

What does it mean to be smart?

Intelligence and Ability in
Professional Astronomy

Nicholas McConnell

UC Berkeley GSPS

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Self-Reflection

Think of something that challenged or frustrated you recently.

Did you try to address the challenge?

If yes: How did you feel while you were trying?

If no: What was undesirable about trying?

How do you feel about your own abilities, as a result of this experience?

My Goals

- Share a perspective that has helped me address challenges in (and outside of) grad school
- Provoke discussion about intelligence and ability
- Consider whether certain attitudes can promote equity in astronomy
- Share a few articles for further reading
- Acknowledge colleagues who have also considered these issues

What Makes a “Good” Astronomer?

- Understand scary equations
- Asks good question
- Ability to communicate efficiently
- Answer the right questions timely
- Get funding
- Connect apparently disparate ideas
- Publish
- Time management, multi-tasking
- Having resourceful friends
- Find things that other people missed
- Finish what you start
- Attend colloquium
- Collaborate
- Knowledge of astro current events
- Intuitive understanding of non-specialization
- Specialization
- Prizes (e.g., Nobel)
- Stress management
- Interpersonal skills
- Group management
- Mentoring
- Teaching
- Produces good students

(group list, 3/16/12)

What Makes a “Good” Astronomer?

- Publishes frequently
- Publishes meaningful results
- Has original ideas
- Makes connections between theory and observations
- Aware of and engaged with the latest research
- Has technical expertise
- Gets telescope time
- Gets grant money
- Leads successful projects
- Collaborates broadly
- Attracts mainstream media to their research
- Presents ideas clearly (gives good talks)
- Receives teaching awards or is regarded as a good teacher
- Mentors students who also become “good” astronomers
- Earns awards (e.g., AAS prize lectures) or society membership (e.g., AAAS)

(NJM’s list)

Professional “Intelligence”

- Absorbing new information
- Analytical thinking
- Creativity
- Writing ability
- Speaking ability
- People skills

Fixed mindset:

These are innate abilities that some people possess.

Growth mindset:

Anyone can develop these abilities through practice and/or instruction.

How does a choice of mindset (fixed, growth, other) affect your response to the following scenarios?

- It takes you weeks or months (or longer) to complete a task you thought would be easy.
- You have a question during a talk but wonder if asking it will reflect your ignorance of the background material.
- You discover a crucial mistake in results you have published.
- Your work is criticized.
- You feel like an imposter.
- You consider pursuing a career outside astronomy.
- You finish a major project and get lots of positive feedback.

Some Follow-Up Questions

(generated during group discussion on 3/16/12)

- Are you 100% responsible for improving your own abilities, or can growth be handed down by others with experience and expertise?
- When is it better to consult an expert, versus work on a problem yourself?
- Even if you think it's possible to get better at absorbing information, or at being creative, how do you do it?

A Few References

- Carol Dweck, Mindset: The New Psychology of Success. 2006, Ballantine Books
full book on fixed vs. growth mindset (self-help format)
- Carol Dweck, “The Secret to Raising Smart Kids.” 2007, Scientific American
short article describing fixed vs. growth mindset
- Jennifer Mangels, et al. 2006, Social Cognitive and Affective Neuroscience, 1, 75
research article on brain wave patterns in people with different mindsets
- Lucas Laursen, “No, You’re Not an Imposter” 2008, Science Careers
short article describing imposter syndrome and solutions -- including self-assessment. Includes links to other resources.