School of Medicine, Seattle, WA. July 2003-July 2005.

Assistant Professor, Division of General Internal Medicine, Department of Internal Medicine, University of Washington School of Medicine, Seattle, WA. August 2005-June 2010.

Associate Professor, Division of General Internal Medicine, Department of Internal Medicine, University of Washington School of Medicine, Seattle, WA. July 2010-present

Affiliate faculty, Center for Health Studies (name change in 2009 to Group Health Research Institute), 2005-present

Adjunct Assistant Professor, Department of Biostatistics, University of Washington School of Public Health, May 2008-June 2010

Adjunct Associate Professor, Department of Biostatistics, University of Washington School of Public Health, July 2010-April 2011

Adjunct Associate Professor, Department of Health Services, University of Washington School of Public Health, May 2011-present

HOSPITAL POSITIONS HELD

Hospitalist, Vencor Hospital (now Kindred Hospital), St. Louis, MO, 2000-2001. Medical Director: Neil Ettinger, MD.

Hospitalist (moonlighting), Virginia Mason Medical Center, Seattle, WA, 2001-2003. Director of Hospitalist Service: Barry Aaronson, MD.

Attending physician, Harborview Medical Center, 2003-. Medical Director: Scott Barnhart, MD; Medical Director: J. Richard Goss, MD MPH

HONORS

Washington Scholar (top 3 students in each legislative district), 1989

Paul Fowler Fellowship (top 6 students in Washington State), 1989

Des Moines Masonic Lodge Outstanding Junior Boy of the Class of 1989, awarded 1988

Top Speaker, 1989 Washington State Debate Tournament, Cross-Examination Debate

National Forensics League Double Ruby Degree of Special Distinction, contest speaking, 1989

Seattle City Light Employee's Association Scholarship, 1989

King County Commended Scholar, 1989

National Merit Scholar Finalist, 1989

Mount Rainier Honor Society Scholarship, 1989

Dean's list, Williams College, every semester 1989-1993

Class of 1960 Scholar in English, Williams College, 1992-1993
Class of 1960 Scholar in History, Williams College, 1992-1993
Highest honors in English, Williams College, 1993
Honors in history, Williams College, 1993
Phi Beta Kappa election (junior year), Williams College, 1992
Edward Gould Shumway Class of 1867 Prize for Most Distinguished Work in English Literature, Williams College, 1993
Third place, 1999 Missouri Chapter, American College of Physicians Resident Poster Contest, Research Division, for “Hormone Replacement Therapy for Black Women”
New Investigator Award, ISOQOL (International Society for Quality of Life Research), for “An outstanding paper presentation entitled ‘Rapid detection of differential item functioning (DIF) in assessments of health related quality of life (HRQL): the Functional Assessment of Cancer Therapy’”, October 22, 2005
General Internal Medicine Division Nominee, Philip J. Fialkow Scholar Award, July 2007
General Internal Medicine Division Nominee, Philip J. Fialkow Scholar Award, July 2008
General Internal Medicine Division Nominee, Philip J. Fialkow Scholar Award, July 2009

BOARD CERTIFICATION

American Board of Internal Medicine, 2000-2010, 2010-2020.

CURRENT LICENSE TO PRACTICE

Washington State, 2001-

PROFESSIONAL ORGANIZATIONS

Member, American Diabetes Association (ADA)
Member, Society for General Internal Medicine (SGIM)
Member, American College of Physicians (ACP)
Member, American Geriatrics Society
Member, ISOQOL (International Society for Quality of Life Research)
Adjunct Member, Seattle Quality of Life Group (SeaQoL), Department of Health Services, University of Washington School of Public Health
Member, International Society for Vascular Cognition (VAS-COG)
Member, Methodology group, Faculty of 1000

TEACHING RESPONSIBILITIES

Health services courses

Guest lecturer, "Item response theory and the future of measurement," Health Services 584, Evaluating Cost and Outcomes in Health and Medicine 2, February 2003. Course Chair: Donald Patrick, PhD
Guest lecturer, same topic, HSERV 584, February 2004. Course chair: Beth Devine, PhD
Guest lecturer, same topic, HSERV 584, February 2005. Course chair: Donald Patrick, PhD
Guest lecturer, same topic, HSERV 584, February 2006. Course chair: Donald Patrick, PhD

Guest lecturer, “My experience with a systematic review,” Health Services 590, Research Methods course for incoming fellows, July 2004. Course chair: Joann Elmore.

Guest lecturer, same topic, July 2005

Guest speaker, “Seeking post-fellowship employment,” RWJ and NRSA fellows, January 2004

Guest speaker, “Measurement invariance,” RWJ fellows, March 2005

Guest speaker, “How to get a K award,” VA fellows, December 2005

Guest speaker, “My experience with a K award,” NRSA fellows, October 2008

Guest speaker “Thoughts on cognitive aging research,” T32 Women’s Health Fellows Conference, Group Health Research Institute, Seattle, June 22, 2010.

