Amber L. Morgan

Master's Thesis Defense

Addressing the Information Crisis: Understanding the Relationships Between Information Choices and Health and Academic Outcomes

Agenda

- Purpose
- Background
- Study Aims
- Methods
- Measures
- Results
- Discussion

Study Purpose

- A 'share first, question later' mentality can lead to negative health and academic outcomes
- Previous findings:
  - Students' abilities to evaluate information[1]
  - Acceptance of misinformation[2,3]
  - Individuals surround themselves with pro-attitudinal arguments [4]
- Current Study
  - Preferences for information attributes
  - Sources used
  - Beliefs and behaviors regarding finding and evaluating information
  - Confidence in information abilities
  - Willingness to admit knowledge limitations and open to others knowledge
  - Associated health and academic outcomes

Information and Health

- Information and its processing impacted:
  - Attitudes[5,6,7,8]
  - Intentions[9,10]
  - Behaviors[11,12,13]

- Alternative news media source usage→ greater acceptance of health misinformation and negative health behaviors.[9,14]
- People who used sources that presented inaccurate information had worse health intentions and behaviors.[15]

Information and Academics

- Students had:
  - Lower abilities and desires to evaluate information[1]
  - Struggled to search for and select credible sources[16]
  - Had difficulties evaluating information they had chosen[17]
- Academics requires these skills for success.
- Inclusion of information literacy course associated with higher student retention and GPAs.[18]

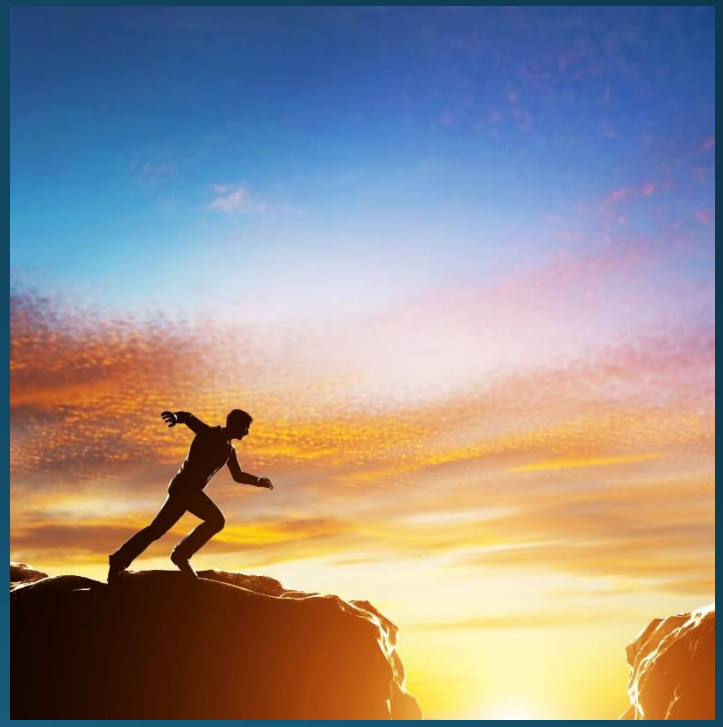
Previous Information Behaviors and Beliefs

- People:
  - Surrounded themselves with information that agreed with biases[4]
  - Viewed sources consistent with biases as more credible[4,19]

- Selective exposure → preferences towards non-argument aspects[20,21]
- Attributes of attitude-consistent sources play a role in decisions to accept future information[4]
- Consistent with Theory of Planned Behavior[22]

Information Self-efficacy*

- Higher self-efficacy predicted:
  - Lower persuasion rates[27,28]
  - Greater identification of misinformation on social media[27,28]
  - Student academic achievement[29]
- Being engaged with information and having more confidence in seeking health information (self-efficacy) associated with healthier activities[30]



*may also be referred to as information competency throughout presentation.

Intellectual Humility

- Individuals high in intellectual humility[31,32,33,34]:
  - Accept knowledge limitations and biases
  - Open to ideas of others
  - Curious and Investigative
  - Desire and Investment in Learning
  - Better evaluation skills

- Associated with positive COVID-19 vaccination attitudes, greater intention to vaccinate, and engagement in investigative behaviors[33,35]

Preference Based Modeling

- Based on Lancaster's characteristics demand theory and random utility theory (RUT) commonly used in microeconomics
  - Lancaster's: all goods and services described by attributes and value depended on attributes[36]
  - RUT: probability of choosing one option over another determined by observed characteristics of the options and unobserved characteristics of the individual making the choice [37,38]

- Discrete-choice modeling:
  - Participants choose between sets of attribute levels known as profiles[39,40]
  - Each choice set = task

Discrete Choice Example

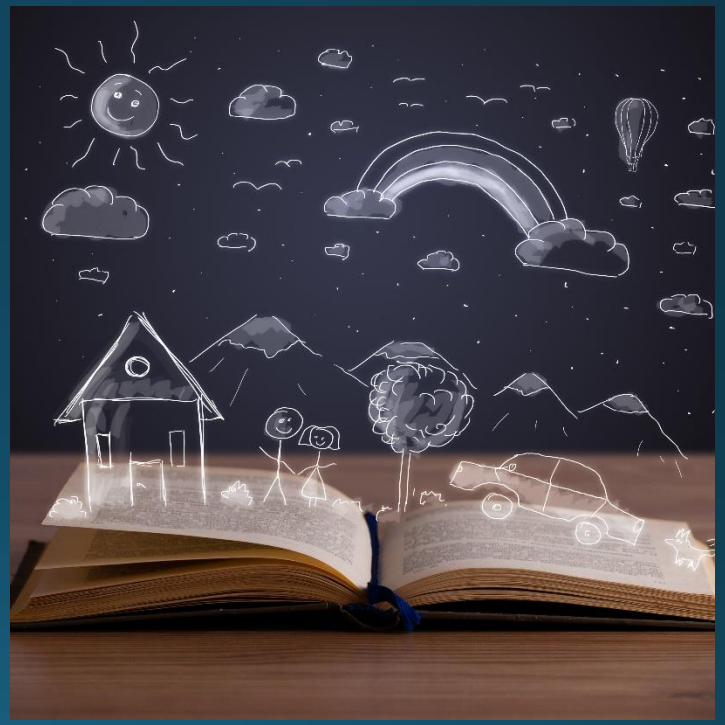
Please indicate your preference between the following vehicle profiles:

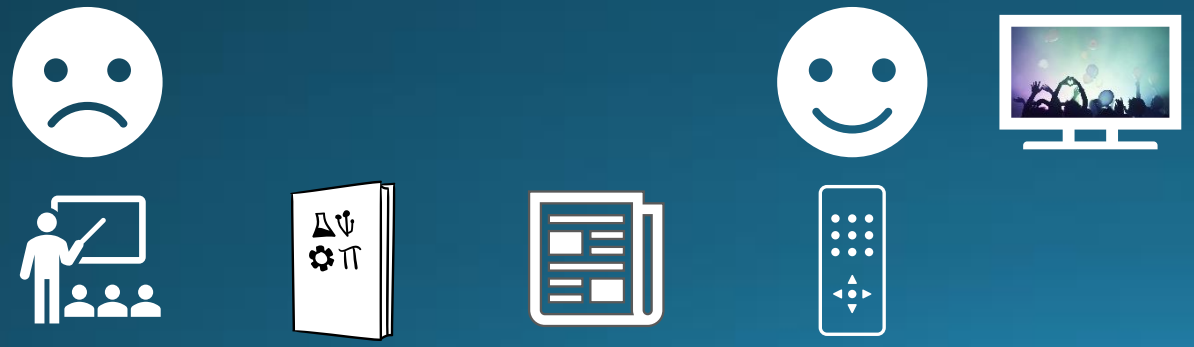
Step 1 of 3

Vehicle		
Color	Black	Red
Gas Mileage	High	Low
Vehicle Type	SUV	Sedan
	○	○

Information Attributes

- Author's Expertise
  - Experts = credible and persuasive
- Source Medium
  - Reputable sources = trustworthy
- Message Structure
  - Narratives are engaging
    - Enhances believability
    - Reduces counter-arguing
    - Impact behaviors





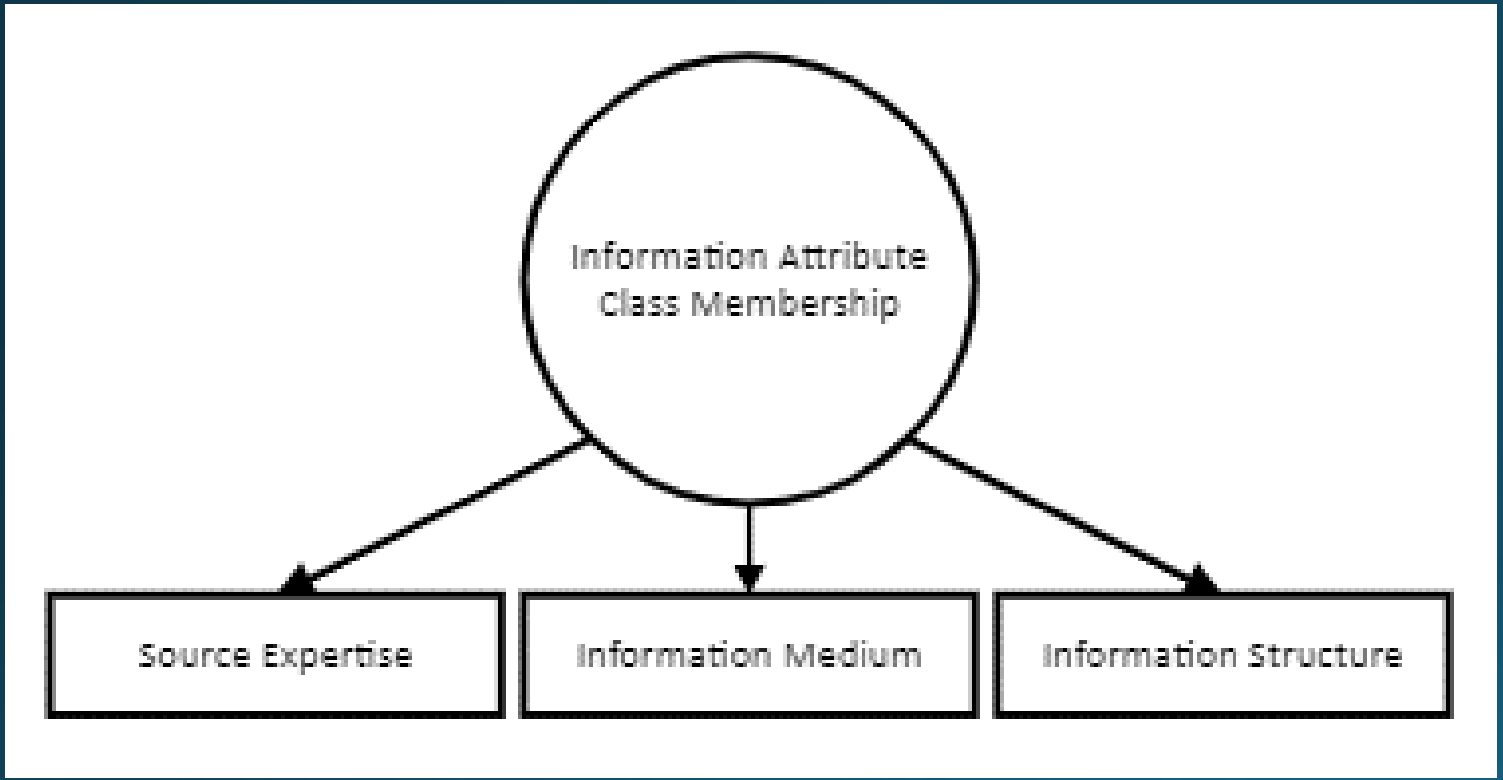
Covariate Variables

- Sex at birth
- Age
- Socioeconomic Status
- Self-esteem
- Social Desirability
- Student Classification*
- Cumulative and transfer GPA*†
- Cumulative† and semester course credits completed*

*used for academic outcomes only

†removed from analyses due to multicollinearity

Aim 1: Identify Preferences for Attributes



Credibility Focused
Source expertise (Expert)
Information Medium (Reputable)

Engagement Focused
Information Medium (Entertaining)
Information Structure (Narratives)

Accuracy Focused
Information Structure (Facts)
Expertise & Reputable Sources

Aim 2: Examine the Effects of Information Predictors on Health and Academic Outcomes

