

Snakes and Ladders: Building a Career in Statistics



sponsored by the
Career Development Committee

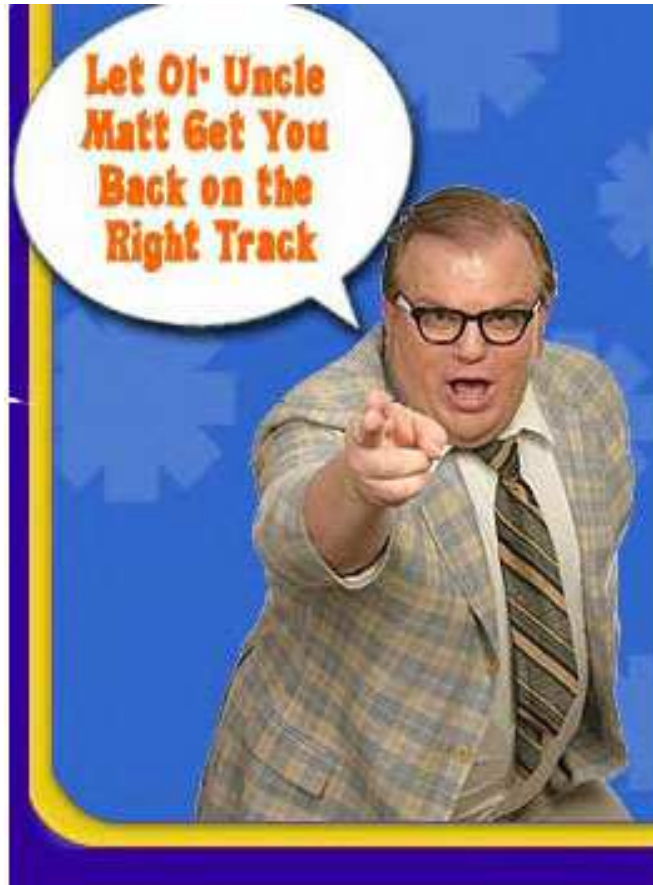
David Banks, Duke University

1. Plan

The purpose of this seminar is to sort out career strategies that can be tailored to individual circumstances of statisticians. Our agenda is:

- Strategy
- Tactics
- Case Studies
- Panel Discussion: Five randomly chosen members of the audience will have a group discussion, with me, of career issues and problems they have encountered.

I have no special expertise in this. You may want to seek a professional.



Chris Farley, playing motivational speaker Matt Foley on Saturday Night Live

However, despite my complete lack of credentials, there are a few reasons why I may be able to make this worth your time:

- As a statistician, I think I understand specifics of our profession that affect career growth.
- As a member of the ASA Committee in Recruitment and Retention, I have a pretty good knowledge of the resources our professional societies offer.
- As someone who's worked for four universities and three federal agencies, in managerial and submanagerial capacities, I have some experience and a lot of war stories.

I have no guarantees. When thinking about successful careers, I am reminded of G. K. Chesterton's explanation of why angels can fly. **“Because they take themselves lightly.”**

2. Strategic Issues

Not everyone will climb high. Some of those who do should not—Deming told a roomful of GM executives that most of them got there by doing the wrong thing.

There are many reasons why the best people can finish last. And careers have a stochastic component.

Nonetheless, long-term planning can help.

Like wavelets, multiresolution analysis is important. One needs a plan for the week, a two-year plan, and a five-year plan. (These plans need not be professional—sometimes one needs to achieve some personal goals first in order to focus on a career.)

One needs to think two jobs ahead.

For almost everyone, advancement requires that you move. Often one must be the bullet-proof best candidate, even overqualified, before the promotion happens.

Change is uncomfortable at first, but in the long run it is good.

In order to be promoted internally, you need to train someone to replace you. This can be hard to do.

If you change jobs, try hard to leave only friends behind. Especially in the statistics profession, your greatest asset is the reputation you have among co-professionals.

Both industry and government offer many chances to make friends at other places. Use these contacts to learn of opportunities and to avoid war zones.

Think of your job as work, and your career as your hobby.

The kinds of strategies you need change with age. What makes you a star as a young statistician can doom you to mediocrity later on.

At the beginning, one needs computational skills and a good attitude. Later on, especially if one moves to managerial work, the technical skills become less important while organizational skills and one's professional network are more influential.