Guest lecturer, Pharmaceutical Outcomes Research & Policy Program (PORPP) seminar series, “Psychometric outcomes,” School of Public Health, University of Washington, Seattle, March 2011.

Guest lecturer, Friday Harbor Advanced Psychometrics Workshop, “Psychometric analyses of ADNI data,” Friday Harbor, Washington, June 2011.

Guest lecturer, Patient Reported Outcomes Research Group, “Modern psychometrics and the Cleveland Clinic experience,” Cleveland Clinic Foundation, Cleveland, December 2011.

Medical students

Medical Students Research Training Program (MSRTP), Summer 2004. Two first-year medical students worked with me for 3 months on a structured research program, including formal didactic training in applied psychometrics, and complementary research projects on a dataset from the Canadian Study on Health and Aging.

One student, Steven Wiest, had an abstract selected as a Subspecialty Award Winner from the Western Student Medical Research Forum in Carmel, California (one of 20 winners from 300 applicants; comes with a \$100 prize). Went on to study internal medicine at the University of Washington.

The other student, Jasper James “JJ” Chen, went on to study surgery at Dartmouth, pursuing additional training in outcomes research.

MSRTP, Summer 2005. Two additional first-year students worked with me, with research on the relationship between acculturation and risk of Alzheimer’s disease, using data from the Kame study and the Honolulu-Asia Aging Study.

One student, Viet Nguyen, had an abstract selected as a Subspecialty Award Winner from the Western Student Medical Research Forum in Carmel, California (one of 20 winners from 300 applicants; comes with a \$100 prize). He matched in Dermatology. See publications 40 and 51, below.

The other student, Keerthi Arani, matched in Radiology. See publications 40 and 51, below.

Mentees

K Awardee Deepa Rao, PhD, 2008-present. Dr. Rao began her mentored career development award from the NIH at Northwestern University on the assessment of stigma among patients infected with HIV. She moved to Seattle and I joined her mentorship advisory committee. I have worked with her on psychometric theory, modern psychometrics, and structural equation modeling. See publication 70 below.

Psychology post-doctoral fellow My Banh, PhD, 2008-2009. Dr. Banh approached me to assist her with analyses of depression measurement in Seattle-area 6th and 8th graders. Our work together has produced a manuscript in advanced stages of development, showing that a commonly-used screening instrument did not have differential item functioning impact with respect to a number of covariates including race/ethnicity, which was her primary research question (see paper 71 below). Our discussions moved far beyond

measurement issues, and we discussed career development issues of a senior post-doctoral fellow. Currently a junior faculty member at Georgetown University.

General internal medicine post-doctoral fellow Shubhabrata “Joey” Mukherjee, PhD, 2008-present. Dr. Mukherjee works with me on several projects, including R01 AG 029672. He has developed expertise in psychometrics, now including new applications in longitudinal assessment of differential item functioning. See publication 65 and submitted paper 3 below.

Statistics post-doctoral fellow S. McKay Curtis, PhD, 2008-2012. Dr. Curtis worked with me on R01 AG 029672 (see papers 66, 84, and 85). Currently employed by Walt Disney Corporation.

Robert Wood Johnson Foundation Grantee Hector Rodriguez, PhD, 2009-present. Dr. Rodriguez is now on the faculty at UCLA; he is working with me to address violations of measurement invariance in measures of consumer satisfaction (the CAHPS measures). See publication 68 below.

Junior faculty member Christina Ryan, MD, Assistant Professor, 2011-present. See publication 78.

Denise Fyffe, PhD, Assistant Professor, Kessler Rehabilitation Center, New Jersey, 2012-present. I serve as a co-mentor for Dr. Fyffe. See paper 79.

Graduate students

Jonathan Gruhl, PhD, July 2006-June 2012. Mr. Gruhl served as an RA on an Alzheimer’s Association grant and then on R01 AG 029672. He worked with Elena Erosheva and me on a dissertation for the Department of Statistics covering advanced topics in psychometrics, including extending item response models for particular kinds of data and evaluating the possibility of a rank likelihood approach to longitudinal data analyses. See publications 51 and 66 and published abstract 26 below. I served on his PhD Dissertation Committee. He is pursuing opportunities in the San Francisco area.

Karen Chang Liu, August 2009-March 2010. Ms. Liu, a biostatistics graduate student, served as an RA on R01 AG 029672 after attending the Friday Harbor Advanced Psychometrics Workshop in 2009.

Continuing Education

International Neuropsychological Society 36th Annual Meeting, February 6-9, 2008. Taught 1.5 hour course, “Modern psychometric tools for generating composite scores from neuropsychological test batteries for use in multidisciplinary research.”