Membership in credibility or accuracy-focused class

↑ information engagement

↓ information apprehension

History of using reputable sources

↑ information competency

↑ intellectual humility

Better mental and physical QOL

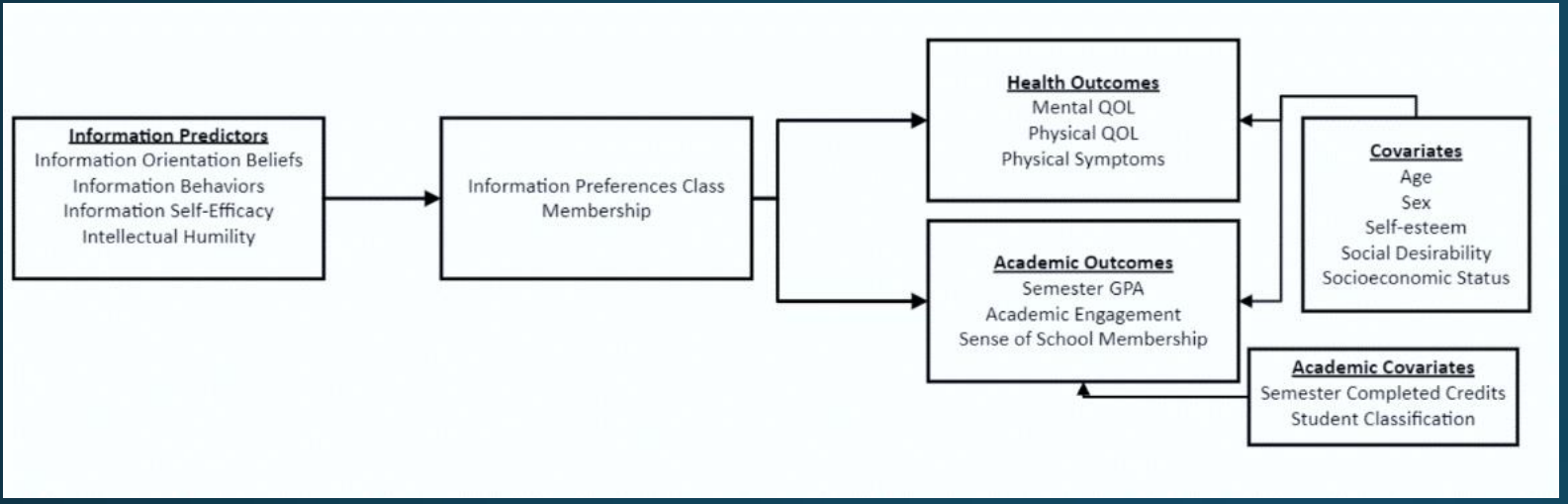
Fewer physical symptoms

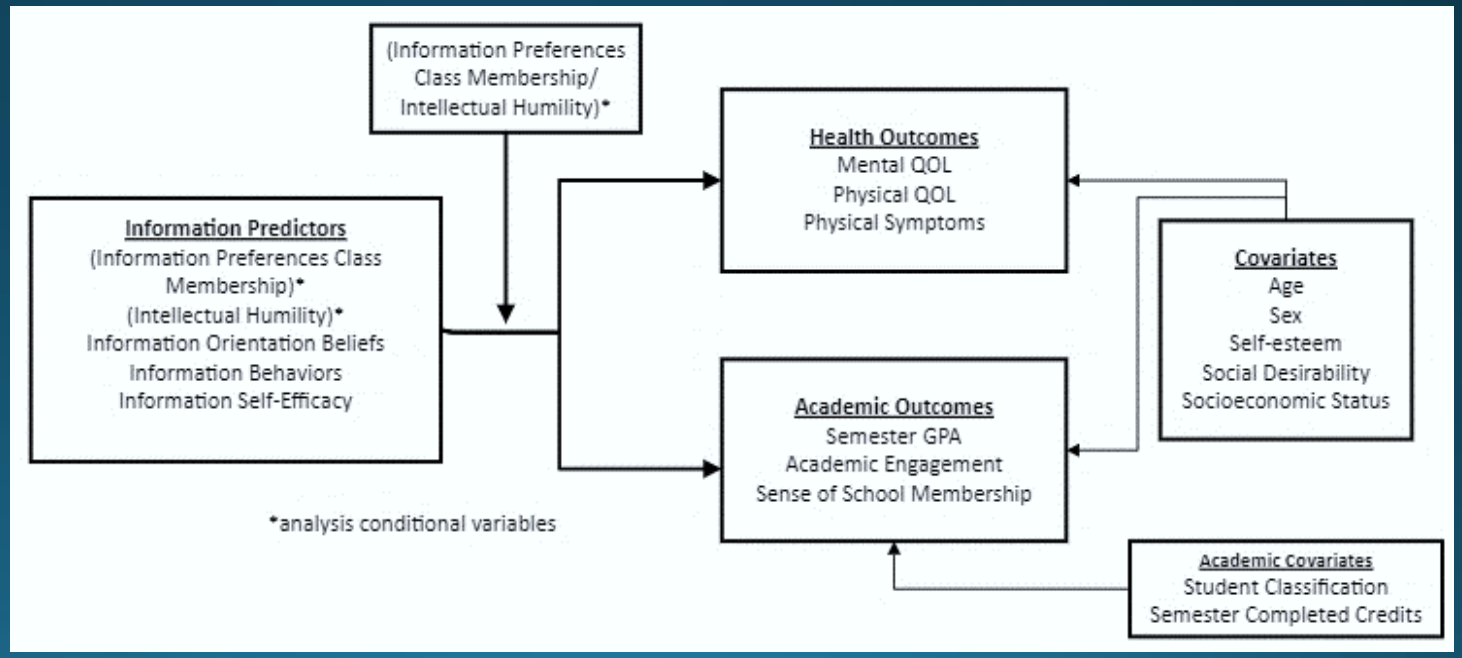
↑ Semester GPA

↑ Academic Engagement

↑ Sense of school membership

Aim 3: Exploratory Models





Methods: Participants and Procedures

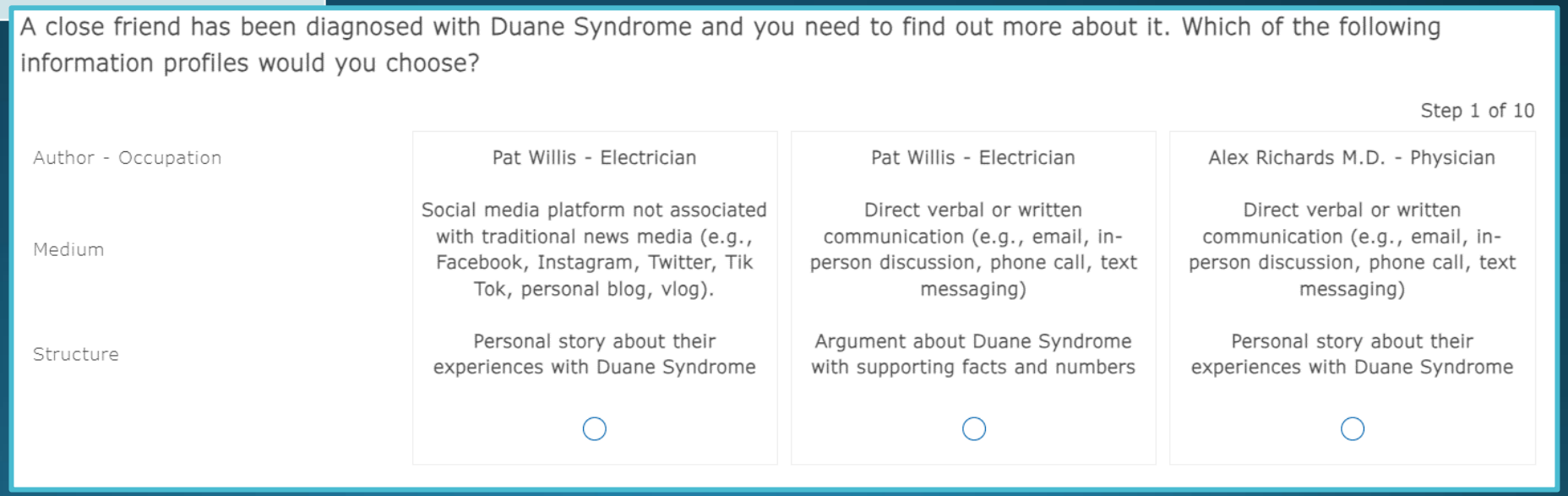
- Recruited from The University of Texas at Arlington through the Department of Psychology Human Research Participant Pool (SONA).

- Compensation: UTA student received 0.5 course credits

- Procedures:
  - Self-report questionnaires
  - Three attention checks
  - Two full-profile discrete choice models with 20 choice tasks total (10 for each topic)
    - "a close friend has been diagnosed with Duane Syndrome, and you need to find out more about it"
    - "a close friend has notified you The Pastry War will be included on your exam, and you need to find out more about it"

Information Attribute Profiles

Attribute	Levels
Source Expertise	Expert
	Non-expert
Information Medium	Traditional news media
	Academic source
	Direct verbal or written communication
	Online platforms not associated with traditional news media sources
	Social media platforms not associated with traditional news media sources
Information Structure	Fact-based
	Story-structure



Measures

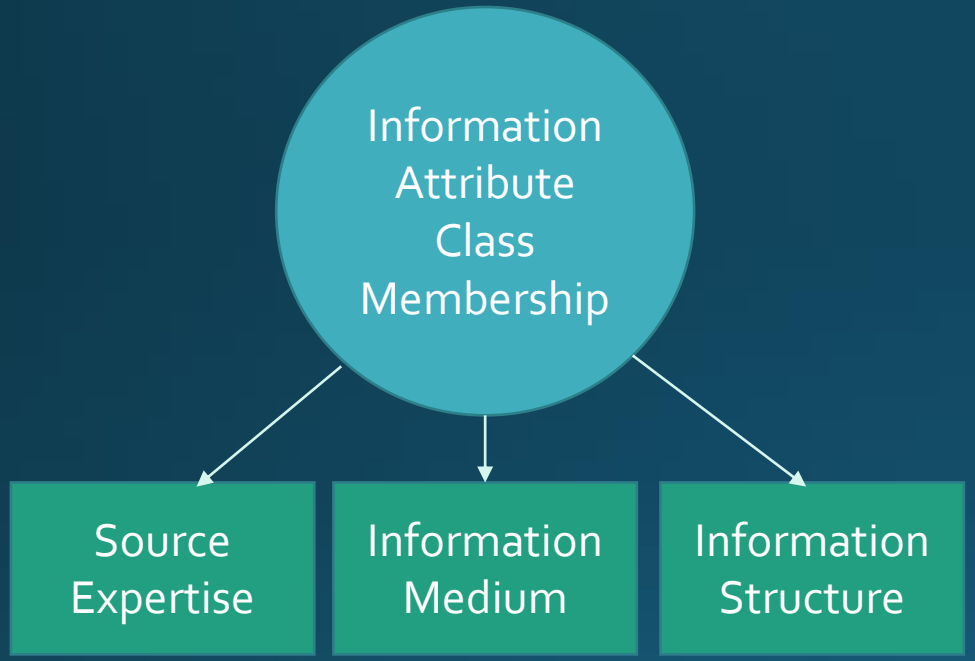
Measure	Source
Rosenberg Self-esteem Scale[46]	Rosenberg, 1965
Marlow-Crowne Social Desirability Scale Short Form[47]	Reynolds, 1982
Cohen-Hoberman Inventory of Physical Symptoms[48]	Cohen & Hoberman, 1983
Medical Outcome Study-SF (MOS SF-36)[49]	Ware & Sherbourne, 1992
University Student Engagement Inventory[50]	Maroco et al., 2016
Psychological Sense of School Membership[51]	Goodenow, 1993
Information Orientation Scale[52]	DuBenske et al., 2009
Comprehensive Intellectual Humility Scale[53]	Krumrei-Mancuso and Rouse, 2016
Self-report Source Behaviors	
Information Competency Scale[54]	Song & Kwon, 2012

Participant Characteristics

- 497 people had valid data usable for analysis; 409 gave consent to obtain University Analytics data.
- Ethnically and racially diverse.
- Female, Freshman, and between 17-22 years old.
- Average semester GPA was 3.33 (B+) and average number of credit hours taken was 13.95.
- 8.1% and 3% of participants had knowledge about Duane Syndrome and Pastry War, respectively*

*removed from further analyses due to confirmation that having prior knowledge influenced class membership.

Hypothesis 1- Identifying Latent Classes



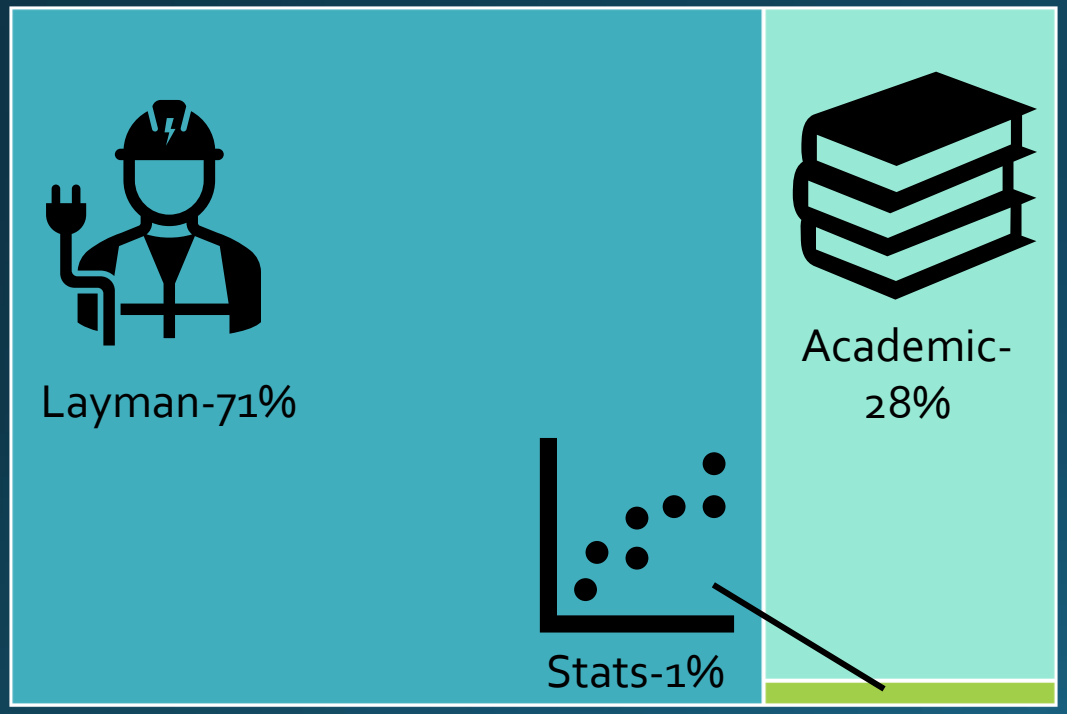
Credibility Focused
Source expertise (Expert)
Information medium (Reputable)

Engagement Focused
Information medium (Entertaining)
Information Structure (Narratives)

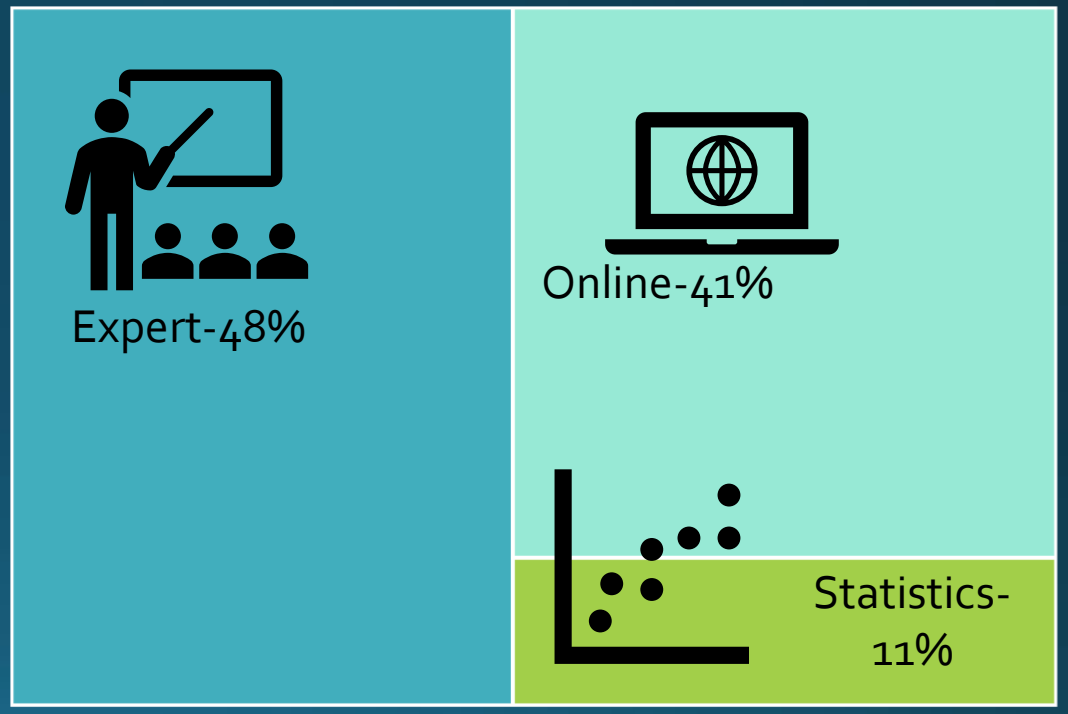
Accuracy Focused
Information Structure (facts)
Expertise & Reputable Sources

