



Industry/University  
Cooperative Research  
Centers

## **Thesis Prospectus**

**S&T Students' acquisition of Social Capital and Networks:  
Traditional Education vs. IUCRC,  
Domestic vs. International  
and Gender Differences**  
IUCRC Evaluator's Meeting  
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# Bowling Alone

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- “Social networks have value. Just as a screwdriver (physical capital) or a university education (human capital) can increase productivity (both individual and collective), so do social contacts affect the productivity of individuals and groups“

Putnam, Robert. (2000), *Bowling Alone: The Collapse and Revival of American Community or America's Declining Social Capital*



# Purpose

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- Social Capital and Networks of professionals facilitate knowledge creation and knowledge transfer
- Study investigates if Social Capital and Networks are more likely to be acquired by young scientists in Triple Helix research centers vs. traditional university settings (focus on STEM scientists whose knowledge is more specific and less concentrated on ‘soft’ skills)
- International students’ experiences, social adaptation and decision to stay in the US (50% of graduate students in research centers & STEM degrees are international)
- Gender differences in acquired social capital and networks in the predominately male-dominated STEM disciplines



# Theory

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## 1. Human Capital and Social Networks

- Bozeman, B., Dietz, J. & Gaughan, M. (1999). Scientific and Technical Human Capital: An Alternative Model for Research Evaluation.

*“S&T human capital further includes the social capital that scientists continually draw upon in creating knowledge – for knowledge creation is neither a solitary nor singular event. In sum, it is this expanded notion of human capital when paired with a productive social capital network that enables researchers to create and transform knowledge and ideas in ways that would not be possible without these resources.”*

## 2. International Students Adaptation

- Social and professional experiences in the US universities
- Language barrier
- Cultural Shock

## 3. Gender and professional Networking

- Feminist perspective on exclusion of women from professional networks in the male-dominated disciplines



# Literature

Author/ Date	Population	Sample	IV	DV Students Outcomes	Method	Analysis	Results
Schneider 2007	IUCRC Graduate Students	N=190 (37%) 2005-2006	Demographic, Student & Center Characteristics; Center Experiences & Interactions	Satisfaction, Perceived Skills, Scholarly Achievement, Career goals	Cross-sectional study	Exploratory Factor Analysis, Multiple Regression and Logistic Regression.	Experiential and multidisciplinary centers, interactions and technical involvement are strongest predictors of students' satisfaction.
Scott, Schaad & Brock 1993	IUCRC Graduates & Traditional Alumni	C = 138 E = 112	Graduate experiences	Perception of Training Experiences	Random Sample. Mail Survey and Telephone Interview	Comparison of means between the groups	IUCRC were more satisfied about their training experiences.
Behrens & Gray 2001	IUCRC Grad Students	Engineering Departments at 6 Universities N=482	Source and form of Industry Funding	Academic Freedom	Purposive Sample. Mail Survey Follow-up by phone call, and Follow-up postcard within 3 weeks	Factor Analysis, Descriptive, Correlation, Regression etc.	Industry support does not negatively influence outcomes for students
Astin, Keup & Lindholm 2002	US Undergraduate Students	117 institutions. 1985-1989 (N)= 14,021, 1994-1998 (N)=9,281	System Transformation of Higher Education	Involvement, student-faculty interaction & service participation	Longitudinal student database at UCLA. Two groups: 1985 (Fr.) – 1989 (follow-up); 1994 (Fr.) – 1998 (follow-up)	Regression (second time period 'expected' while first is a standard)	Increase in student-faculty interaction in liberal arts colleges, and lower than average increase in public and private universities.



# Hypothesis

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- Graduate students in IUCRCs gain more social capital, professional networking and receive more job offers than graduate students in the traditional university settings.
- International students in IUCRCs have a higher level of social adaptation to a new culture and express more interest to stay in the US after completion of their studies.
- There is gender differences in professional networks and social capital students acquire in both settings.



# Terms

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- Definitions
  - Networks and Social Capital
  - IUCRC and ‘traditional’ university settings
  
- Measures and Instrumentation
  - Social Networks Analysis (density, centrality, cohesion)
  - International Students’ adaptation



# Method

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- Population and Sample
  - Total N 200
  - IUCRC (N=100) and traditional (N=100) graduate students in the same departments and universities
  - Equal sample N for US and international students in both groups
  - International students and defense research
  
- Procedure
  - Identification: contact IUCRCs' directors and evaluators and S&T departments
  - Data Collection:
    1. electronic questionnaire
    2. one-week and two-week electronic follow-ups
    3. three-week phone call
  - Motivation:
    - a. authority
    - b. reward (gift card)
  
- Analysis: multiple regression and/or path analysis





# Design

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## IV (Schneider)

- Training Process
- Organizational Structure
- Demographics

## Mediators

- Teams vs. Individuals
- Exposure to and Networking with people from different disciplines

## DV

- US and International:
  - Perceived Acquisition of Social Capital and professional Networks
  - Number of Internships/Job offers
- International:
  - Decision to stay in the US
  - Level of social adaptation