EDITORIAL RESPONSIBILITIES – Editorial Boards

Journal of the American Geriatrics Society, Editorial Board, 2011-present

EDITORIAL RESPONSIBILITIES – Ad Hoc Reviewing

Alzheimer Disease and Associated Disorders, 2003-present

Annals of Neurology, 2005-present

Archives of General Psychiatry, 2011

Arthritis Care & Research, 2008-present

Cardiovascular Psychiatry and Neurology, 2009-present

European Journal of Psychological Assessment, 2012-present

Evaluations & Health Professions Journal, 2004-present

Genetic Epidemiology, 2007-present
Health and Quality of Life Outcomes, 2007-present
International Journal of Geriatric Psychiatry, 2010-present
International Psychogeriatrics, 2004-present
Journal of Experimental Education, 2012-present
Journal of General Internal Medicine, 2003-present
Journal of the American Geriatrics Society (JAGS), 2003-2011
Journal of the International Neuropsychological Society, 2006-present
Neurobiology of Aging, 2007-present
New England Journal of Medicine, 2008-present
Psychosomatic Medicine, 2008-present
Quality of Life Research, 2005-present
Statistics in Medicine, 2010-present
PLoS One, 2012-present

SPECIAL INTERNATIONAL RESPONSIBILITIES

Co-convener, First Pacific Northwest Health Measurement (Health and Medical Psychometrics) Meeting, Vancouver, British Columbia, May 1, 2004.

Co-convener, Psychometrics Workshop at Friday Harbor, Washington, September 19-25, 2004. Meeting attended by 30 people from the U.S., U.K., and Canada. Presented five talks on measurement topics over the course of five days.

Abstract reviewer, 2005 ISOQOL Annual Meeting, June 2005.

Co-convener, 2nd Psychometrics Workshop at Friday Harbor, Washington, August 21-27, 2005.

Co-convener, 3rd Psychometrics Workshop at Friday Harbor, Washington, August 2006.

Co-convener, 4th Advanced Psychometrics Workshop at Friday Harbor, Washington, August 2007.

Co-convener, 5th Advanced Psychometrics Workshop, UC Santa Cruz, August 2008.

Co-convener, 6th Advanced Psychometrics Workshop at Friday Harbor, Washington, August-September 2009.

Co-convener, 7th Advanced Psychometrics Workshop at Friday Harbor, Washington, August-September 2010.

Co-convener, 8th Advanced Psychometrics Workshop at Friday Harbor, Washington, June 2011.

Abstract reviewer, 2011 Alzheimer's Association International Conference on Alzheimer's Disease (AAICAD), February 2011.

Co-convener, 9th Advanced Psychometrics Workshop at Friday Harbor, Washington, June 2012

Co-convener, 10th Advanced Psychometrics Workshop at Friday Harbor, Washington, June 2013

Session co-chair, Basic Science: Genetics III: Common Variation and Risk for AD, Alzheimer's Association International conference, July 17, 2013 at 4:00 PM, in Boston, Massachusetts, United States.

SPECIAL NATIONAL RESPONSIBILITIES

Grant reviewer, Alzheimer's Association, New Investigator Research Awards, Spring 2004

Grant reviewer, Alzheimer's Association, Investigator Initiated Research Awards, Spring 2005

Abstract reviewer, ISOQOL annual meeting, Spring 2005

Grant reviewer, Alzheimer's Association, New Investigator and Investigator Initiated Research Awards, 2006-2012

Invited external reviewer, University of Texas at San Antonio Minority Biomedical Research Support (MBRS) – Support for Continuing Research Excellence (SCORE), April 2008

Grant reviewer, International Conference on Alzheimer's Disease, Genetics Section, Spring 2011

Grant reviewer, Alzheimer's Association, International Grant Program for Zenith Award, 2011

Grant Reviewer, National Institutes of Health, Special Emphasis Panel, Methods and Measurement in Behavioral and Social Sciences, October 2011.

External expert reviewer, Effective Health Care Program, Agency on Healthcare Reform and Quality (AHRQ), for Methods Report EHC-2011-12-0116: "Individual Participant Search Strategies", Fall 2012

SPECIAL LOCAL RESPONSIBILITIES

Organizer, Division of General Internal Medicine Research Seminar Series, February 2003-June 2005.

Organizer, Division of General Internal Medicine Junior Scientist Works-In-Progress Sessions, July 2005-2007.

Ad-hoc local grant reviewer, Center for Ecogenetics and Environmental Health, Department of Environmental and Occupational Health Sciences, School of Public Health, March 2009.

Search Committee Member, General Internal Medicine Assistant Professor, Spring 2009.

Grant reviewer, Institute of Translational Health Sciences (ITHS), Fall 2009.

Organizer, Division of General Internal Medicine Research Incubator Series (RISE), June 2010-present.

