Implicit theories of science interest among diverse adolescent youth

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APA 2022 Division 15

Introduction

- **Enhancing science interest** among school-aged children & youth remains a top priority
- An **implicit theories perspective** argues that individuals possess different beliefs regarding the malleability of interest
- We propose an **integrative theoretical approach** that combines implicit theories, interest development theory, and identity-based motivation theory (Figure 1)

Methods

- **30 students** (Grades 9-12) participating in two university-sponsored summer camps for historically underrepresented students
- **Gender identity:** 16 female, 14 male
- **Race/ethnicity:** 17 Hispanic/Latinx, 9 Black/African American, 2 Asian-American, 1 White, 1 Multiracial

Procedure

- Students watched two **digital storytelling videos** featuring unscripted mentored science learning activities, based on **identity-based motivation theory**
- Participants shared their thoughts about science and the malleability of science interest via a **focus group**
- **Analysis plan:** Deductive coding and inductive coding using a memoing process

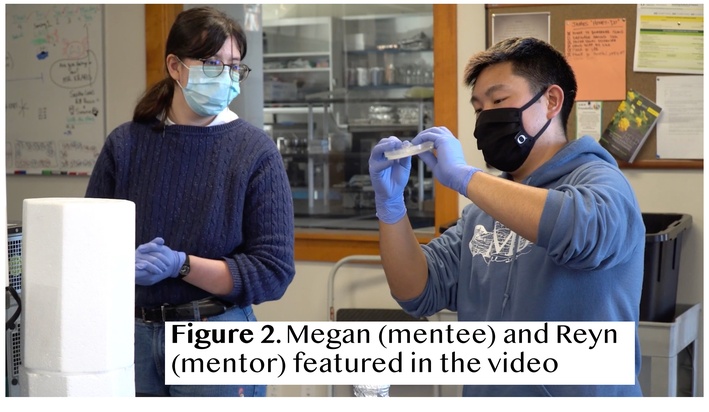

Figure 2. Megan (mentee) and Reyn (mentor) featured in the video

Research question

After watching digital storytelling videos designed to trigger interest in science, how do racially diverse high school students express beliefs about the malleability of science interest?

"How do stories cue beliefs about interest that are situated in an individual's sociocultural context?"

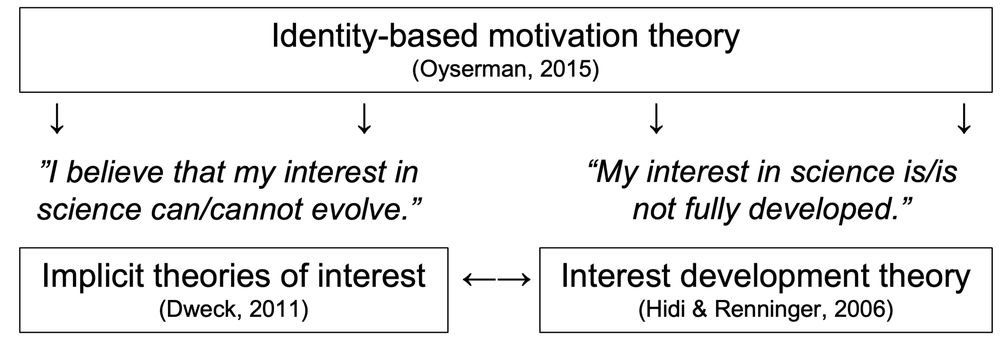

Figure 1. Conceptual framework underpinning the present study

"My interest is working with kids...You could be a teacher. Or I could be a pediatrician. I could be a pediatric dentist. I could do so many things for just like working with kids. So, I think keeping an open mind, and learning new information is very helpful."

"Some people do come in with an open mind and change their core interest. But some people when they watch or do something new, they just throw those skills out the window when it's over."

Table 1. Emergent themes about implicit theories of science interest

Reasons for growth mindset (N = 14)	Reasons for fixed mindset (N = 16)
Core interests and passion can change, but need to grow from some existing interest	People have different experiences and exposure to topics
Being exposed to new things can reveal brand new ideas and possible interests	Belief systems may conflict with science interest (e.g., Christian belief against evolution)
One core interest (e.g., social justice) can feed a new interest (e.g., science)	Interest is different than lifelong passion
New interests depend on a person's open mind	Core interests don't change
	Some things don't catch people's attention

Results

Emergent themes can be found in Table 1.

1. Science interests are **nested** and resemble a **hierarchy** (e.g., big I vs. small i interests; core values vs. interests)
2. Mapping **entity-incremental theories** and **situational-individual interests** is not straightforward
3. The **social ecology** shapes science interest development (e.g., proxy socializing agents; vicarious experiences)

Conclusions

- Interest and related terms (core value, passion, self-transcendent purpose) may reflect the **jingle/jangle fallacy**: More research on the factor structure of science interest is needed
- Students' beliefs about the malleability of science interest reflect a **continuum** rather than a fixed vs. growth dichotomy
- Fixed mindsets about science interest might reflect **inequality of exposure to triggers/opportunities**; digital storytelling videos could address this gap at scale

Other information

Links to **videos** and the **focus group protocol** can be found on our OSF project page

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Acknowledgments

This research was supported by grants from the National Science Foundation: DRL1759442 and DRL 2032226