What should be the topic of my lecture ???
What the hell are Complex Systems?

seashell: spatial pattern
zebra stripes: spatial pattern

NO: too direct
From the other side of the diversity
NO: too subjective and ... painful
RANKING
the hidden rules of the social game
we all play

Péter Érdi
Henry R. Luce Professor
Center for Complex Systems Studies
Kalamazoo College

http://people.kzoo.edu/ perdi/

Lucasse Lecture
April 11th, 2019
My Early Encounters with Ranking
• How to lead the popularity list?

• It is impossible to play soccer if you don’t have a ball. But we had one, so we played!

• The ninety-fifties in Budapest

Figure 1: Star-like organization. The kid who had a real soccer ball was the best friend of everybody.

Figure 2: Pannonia: elementary school: fake class pic
My Early Encounters with Ranking

Between

subjectivity

and

objectivity

Figure 3: Seasonal scores - soccer
-(subjective - but not random!) evaluation averaged (objectively).
A not-so beautiful tale: an example of intentional biased ranking from a Hungarian folktale

A number of animals escaped from their homes and fell into a trap. They were not able to escape, and they became very hungry.

There wasn’t any food around, so the wolf in the group suggested a solution:
A not-so beautiful tale: an example of intentional biased ranking from a Hungarian folktale

“Well, my dear friends! What to do now? We should eat soon, otherwise we will starve to death. I have an idea! Let us read out the names of all of us, and the most ugly one will be eaten.” Everybody agreed. (I have never understood, why). The wolf assigned himself to be the judge, and counted:

“Woolf-boolf o! So great! Fox-box also great, my-deer-my-beer very great, rabbit-babbit also great, cock-bock also great, my-hen-my-ben, you are not great,” and they ate the hen.
Upward and downward comparison

Figure 4: Self-image. Perceptual/cognitive bias versus reputation management.
Upward and downward comparison

Social comparison theory

We are constantly making self and other evaluations across a variety of domains (for example, attractiveness, wealth, intelligence, and success).

Most of us have the social skills and impulse control to keep our envy and social comparisons quiet but our true feelings may come out in subtle ways.

Types of Social Comparison

- Upward Social Comparison
  - You > Me
  - “You are better…”
- Downward Social Comparison
  - Me > You
  - “I feel sorry for you…”

comparison is the thief of joy

— Theodore Roosevelt —
Upward and downward comparison

Figure 5: “The grass is always greener on the other side of the fence” in the poetry of Ovid (43 BCE - 17 or 18 CE)

The grass is not, in fact, always greener on the other side of the fence. No, not at all. Fences have nothing to do with it. The grass is greenest where it is watered.

Robert Fulghum
Trabant

- Cars in the nineteen-seventies and early nineteen-eighties in Budapest

- Trabant: two-stroke engine - obsolete even at that time

- Two people were needed for its construction—one to cut and one to glue, as it was made from plastic, and many jokes were made about its quality
A donkey and a Trabant meet in the Thuringian Forest. “Hi car!”—greets the donkey. “Hi donkey!”—answers the Trabant. Offended, the donkey replies, “It is not nice to call me donkey if I addressed you as a car. You should have called me at least a horse!”
Upward and downward comparison

- Joe: French company - Western car (Renault)
- Peter: supportive family background: used Eastern car (Trabant)
- John: mathematician with high diopter glasses (never had a driving licence)
Ranking and Rating
**Ranking** is a relationship between a set of items such that, for any two items, the first is either 'ranked higher than', 'ranked lower than' or 'ranked equal to' the second. Ranking procedure generates a rank-ordered list of elements. **Rating** gives a list of numerical scores, one for each object. A rating list, when sorted, generates a ranking list.

<table>
<thead>
<tr>
<th>Score</th>
<th>Grading</th>
</tr>
</thead>
<tbody>
<tr>
<td>720 and Above</td>
<td>Excellent</td>
</tr>
<tr>
<td>680 to 719</td>
<td>Good</td>
</tr>
<tr>
<td>620 to 679</td>
<td>Average</td>
</tr>
<tr>
<td>580 to 619</td>
<td>Poor</td>
</tr>
<tr>
<td>500 to 579</td>
<td>Bad</td>
</tr>
<tr>
<td>Less than 500</td>
<td>Miserable</td>
</tr>
</tbody>
</table>

- 1. The Beatles
- 2. The Rolling Stones
- 3. Queen
- 4. Pink Floyd
- 5. Led Zeppelin
Could we assign a number to our actual sense of pain?