Search Committee Member, General Internal Medicine Assistant Professor, Fall 2010.

Grant reviewer, Royalty Research Fund, Spring 2011.

Grant Reviewer, ITHS, Fall 2012

RESEARCH FUNDING

Current

1U01HG006375-01 Larson (PI) 08/15/11-07/31/15
NIH/NHGRI Annual direct: \$214,958

Development and use of network infrastructure for high-throughput GWA studies

This project will continue the efforts of the Group Health/University of Washington eMERGE collaboration to expand the library of phenotypes derived from electronic medical records; advance the integration of genome-scale data into clinical practice; and broaden the impact of eMERGE through new collaborations. Role: Co-Investigator

U01 AG006781 Larson (PI) 09/15/09-08/31/14
National Institute on Aging Total costs: \$11,931,000

Alzheimer's Disease Patient Registry (ADPR)

The Adult Changes of Thought (ACT) study's goals are to advance understanding of factors associated with late life brain outcomes of dementia, cognitive decline, and fixed and frozen findings at autopsy. (Wrote the majority of the grant application.) Role: PI of UW subcontract. Annual direct costs to subcontract: \$710,097

2U01 AG006781 Larson (PI) 03/01/12-08/31/14

Longitudinal Effect of Anticholinergic Polypharmacy on Dementia and Neuropathology

Role: Co-investigator. (funded Supplement)

U01 AR 057954 H. Crane, P. Crane, and D. Patrick (multiple PIs) 09/30/09-07/31/13

National Institute of Arthritis and Musculoskeletal & Skin Diseases Total costs: \$6,232,922

Patient reported outcomes in routine clinical care of patients infected with HIV

The goals of this project are to evaluate the validity of Patient Reported Outcome (PRO) Measurement Information System (PROMIS) scales for patients with HIV, and to integrate PRO assessment into routine clinical care. (Wrote the majority of the grant application.) Role: One of 3 Principal Investigators.

R01 AG010220 Mungas (PI) 08/15/08-05/31/13
National Institute on Aging Annual direct: \$53,393

English and Spanish assessment of cognition in elderly

The goals of this project are to further develop and establish the validity of the Spanish and English Neuropsychological Assessment Scales (SENAS). Role: Co-Investigator.

R01 AG 029672 P. Crane (PI) 09/15/07-08/31/12
National Institute on Aging Total costs: \$3,032,027

Improving cognitive outcome precision & responsiveness with modern psychometrics

The goals of this project are to identify optimal ways of scoring neuropsychological test data from the Alzheimer's Disease Neuroimaging Initiative (ADNI) and the Subcortical Ischemic Vascular Dementia Program Project Grant (SIVD PPG) using tools of modern psychometrics. (Wrote the majority of the grant application.) Role: Principal Investigator

R01 AG030618 Marcantonio (PI) 09/01/08-6/30/12
National Institute on Aging Total costs: \$2,097,078

3D-CAM: Deriving and Validating a 3-minute Diagnostic Assessment for Delirium

The goal of this project is to develop and validate a 3 minute tool for identifying delirium in hospitalized and institutionalized individuals. Role: Co-Investigator.

U01 AG 032984 Schellenberg (PI) 04/01/11-03/31/12
National Institutes of Health Annual direct: \$7,314

Genetics of robustness: psychometrically sophisticated GWAS of cognitive decline in AD

The goals of this project are identifying SNPs associated with faster or slower rates of decline in cognitive functioning among AD cases. Role: Co-investigator.

Pending

R01 AG 029672 P. Crane (PI) 9/1/2013-8/13/2018
National Institute on Aging Total costs: 3,802,614

Improving cognitive outcome precision & responsiveness with modern psychometrics

The goals of this project are to apply what we learned in the first cycle of this project to the new category of Early Mild Cognitive Impairment (EMCI); to use Bayesian approaches to improve our measurement; and to evaluate longitudinal relationships between brain structure, metabolism, and cognition. Role: PI.

R24 AHRQ Katzan (PI) 8/19/2013-8/18/2018
AHRQ Total, UW sub: \$457,450

Using Health IT with PROs to Improve Patient-Centered Care in Neurologic Disorders

The goals of this project are to establish research infrastructure for evaluating patient-reported outcomes data collected at the point of care. Role: Co-investigator; PI of UW subcontract

BIBLIOGRAPHY

Refereed Journals

1. Crane PK, Larson EB. What is mild cognitive impairment? Defining, diagnosing, and managing prodromal dementia. Women's Health in Primary Care 2003; 6: 201-209.

