Medical Experiences' Influence on Science Motivation

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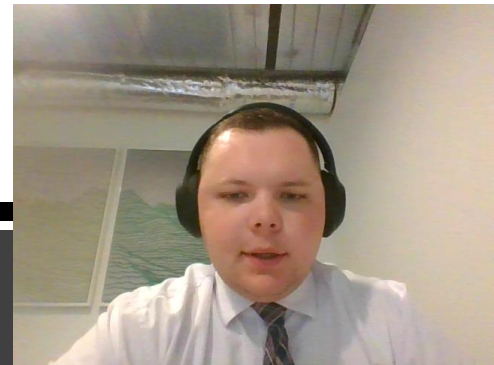
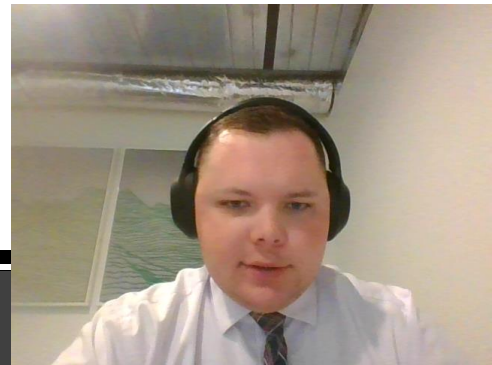


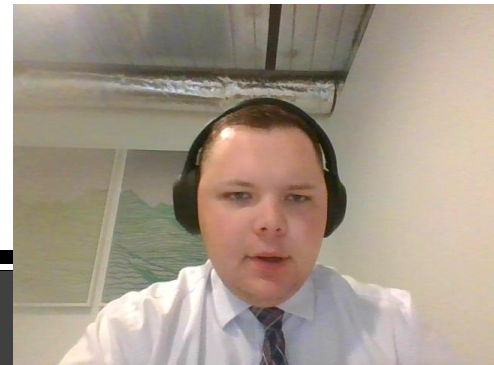
NSF iSPIRE Inclusive Science Pedagogy & Identity in Research Experiences
UTAH VALLEY UVU UNIVERSITY

Introduction: A student perspective- Porter's medical experience history



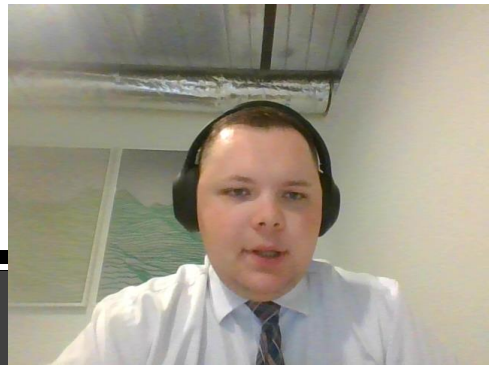
Introduction: Previous Research

- Previous research shows there is a lack of literature on the impact medical experiences can have on student motivation
- Motivation comparison between medical and dental school (Crossley & Mubarik, 2002)



Hypothesis and Rationale

- View of science as more communal may be higher in students that have more medical experiences as they have more exposure to the science community
  - Diekman et al., 2015- lack of viewing science as communal can stop student from pursuing a science degree and career



Methods

- Quantitative Survey
  - Courses
    - Non-majors Biology
    - Intro. Majors Biology
    - Advanced Majors Biology
  - Fall 2021 and Spring 2022
  - 1,057 students
  - IRB approved (UVU #936)

Table 1

Description of survey questions

Survey Aspects	Example Questions
Science Identity	"I see myself as a biology person"
	"I see myself as a scientist"
	"My science instructors see me as a science person"
Career Motivation	"Learning science will help me get a good job"
	"Understanding science will benefit me in my career"
	"Knowing science will give me a career advantage"
Intrinsic Motivation	"Learning science is interesting"
	"I am curious about discoveries in science"
	"The science I learn is relevant to my life"
Self Determination	"I study hard to learn science"
	"I prepare well for science tests and labs"
	"I put enough effort into learning science"
Self Efficacy	"I am confident I will do well on science labs and projects"
	"I am confident I will do well on science tests"
	"I believe I can earn a grade of 'A' in science"
Grade Motivation	"Scoring high on science tests and labs matter to me"
	"It is important that I get an 'A' in science"
	"I think about the grade I will get in science"
Science Engagement	"I am good at solving complicated scientific problems"
	"I read websites, articles, or books about scientific issues"
	"I work on a project involving scientific concepts"
Value of Community	"To what extent is serving your community important to you?"
	"To what extent is working with people important to you?"
	"To what extent is helping others important to you?"
Communal Nature of Science	"To what extent is serving your community important to scientific work?"
	"To what extent is working with people important to scientific work?"
	"To what extent is helping others important to scientific work?"