PAIN ASSESSMENT TOOL

![Pain Scale]

Figure 6: How (not) to use it? - Zero pain ??
Comparison, ranking, rating

- pecking order
- social ranking
- universities
- countries
From Pecking Order to Social Hierarchies

Figure 7: The rankings emerge from squabbles over food, and when a chicken finds itself defeated in a dispute, it will forever submit to the winner. Each member of the flock understands who ranks above and below it.
From Pecking Order to Social Hierarchies

- Thorleif Schjelderup-Ebbe (1894-1976)
- Chickens learn hierarchy -> relative social status with a painful peck
- Social dominance: general feature of the animal kingdom
- Konrad Lorenz: ethology
- From chickens to humans. How?
Dominance, prestige, hierarchy

- **Status**: an individual’s standing in the social hierarchy which determines priority access to resources.

- **Dominance** hierarchies: individuals achieve priority access to resources through threat, intimidation and displays of force.

- **Prestige**, in contrast, is freely deferred status granted to individuals because they help other individuals achieve their goals.
Dominance and prestige

- genetically coded
- controlled mainly by hormones
- mostly instinctive
- main purpose: to minimize intra-group aggression

- culturally coded
- controlled mainly by the neocortex
- main purpose: to harmonize the behavior of group members
Dominance, prestige, hierarchy
Nobody likes, everybody uses: university ranking
HOW to MEASURE? (features and weights -> score)

U.S. news

- Undergraduate academic reputation: 22.5%
- Graduation and freshman retention rates: 20%
- Faculty resources: 20%
- Student selectivity: 15%
- Financial resources: 10%
- Graduation rate performance: 7.5%
- Alumni giving: 5%
Nobody likes, everybody uses: university ranking
Times Higher Education World University Rankings system

• Teaching (the learning environment): 30%
• Research (volume, income and reputation): 30%
• Citations (research influence): 30%
• International outlook (staff, students, research): 7.5%
• Industry income (knowledge transfer): 2.5%
### Ranking Games we All Play

#### Recommending Graduate Students

1. Rate the applicant in comparison with others whom you have known at similar stages in their careers.

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# Ranking Games we All Play

## Recommending Graduate Students

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RANKING THE WORLD
Grading States as a Tool of Global Governance
EDITED BY
Alexander Cooley
Jack Snyder
Ranking Happiness of Countries: How to Measure?

Assume that this ladder is a way of picturing your life. The top of the ladder represents the best possible life for you. The bottom rung of the ladder represents the worst possible life for you.

Indicate where on the ladder you feel you personally stand right now by marking the circle.
The 2019 World Happiness Report has been released, and it reveals the countries whose residents say they are the happiest and least happy. The 10 happiest countries are:

1) Finland
2) Denmark
3) Norway
4) Iceland
5) Netherlands
6) Switzerland
7) Sweden
8) New Zealand
9) Canada
10) Austria
1. Prologue: My Early Encounters with Ranking
2. Comparison, ranking, rating, and lists
3. Social ranking in animal and human societies
4. Choices, Games, Laws, and the Web
5. The Ignorant and the Manipulative
6. Ranking games
7. The Struggle for Reputation
8. Inspired by Your Wish List: How (Not To) Buy a New Lawnmower
9. Epilogue: Rules of the Ranking Game - Where Are We Now?
Should we or Should not We?
To ensure a fair selection you all get the same test. You must all climb that tree.
You can like it or not, ranking is with us. It is not a magic bullet that produces order out of chaos, but it is not the product of some random procedure. Like it or not, parents and students will carefully study the college ranking lists.

It’s our very human nature to compare ourselves to others. The question is how to cope with the results of these comparisons.

Social ranking has an evolutionary root. Dominance is based on aggression and manipulation, prestige is based on knowledge.
• We humans constructed ranking algorithms. One of the biggest tasks of any society is to make collective decisions based on individual opinions.

• Ranking games are with us, even hermits cannot avoid playing.

• Metrics are more useful than totally subjective evaluations. Can metrics be gamed? Yes, but ...

• The suggested rule: “Trust but with caution!”

• Keep the balance between the struggle for reputation and external success and the desire for internal peace!

• Recommendation systems are with us. Each day! They help us to think about our options.
In the age of algorithms: Who has the last word: the human or the computer?

Madeline Chu: "No exception policy"!

(Maybe I tell a fresh story. Maybe not.)
Who has the last word: the human or the computer?

I leave the question and the possible answers to the generations Z and Z+ (possibly Alpha).
Two from Generation Alpha ... and their Dad from Generation X