Overall Importance of Attributes

Health Topic

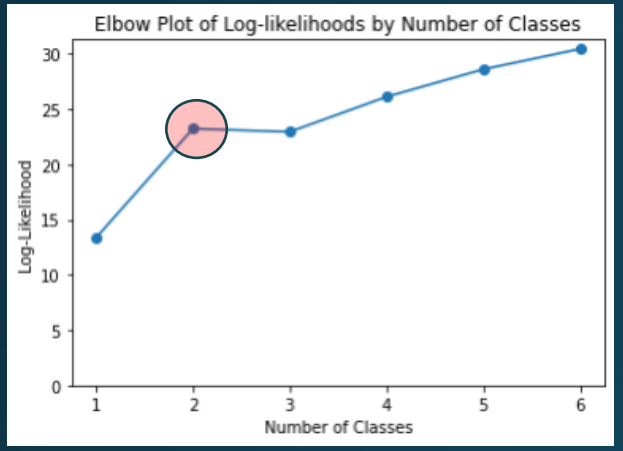


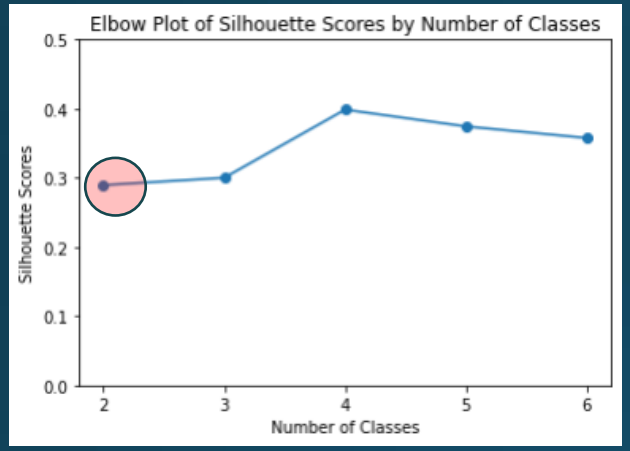
Academic Topic

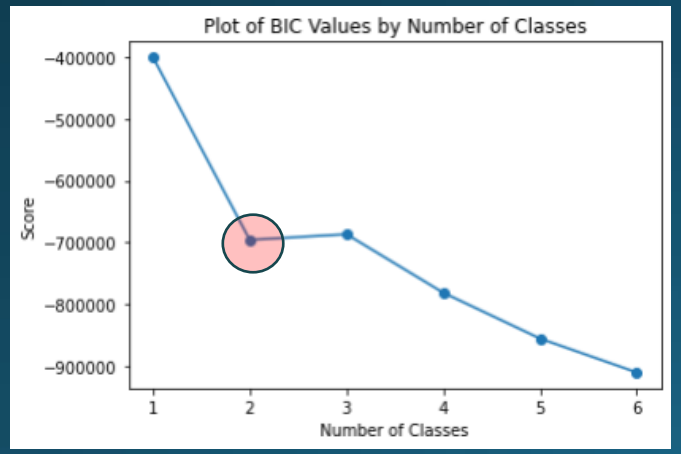


Latent Class Analysis Results

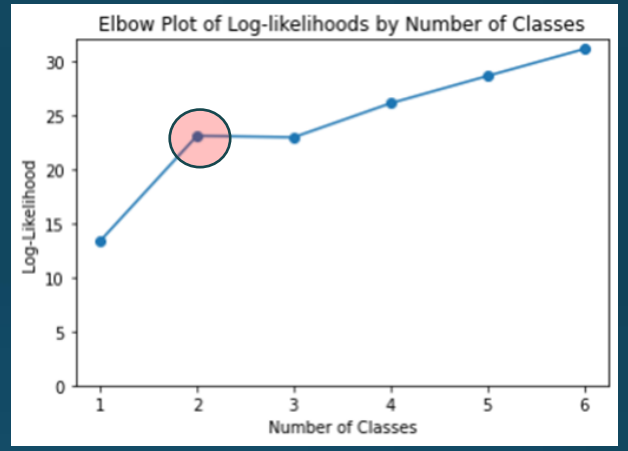
Health Topic

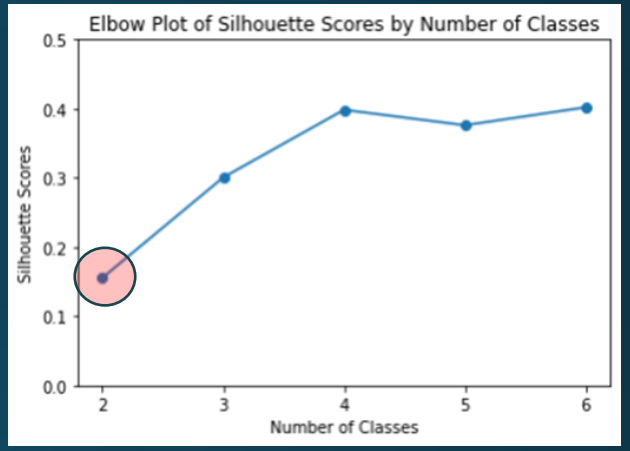


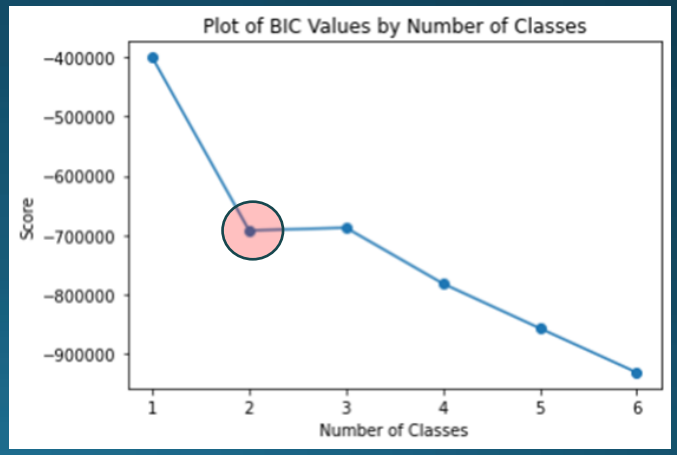




Academic Topic







Level Importance by Topic and Class

Health Information Classes

Clarity-Accuracy Focused (n = 369)

Layman

Academic

Stats

Credibility-Accessibility Focused (n = 91)

Expert

Social Media

Story

Importance Indicator
(within class only)

low — high

Academic Information Classes

Clarity-Accessibility Focused (n = 250)

Layman

Online

Stats

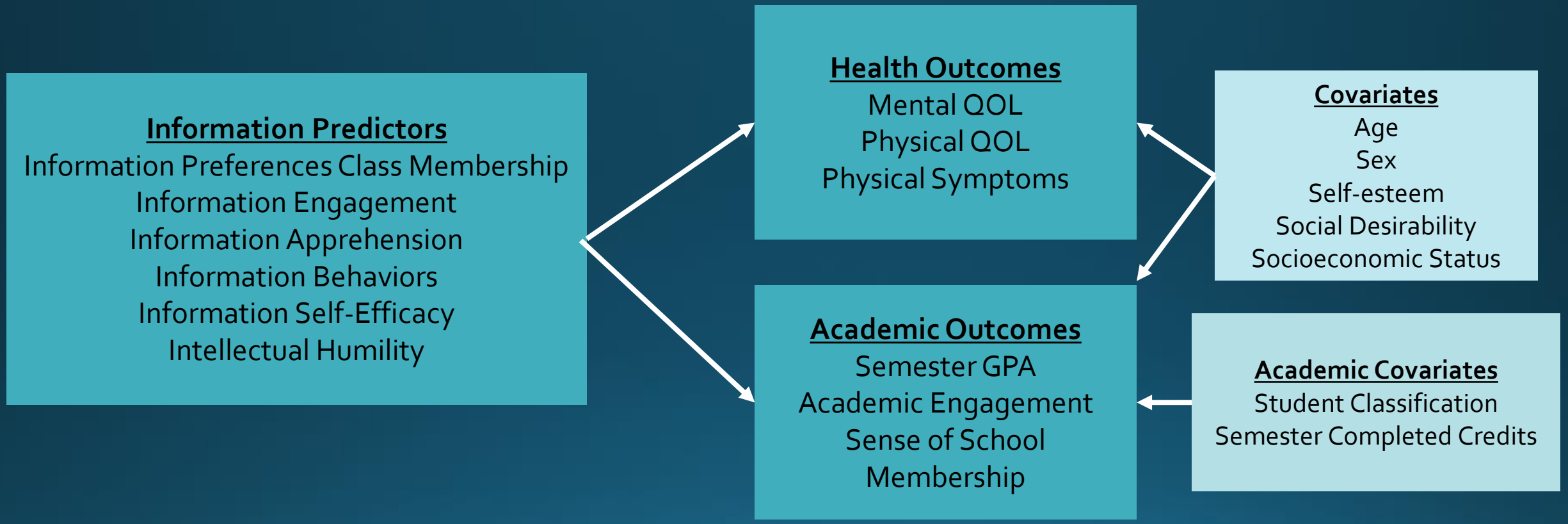
Credibility-Accessibility-Story Focused (n = 235)

Expert

Social Media

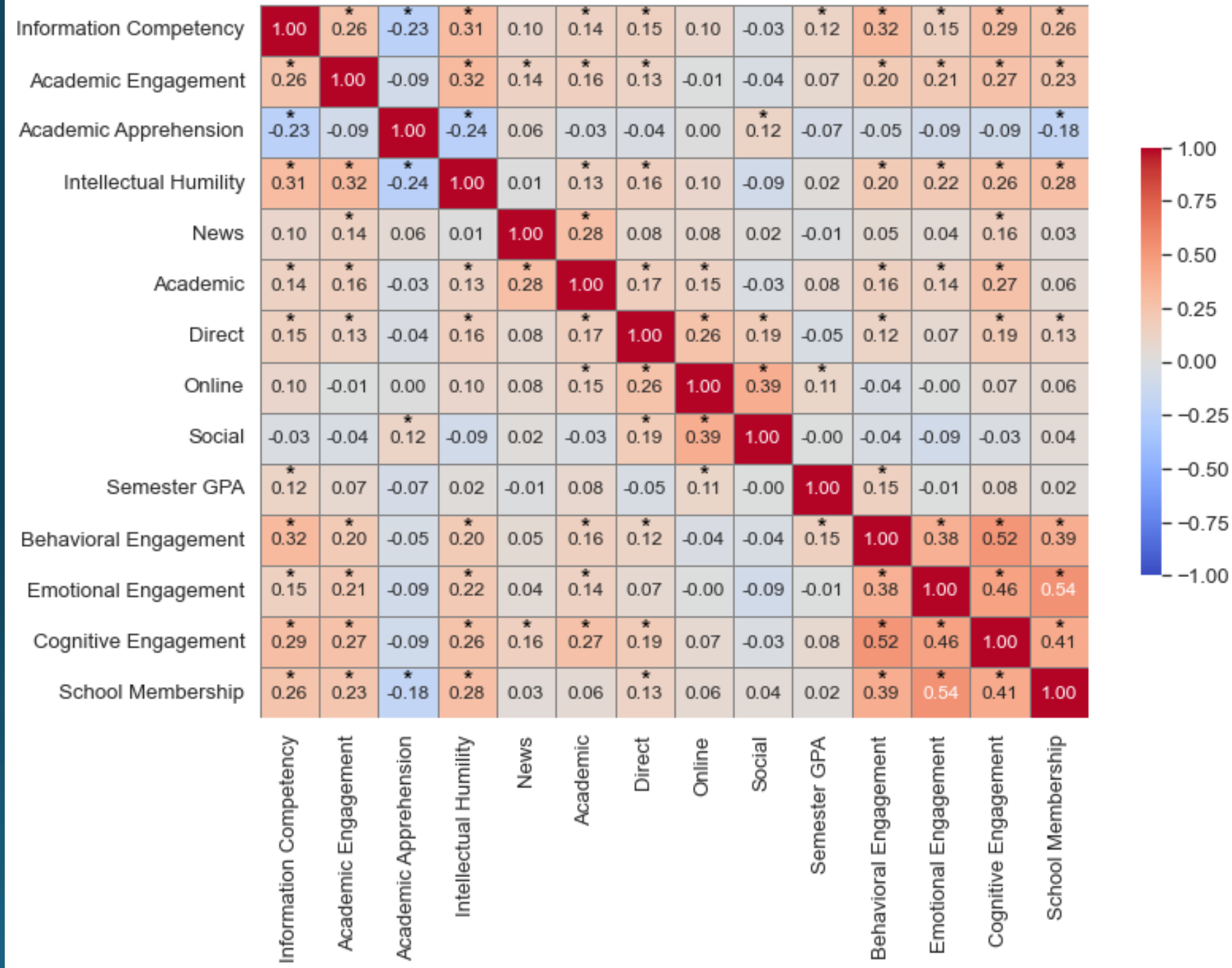
Story

Aim 2: Intercorrelations and Predictive Relationships

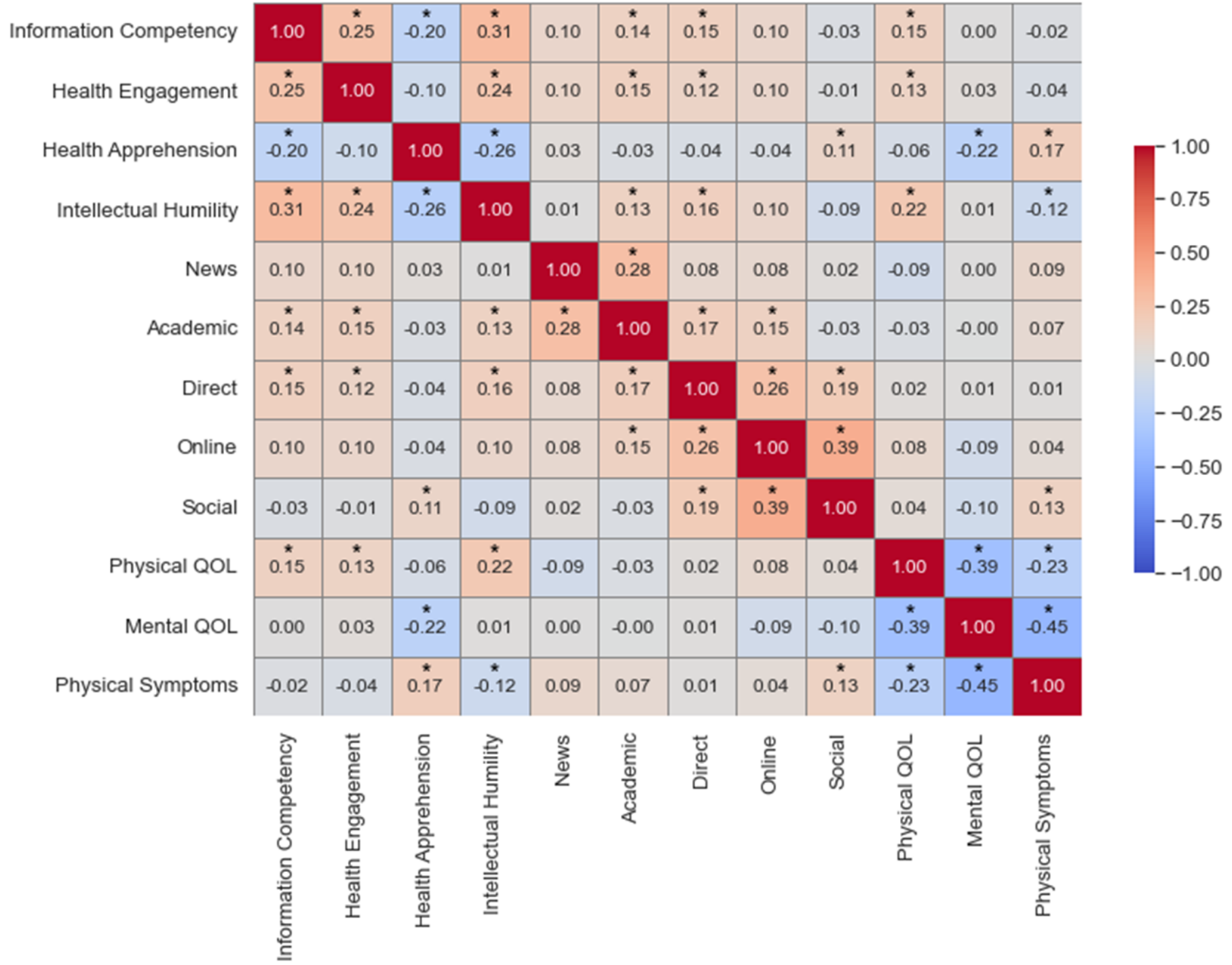


Model included relevant quadratic terms.