2. Arterburn DE, Crane PK, Veenstra DL. The efficacy and safety of sibutramine for weight loss: a systematic review. Archives of Internal Medicine 2004; 164: 994-1003.
3. Crane PK, van Belle G, Larson EB. Test bias in a cognitive test: differential item functioning in the CASI. Statistics in Medicine 2004; 23: 241-256.
4. Shen J, Crane P, Gao S. A latent variable model approach for assembling and scoring screening tests for dementia. Journal of Alzheimer's Disease. 2003;5: 399-407.
5. Arterburn DE, Crane PK, Sullivan SD. The coming epidemic of obesity in the elderly. Journal of the American Geriatrics Society 2004; 52: 1907-1912.
6. Wang L, van Belle G, Crane PK, Kukull WA, Bowen JD, McCormick WC, Larson EB. Subjective memory deterioration and future dementia in people aged 65 years and over. Journal of the American Geriatrics Society 2004; 52: 2045-2051
7. Mungas D, Reed BR, Crane PK, Haan MN, Gonzales H. Spanish and English neuropsychological assessment scales (SENAS): further development and psychometric characteristics. Psychological Assessment 2004; 16: 347-359.
8. Von Korff M, Crane P, Lane M, Miglioretti D, Simon G, Saunders K, Stang P, Brandenburg N, Kessler R. Chronic spinal pain and physical-mental comorbidity in the United States: results from the National Comorbidity Survey Replication. Pain 2005; 113: 331-339
9. Crane PK, Gibbons LE, Jolley L, van Belle G. DIF analysis with ordinal logistic regression techniques: DIFdetect and difwithpar. Medical Care 2006; 44(11 supp 3): S115-S123.
10. Crane HM, Kadane JB, Crane PK, Kitahata MM. Diabetes case identification methods applied to electronic medical record systems: their use in HIV infected patients. Current HIV Research 2006; 4: 97-106.
11. Hart DL, Cook KF, Mioduski JE, Teal CR, Crane PK. Simulated computerized adaptive test for patients with shoulder impairments was efficient and produced valid measures of function. Journal of Clinical Epidemiology 2006; 59: 290-298.
12. Crane PK, Hart DL, Gibbons LE, Cook KF. A 37-item shoulder functional status item pool had negligible differential item functioning. Journal of Clinical Epidemiology 2006; 59: 478-484.
13. Crane PK, Gibbons LE, Jolley L, van Belle G, Selleri R, Dalmonte E, De Ronchi D. Differential item functioning related to education and age in the Italian version of the Mini-Mental State Examination. International Psychogeriatrics 2006; 18: 505-515.
14. Larson EB, Wang L, Bowen JD, McCormick WC, Teri L, Crane P, Kukull W. Exercise is associated with reduced risk for incident dementia among persons 65 years of age and older. Annals of Internal Medicine 2006; 144: 73-81
15. Simon GE, Von Korff M, Saunders K, Miglioretti DL, Crane PK, van Belle G, Kessler RC. Association between obesity and psychiatric disorders in the US adult population. Archives of General Psychiatry 2006; 63: 824-830.
16. Crane PK. Commentary on comparing translations of the EORTC QLQ-C30 using differential item functioning analyses. Quality of Life Research 2006; 15: 1117-1118.
17. Crane P, Crane H. Indwelling intravenous catheter-associated *Bacillus cereus* sepsis in an immunocompetent patient. Infections in Medicine 2007; 24: 40-42.
18. Lai JS, Crane PK, Cella D. Factor analysis techniques for assessing essential unidimensionality of cancer related fatigue. Quality of Life Research 2006; 15: 1179-1190.
19. Crane PK, Gibbons L, Narasimhalu K, Lai J-S, Cella D. Rapid detection of differential item functioning in assessments of health-related quality of life: the Functional Assessment of Cancer Therapy. Quality of Life Research 2007; 16: 101-114.

