



STATISTICS
TEXAS A&M UNIVERSITY

Raymond J. Carroll

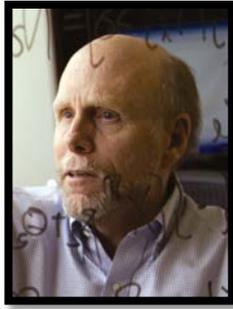
YOUNG INVESTIGATOR
AWARD CEREMONY

Thursday, February 20, 2014
4:00 pm – 5:00 pm

Hilton Hotel and Conference Center
Brazos Amphitheatre

TYLER J. VANDERWEELE
2013 RECIPIENT

Professor of Epidemiology and Biostatistics
Harvard University, School of Public Health



Raymond J. Carroll, Distinguished Professor

The Raymond J. Carroll Young Investigator Award was established to honor Dr. Raymond J. Carroll, Jill and Stuart A. Harlin '83 Chair in Statistics, Distinguished Professor of Statistics, Nutrition and Toxicology, for his fundamental contributions in many areas of statistical methodology and practice, such as measurement error models, nonparametric and semiparametric regression, nutritional and genetic epidemiology. Carroll has been instrumental in mentoring and helping young researchers, including his own students and post-doctoral trainees, as well as others in the statistical community.

Dr. Carroll is highly regarded as one of the world's foremost experts on problems of measurement error, functional data analysis, semiparametric methods and more generally on statistical regression modeling. His work, characterized by a combination of deep theoretical effort, innovative methodological development and close contact with science, has impacted a broad variety of fields, including marine biology, laboratory assay methods, econometrics, epidemiology and molecular biology.

In 2005, Raymond Carroll became the first statistician ever to receive the prestigious National Cancer Institute Method to Extend Research in Time (MERIT) Award for his pioneering efforts in nutritional epidemiology and biology and the resulting advances in human health. Less than five percent of all National Institutes of Health-funded investigators merit selection for the highly selective award, which includes up to 10 years of grant support.

The Carroll Young Investigator Award is awarded bi-annually on odd numbered years to a statistician who has made important contributions to the area of statistics. Previous winners of the award include S.C. Samuel Kou (2009 Inaugural Recipient) and Marc Suchard (2011). We proudly recognize Prof. Tyler J. VanderWeele, Professor of Epidemiology and Biostatistics of Harvard University, School of Public Health as the 2013 recipient of this prestigious award.



Tyler J. VanderWeele

*Professor of Epidemiology and Biostatistics
Harvard University, School of Public Health*

Tyler J. VanderWeele received two B.A. degrees in 2000; one in Mathematics and another in Philosophy and Theology from the University of Oxford. He then earned a Master of Arts degree in Finance in 2002 from the Wharton School, University of Pennsylvania and another in Mathematics from the University of Oxford in 2005. He was then admitted as a doctoral student at Harvard University where he earned an A.M. in Biostatistics in 2005 with his Ph.D in Biostatistics being awarded in 2006.

Prof. VanderWeele is currently a professor in the Department of Epidemiology as well as the Department of Biostatistics at Harvard University's School of Public Health. His research is primarily focused on methodology studies and empirical research. His methodologic research concerns how to distinguish the association and causation in the social and biomedical sciences. He has done empirical research in perinatal, psychiatric, and genetic epidemiology, throughout the social sciences. His work in religion and health also includes the study of the role of religion and spirituality in end-of-life care and of the mechanisms governing the associations between religion and health.

He has received prestigious awards such as the 2009 Statistics in Epidemiology Young Investigator Award from the American Statistical Association and the 2012 Rising Star Award from the Society of Pediatric and Perinatal Epidemiologic Research.

Prof. VanderWeele was chosen to receive this award for his substantial contributions to causal inference and his important empirical work in epidemiology and the social sciences. For publications and more information on Tyler VanderWeele, please visit www.hsph.harvard.edu/tyler-vanderweele/.

SURROGATE MEASURES AND CONSISTENT SURROGATES

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Surrogates which allow one to predict the effect of the treatment on an outcome from the effect of the treatment on the surrogate are of interest when it is difficult or expensive to measure the primary outcome. There have, however, been several instances of drugs that have been approved for use on the grounds of randomized trials using surrogate outcomes, that have subsequently led to public health catastrophes, costing thousands of lives. It is now clear that the use of surrogates can give rise to paradoxical situations in which the effect of the treatment on the surrogate is positive, the surrogate and outcome are strongly positively correlated, but the effect of the treatment on the outcome is negative, a phenomenon sometimes referred to as the "surrogate paradox." New results are given for consistent surrogates that extend the existing literature on sufficient conditions that ensure the surrogate paradox is not manifest. Specifically, it is shown that for the surrogate paradox to be manifest it must be the case that either there is (i) a direct effect of treatment on the outcome not through the surrogate and in the opposite direction as that through the surrogate or (ii) confounding for the effect of the surrogate on the outcome, or (iii) a lack of transitivity so that treatment does not positively affect the surrogate for all the same individuals for which the surrogate positively affects the outcome. The results are related to several common approaches and measures for assessing surrogacy including the "proportion explained" and the Prentice criteria, the "proportion mediated", meta-analytic approaches, and principal strata effects. None of these measures or approaches entirely protect against the surrogate paradox. An attempt is made to synthesize the existing approaches and results into guidelines on avoiding the surrogate paradox and ensuring consistent surrogates.



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