Music, Movies, and NASA:
How pop-culture and space exploration can illuminate the way for change

Shawn M. Bergman, PhD
Appalachian State University
Vela Institute
Can teach us about growth & change

A woman you have never met

A guy you do not know
The End at the Beginning

Look for “opposite” information

Feed the machine

Know where everyone stands
**College** \(\text{kä-lij}\)

**Noun:** Any institution of higher education that awards a degree or credential post-high school graduation. This includes, but is not limited to, universities, community colleges, trade schools and more.

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**Employment changes 2018 – 2028**

- **High School degree or less:** 3.60%
- **Post-secondary credential:** 8.20%

ANNUAL WAGES RISE AND UNEMPLOYMENT RATE DROPS WITH EDUCATION

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Median 12 month earnings, 2017</th>
<th>Unemployment Rate, 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than high school graduate</td>
<td>$24,957</td>
<td>5.6%</td>
</tr>
<tr>
<td>High school graduate (includes equivalency)</td>
<td>$31,161</td>
<td>5.5%</td>
</tr>
<tr>
<td>Some college or associate's degree</td>
<td>$36,756</td>
<td>4.1%</td>
</tr>
<tr>
<td>Bachelor's degree</td>
<td>$56,643</td>
<td>2.4%</td>
</tr>
<tr>
<td>Graduate or professional degree</td>
<td>$73,296</td>
<td>2.4%</td>
</tr>
</tbody>
</table>

SOURCE: AMERICAN COMMUNITY SURVEY 1-YEAR ESTIMATES, 2017
College Participation Rates by Family Income Quartile for Dependents 18-24 Year Olds

- Fourth (Highest) Income Quartile: 78%
- Third Income Quartile: 68%
- Second Income Quartile: 56%
- First (Lowest) Income Quartile: 48%

Where Are We Going?

Why Change is so Freakin’ Hard!
- Bad new
- Good news
- Better news

Some Ways to Make a Change
- Science
- Psychology
- Data
- Technology

Closing Recap and Take-Aways
- Why keep learning?
- Why keep changing?
Bad News: It Is Hard to Change
Good News: It Is Not All Your Fault
Grandfather Mountain
### Why We Do Not Like Uncertainty

<table>
<thead>
<tr>
<th>Perceived Threat</th>
<th>Real Threat</th>
<th>Not a Real Threat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did Not Perceive the Threat</td>
<td>![Real Threat Image]</td>
<td>![Not a Real Threat Image]</td>
</tr>
</tbody>
</table>

Legend:
- **True Positive**: Perceived threat, real threat.
- **False Positive**: Perceived threat, not a real threat.
- **True Negative**: Did not perceive the threat, not a real threat.
- **False Negative**: Did not perceive the threat, real threat.
Common Uses for Heuristics

- Simplify complex & difficult questions.
- Help with problem-solving.
- They’re a fast way to arrive at a conclusion.
- Reduce mental effort needed to make decisions.

Cognitive Bias Codex

- What To Remember?
- To Much Information
- We Need To Act Fast
- Not Enough Meaning

Confirmation Bias

Not seeking out objective facts.

Interpreting information to support your existing belief.

Only remembering details that uphold your belief.

Ignoring information that challenges your belief.
Better News: There Is A Better Way

SCIENTIFIC LITERATURE
What research has been published to support or guide the development of the study?

ORGANIZATIONAL INFORMATION
What does our internal data tell us?

TECHNOLOGY
What can we learn from technology and how can we leverage it to communicate?

PROFESSIONAL EXPERTISE
What does your professional expertise tell you is happening?

STAKEHOLDERS
What are the stakeholder perspectives, values or concerns?

ASK
Translating the practical issue into an answerable question.

ACQUIRE
Systematically searching for and retrieving evidence from all sources.

APPRAISE
Critically judging the trustworthiness or relevance of the evidence collected.

AGGREGATE
Weighing and combining evidence from each source.