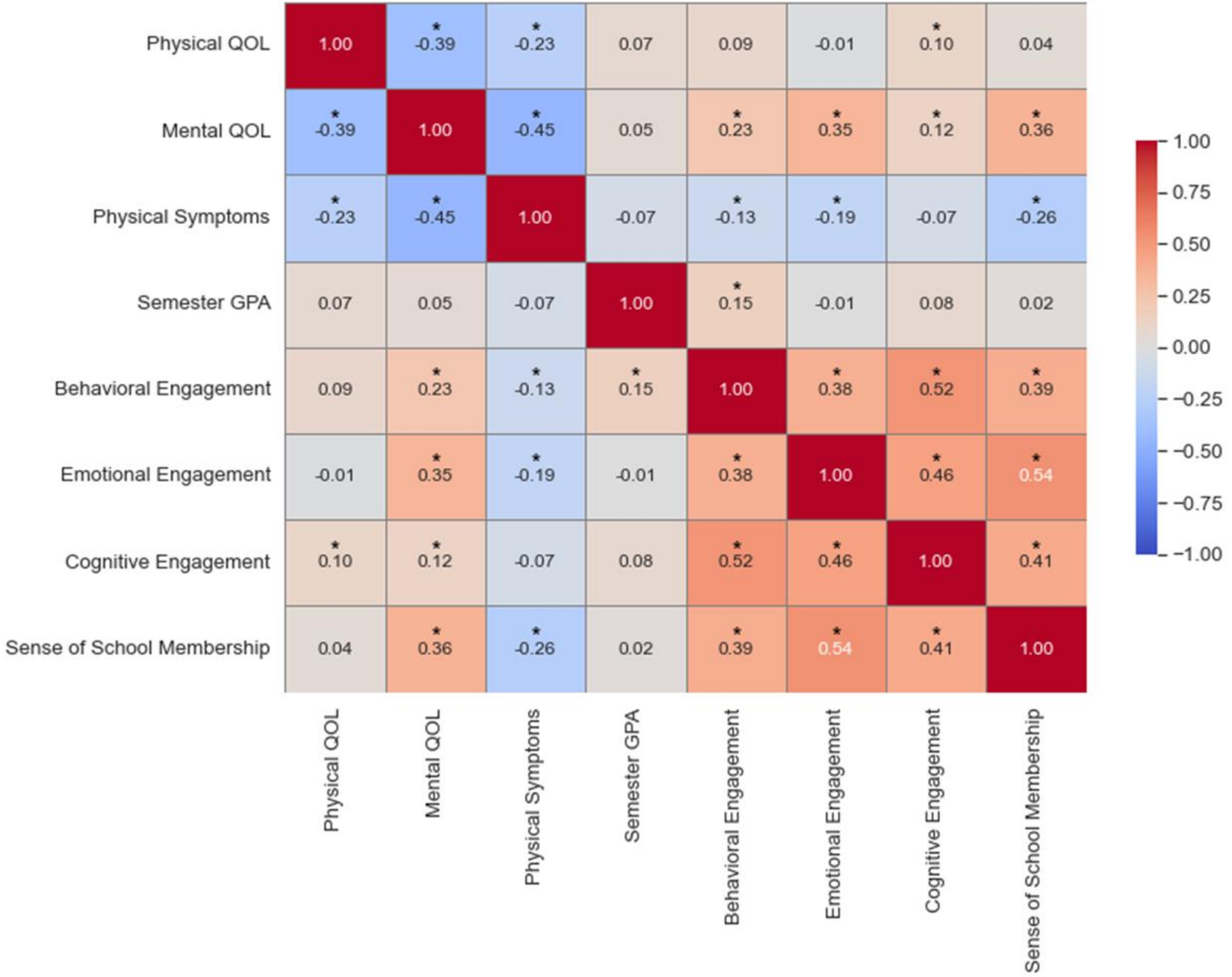
Aim 2: Academic Intercorrelations

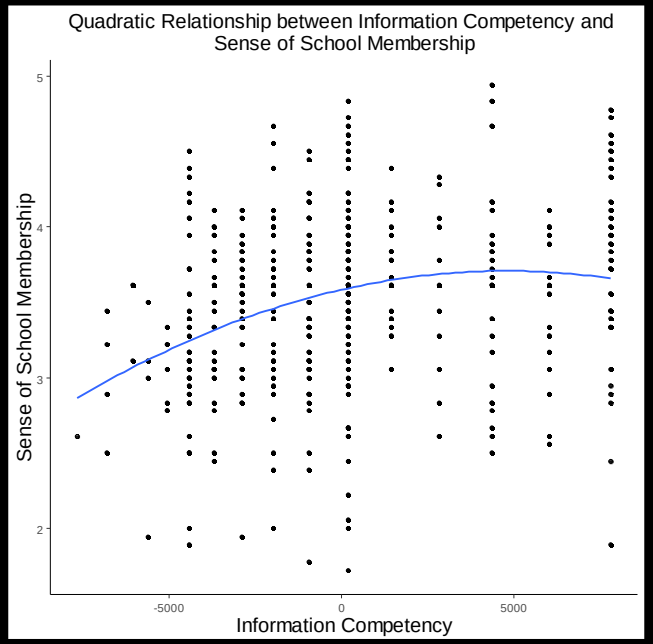


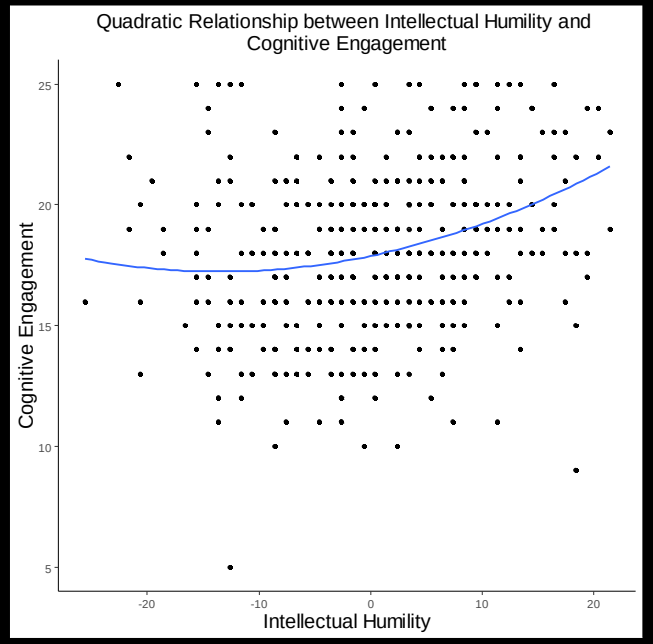
Aim 2: Health Intercorrelations

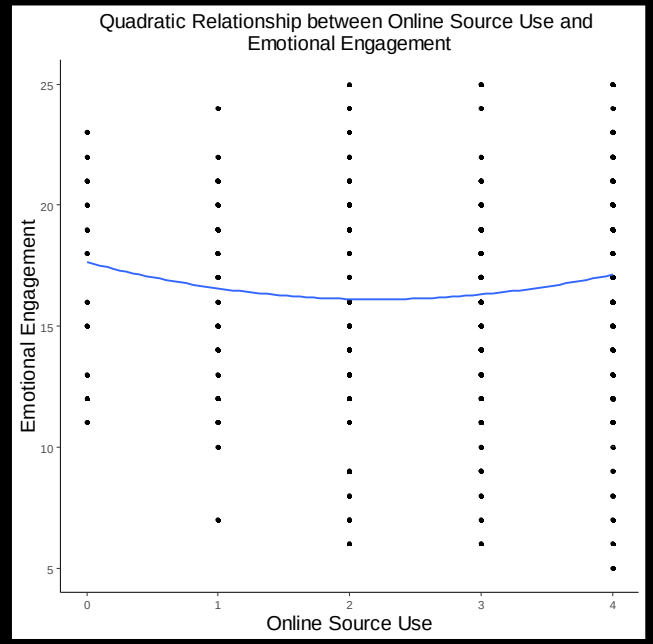


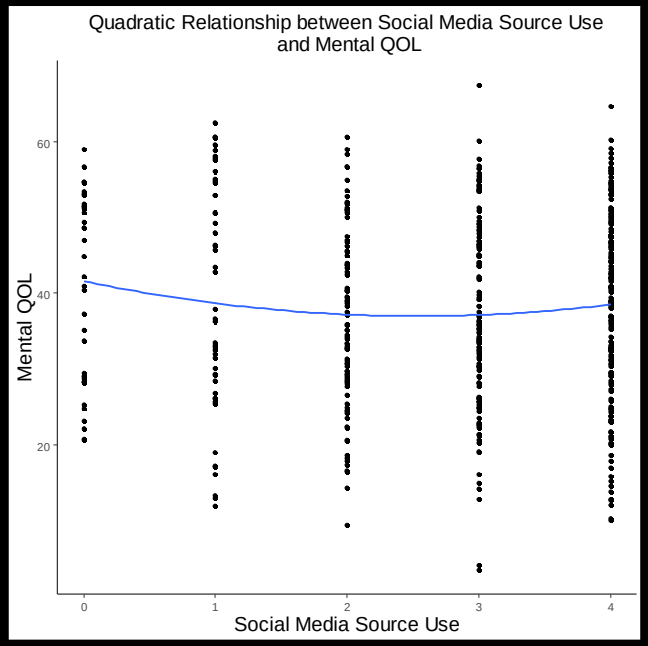
Aim 2: Outcome Intercorrelations

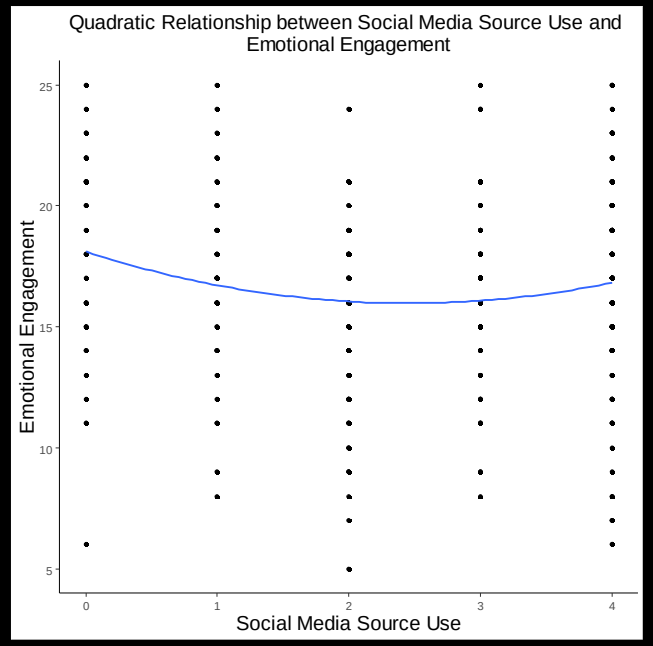


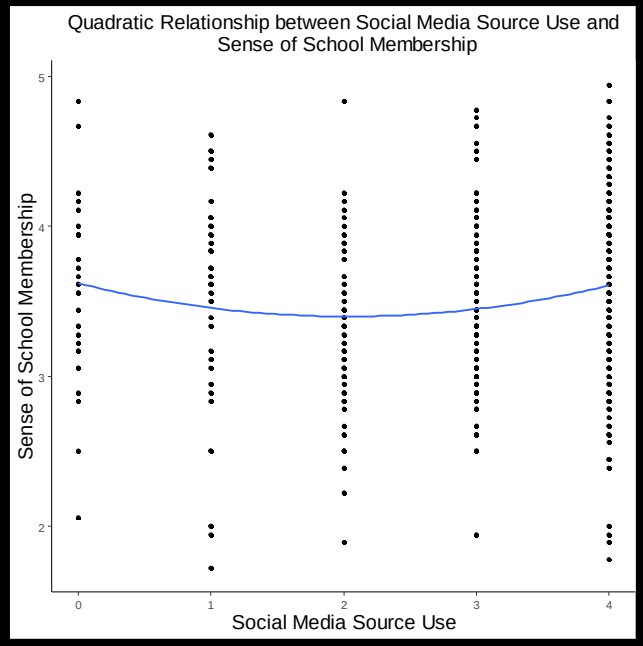

Quadratic Relationship between Information Competency and Sense of School Membership
Sense of School Membership
Information Competency
5
4
3
2
-5000
0
5000


Quadratic Relationship between Intellectual Humility and Cognitive Engagement
Cognitive Engagement
Intellectual Humility
25
20
15
10
5
-20
-10
0
10
20

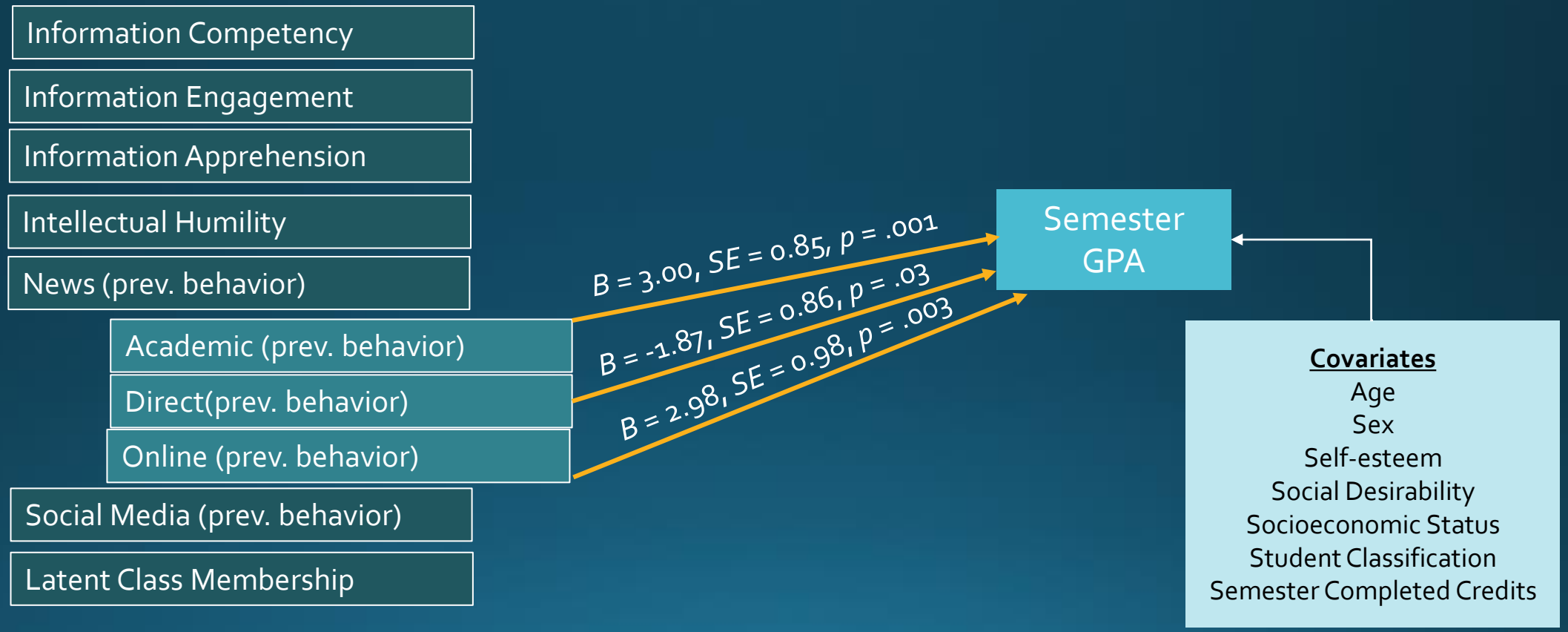

Quadratic Relationship between Online Source Use and Emotional Engagement
Emotional Engagement
Online Source Use
25
20
15
10
5
0
1
2
3
4


Quadratic Relationship between Social Media Source Use and Mental QOL
Mental QOL
Social Media Source Use
60
40
20
0
1
2
3
4


Quadratic Relationship between Social Media Source Use and Emotional Engagement
Emotional Engagement
Social Media Source Use
25
20
15
10
5
0
1
2
3
4


Quadratic Relationship between Social Media Source Use and Sense of School Membership
Sense of School Membership
Social Media Source Use
5
4
3
2
0
1
2
3
4