Some general guidelines:

- The Law of Multiplication of Advantage (I. J. Good)
- The Peter Principle (Laurence Peter)
- Avoid Other People's Nonsense (Lynne Hare)
- Don't be Evil (Google's SEC business statement)
- Honest Work is Never Wasted (Persi Diaconis)
- All That Matters is One Thing (Jack Palance, City Slickers)



“Chance favors the prepared mind.”

Eric Bogosian, playing the criminal genius Troy Dane in Under Siege 3.

(Also Louis Pasteur.)

3. Tactics



“Strategy without tactics is the slowest route to victory. Tactics without strategy is the noise before defeat.”

Sun Tzu, The Art of War

3.1 Use the ASA

The American Statistical Association was created to be an engine for the career growth of all statisticians. It provides:

- Salary surveys for statisticians, broken out by useful covariates—this is essential for evaluating job offers and negotiation.
- Professional job fairs, at every JSM. The last day is open to all, and it never hurts to look.
- Continuing education opportunities, as a student or a teacher.
- Sections and committees that are ladders for leadership within the ASA, opportunities for networking with like-minded people, and simple ways to build one's resume.
- Chapters that do the same thing, but along geographical rather than topical lines.

- Practice in public speaking, and a 20-minute opportunity to advertise yourself once a year.
- Journals, a directory, on-line job listings, on-order shortcourses, and so forth.
- The COPSS visiting lecturer program, which provides good statistical talks to almost any organization.
- The opportunity to befriend and support worthy colleagues by nominating them for committees or honors.

Jonathan Kurlander started the SIG on Statistical Volunteerism by suggesting it in a letter to Fritz Scheuren, then the ASA president.

Monica Johnston started a support program for M.S. level statisticians by contacting the ASA Committee on Membership and Recruitment (and she will join that Committee in 2007).

3.2 Time Management

A sine qua non for success in any career path is good time management. Some people are just not able to do this—mostly teenagers, movie stars, and pure mathematicians.

If you are vastly talented, then probably you can find someone to manage your time for you—an executive assistant or an agent. Otherwise, you must rely upon your spouse or yourself. For career advancement, most people need to manage their time themselves.

Jay Kadane once told me, when I was a junior faculty member at Carnegie Mellon, that the key to success was to carry a pocket diary.

But there is more. Besides a pocket diary, it is good to have a make a regular to-do list, and cross it off as you proceed.

Balance your list to have a mix of easy jobs and hard jobs, so you can simulate a sense of accomplishment when tired or lazy.

Return phone calls and email promptly. A boss gets worried when an employee goes dark—that often means that a project is in trouble. Keep the boss informed about delays in advance.

Everyone goofs off (except Peter Hall). Allow time for that, and don't judge yourself harshly. But sometimes one is tempted to goof off too much. This can indicate either:

- An immature personality, or one prone to addiction to computer games, or
- That your job is not sufficiently challenging.

In latter case, replace some of the goof-off time with systematic efforts to improve your job situation.

A main subcategory of time management is paperwork. Nobody likes it.

That is why, if you tackle it diligently and quickly, hitting the ball back over the net every time it lands on your desk, you quickly get a largely undeserved reputation for organization and responsibility.

No manager can confidently promote someone whose paperwork is slow and problematic.

Work expands to fill the available time. If you agree to do a lot, you probably will find yourself becoming faster, more decisive, and more focused. In general, an **A-** on three projects is better than an **A+** on one.

But good time management can make you start to feel like a circus plate-spinner. Some people enjoy this, others are very uncomfortable.

3.3 Social Networking

It may seem odd, but statisticians know all about this, at least from a theoretical perspective.

Social network models in statistics began Holland and Leinhardt, but were developed by Fienberg, Wasserman, Snijders, Handcock, Hoff, and many others. A simple version is:

$$\text{logit } p_{ij} = \mu + \alpha_i^T \mathbf{x}_i + \beta_j^T \mathbf{x}_j + \gamma_{ij}^T \mathbf{x}_{ij} + \epsilon_{ij}$$

where p_{ij} is the probability of a link from actor i to actor j , the α_i and β_j are actor-specific coefficient vectors on covariate vectors \mathbf{x}_i and \mathbf{x}_j , the γ_{ij} is a vector coefficient for dyadic covariates, and the ϵ_{ij} is random error.

You should think about each of these terms in the context of your own job situation.