20. Crane HM, Lober W, Webster E, Harrington RD, Crane PK, Davis TE, Kitahata MM. Routine collection of patient-reported outcomes in an HIV clinic setting: the first 100 patients. Current HIV Research 2007; 5: 109-118.
21. Rabin LA, Borgos MJ, Saykin AJ, Wishart HA, Crane PK, Nutter-Upham KE, Flashman LA. Judgment in older adults: development and psychometric evaluation of the Test of Practical Judgment. Journal of Clinical and Experimental Neuropsychology 2007; 29: 752-767.
22. Reeve BB, Hays RD, Bjorner JB, Cook KF, Crane PK, Teresi JA, Thissen D, Revicki DA, Weiss DJ, Hambleton RK, Liu H, Gershon R, Reise SP, Cella D. Psychometric evaluation and calibration of health-related quality of life item banks: plans for the Patient-Reported Outcome Measurement Information System (PROMIS). Medical Care 2007; 45 (5 Suppl 1): S22-S31.
23. Teresi J, Ocepek-Welikson K, Kleinman M, Cook K, Crane P, Gibbons L, Morales L, Orlando M, Cella D. Evaluating measurement equivalence using the item response theory log-likelihood ratio (IRTLR) method to assess differential item functioning (DIF): applications (with illustrations) to measures of physical functioning ability and general distress. Quality of Life Research 2007; 16 Suppl 1: 43-68.
24. Crane PK, Gibbons LE, Ocepek-Welikson K, Cook K, Cella D, Narasimhalu K, Hays R, Teresi J. A comparison of three sets of criteria for determining the presence of differential item functioning using ordinal logistic regression. Quality of Life Research 2007; 16 Suppl 1: 69-84.
25. Cook KF, Teal CR, Bjorner JB, Cella D, Chang C-H, Crane PK, Gibbons L, Hays RD, McHorney CA, Ocepek-Welikson K, Raczek AE, Teresi JA, Reeve BB. IRT Health Outcomes Data Analysis Project: An Overview and Summary. Quality of Life Research 2007;16 Suppl 1: 121-132.
26. Crane PK, Cetin K, Cook KF, Johnson K, Deyo R, Amtmann D. Differential item functioning in a modified version of the Roland-Morris Disability Questionnaire. Quality of Life Research 2007;16: 981-990.
27. Li G, Rhew IC, Shofer JB, Kukull WA, Breitner JCS, Peskind E, Bowen JD, McCormick W, Teri L, Crane PK, Larson EB. Association of blood pressure and risk of dementia varies with age: a community-based prospective cohort study. Journal of the American Geriatrics Society 2007; 55: 1161-1167.
28. Pierce B, Austin MA, Crane PK, Retzlaff BM, Fish B, Hutter CM, Leonetti DL, Fujimoto WY. Measuring dietary acculturation in Japanese Americans using confirmatory factor analysis of food frequency data. American Journal of Clinical Nutrition 2007; 86: 496-503.
29. Sonnen JA, Larson EB, Crane PK, Haneuse S, Li G, Schellenberg GD, Craft S, Leverenz JB, Montine TJ. Pathologic correlates of dementia in a longitudinal population-based sample of aging. Annals of Neurology 2007; 62: 406-413.
30. * Crane PK, Narasimhalu K, Gibbons LE, Mungas DM, Haneuse S, Larson EB, Kuller L, Hall K, van Belle G. Item response theory facilitated co-calibrating cognitive tests and reduced bias in estimated rates of decline. Journal of Clinical Epidemiology 2008; 61:1018-1027; 1027e1-1027e9.
31. Gray SL, Anderson ML, Crane PK, Breitner JCS, McCormick W, Bowen JD, Teri L, Larson E. Antioxidant supplement use and risk of dementia or Alzheimer's disease in older adults. Journal of the American Geriatrics Society 2008; 56: 291-295.
32. Von Korff M, Crane PK, Alonso J, Vilagut G, Bruffaerts R, de Giralamo G, Gureje O, de Graaf R, Huang Y, Iwata N, Karam EG, Kovess V, Lara C, Levinson D, Posada-Villa J, Scott KM, Ormel J. Modified WHODAS-II provides valid measure of global disability but filter items increased skewness. Journal of Clinical Epidemiology 2008; 61: 1132-1143.
33. Cook KF, Choi SW, Crane PK, Deyo RA, Johnson KL, Amtmann D. Letting the CAT out of the bag: comparing computer adaptive tests and an eleven-item short form of the Roland-Morris Disability Questionnaire. Spine 2008; 33: 1378-1383.
34. Crane PK, Narasimhalu K, Gibbons LE, Pedraza O, Mehta KM, Tang Y, Manly JJ, Reed BR, Mungas DM. Composite scores for executive function items: demographic heterogeneity and relationships with

