The Scientific Character Virtues: An Interdisciplinary Study

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The Scientific Character Virtues

- Theoretical
  - Philosophical & historical account of the scientific disciplinary virtues

- Empirical
  - Formal study of scientists’ ethical perceptions and stories

- Practical
  - Creation of SV-based science and RCR training curriculum
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Virtue Theory

- “[A] settled disposition of the mind that determines our choice of actions and emotions…” - Aristotle

- Classical “Cardinal” Virtues
  - Prudence
  - Justice
  - Temperance
  - Courage

- Moderation distinguishes virtue from vice
The Scientific Character

From Philosophy of Science to Philosophy of the Scientist
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What Possible Scientific Virtues?

- Philosophical theory & historical background
- Informal interviews
- Open ended questions
- Pilot survey narrowed list to 25 possible virtues

How important are the following traits as descriptive of the character of the *exemplary* scientist?

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<th>Trait</th>
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### Endorsement of Scientific Virtues by Exemplary Scientists

<table>
<thead>
<tr>
<th>Scientific Virtues</th>
<th>Mean</th>
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<tbody>
<tr>
<td>Honesty</td>
<td>9.7</td>
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<tr>
<td>Curiosity</td>
<td>9.4</td>
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<tr>
<td>Attentiveness or observant</td>
<td>8.8</td>
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<tr>
<td>Perseverance or patience</td>
<td>8.6</td>
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<tr>
<td>Objectivity</td>
<td>8.6</td>
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<tr>
<td>Humility to evidence</td>
<td>8.6</td>
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<tr>
<td>Skepticism</td>
<td>8.1</td>
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<tr>
<td>Meticulousness</td>
<td>7.5</td>
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<tr>
<td>Courage</td>
<td>7.2</td>
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<tr>
<td>Collaborative</td>
<td>6.4</td>
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</table>

N = 481

(Pennock & Miller – preliminary data analysis)
In judging whether to take on some prospective graduate student or post-doc, do you look primarily at their academic record or do you also try to judge what scientific character traits that they have, positive or negative, in making your decision?

12% - Academic record
88% - Character traits

(Pennock & Miller – preliminary data analysis)
Do you think that exemplary scientific values and virtues – the kinds of traits on our list – can be learned?

94% - Yes
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Responsible Conduct of Research

Traditional vs. Virtue-based Approach
STEM Education
Cultivating Curiosity and Scientific Values
“Most people say that it is the intellect which makes a great scientist. They are wrong: it is character.”

- Albert Einstein
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