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# An Empirical Comparison of Logistic Regression to Decision Tree Induction in the Prediction of Intimate Partner Violence Reassault

Steven L. Brewer Jr.

*Indiana University of Pennsylvania*

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STUDENT HAS RESTRICTED ACCESS TO FULL TEXT OF THE DISSERTATION.

ONLY COVER PAGES AND ABSTRACT ARE AVAILABLE AT THIS TIME

AN EMPIRICAL COMPARISON OF LOGISTIC REGRESSION TO DECISION  
TREE INDUCTION IN THE PREDICTION OF INTIMATE PARTNER VIOLENCE  
REASSAULT

A Dissertation

Submitted to the School of Graduate Studies and Research

in Partial Fulfillment of the

Requirements for the Degree

Doctor of Philosophy

Steven L. Brewer Jr.

Indiana University of Pennsylvania

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Indiana University of Pennsylvania  
School of Graduate Studies and Research  
Department of Criminology

We hereby approve the dissertation of

Steven L. Brewer Jr.

Candidate for the degree of Doctor of Philosophy

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Erika Frenzel, Ph.D.  
Associate Professor of Criminology, Chair

---

Jennifer J. Roberts, Ph.D.  
Professor of Criminology

---

Jennifer L. Gossett, Ph.D.  
Associate Professor of Criminology

---

Bitna Kim, Ph.D.  
Assistant Professor of Criminology

ACCEPTED

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Timothy P. Mack, Ph.D.  
Dean

Title: An Empirical Comparison of Logistic Regression to Decision Tree Induction in the  
Prediction of Intimate Partner Violence Reassault

Author: Steven L. Brewer Jr.

Dissertation Chair: Dr. Erika Frenzel

Dissertation Committee Members:           Dr. Jennifer J. Roberts  
  Dr. Jennifer Gossett  
  Dr. Bitna Kim

Abstract:

The purpose of this research was to determine if the decision tree analytical technique offered improvement in predicting intimate partner violence outcomes. Two dependent variables were used to examine the research question. The first variable represents a dichotomy; reassault versus no reassault. The second variable included five categories; no reassault, controlling behaviors only/ threatening reassault, one-time reassault, and repeat reassault. Logistic regression and decision trees were used to assess the outcome and were compared to one another for predictive accuracy. For logistic regression, there were two models; dichotomous logistic regression and multinomial logistic regression. For the decision tree models there were four algorithm-based models; CHAID, Exhaustive CHAID, CART, and QUEST. The models were ranked on AUC, overall classification, sensitivity for the target category, and selection of the splitting variable. The results suggested that decision trees offer an improvement over logistic regression in the prediction of intimate partner violence reassault and repeat reassault. The CART

algorithm was found to be most effective in predicting the outcomes associated with intimate partner violence. The decision tree models selected “controlling behaviors” as the most influential variable in predicting intimate partner violence.