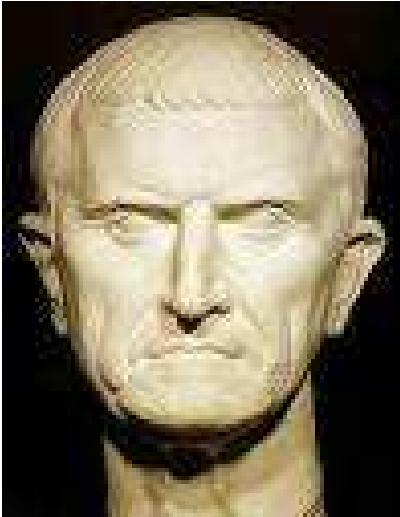
What statisticians don't know about social networks is how to use them.

David Krackhardt has done a study of Simmelian ties. These are triadic links in social networks, as opposed to dyadic links.

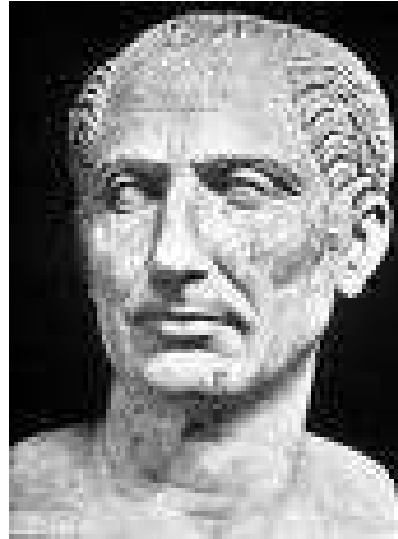
Krackhardt found that in plays of Prisoner's Dilemma, people who had only dyadic ties were about as likely to defect as strangers. But people who have triadic ties are much more likely to cooperate.

Cliques provide a social context that defines a team. So build a clique for yourself. This involves:

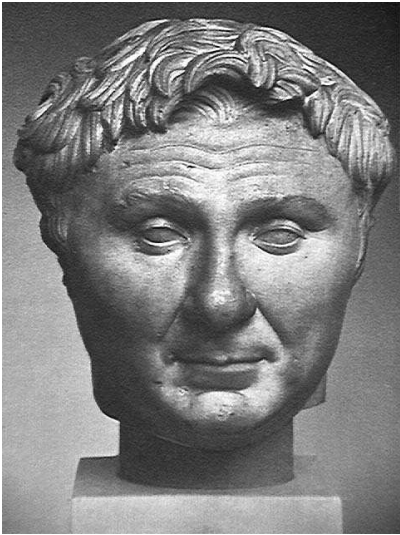
- introducing people you know to others whom you know;
- organizing movie nights or dinners for gangs of friends;
- joining pre-existing teams and networking them together.



Crassus



Caesar



Pompey

The first triumvirate. It didn't end well, but they took over Rome.

3.4 Meetings

Many people look really stupid in meetings. My suggestions are:

- Stay focused; maintain meeting discipline.
- Be decisive, incisive, and concise.
- Make only one point per hour.
- No meeting should last longer than an hour.
- Don't think out loud—unless you are the smartest person in the room you are guaranteed to look dumb to someone, and even if you are the smartest you may still look dumb.
- Watch the group dynamics and body language.
- Don't pursue lost causes or raise dead issues.
- Try to act like the characters in West Wing.

3.5 Sculpting Your Own Image

1. Sit in front, and ask one question.
2. If you go to a colloquium, you can look up the speaker on-line beforehand, and skim the paper or technical report at the website which is most pertinent to the talk. That way you can be sure you have something to say, and you generate the illusion of omniscience among your colleagues.
3. Read widely, especially in areas that are pertinent to your career path. The history of statistics or biographies of statisticians are good for all us; if you work for the FDA, you might also try Gina Kolata's Flu, and so forth.
4. Scan the newspaper (or a newswebsite) every day. Find one article per day that is a good topic of conversation with colleagues.

5. Think of a new idea each week. Some of them will be good enough to pitch to the boss. And that's a skill worth practicing. (As part of that, always have an elevator pitch teed up and ready to go.)
6. Learning to write well is a lifetime process. Cultivate a fussiness about grammar, spelling, and condign expression. Use spellcheck tools, but don't be their prisoner.
7. Learning to teach is also a lifetime process. Practice it with an eye to continual improvement. Perhaps you can volunteer to give a lecture or a class on some aspect of statistics to people at work.
8. Seem happy and be active. Don't complain (except maybe rarely and colorfully). Say nice things to people whenever possible (especially the secretary!). Courtesy counts. You have to play office politics, but respect the rules.
9. Have some party tricks.