Aim 2: Academic Predictive Model Results



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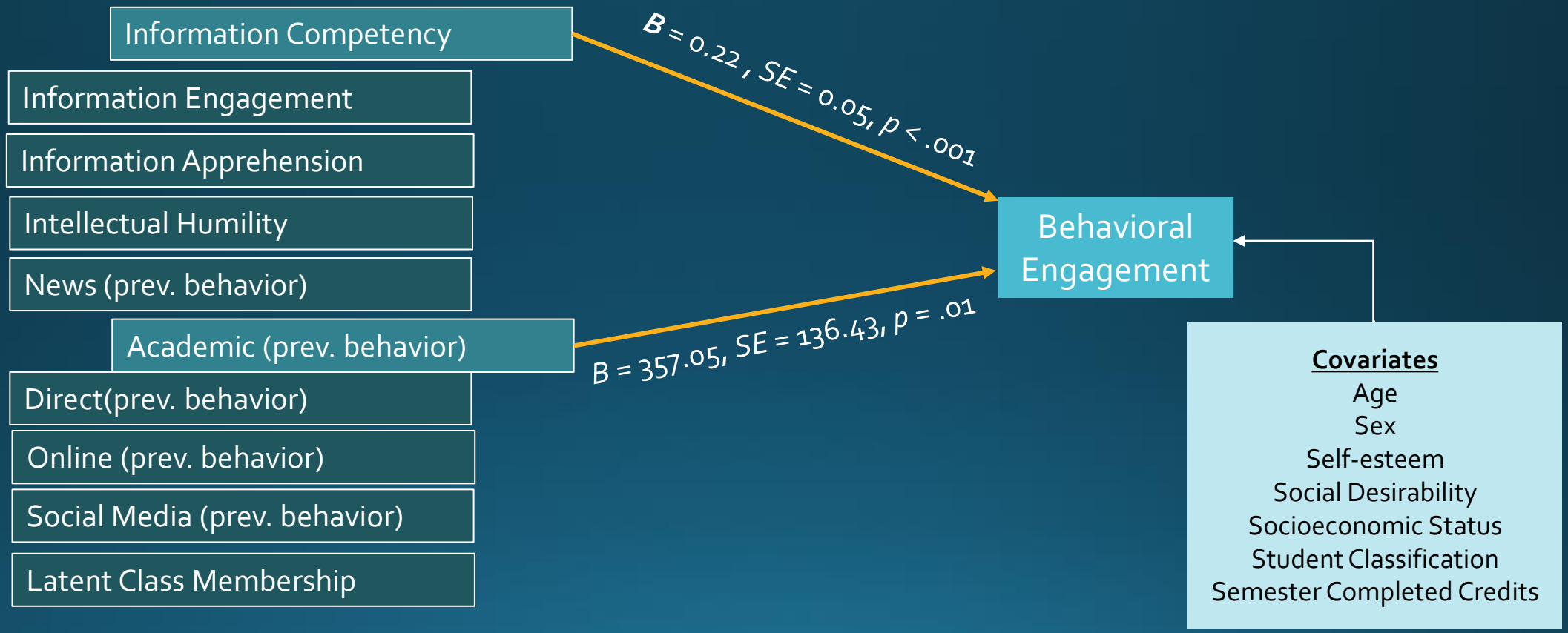

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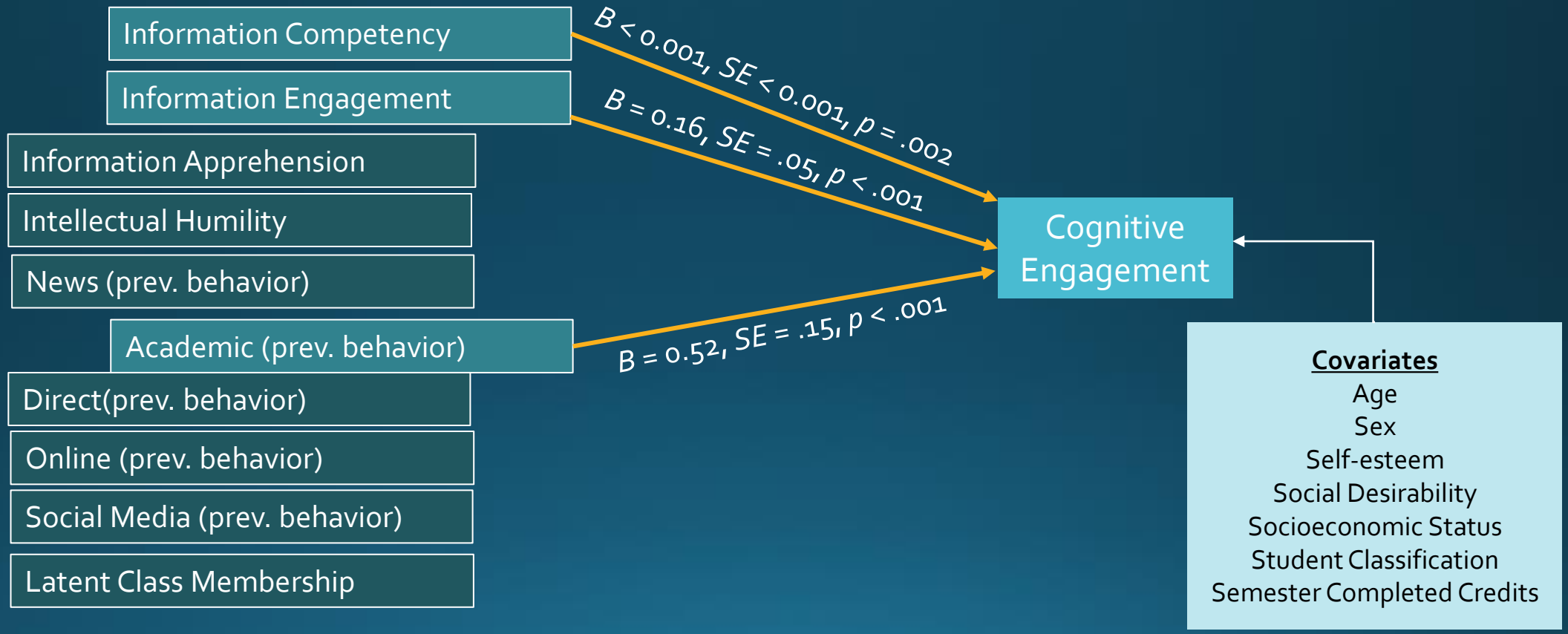

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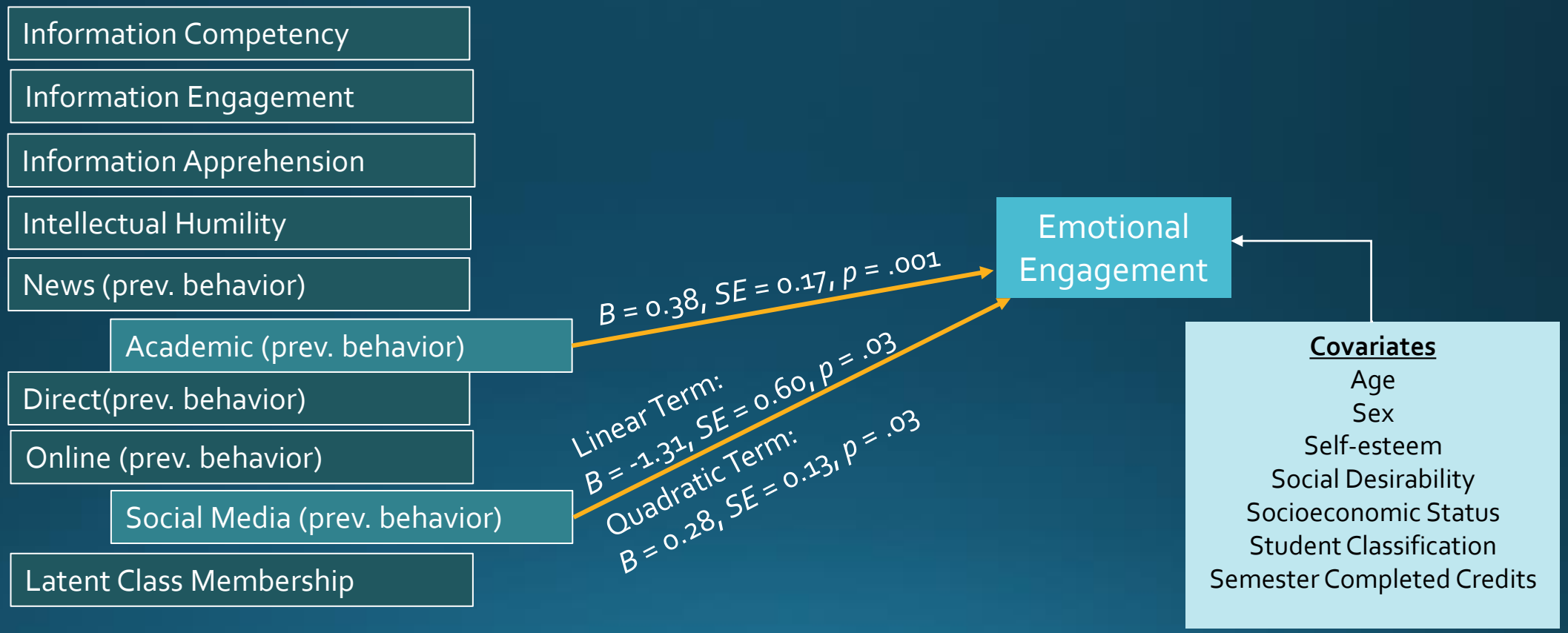

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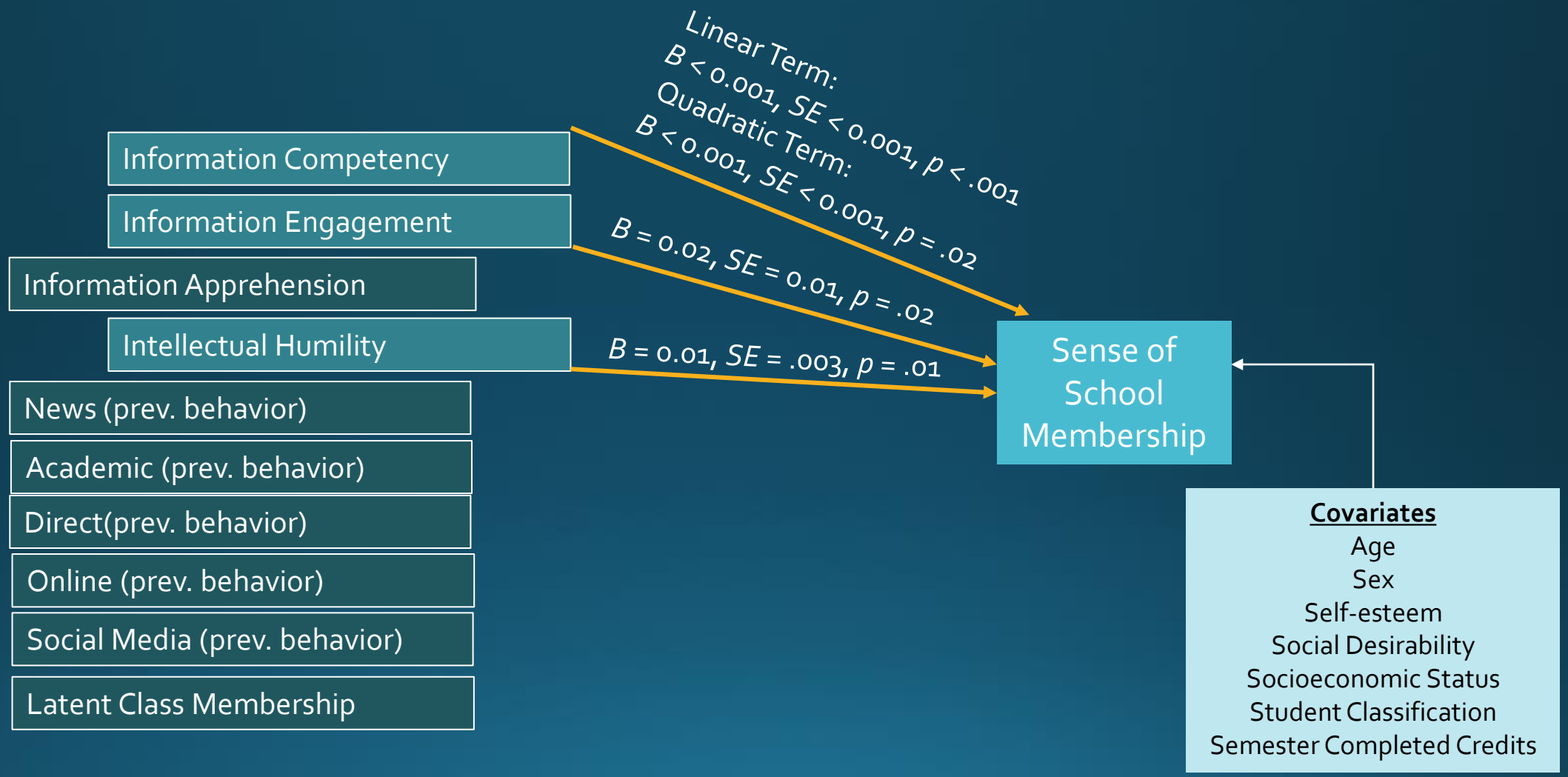
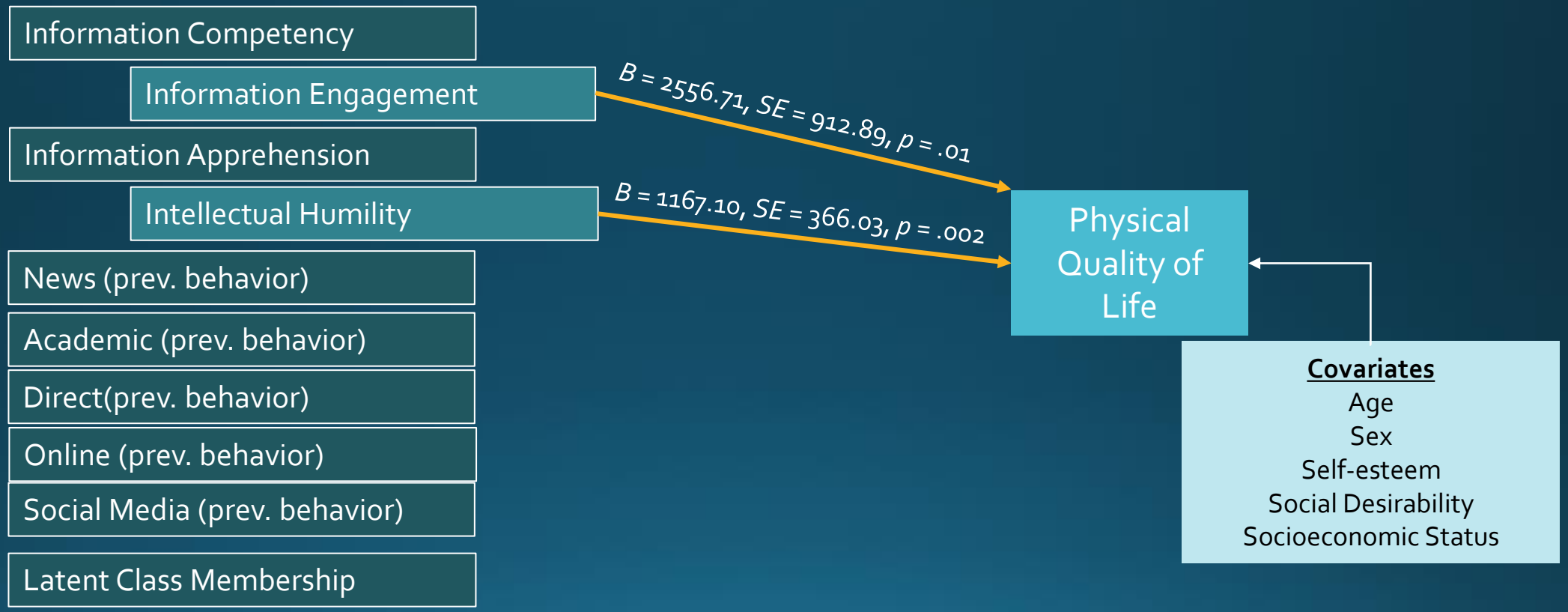
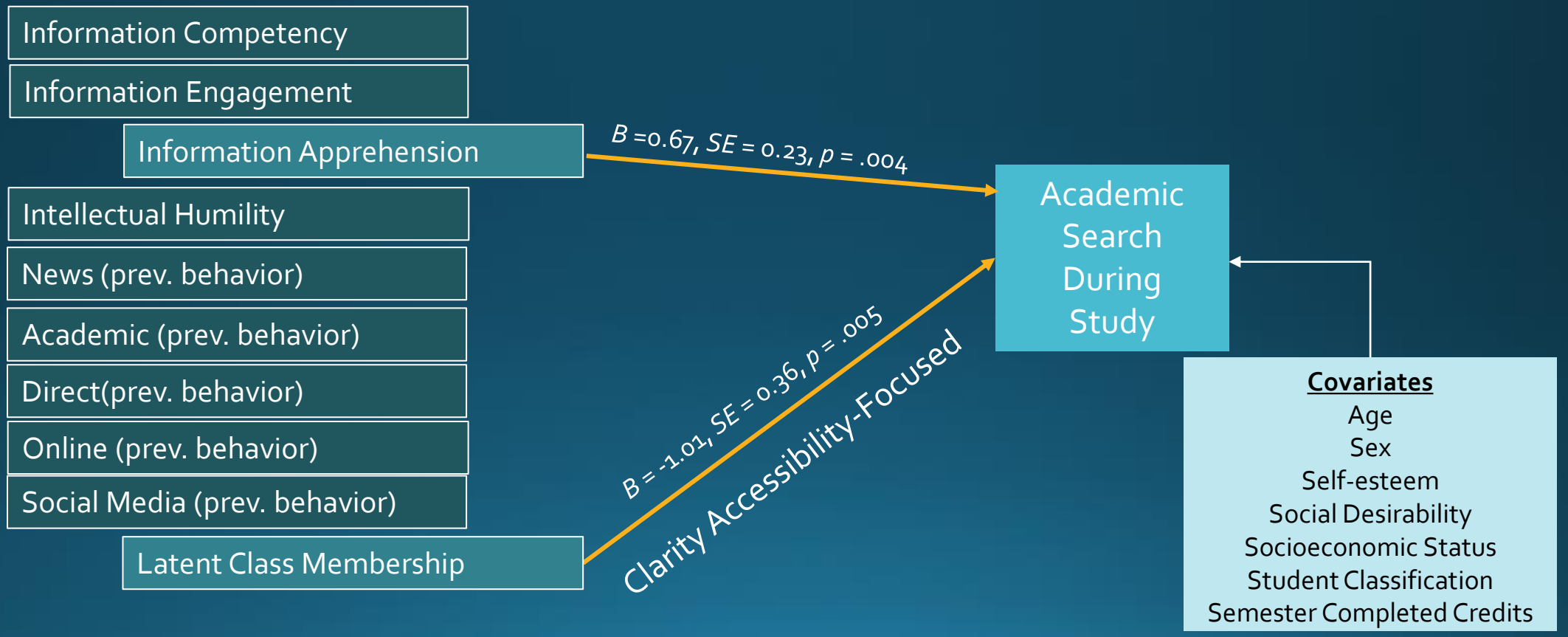


