Star Performers and the Credibility Crisis in Science: Insights from Talent Management

Herman Aguinis
Avram Tucker Distinguished Scholar & Professor of Management
School of Business
George Washington University

www.hermanaguinis.com
It’s Been an Extraordinary First Year @ GW

THANK YOU!!
Research Philosophy and Interests

• Professional and life agenda
• Problem-focused, interdisciplinary, and multi-method research:
  • Talent management
    • How to turn talent management into a source of inimitable and sustainable competitive advantage and, simultaneously, improve employee well-being?
  • Research methods and analysis
    • How to improve research methods and analysis to make important theory advancements with clear implications for practice and policies?
Examples of Recent Projects

How can we enhance employee engagement?

What is the causal chain of leadership?

How to produce and manage star performers?
Today’s Presentation

- Star performers

- Credibility crisis in science

- Insights from talent management research and theories help us understand:
  - How to produce and manage star performers
  - How to address the credibility crisis conceptualized as a performance problem (i.e., “research performance” problem)
Argentina early 1970s...
Star Performers in Sports

1974: Soccer cards—Soccer World Cup in Munich

- Grzegorz Lato scored 7 goals, Johan Neeskens and Andrzej Szarmach scored 5 goals, 3 other players 4 goals, 6 players 3 goals, 9 players 2 goals, 29 players 1 goal, and about 170 players scored zero goals
- 5 of the 6 top scorers in the three best teams (out of 16)
Not Just in Sports ...

• Mark Zuckerberg: “Someone who is exceptional in their role is not just a little better than someone who is pretty good... They are 100 times better”
Not Just in Sports ...

- Marc Andreessen: “Five great programmers can completely outperform 1,000 mediocre programmers”
Not Just in Sports ...

- Jack Welch: “The team with the best players wins”
Different Samples & Measures

- Multiple studies including more than 600,000 people:
  - Researchers in more than 50 academic disciplines
  - Actors, actresses, directors, choreographers, and lighting specialists in the movie and TV industries
  - Fiction and nonfiction writers
  - Musicians
  - Elected officials in the United States and other country-level legislative bodies (e.g., Australia, Canada, Ireland, Estonia)
  - Professional and collegiate athletes in football, baseball, basketball, cricket, swimming, track and field, skiing, tennis, and other sports (individual and team sports)
  - Other types of workers including bank tellers, call center employees, grocery checkers, electrical fixture assemblers, wirers
How Much Better are the Best?

• About 65.8% of researchers fall below the mean number of top-tier journal articles published

• Based on the Emmy-nominated entertainers, 83.3% fall below the mean in terms of number of nominations

• For US Representatives, 67.9% fall below the mean in terms of number of times elected

• For NBA players, 71.1% are below the mean in terms of points scored
Let’s Formalize these Results…

\[ p(x) \propto x^{-\alpha}, \text{ where } \alpha (\alpha > 1) \text{ is the rate of decay} \]
The “Normal” View of Performance

National Public Radio’s Morning Edition (900 stations, 20 million listeners)
Just Three Examples (of 100s)
How Google’s VP for People Operations Summarized our Results

O’Boyle and Aguinis led five studies encompassing a population of 633,203 researchers, entertainers, politicians, and athletes. The table below compares how many people in each group you would expect to be at the 99.7th percentile of performance using a normal statistical distribution, and how many there are in reality.

<table>
<thead>
<tr>
<th>Researchers who have published 10 or more papers</th>
<th>Number predicted by the normal distribution</th>
<th>What you see in reality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artists with more than 10 Grammy nominations*</td>
<td>35</td>
<td>460</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>64</td>
</tr>
<tr>
<td>Members of the US House of Representatives who have served more than 13 terms†</td>
<td>13</td>
<td>172</td>
</tr>
</tbody>
</table>

* The same pattern holds for Oscars, Man Booker Prize nominations, Pulitzer Prize nominations, Rolling Stone Top 500 Songs, and thirty-six other awards.

† The same pattern holds in US state and Canadian provincial legislatures, the parliaments of Denmark, Estonia, Finland, Ireland, the Netherlands, and the United Kingdom, and in the New Zealand legislature.
Research Program: Relevant Sources

• Available at www.hermanaguinis.com:
Some Implications for Theory

• Increased star presence in 21st-century organizations: job complexity, reduced situational constraints, more autonomy, flexible hierarchies, more access to knowledge and information
• The addition and departure of stars has extraordinary consequences on overall organizational productivity
• The relation between performance and value follows a non-linear function with approximately 30% of value vested in the top 10% of workers and 50% of value vested in the top 25%
• The non-linear relationship between individual performance and value is moderated by a position’s degree of proximity to an organization’s strategic core competence: steeper curve as proximity increases
• Performance-based pay dispersion (i.e., pay for performance) leads to increased star performer retention and less pay dispersion leads to increased star performance turnover
Given These Results...

Implications for practice:

• Your suggestions for producing star performers?
• Your suggestions for “cloning” star performers?
• Your suggestions for managing star performers?
• Your suggestions for retaining star performers?
• Your suggestions for managing average performers?
Some Implications for Practice

• Minimize situational constraints (i.e., ceiling constraints) faced by workers to allow for the emergence of more star performers.

• Allow star performers to revolve in and out of teams because this widens the star’s network and takes full advantage of knowledge transfer to rising stars.

• Firms experiencing financial difficulties should pay special attention to star performers as budget cuts, downsizing, and other cost cutting measures signals that the organization is in decline and leads to preemptive star departure.

• I-deals for stars should be clearly articulated and applied fairly—everyone can become a star.

• Managers investing a disproportionate amount of their resources into stars generate greater overall output and create positive gain spirals.
Some Implications for Practice

• Nothing wrong with being an average performer!

