



# Predicting Peer Groups Effects On University Exam Results

Philip Scanlon & Prof Alan Smeaton

## Abstract

*There has been a multitude of studies and research papers in the areas of the influence on an individual, of the heterogeneous groups to which they become members. Manski [1] addresses the concept of "Reflection" (influence) within the group dynamic. His research found that inference of influence is only possible if additional information about the subjects making up the group is known. Using anonymised campus wifi access logs collected by the Eduroam system it is the intention of this research to identify interaction of students and thus identify group members. Once a group's members have been identified additional academic, social and environmental information will be used to identify students whose academic studies could benefit from early stage intervention.*

## 1. Introduction

University campuses are a controlled environment in which individuals voluntarily attend classes, study or engage in social activities. Additionally students provide, through interaction with the university systems, lecturers and students, large quantities of data that are the basis for my academic research regarding the dynamics of groups and their influence on their members. It is the endogenous social effects of being part of a group and the make up of that group that will be examined. My research is being undertaken within an environment where it is considered possible to identify groups as they successfully pass through Tuckman's[2] stages of group formation, and to supplement the group's identity with additional qualitative information about the members. Further research will identify group dynamics and the influences of changes on the individual and the effect on their academic studies.

## 2. Problem Statement

During their university career most students will become part of one or more groups. The research question posed; is it possible to identify the achievement level of a student based on the "friends" and peer groups that they associate with, whether for different social or academic activities.

## 3. Hypothesis

My hypothesis is that individuals will become members of a number of emergent groups in the early stages of interaction before forming "friendships" that will become influential in their development. The strength of the bond and the effects of the individual on the group and by the group will vary on many levels including personality, academic achievements and social maturity.

## 4. Motivation

It is the motivation of this research to identify early in a group's development stages those students who may require some form of intervention or support to ensure maximizing their capabilities.

## 5. Related work

Carrell, et al [3] in their study at a United States Air Force Academy monitored students exogenously assigned to groups and identified a peer effect of greater magnitude than previously found. I intend to compare their empirical studies against our groups, which have minimal exogenous influence in their formation.

I also will be using Carney, M. [4] literary review paper as a base source of research papers examining the topics of peer influence.

## 6. Proposed solution

Using the DCU wifi access logs collected by the Eduroam system for a complete academic year, we can establish the duration and location of individuals while on campus. It is the intention of this research to use the log data to identify which students interact on a continuous basis both within the confines of the class but more specifically in areas where gathering would be for more social or shared studying locations. From these findings we can infer a relationship or friendship, and the context in which they occur. The context of the interaction will be used to determine the type and strength of the friendship and address Manski's [1] problem of Reflection. Based on the examination result trends from the identified students, a model will be developed using Machine Learning techniques, which can identify those students whose performance varies due to changes in their group(s) membership.

## 7. References

- [1]Manski, Charles F, 1993. "Identification of Endogenous Social Effects: The Reflection Problem." Review of Economic Studies 60(3): 531-42.
- [2]Tuckman, Bruce (1965). "[Developmental sequence in small groups](#)". [Psychological Bulletin](#) 63 (6): 384–99.
- [3] Carrell, Scott E., Richard L. Fullerton and James E. West. 2009. "Does Your Cohort Matter? Estimating Peer Effects in College Achievement." Jnl Labor Economics 27(3): 439-464.
- [4] Carney,M. 2013. Identifying Peer Effects: Thinking outside the "Linear-in-Means" Box. [http://www.econ.ucsb.edu/~pjkuhn/Ec250A/StudentsPapers/Carney\\_PeerEffects.pdf](http://www.econ.ucsb.edu/~pjkuhn/Ec250A/StudentsPapers/Carney_PeerEffects.pdf).