

# Selection of Average Causal Effects (ACE) measures for Binary Outcomes using Propensity Score Subclassification

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Nov. 15, 2005

## Abstract for 2006 ENAR

Propensity scoring (Rosenbaum, Rubin, 1983,1984) has become increasingly popular for estimating average causal effects (ACE). However, little attention has been devoted to the choice of different ACE measures in analysis of binary outcomes. Such attention is needed because different choices of ACE measures are differentially subject to the failure of collapsibility, defined in our paper as equality of the marginal ACE to a weighted average of bin-specific causal effects. Such attention is also needed because subject-specific knowledge and scientific aims may suggest reference of certain ACE measures over others. So, **our first aim** is to clarify the collapsibility properties of different ACE measures, and associated consequences for estimation by propensity score subclassification. These properties suggest an inherent advantage for the interpretability of the average risk difference and marginal relative risk over the marginal odds ratio. **Our second aim** is to reveal a connection between the choices of ACE measures and subject-specific knowledge of comparative potential risks under exposure/treatment and no exposure/no treatment. We suggest a graphical way to visualize this connection. Collectively, this work suggest how the effective choices of ACE measures can be based not only on statistical convenience, but also on their interpretability and subject specific knowledge.