



The University of Chicago  
Department of Statistics

FOURTH YEAR PHD PRESENTATION

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**How Should We Measure Dependence?**

**WEDNESDAY, November 2, 2011, at 1:30 PM**  
110 Eckhart Hall, 5734 S. University Avenue

## **ABSTRACT**

A unified theory on measuring dependence was first introduced by Alfred Renyi in 1959. Since then, there have been several iterations of Renyi's axioms that have attempted to perfect this framework (for example Bell (1962), Hall (1970), Schweizer and Wolf (1981), and Nelsen (2010)). However, Renyi's framework and all of its iterations have missed some important considerations from a statistical perspective. In particular, no framework for dependence that we have found incorporates the **intended use** of the measure. For example, no distinction is made between measures intended to **detect** a relationship and those intended to **quantify** one. I will discuss this dichotomy and present some ideas on a framework for dependence measures when the goal is the latter. Time permitting, I will also discuss how these ideas are guiding my current research in two areas:

1. determining prior consistency and informativeness,
2. developing new measures and adapting old ones for functional data analysis.