- quantitative MRI. Journal of the International Neuropsychological Society 2008; 14: 746-759. PMID: PMC2683684
35. Gibbons LE, McCurry S, Rhoads K, Masaki K, White L, Borenstein AR, Larson EB, Crane PK. Japanese-English language equivalence of the Cognitive Abilities Screening Instrument among Japanese-Americans. International Psychogeriatrics 2009; 21: 129-137.
 36. Woltjer RL, Sonnen JA, Sokal I, Rung LG, Wang W, Kjerulf JD, Klingert D, Johnson C, Rhew I, Tsuang D, Crane PK, Larson EB, Montine TJ. Quantitation and mapping of detergent-insoluble proteins in the elderly. Brain Pathology 2009; 19: 365-374.
 37. Sonnen JA, Larson EB, Gray SL, Wilson A, Kohama SG, Crane PK, Breitner JCS, Montine TJ. Free radical damage to cerebral cortex in Alzheimer's disease, microvascular brain injury, and smoking. Annals of Neurology 2009; 65: 226-229.
 38. Haneuse S., Schildcrout J, Crane P, Sonnen J, Breitner J, Larson E. Adjustment for selection bias in observational studies with application to the analysis of autopsy data. Neuroepidemiology 2009; 32: 229-239.
 39. Sonnen JA, Larson EB, Brickell K. Crane PK, Woltjer R, Montine TJ, Craft S. Different patterns of cerebral injury in dementia with or without diabetes. Archives of Neurology 2009; 66: 315-322.
 40. Crane PK, Gibbons LE, Arani K, Nguyen V, Rhoads K, McCurry SM, Launer L, Masaki K, White L. Midlife use of written Japanese and protection from late life dementia. Epidemiology 2009; 20: 766-774.
 41. Breitner JCS, Haneuse SJPA, Walker R, Dublin S, Crane PK, Gray SL, Larson EB. Risk of dementia and AD with prior exposure to NSAIDs in an elderly community-based cohort. Neurology 2009; 72: 1899-1905.
 42. Teresi JA, Ocepek-Wlikson K, Kleinman M, Eimicke JP, Crane PK, Jones RN, Lai J-S, Choi SW, Hays RD, Reeve BB, Reise SP, Pilkonis PA, Cella D. Analysis of differential item functioning in the depression item bank from the Patient Reported Outcome Measurement Information System (PROMIS): an item response theory approach. Psychology Science Quarterly 2009; 51: 148-180.
 43. Sonnen JA, Larson EB, Haneuse S, Li G, Crane PK, Craft S, Montine TJ. Neuropathology in the Adult Changes in Thought study: a review. Journal of Alzheimer's Disease 2009; 18(3): 703-711.
 44. Hart DL, Deutscher D, Crane PK, Wang Y-C. Differential item functioning was negligible in an adaptive test of functional status for patients with knee impairments who spoke English in the United States or Hebrew in Israel. Quality of Life Research 2009; 18: 1067-1083.
 45. Tsuang D, Larson E, Li G, Shofer J, Montine KS, Thompson ML, Sonnen JA, Crane P, Leverenz J, Montine TJ. Association between lifetime cigarette smoking and Lewy body accumulation. Brain Pathology 2010; 20(2): 412-418. PMID: PMC2864364.
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2. Mungas D, Tractenberg R, Schneider JA, Crane PK, Bennett DA. A two process model for neurofibrillary tangles in Alzheimer's disease. *Brain* (submitted 2012).
3. Jones RN, Tommet D, Choi SW, Teresi JA, Yang FM, Saag MS, Kitahata MM, Willig JH, Mugavero MJ, Schumacher JE, Crane HM, Crane PK. Impact of DIF in the PROMIS depression item bank was trivial under simulated full bank and CAT administration. *Journal of Clinical Epidemiology* (submitted 2012).
4. Dublin S, Anderson ML, Heckbert SR, Hubbard RA, Sonnen JA, Crane PK, Montine TJ, Larson EB. Neuropathologic changes associated with atrial fibrillation in a population-based autopsy cohort. *Neurology* (submitted November 2012; minor revisions requested May 2013).
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6. Gruhl J, Erosheva EA, Crane PK. A semiparametric approach to mixed outcome latent variable models: estimating the association between cognition and regional brain volumes. *Annals of Applied Statistics* (submitted November 2012; minor revisions requested June 2013).

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30. Trittschuh E, Larson E, Crane P, Cholerton B, McCurry S, McCormick W, Bowen J, Arbuckle A, Wojtowicz M, Craft S. Heterogeneity of MCI characterization across two time points in a community-based population. Alzheimer's & Dementia 2010; 6 (4) Suppl 1. S78-S79.

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33. Mukherjee S, Gibbons LE, Kristjansson E, Crane PK. Accounting for differential item functioning (DIF) in groups defined by educational attainment reduced the difference in rates of cognitive decline: illustration of a novel DIF detection framework using Modified Mini-Mental State Examination (3MS) data from the Canadian Study on Health and Aging (CSHA). Alzheimer's & Dementia 2010; 6 (4) Suppl 1. S469-S470.
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36. Mukherjee S, Gibbons LE, Kristjansson E, Crane PK. The relationship between educational attainment and the rate of cognitive decline in elderly Canadians depends on how one scores the 3MS: The Canadian study of health and aging (CSHA). Alzheimer's & Dementia 2011; 7 (4) Suppl. S603.
37. O'Hare A, Walker R, Haneuse S, Crane PK, Larson E. Variability in trajectory of estimated glomerular filtration rate is associated with risk of dementia. Alzheimer's & Dementia 2011; 7 (4) Suppl. S297.
38. Gibbons LE, Carle A, Insel P, Mackin S, Mukherjee S, Curtis SM, Harvey D, Mungas D, Weiner M, Crane PK. Composite scores for memory outperformed other approaches to the neuropsychological data collected by the Alzheimer's Disease Neuroimaging Initiative (ADNI). Alzheimer's & Dementia 2011; 7 (4) Suppl. S245-S246.