Aim 2: Health Predictive Model Results



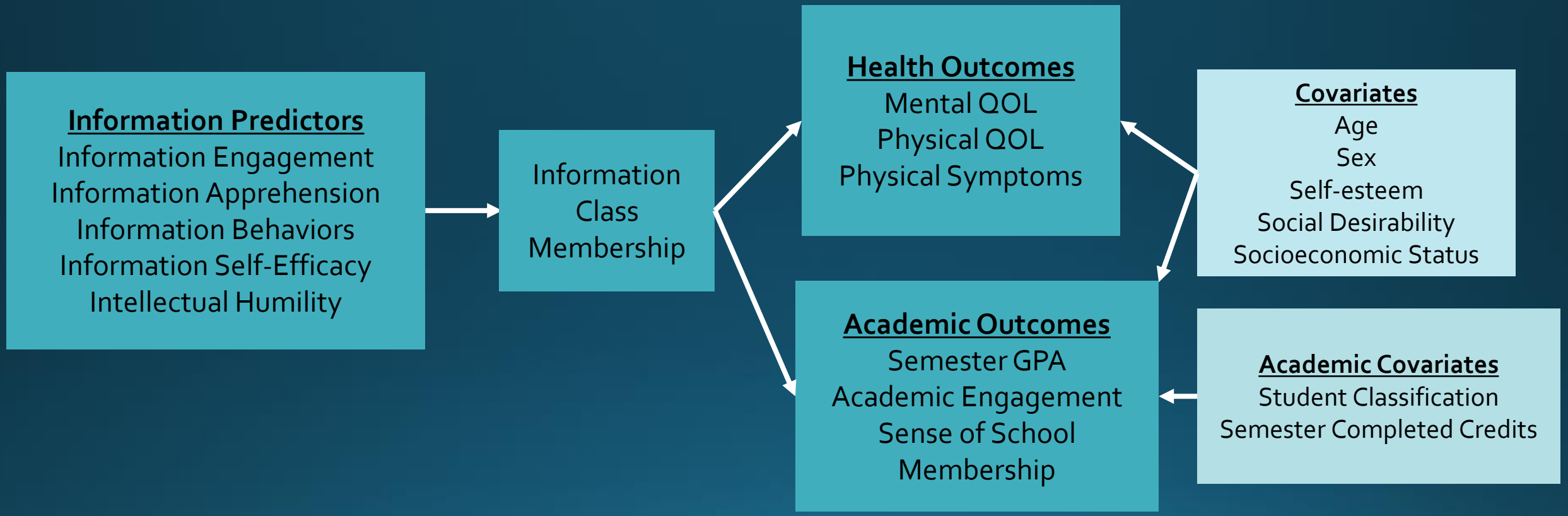
Aim 2: Health and Search Behaviors Predictive Model Results

- No significant predictors of Mental Quality of Life, Physical Symptoms, or whether they searched for information on the health topic during the study session.

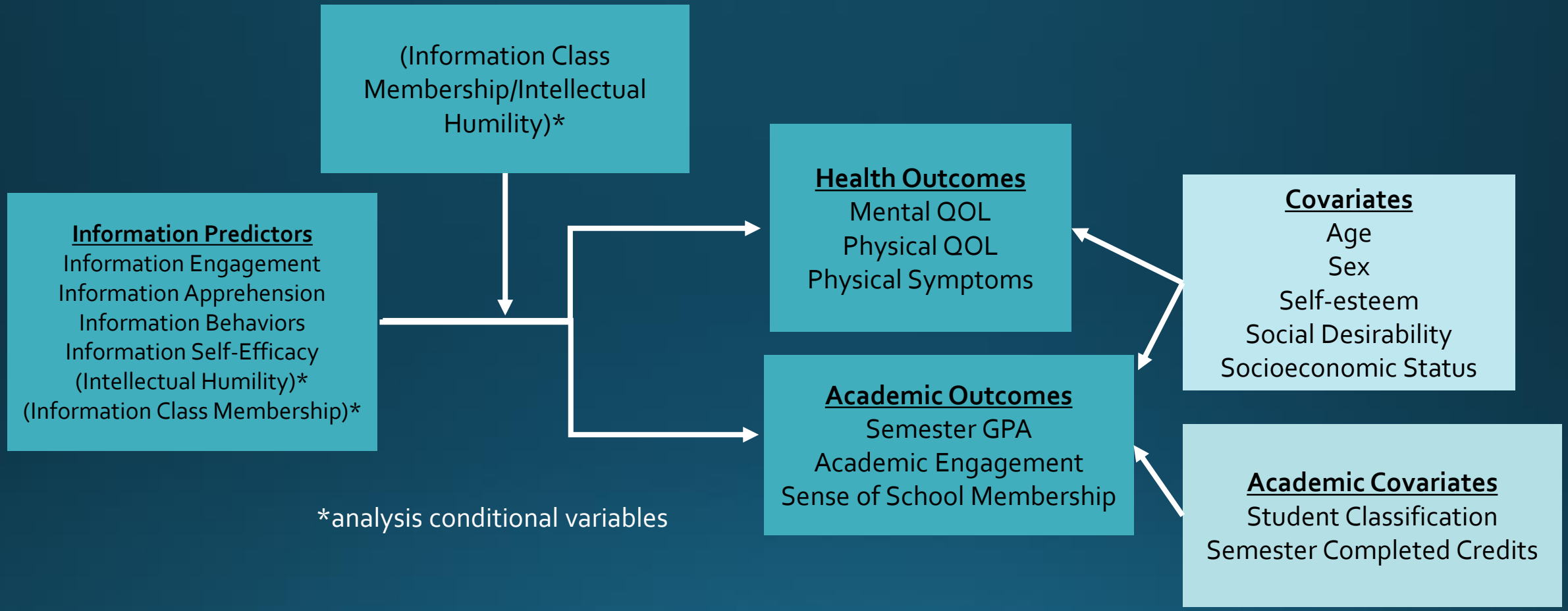


Aim 3: Exploratory Mediation Model

Not conducted due to previous findings.



Aim 3: Exploratory Moderation Model

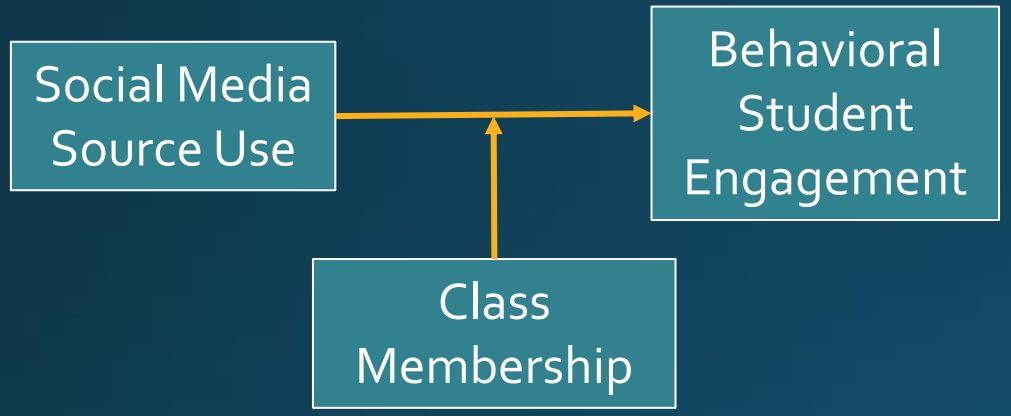


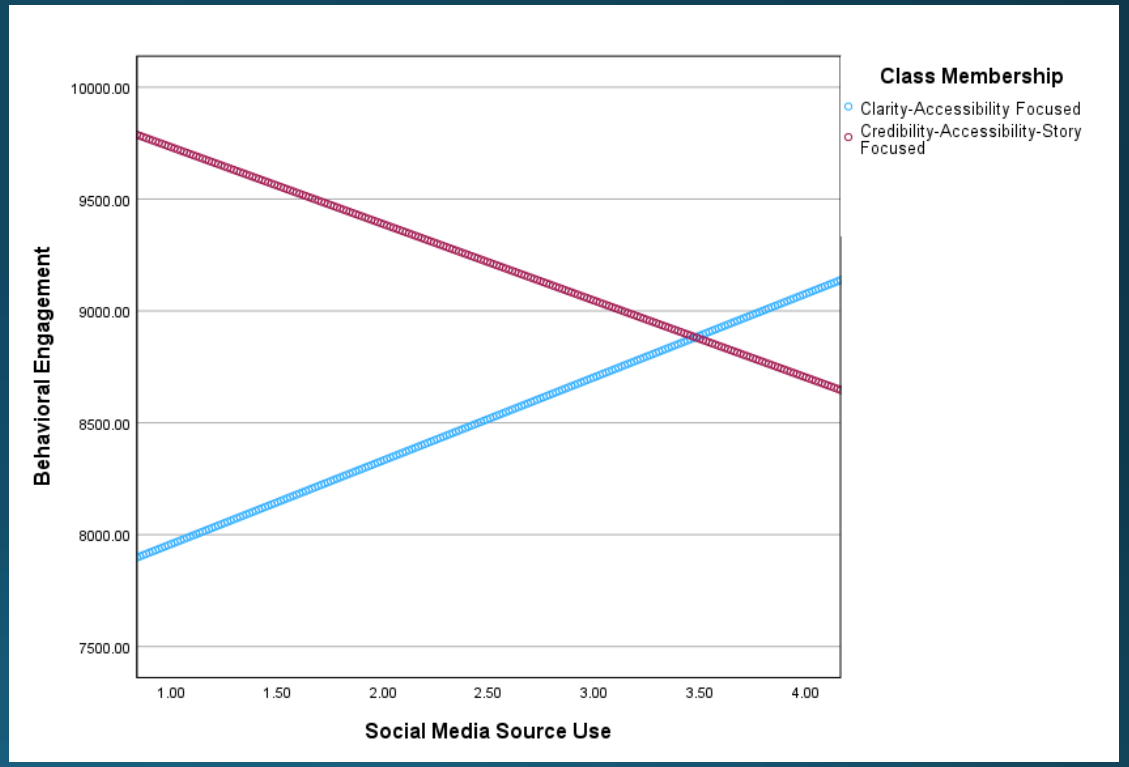
*analysis conditional variables

Quadratic predictor terms removed from exploratory analyses due to limitations with statistical power.

