

# Correlates of Native American Engineering Students' Career Interests and Efficacy: A Test of SCCT

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# Introduction

- \* There is an urgent need for young people to prepare for and pursue engineering careers. Engineering occupations comprise 20% of the science, technology, engineering, and math (STEM) jobs in the U.S. (Bureau of Labor Statistics, 2017). The average wage for STEM occupations is nearly double that of non-STEM occupations, with engineers commanding some of the highest salaries in STEM (Bureau of Labor Statistics, 2017).

# Introduction

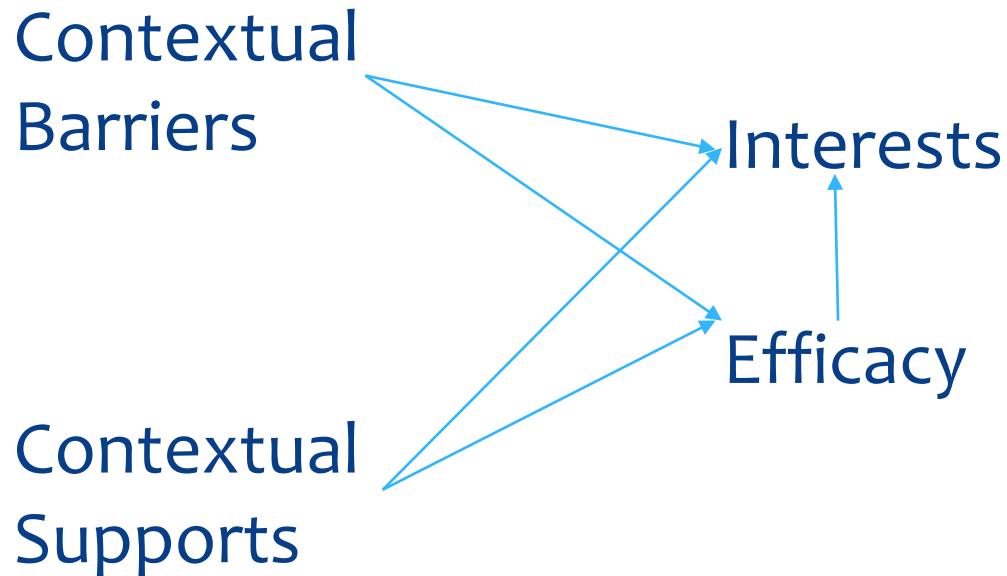
- \* Engineering occupations are expected to be some of the fastest growing occupations in the U.S. over the next 10 years (Occupational Outlook Handbook, 2018); yet, there are current and projected shortages of workers in the engineering workforce so that many engineering jobs will go unfilled (Bureau of Labor Statistics, 2015)

# Introduction

- \* Native Americans are highly underrepresented in engineering (NSF, 2017). They comprise approximately 2% of the U.S. population (U.S. Census Bureau, 2013), but only 0.3% of engineers (Sandia National Laboratories, 2016). Thus, they are not positioned to attain a high-demand, high-growth, highly rewarding engineering job, nor to provide engineering expertise to meet the needs of their own communities or society at large.

# Social Cognitive Career Theory

(Lent, Brown, & Hackett, 1994, 2000)



# Operationalization of SCCT Variables

Engineering Interests – interest in pursuing an engineering career

Engineering Self-efficacy -- people's judgments of their abilities to perform career behaviors in relation to career development, choice, and adjustment (Anderson & Betz, 2001). In this case, related to an engineering career

Lack of Ability – lack of overall ability rather than ability related specifically to an engineering career

Proactivity – creating or controlling a situation by causing something to happen rather than responding to it after it has happened

# Purpose of the Study

- \* To examine factors that encourage or discourage Native American college students' entry into engineering. Using Social Cognitive Career Theory (SCCT; Lent, Brown, & Hackett, 1994; 2000), we examined the correlates of these students' interests and efficacy in engineering to accomplish this goal.

# Hypotheses

Lack of Academic Prep. (-)

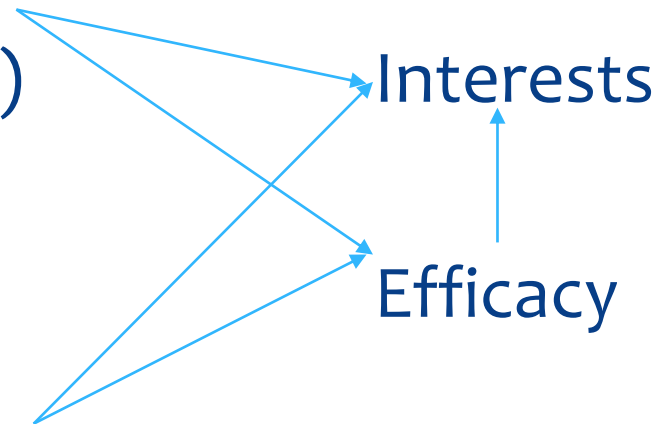
Lack of Ability (perceived) (-)

Academic Achievement (+)

Career Exploration (+)

Proactivity (+)

Parent & Peer Support (+)





# Participants

30 Native American engineering college students from the Midwest

65% men

30% women

4% other gender

Mean age = 25.87 (SD = 6.98).

Data were collected over one year on college campuses and at professional development conferences via an online survey hosted on Qualtrics.