Invited Talks and Abstracts Accepted for Oral Presentation

National Talks

1. Limitations of statistics used to measure responsiveness. Society for Clinical Epidemiology and Healthcare Research (Sydenham Society), Society of General Internal Medicine, Atlanta, GA, May 2002.
2. Differential item functioning in a cognitive test. Statistical Methodology in Alzheimer's Disease Research II, Lexington, KY, May 2002.
3. DIFdetect for STATA: An ordinal logistic function technique for assessing differential item functioning. Harvard School of Public Health, Boston, MA, February 2003.
4. Limitations of statistics used to measure responsiveness: Tentative steps in a new direction. Harvard School of Public Health, Boston, MA, February 2003.
5. A strategy for improving psychometric screening tests with tools from item response theory: theory and a brief illustration. Society for Clinical Epidemiology and Healthcare Research (Sydenham Society), Society of General Internal Medicine, Vancouver, BC, May 2003.
6. DIFdetect analyses of the General Distress and Physical Functioning Data. Advances in Health outcomes Measurement: Exploring the Current State and the Future Applications of Item Response Theory, Item Banks, and Computer Adaptive Testing, cosponsored by NCI, NIH, DHHS and DIA, Bethesda, MD, June 23-25, 2004.
7. Rapid detection of differential item functioning (DIF) in assessments of health related quality of life (HRQL): the Functional Assessment of Cancer Therapy. ISOQOL Annual Scientific Meeting, San Francisco, CA, October 22, 2005.

8. Perturbed IRT scores to account for measurement error in simulated longitudinal studies of cognitive decline dramatically reduce bias. *New Directions in Psychological Measurement with Model-Based Approaches*, Georgia Institute on Technology, February 17-18, 2006.
9. Midlife proficiency with written Japanese and late life dementia risk among Japanese-American men: the Honolulu-Asia Aging Study. *International Conference on Prevention of Dementia*, Washington, DC, June 9-12, 2007.
10. Modern psychometric tools for generating composite scores from neuropsychological test batteries for use in multidisciplinary research. *International Neuropsychological Society meeting*, Waikiloa, HI, February 6-9, 2008.
11. Development and evolution of the ordinal logistic regression / item response theory framework for DIF detection. *The second PROMIS conference: Improving Measurement of Patient-Reported Outcomes – New Tools and the Science Behind Them*, Bethesda, MD, March 2-5, 2008.
12. Thoughts on cognitive aging research. *T32 Women's Health Fellows Conference*, Group Health Research Institute, Seattle, June 22, 2010.
13. Psychometric outcomes. *Pharmaceutical Outcomes Research and Policy Program*, University of Washington, Seattle, WA, March 2, 2011.
14. Psychometric analyses of ADNI data. *Friday Harbor Advanced Psychometrics Workshop*, Friday Harbor, WA, June 2011.
15. Item level approaches. *Methodological Challenges in the Genetic Analysis of Longitudinal Cognitive Phenotypes*, Rush University, Chicago, IL, June 30, 2011.

International Talks

1. The accuracy of stroke identification in patients with incident dementia by computed tomography: the ADPR Study. *First Congress of the International Society for Vascular Behavioural and Cognitive Disorders*, Goteborg, Sweden, August 2003.
2. Applied psychometrics at the University of Washington: some recent work and coming attractions. *First Pacific Northwest Health Measurement (Health and Medical Psychometrics) Meeting*, Vancouver, BC, Canada, May 1, 2004.
3. Increased volume of frontal lobe white matter signal hyperintensities (WMH) was associated with more rapid decline in executive functioning. *Fourth Congress of the International Society for Vascular, Cognitive and Behavioural Disorders (VAS-COG)*, Singapore, January 14-16, 2009.
4. Cortical gray matter microvascular brain infarcts were independently associated with cognitive impairment and with dementia: the Honolulu Asia Aging Study. *Fourth Congress of the International Society for Vascular, Cognitive and Behavioural Disorders (VAS-COG)*, Singapore, January 14-16, 2009.
5. IRT co-calibration of cognitive status exams. *Integrative Analyses of Longitudinal Studies of Aging Conference*, Victoria, BC, Canada, June 22-25, 2010.
6. Variability in trajectory of estimated glomerular filtration rate is associated with risk of dementia. *Alzheimer's Association International Conference on Alzheimer's Disease*, Paris, France, July 2011.

Undergraduate theses

Crane PK. *Dante's Audacious Allusions: Studies in the Divine Comedy*. Williamstown MA: Williams College, 1993. Awarded highest honors in English.

Crane PK. *Black Feminist Theory: An Introduction for Historians*. Williamstown, MA: Williams College, 1993. Awarded honors in History.