Aim 3: Exploratory Analyses

Main effect: $B = 11.20$, $SE = 2.73$, $p < .001$



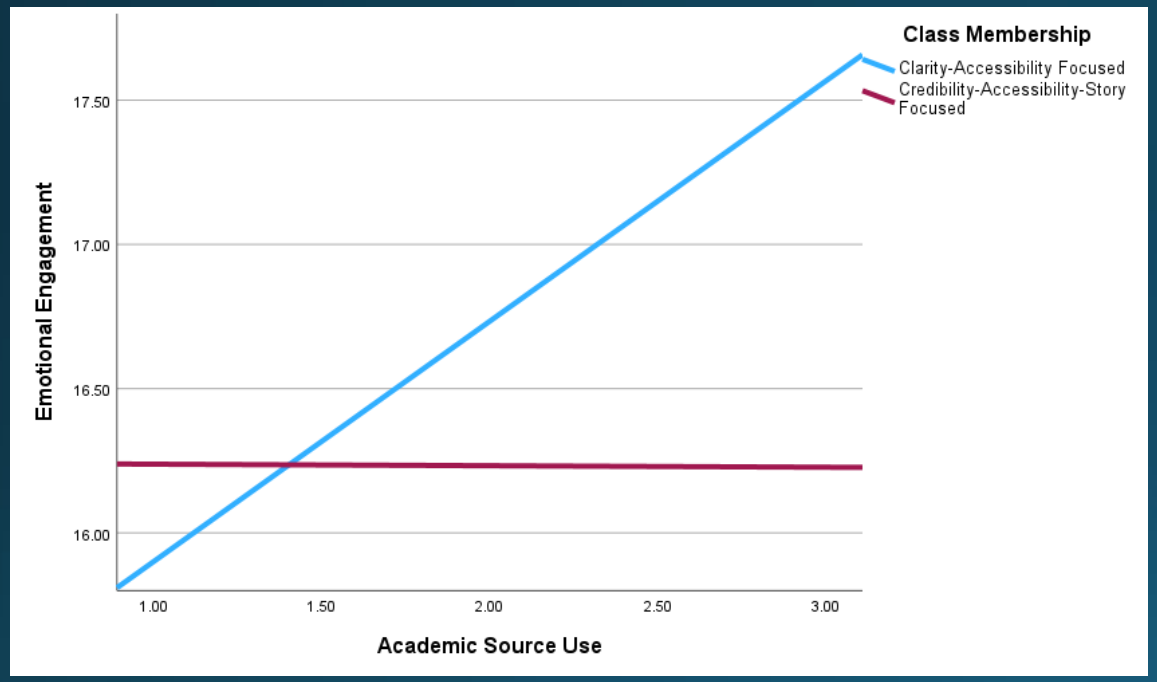


<u>Conditional Effects</u>

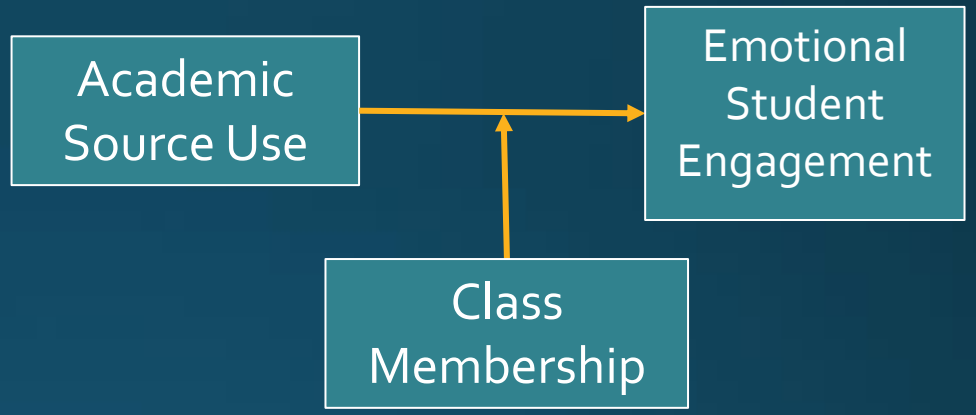
Clarity-Accessibility Focused: Positive

Credibility-Accessibility-Story Focused: Negative

Aim 3: Exploratory Analyses



Main effect: $B = 5.53$, $SE = 2.08$, $p = .01$



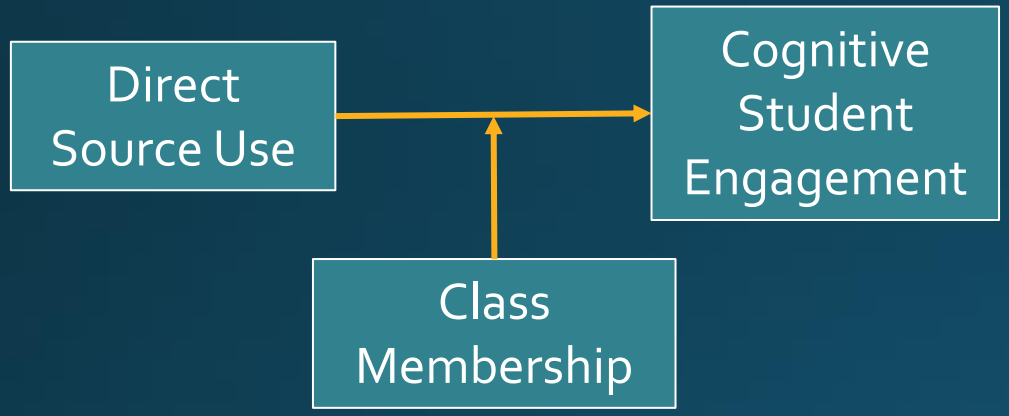
<u>Conditional Effects</u>

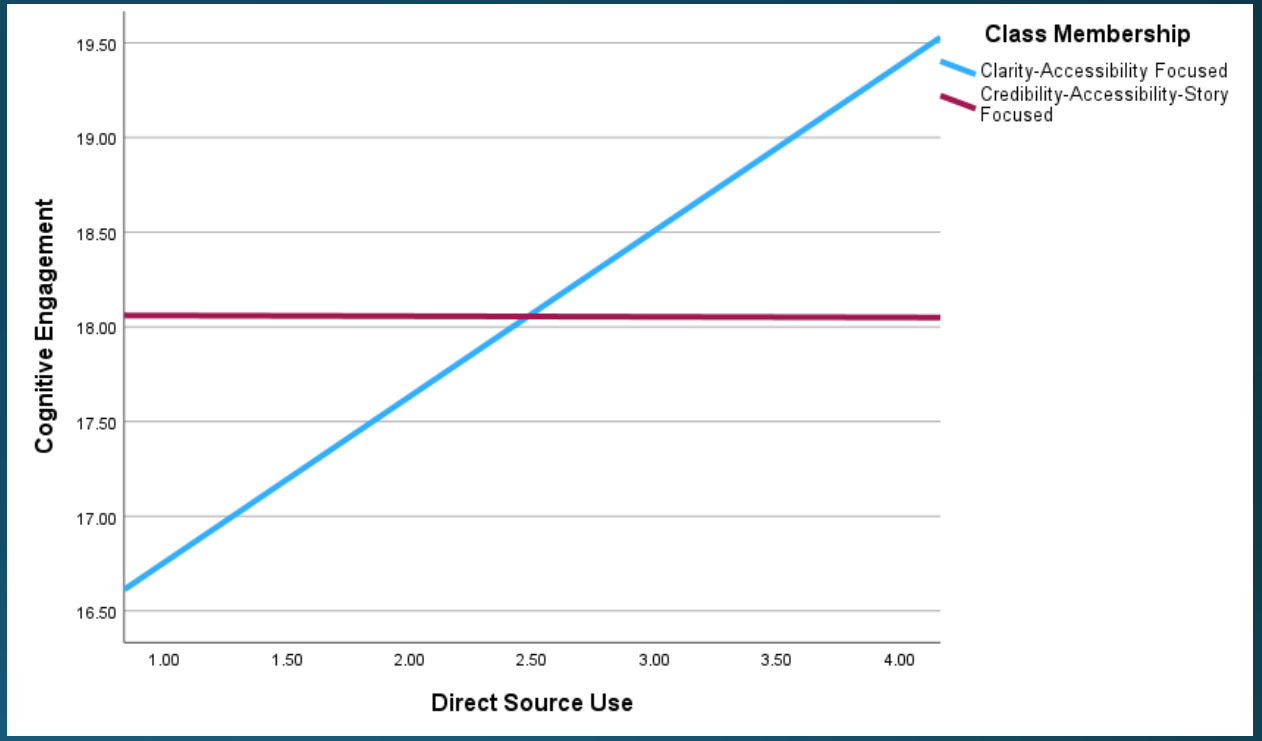
Clarity-Accessibility Focused: Positive

Credibility-Accessibility-Story Focused: Not Significant

Aim 3: Exploratory Analyses

Main effect: $B = 11.20$, $SE = 2.73$, $p < .001$



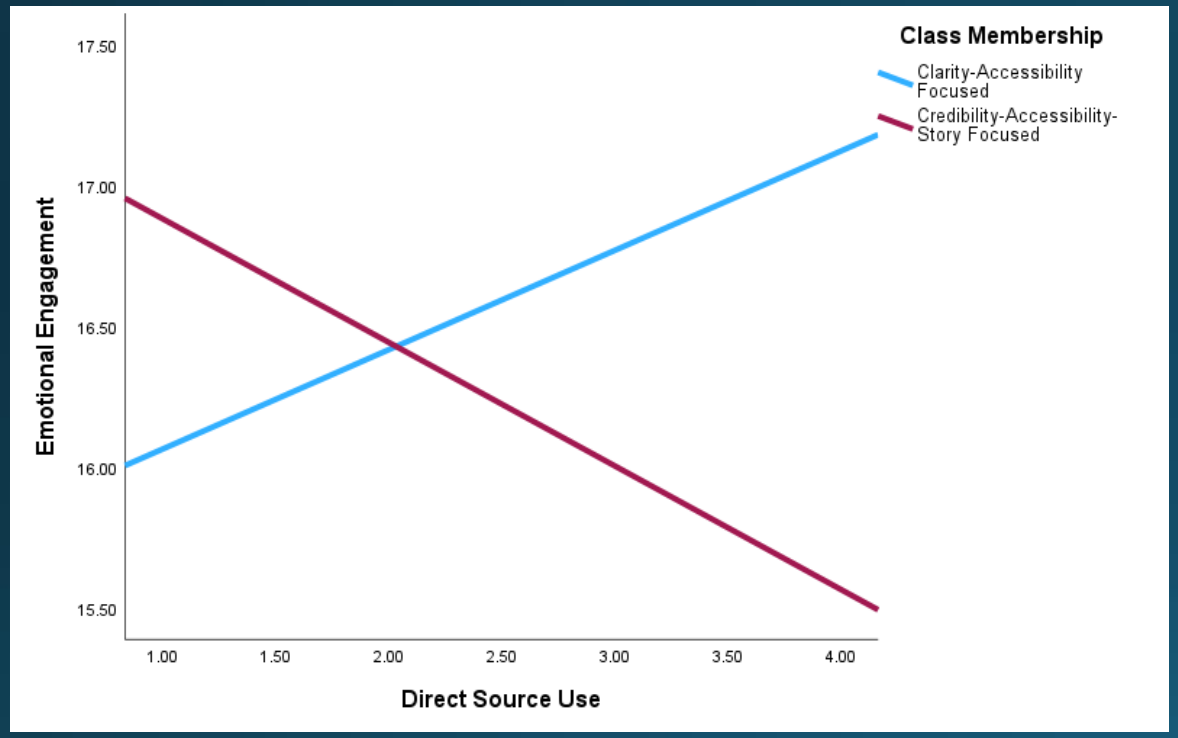


<u>Conditional Effects</u>

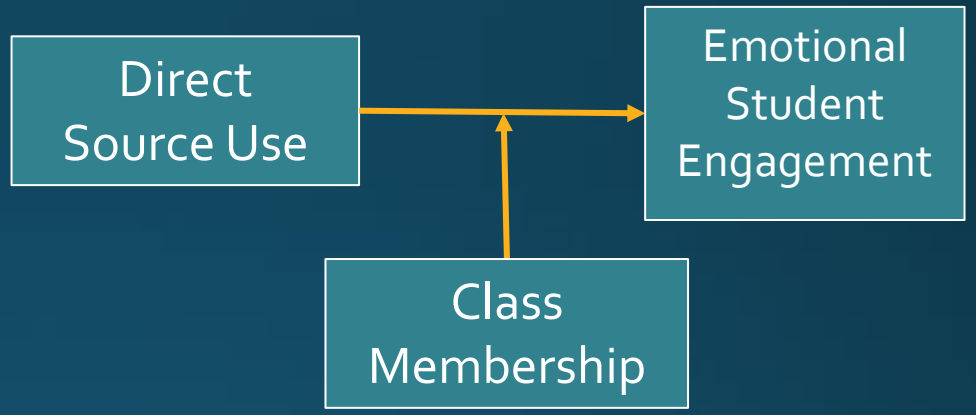
Clarity-Accessibility Focused: Positive

Credibility-Accessibility-Story Focused: Not Significant

Aim 3: Exploratory Analyses



Main effect: *B* = 5.53, *SE* = 2.08, *p* = .01

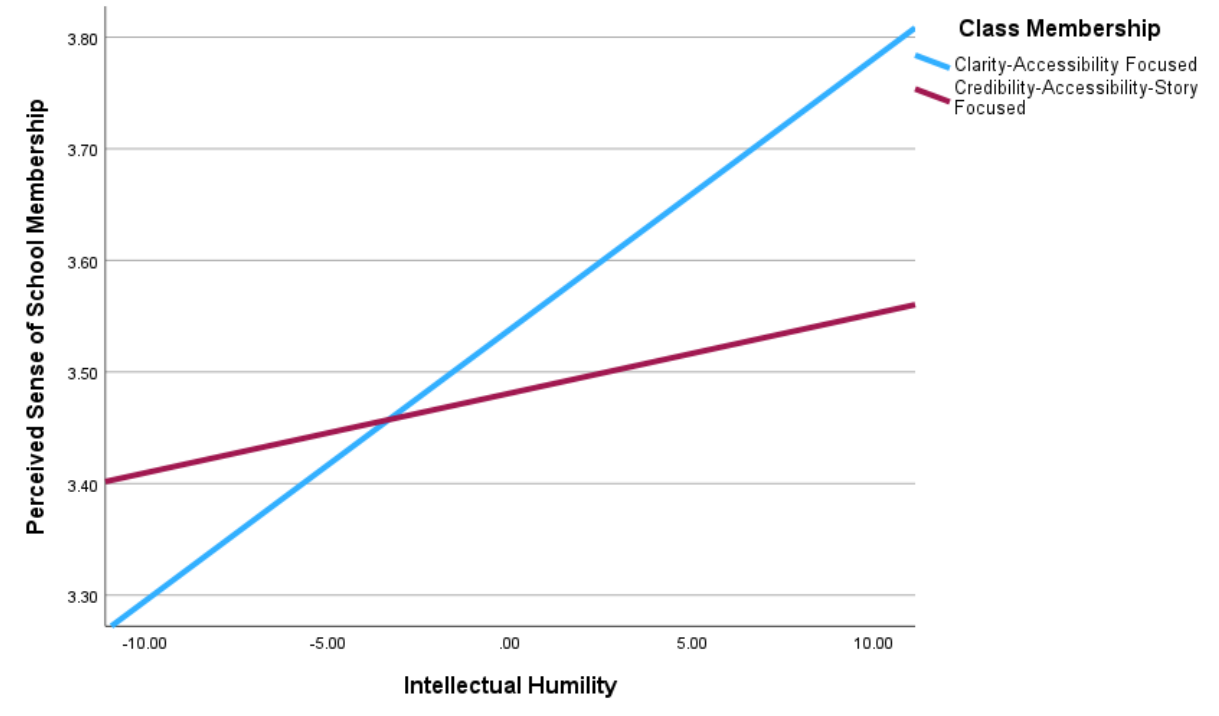


<u>Conditional Effects</u>

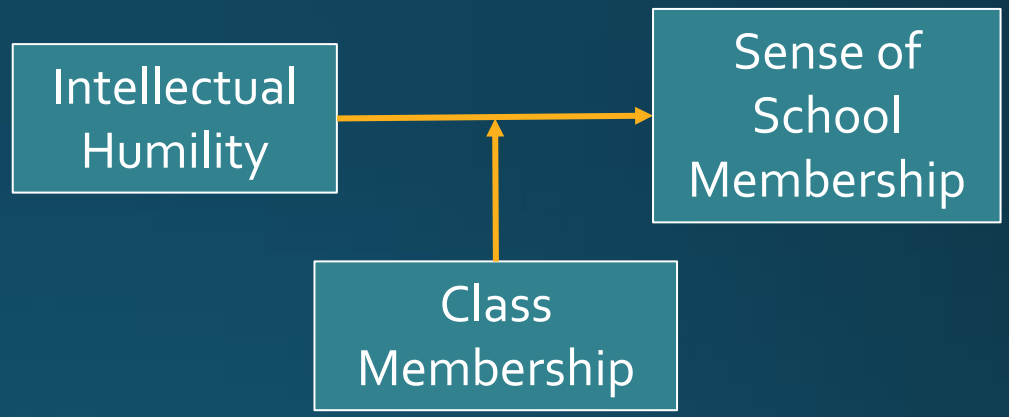
Clarity-Accessibility Focused: Not Significant