# Instrumentation

Mapping Vocational Challenges – Engineering  
(Lapan & Turner, 2000, 2016)

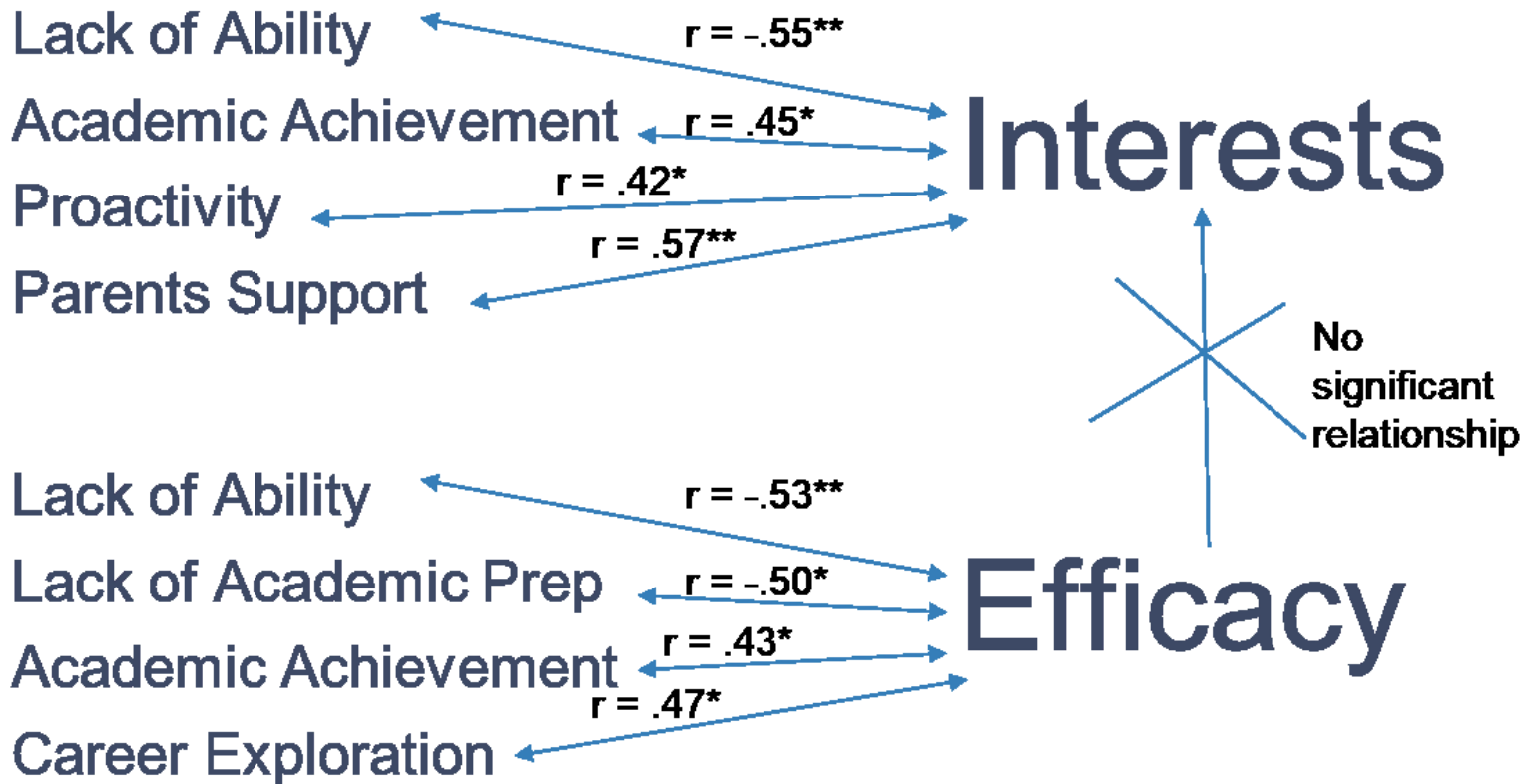
Perceptions of Barriers Scale  
(POB; McWhirter, 1998)

Structured Career Development Inventory  
(Lapan, 2004; Turner & Lapan, 2005)

# Data Adequacy

- \* A priori Power Analysis ( $f^2 = .50$ ;  $\alpha = .05$ ,  $1 - \beta = .90$ ) indicated our sample size was adequate.
- \* For all scales, full-scale Cronbach's  $\alpha$  reliabilities ranged from .82 to .86.

# Results



Note.  $*p < .05$ ,  $**p < .01$

# Discussion – Engineering Interests

- \* Both efficacy and interests are driven by hypothesized barriers and supports.
- \* Students' engineering interests are more strongly related to a lack of belief in their overall abilities than to their engineering career self-efficacy.
- \* Likewise, if students demonstrate greater achievement in engineering, they are also more interested in engineering.
- \* Parent and peer support continue to play a strong role in the development of engineering interests.

# Discussion – Engineering Efficacy

- \* Students' engineering efficacy is also related to lack of beliefs in their overall abilities.
- \* A lack of academic preparation mitigates against the development of their engineering self-efficacy
- \* Both academic achievement and career exploration play an important role in the development of engineering self-efficacy, thus demonstrating the critical nature of attending to both the academic and the career development aspects of preparing Native American students to pursue engineering careers.
- \* The non-significant relationship between engineering interests and efficacy in this population may indicate a developmental trajectory that is unique to Native American engineering students.

# Recommendations

- \* Advising/Mentorship is key to assisting Native American engineering students in exploring careers, connecting with academic resources, and providing support.
- \* Providing information on engineering education and engineering careers to the Native American community can increase parent and peer support of Native American engineering students.
- \* Counseling to help Native American engineering students understand their natural abilities and acquired capabilities, and can help them translate these into engineering acumen, thus increasing interests, efficacy, and student success.