Selecting Astronauts
The Role of Psychologists

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NASA – Johnson Space Center
Behavioral Health & Performance

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A Snapshot of Astronaut Demographics

Who becomes a US astronaut?

US astronauts selected
Number, by year
- 1959: 7
- 1962: 9
- 1963: 14
- 1965: 6
- 1966: 19
- 1967: 11
- 1969: 7
- 1978: 35
- 1980: 19
- 1984: 17
- 1985: 13
- 1987: 15
- 1990: 23
- 1992: 19
- 1995: 19
- 1996: 35
- 1998: 25
- 2000: 17
- 2004: 11
- 2009: 14

Military or civilian?
- Civilian: 134
- Military: 199

Hours of space flight time
Cumulative hours and year astronaut selected
- Michael Finke: 9,159 hrs 1996
- Peggy Whitson: 9,048 hrs 1996

Which ones have flown the most
By total number of flights and year selected
- Franklin Chang-Diaz, 1980
- Jerry Ross, 1980
- Michael Foale, 1987
- Michael Lopez-Alegria, 1996
- Cari Walz, 1992
- Jeffrey Williams, 1987
- Michael Foale, 1987
- William McCool, 1990
- LeRoy Chiao, 1990
- Daniel Bursch, 1990
- Shannon Lucid, 1990
- 5,398, 1990
- 5,503, 1990
- 5,544, 1990
- 5,354, 1978

Sex of astronauts
- Male: 286
- Female: 48

At APA, it's always nice to make some noises about ethical considerations and cultural considerations… The informed consent process and privacy policy…

Pictures and stories help people stay awake.
Application Status

Your application materials have been submitted for consideration to the Johnson Space Center for Astronaut Candidate.

Make sure that you have read the announcement carefully and submitted all required documentation and application materials. Please note that submitting your resume and documents from USAJOBS may not be the only step in the process.

You may monitor the status of your application for Astronaut Candidate on the Application Status page on USAJOBS.
## Milestones in Selection 2013

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<thead>
<tr>
<th>N</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
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<tr>
<td></td>
<td>Nov</td>
<td>Dec</td>
<td>Jan</td>
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<tr>
<td>Applications received</td>
<td>6113</td>
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ASB = Astronaut Selection Board
JSC = Johnson Space Center
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What is the goal of BHP?

• To weed out those not qualified to be astronauts due to medical psychopathology (Select-Out)
• To identify those best suited to being astronauts (Suitability)
What Makes Selecting Astronauts Challenging?

- Predicting behavior so far in the future
- Job likely to change before those selected fly
- Differentiating amongst a homogeneous pool
- Constrained by culture, ethics, law

Diagram:
- Astronaut Candidate
  - Basic Training: ~1.5 – 2 years
- Astronaut
  - Advanced Training: ~1.5 – 2 years
  - Refresher Training: As Required
  - Increment-Specific Training: ~2.5 years
- Flight:
  - ISS Crewmember: ~6 mos – 1 yr
Simplified Overview of the BHP Role In Astronaut Selection

**Round 1**
- Psychological Testing
- Test Brief
- Team Exercises
- Suitability Interview
- Select-Out Interview

**Round 2**
- Clinical Staffing
- Competency Based Summary
- Clinically Qualified/Disqualified
- Astronaut Selection Board
- Astronaut Medical Board

**SUITABILITY**

**SELECT-OUT**
The Select-Out Process

- What does it mean to be considered qualified (Q) or disqualified (DQ)?
- Why is this a binding decision?
- What criteria are used to determine medical psychopathology?
- Once DQ always DQ?
Generalizability of NASA BHP’s Select-Out Process

• Greatest generalizability to public safety occupations
• Safety and ethics can be an issue at work for most any job
• More common methods for psychological select-out
  • Alcohol/drug screening
  • Situational judgment tests
  • Integrity/honesty tests
  • Counterproductive work behavior personality tests
Suitability

What it is … What it isn’t

Chris Hadfield of Bowie’s Space Oddity fame on YouTube
Simplified Overview of the BHP Role In Astronaut Selection

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SUITABILITY

SELECT-OUT

- Select-Out Interview
- Clinically Qualified/Disqualified
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Astronaut Selection Board
Suitability: Sample Competencies

1. Mental/Emotional stability
2. Performance under stressful conditions
3. Group living skills
4. Teamwork skills
5. Family issues
Team Exercises

• Goals of team exercises
  – To assess an applicant’s ability to perform in a team
  – To assess performance in terms of a subset of our competencies

• Development of team exercises
  – A lower fidelity simulation
  – Require applicants to work together to solve a series of tasks requiring physical and mental agility
Team Exercises
Evaluation and Generalizability

• Does it work?
  – Favorable feedback from astronauts, applicants, and assessors
  – Elicited a range of behaviors
  – Used BARS to assess on a tablet-based app

• Could it be applied to other jobs requiring problem-solving in the field?
  – Public safety occupations
  – Chemical and refinery plant and rig occupations
The Future of Psychological Assessment at NASA

• Remain a clinical process
• Revisions in response to updated competencies
• Little change to basic flow expected
• Continue to explore methods of gathering data
  — Situational judgment test
  — Biodata
Thank You

Clay Anderson