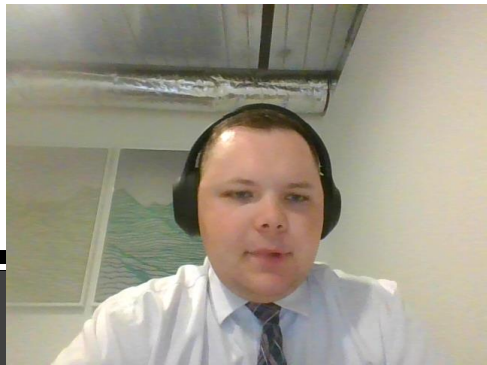


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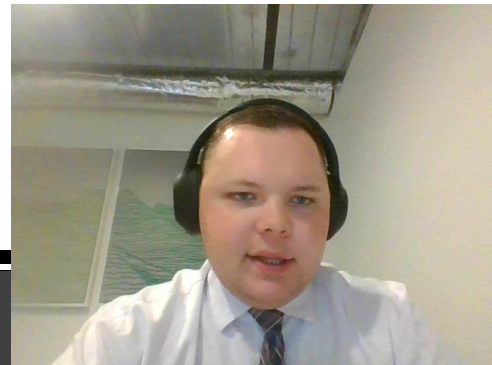
Table 2

Demographic aspects explored

Example Questions
"Which of the following best describes your major?"
"What is your intended career?"
"What is your gender?"
"What is your racial identity?"
"Did your mother or father graduate from college with a 4-year degree?"
"How many dependents do you care for?"
"Have you ever had a medical experience (hospitalization, chronic medical condition, and/or issues with mental, physical, emotional health etc.)?"
"Do you provide unpaid assistance or care to a family member or friend because of a health condition or disability?"
"Are you current working full time (35-40 hours a week) or have been working full time for a majority of your time in college?"



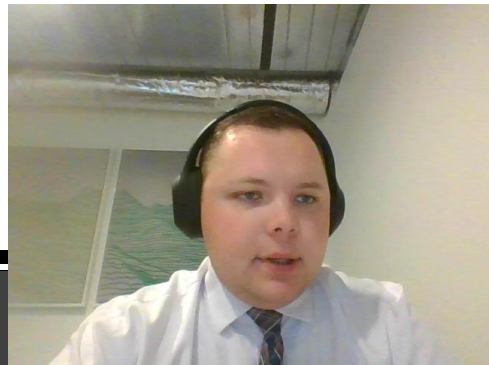
Results by Medical Experiences

- Medical experiences are associated with higher intrinsic motivation, self-efficacy, and science engagement.
- Those without medical experiences place a significantly higher value on community.

Table 3

Results by medical experiences

Type	Question Examples	Have Medical Conditions	No Medical Conditions
Intrinsic Motivation	"Learning science is interesting" "I am curious about discoveries in science" "The science I learn is relevant to my life"	**4.16 +/-.04**	4.05 +/-.04
Self Efficacy	"I am confident I will do well on science labs and projects" "I believe I can earn a grade of 'A' in science" "I am confident I will do well on science tests"	**4.32 +/-.06**	4.16 +/-.05
Science engagement	"I am good at solving complicated scientific problems" "I read websites, articles, or books about scientific issues" "I work on a project involving scientific concepts"	**3.51 +/-.04**	3.36 +/-.04
Value of Community	"To what extent is serving your community important to you?" "To what extent is working with people important to you?" "To what extent is helping others important to you?"	5.15 +/-.04	**5.43 +/-.04**
Communal nature of science	"To what extent is serving your community important to scientific work?" "To what extent is working with people important to scientific work?" "To what extent is helping others important to scientific work?"	5.15 +/-.04	**5.3 +/-.04**



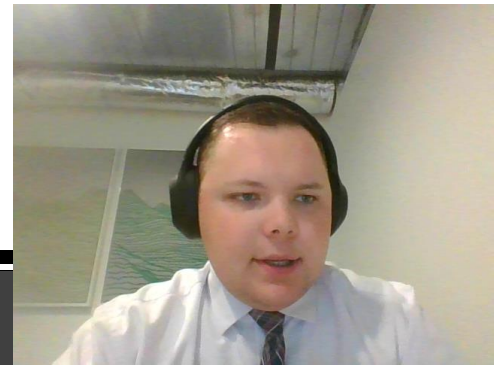
Results by Medical Experiences and Course

- Career motivation increases through advancement of degree, but it is more pronounced in those without medical experiences

Table 4

Results by medical experiences and course

Classes	Type	Question Examples	Have Medical Conditions	No Medical Conditions
Non Majors	Not predictive for any variables			
Intro Majors	Career Motivation	"Learning science will help me get a good job." "Understanding science will benefit me in my career." "Knowing science will benefit me in my career."	**4.48**	4.25 +/-.08
	Value of Community	"To what extent is serving your community important to you?" "To what extent is working with people important to you?" "To what extent is helping others important to you?"	5.43 +/-.04	**5.84 +/-.04**
	Communal nature of science	"To what extent is serving your community important to scientific work?" "To what extent is working with people important to scientific work?" "To what extent is helping others important to scientific work?"	5.44 +/-.04	**5.77 +/-.04**
Advance Majors	Career Motivation	"Learning science will help me get a good job." "Understanding science will benefit me in my career." "Knowing science will benefit me in my career."	4.54 +/-.01	**4.79 +/-.05**
	Science Engagement	"I am good at solving complicated scientific problems" "I read websites, articles, or books about scientific issues" "I work on a project involving scientific concepts"	**4.41 +/-.07**	4.09 +/-.1



Conclusion

- When educators include medical examples in their STEM teaching, inclusive language and consideration of student experiences should be thought of (around ½ of the students given the survey said they had a medical experience).
- Flexible instruction and awareness that students who have /currently battling medical experiences may need more support (burnout associated with medical experiences).
- Next steps
  - Further surveys
  - Focus groups