• Abby Wambach (184 goals in international matches): “I’ve never scored a goal without getting a pass from someone else.”

• Management practices such as non-performance based incentives, limited pay dispersion, and longevity-based promotion decisions that emphasize homogeneity demotivate stars and lead to their psychological withdrawal, emotional detachment, and eventually (when the right opportunity appears) their departure
Star Performers

- Other thoughts?
- Other reactions?
Let’s Switch Gears...
Credibility Crisis in Science

- Between 30% to 60% of the published empirical studies are not replicable in several scientific fields...
  - Psychology
  - Economics
  - Management
  - Not just a social science problem...
Results of a Nature Survey

Estimating the reproducibility of psychological science

Open Science Collaboration

Reproducibility is a defining feature of science, but the extent to which it characterizes current research is unknown. We conducted replications of 100 experimental and correlational studies published in three psychology journals using high-powered designs and original materials when available. Replication effects were half the magnitude of original effects, representing a substantial decline. Ninety-seven percent of original studies had statistically significant results. Thirty-six percent of replications had statistically significant results; 47% of original effect sizes were in the 95% confidence interval of the replication effect size; 39% of effects were subjectively rated to have replicated the original result; and if no bias in original results is assumed, combining original and replication results left 68% with statistically significant effects. Correlational tests suggest that replication success was better predicted by the strength of original evidence than by characteristics of the original and replication teams.
Psychology

• 100 experimental and non-experimental studies in three leading psychology journals
• 270 authors conducted the 100 replications
• Replications with high fidelity to the original designs
• Results:
  • Mean $r$ declined from .40 to .20
  • Number of statistically significant results declined from 97% to 36%
  • Effect size $r$ declined in 53% of the effect sizes
  • Replication failure rate: 60%

Evaluating replicability of laboratory experiments in economics

Colin F. Camerer,1*† Anna Dreber,2† Eskil Forsell,2† Teck-Hua Ho,3,4† Jürgen Huber,5† Magnus Johannesson,2† Michael Kirchler,5,6† Johan Almenberg,7 Adam Altmejd,2 Taizan Chan,8 Emma Heikensten,2 Felix Holzmeister,5 Taisuke Imai,1 Siri Isaksson,2 Gideon Nave,1 Thomas Pfeiffer,9,10 Michael Razen,5 Hang Wu4
Economics

- 18 authors and research design was verified by original authors
- Results:
  - Overall, 40% not replicable
  - Mean effect size = .47 original studies, .28 replication
  - Non-experimental research: more than 75% not replicable

Is there a credibility crisis in strategic management research? Evidence on the reproducibility of study findings

Donald D Bergh  
University of Denver, USA

Barton M Sharp  
Northern Illinois University, USA

Herman Aguinis  
George Washington University, USA

Ming Li  
University of Liverpool, UK
Management

• Reproducibility: Retest the hypotheses using the same data as in the original study
• 88 OLS regression or SEM models as reported in Strategic Management Journal
• 70% reported incomplete data to allow for any type of reproducibility attempt
• Of those that could be reproduced, about 1 in 3 hypothesis tests led to statistically non-significant rather than significant conclusions

The Perfect Storm...

- Increased pressure to publish in “A” journals and increased rejection rates and number submissions at “A” journals
- Increased methodological sophistication
- Decreased resources for doctoral & faculty training & retooling
- Increased demands to become “da Vinci Academics”
On Torturing the Data Until they Confess

“If you don't reveal some insights soon, I’m going to be forced to slice, dice, and drill!”
What Do French Cuisine and Many Journal Articles Have in Common?

• The final “perfect” product...
Torturing the Data Until they Confess

- What happened in the “research kitchen”?  
- Selection of variables to include in a model
- Use of control variables
- Handling of outliers
- Reporting of $p$-values
- Hypothesizing after results are known (HARKing)
Talent Management Insights: Performance Problem

- Performance is determined mostly by two major factors (e.g., Van Iddekinge, Aguinis, Mackey, & DeOrtentiis, in press, *Journal of Management*):
  - Knowledge, skills, and abilities (KSAs)
    - One needs to *know* how to do the job well
  - Motivation
    - One needs to *want* to do the job well
- Researchers need to have the *necessary KSAs* to create reproducible and replicable knowledge—knowledge that will be credible, trustworthy, and useful
- Researchers need to *want to* create reproducible and replicable knowledge
“Research Performance” Problem

• KSAs:
  • Reduced training for doctoral students
  • Methodology courses often “outsourced”
  • Reduced resources for re-tooling of more senior researchers
  • Some university administrators erroneously perceive doctoral programs as a “cost center” rather than “research-capabilities & research-culture-building center”

• Motivation:
  • Pressure to publish in “A” journals by all means necessary
  • 1994 vs. 2013 in Journal of Applied Psychology:
    • Telling a “good story” seems critical based on number of pages: Introduction (2.49 to 3.90), Discussion (1.71 to 2.69), Method (1.58 to 1.81), Results (2.41 to 2.34)
Should We Do Anything About this in Our Fields? At GWSB?

- Accounting?
- Decision sciences?
- Finance?
- Information systems & technology management?
- International business?
- Management?
- Marketing?
- Strategic management and public policy?
Our Modest Proposals

• Available at www.hermanaguinis.com:
• Aguinis, H., Ramani, R. S., & Alabduljader, N. in press. What you see is what you get? Enhancing methodological transparency in management research. *Academy of Management Annals.*
Our Modest Proposals


Talent Management Research and Theories offer Useful Insights...

- If we want to produce, manage, retain, and “clone” star performers

- If we want to understand and address the credibility crisis and the challenging “research performance problem” in management, economics, psychology, and many other fields

- Articles available at [www.hermanaguinis.com](http://www.hermanaguinis.com)
THANK YOU!!!