Credibility-Accessibility-Story Focused: Negative

Aim 3: Exploratory Analyses



Main effect: $B = 11.20$, $SE = 2.73$, $p < .001$

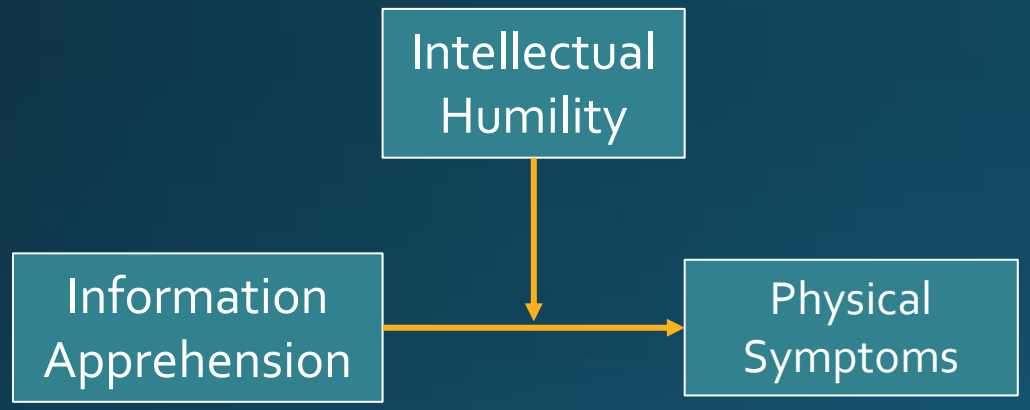


<u>Conditional Effects</u>

Clarity-Accessibility Focused: Positive

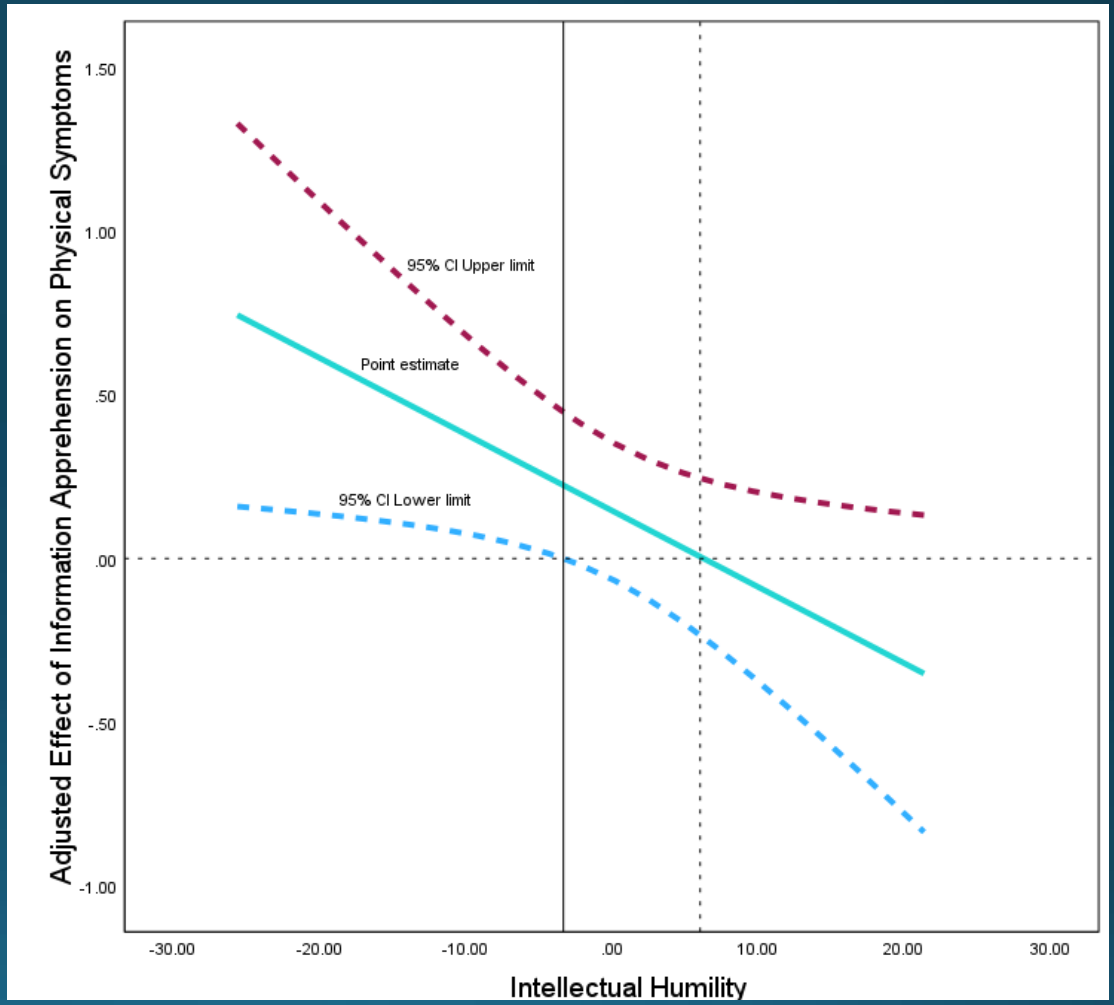
Credibility-Accessibility-Story Focused : Not Significant

Aim 3: Exploratory Analyses



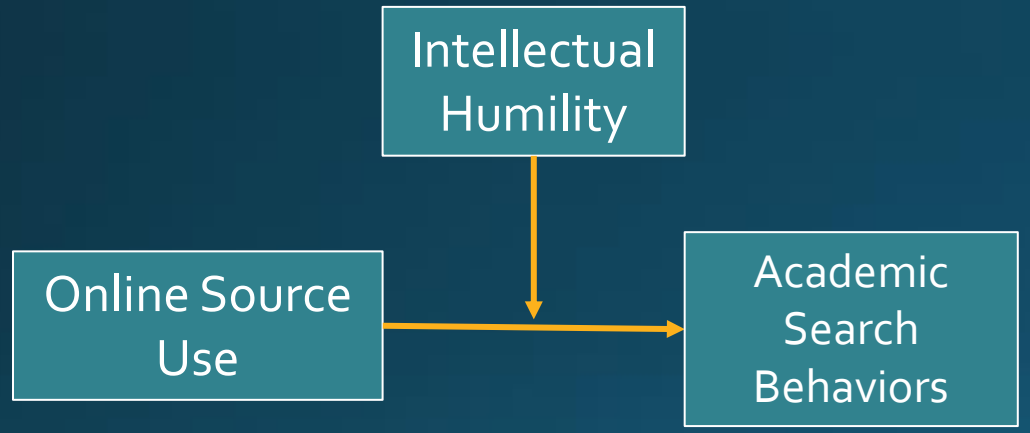
Main effect: B = 0.15, SE = 0.11, p = .17

Johnson-Neyman Plot: Moderation of Intellectual Humility on the Relationship Between Information Apprehension and Physical Symptoms



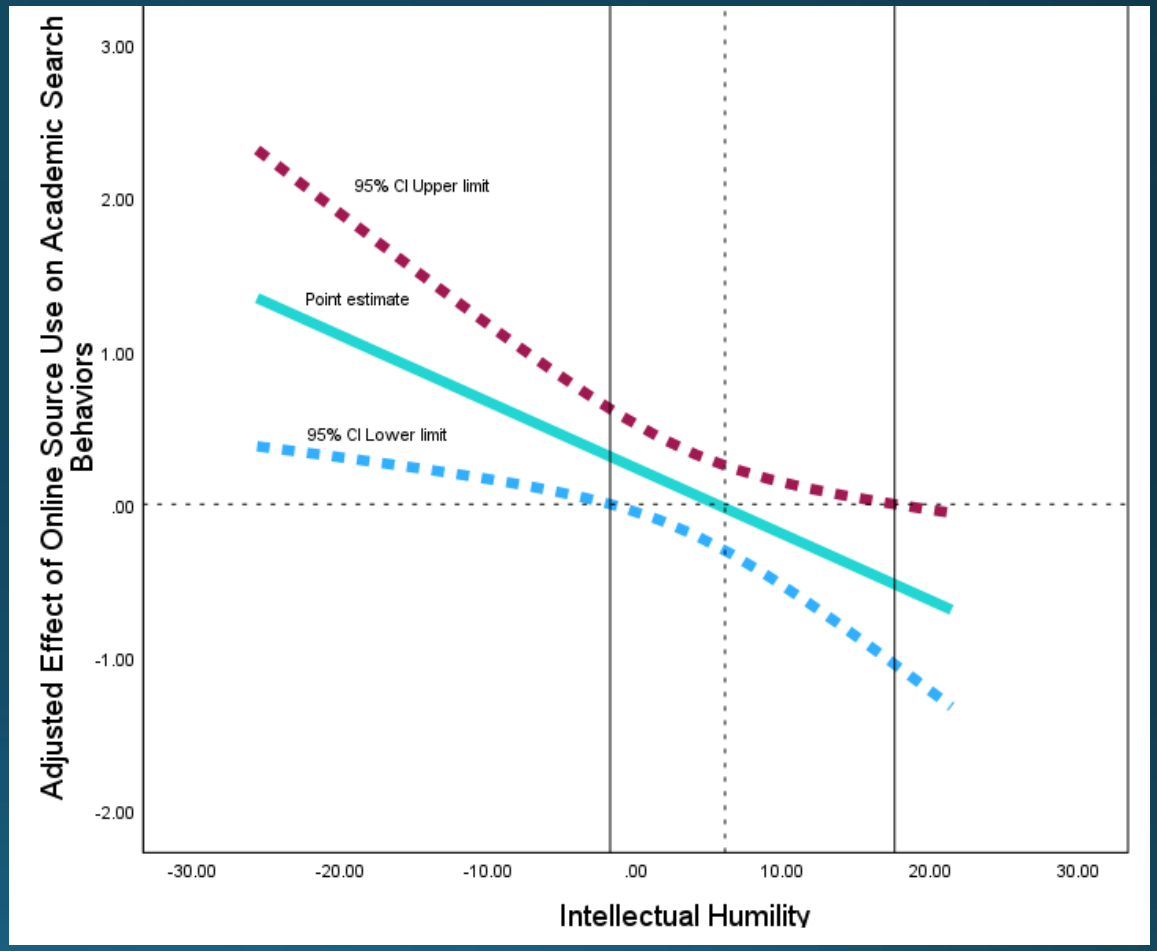
Note. Johnson-Neyman values and CIs. At the moderator value of -3.03 and below (35.4% of the sample), the adjusted effect of information apprehension on physical symptoms became significant and more positive as intellectual humility decreased. As intellectual humility was mean-centered, a value of -3.03 indicates 3 points below the mean.

Aim 3: Exploratory Analyses



Main effect: *B* = 0.15, *SE* = 0.11, *p* = .17

Johnson-Neyman Plot: Moderation of Intellectual Humility on the Relationship Between Online Source Use and During Study Search Behaviors



Note. Johnson-Neyman values and CIs. At the moderator value of -1.72 and below (40.2% of the sample), the adjusted effect of online source use on academic search behaviors became significant and more negative as intellectual humility decreased Additionally, at the moderator value of 17.54 and above (2.9% of the sample), the adjusted effect of online source use on academic search behaviors became significant and more positive as intellectual humility increased. As intellectual humility was mean-centered, a value of -1.72 and 17.54 indicate that many points from the mean.

Overview of Findings

- Aim 1
  - Two latent classes identified based on information profile choices for health and academic topics.
  - Attribute preferences consistent with overall sample but differ in preferred levels
  - Clarity-Accuracy Focused and Credibility-Accessibility Focused classes (health)
  - Clarity-Accessibility Focused and Credibility-Accessibility-Story Focused classes (academic)
  - Preferences were context specific
- Aim 2
  - Not all predictors consistently predicted all outcomes.
  - Some relationships had unexpected directions (e.g., online source and higher GPA).
  - The impact of information predictors on outcomes is complex and multifaceted but important to examine.
- Aim 3
  - Latent classes did not explain the relationships
  - Interaction effects identified, indicating roles of latent class membership and intellectual humility.
  - Intellectual humility and latent classes influence the impact of information predictors on outcomes.

Potential Applications

Enhancing Information Skills and Decision-Making

- Develop interventions to promote effective information acquisition and decision-making.
- Design programs and resources to empower information evaluation and selection skills.
- Equip people with tools to navigate the complex landscape of information effectively.[55]

Tailoring Information Delivery

- Recognize individuals' preferences when seeking information.
- Tailor information delivery to align with needs and preferences of target audience.
- Utilize appropriate strategies to optimize impact.

Personalizing Learning Experiences

- Customize instructional materials and content to match learners' preferences.[56]
- Leverage learner profiles and preferences to engage and cater to different learner groups.
- Utilize clear language, multimedia, interactive platforms, and credible experts for effective learning experiences.

Re-evaluate Social Media Integration

- Challenge assumptions about social media use and recognize potential benefits in education.
- Explore innovative ways to incorporate social media into formal learning environments.
- Foster responsible social media use to enhance motivation, engagement, and student outcomes.[57]

Limitations

Cross-Sectional Design

Limited assessment of temporal relationships or changes over time.

Discrepancy Between Stated Preferences and Behavior

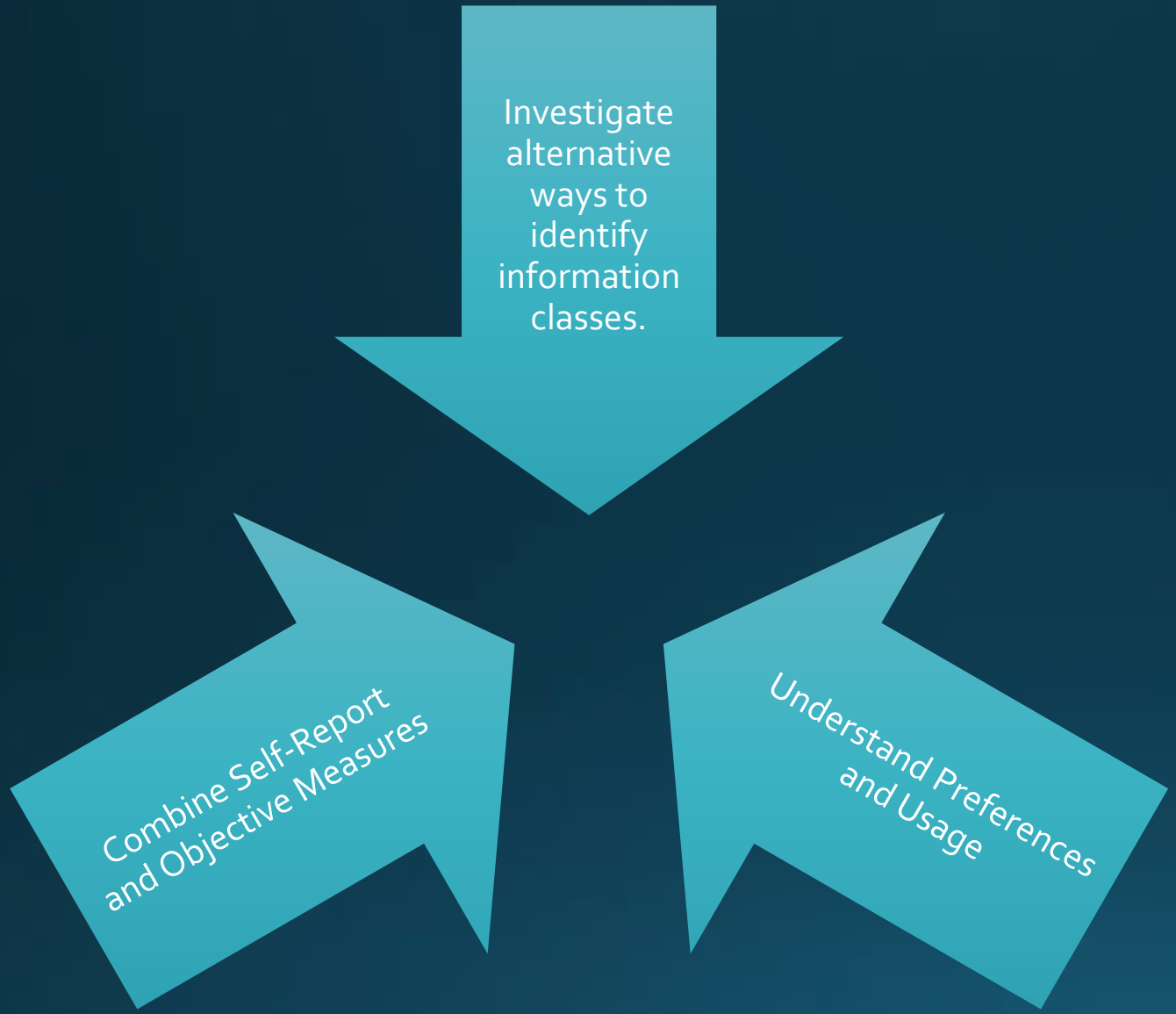
Use of choice-based scenarios may not entirely align with decision-making.

Reliance on Self-Report Measures

Participant Fatigue and Response Accuracy

Some participants may exhibit less than optimal attention and response accuracy.

Future Directions



Conclusion

P… …bility in …s doma… …ontext-… …egies a…

…change in …aries among …d contexts.[60]

- Teach evaluation skills
- Promote high-quality sources
- Address biases
- Encourage intellectual humility

Health Topic

Academic Topic

External influences and advancements in technology impact preferences.[61, 62]

Individual experiences and personal development contribute to changes in preferences.

Implications for Information Literacy.[58, 59]

Thank you!

Any questions?

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