APPLY
Incorporating the evidence into the decision-making process and conversation.

ADVERTISE
Communicating ongoing feedback.

ASSESS
Evaluating the outcome of the decision that was made.

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Closing Recap and Take-Aways
• Why keep learning?
• Why keep changing?
Science, Psychology, Data, and Technology
Produce models of reality that explain how the natural world works
Why Is Science So Hard?

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<tr>
<td>Did Not Perceive the Threat</td>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
</tbody>
</table>

Legend:
- True Positive
- False Positive
- True Negative
- False Negative
### Why Is Science So Hard?

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Observable Information</th>
<th>Real Threat</th>
<th>Not a Real Threat</th>
</tr>
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<td></td>
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Science

Look for “opposite” information

• We aren't perfect
  • Be open to being wrong (honest collection of information)
• Understand the reality of natural world
  • Not just what you want to see (confirmation bias)
Psychology: Conditioning

Positive
- Add Something

Negative
- Remove Something

Reinforce
- Encourage Action

Punish
- Discourage Action

Psychology: Conditioning

- **Add Something**
  - Positive Reinforce
  - Negative Reinforce

- **Remove Something**
  - Positive Punish
  - Negative Punish

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Let’s Introspect!

Think about something you do that you would like to change.
Psychology

Feed the machine

- Understand what reinforces (encourages)
- Figure out what discourages (punishes)
- Think about short-term and long-term
Psychology

Know where everyone stands
Others’ Viewpoints
Psychology

Know where everyone stands

- What reinforces other people?
- Are you encouraging and/or discouraging change in others?
- Their perspectives help communicate, plan, act, and change
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Feeding the Machine

FAFSA Challenge Tracker

Using Federal FAFSA data as of December 20, 2018

High School Rank By: % of Current Seniors Completing FAFSA

<table>
<thead>
<tr>
<th>Rank</th>
<th>School</th>
<th>% of Seniors Completing FAFSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cleveland High</td>
<td>31.2%</td>
</tr>
<tr>
<td>2</td>
<td>Lewis High</td>
<td>20.4%</td>
</tr>
<tr>
<td>3</td>
<td>Central High</td>
<td>25.0%</td>
</tr>
<tr>
<td>4</td>
<td>Mooreville High</td>
<td>25.0%</td>
</tr>
<tr>
<td>5</td>
<td>Garrott High</td>
<td>23.7%</td>
</tr>
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% of FAFSAs completed by HELP deadline last year to this year

- **Belmont School**: 42.7% last year, 46.6% this year
- **Central High School**: 42.6% last year, 43.9% this year
- **Cleveland High School**: 44.4% last year, 45.8% this year
- **Early College High School**: 10.9% last year, 13.3% this year
- **Garrott High School**: 32.7% last year, 40.6% this year
- **George County High School**: 50.9% last year, 48.6% this year
- **Jefferson Co High School**: 16.3% last year, 32.4% this year
- **Lewis High School**: 33.7% last year, 22.7% this year
- **Mooreville High School**: 44.1% last year, 43.0% this year
- **Pettis High School**: 22.5% last year, 33.5% this year
- **Pitts High School**: 11.9% last year, 15.7% this year
- **Provost High School**: 32.4% last year, 40.6% this year

College Financial Aid Administrators were invited to adopt a high school to promote FAFSA completion by March 31, 2019, ensuring students receive as much funding as they can. The winners receive $1000 if their high school has either the highest FAFSA completion, the highest FAFSA increase of the best FAFSA completion strategy.
We Can Continue Our Conversation

48 SHADES OF GREY
Sex, drugs, rock and roll (with data) will change your world

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It is not as complicated as you think:
a gentle introduction to analytics
and how to make data work for you

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Data can be Scary
but it does not have to be:
build a blueprint to effectively use data

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Change the Way You Think

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Know where everyone stands
Change Is Hard (and Needed)

CHANGE
your thoughts
and you’ll
CHANGE
your
WORLD
Thank You!!

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