10. Reach out to some other statistician once a week. Call an old friend from graduate school, or a former colleague, or someone you met at an ASA chapter/section meeting.
11. Once a week, do something that invests in your career. This might be doing something with the ASA, or going to an ASA chapter meeting, or learning a new software package.
12. Don't use your hands when you speak. (I don't know why, but I took a management seminar once when I was at the Bureau of Transportation Statistics, and the coach said it was bad—maybe it makes you come across like Vincent D'Onofrio in Law & Order: Criminal Intent.)

A lot of your career is about acting. Put yourself in the place of your boss or your colleague, figure out what they would like to see, and then enact it.



“Be what you would seem.”
Marcus Aurelius, The Meditations.

3.6 Risk Assessment

Your job is always in jeopardy. And any new job you take will have unexpected pitfalls. So you should take some time to think about the informal risk calculus that applies to your situation. You should always have a sense of the probabilistic balance of costs and benefits in terms of your current job and possible alternatives.

As a general rule of thumb, your office is never more than two bad managers (in time or hierarchy) away from a meltdown. And sane, competent, honest managers are surprisingly rare.

If your office is in trouble, you can use that. The first people to leave are the best (they tend to get good offers). Join that wave. And when the interviewer for your next job asks why you want to leave, the answer is transparent.

A key part of doing the cost/benefit tradeoff is getting accurate knowledge. This requires a combination of homework and scuttlebutt.

The homework consists of knowing about alternatives, e.g., through the ASA on-line jobsite. It also entails keeping an eye on the upper-level plans for your group, the business prospects in your sector, changing trends in statistics, and so forth.

Factoid: Economists calculate that the average employee generates about \$66,000/year in profit for their company. Statisticians probably facilitate more than the average.

The office gossip is where you learn which projects are hot, and with whom it is good to work.

Gossip also includes salary. Most places (in the U.S.) discourage employees from discussing salary among themselves. This code of silence is highly advantageous to employers, and really bad for employees (e.g., gender discrimination in salaries, office favoritism, Mrs. Parker and the Vicious Circle).

When one has choices about projects, training, or meetings, it is wise to do some qualitative risk assessment.

- Avoid doomed projects, and ones that do not build new assets.
- Look for projects that cross departmental boundaries.
- Don't be too risk averse—gamble when the payoff is right. (“**The Lord hates a coward**”, Sean Connery playing Malone in The Untouchables).
- Have multiple irons in the fire.
- Try to join two professional societies: the JSM, for all the obvious reasons, and a smaller one, perhaps in a specific domain, where you can grow influential.
- Have an exit plan ready, and don't wait when the weather changes.

At different stages of life, there are different constraints on the risk analysis; e.g., children in high school, or a spouse in a good job.

If you cannot move, then study local options, and/or work aggressively to grow the health and career potential of your current job.

Part of any risk assessment is a clear sense of one's strengths and weaknesses. Some categories in which you might rate yourself, say on a Likert scale, are:

- public speaking
- computational skills (these are area dependent—SUDAAN, R, SAS, etc.)
- analytic skills
- writing ability
- management capability
- leadership (this is different from management)
- cross-training breadth
- social skills

Sadly, some people tend to overrate themselves, especially in areas in which they are most deficient.



“A man’s gotta know his limitations.”

Clint Eastwood, playing Dirty Harry in Magnum Force

Steve Smaha, founder of Haystack Laboratories, said that people tend to be pioneers, homesteaders, or farmers. (Of course, we understand mixture distributions...) All three types can rise to the top.

His point is that people have different temperaments. One should think about what kind of life one would enjoy, and make decisions accordingly—in other words, know your utility function.

Once a decision is made, don't look back. **“What is behind me, she does not matter!”** (Raul Julia, playing the Italian racer in The Great Gumball Rally).

And remember, to rise one only needs to be the best in one's group, not the best in the world. From that standpoint, one strategy is to start in a large group, to establish credibility and contacts, then move to a small group where you can be a star, and then perhaps move back to a large group with a higher rank and accelerated experience.

4. Three Case Studies

I've worked at three universities and three federal agencies. I intend to be pretty candid about some of the problems I have seen. I won't name people (or maybe only a few who did right), but it would not take much detective work to sort out who was involved.

Therefore, I am not going to put my comments on the case studies in writing. A key component of building a successful career is to be careful about one's paper trail (cf. Michael Scanlon and Jack Abramoff).

Although I shall strive to be scrupulously fair and accurate, these kinds of trainwrecks are like Rashômon—everyone has their own interpretation. And there's no percentage in offending people needlessly.

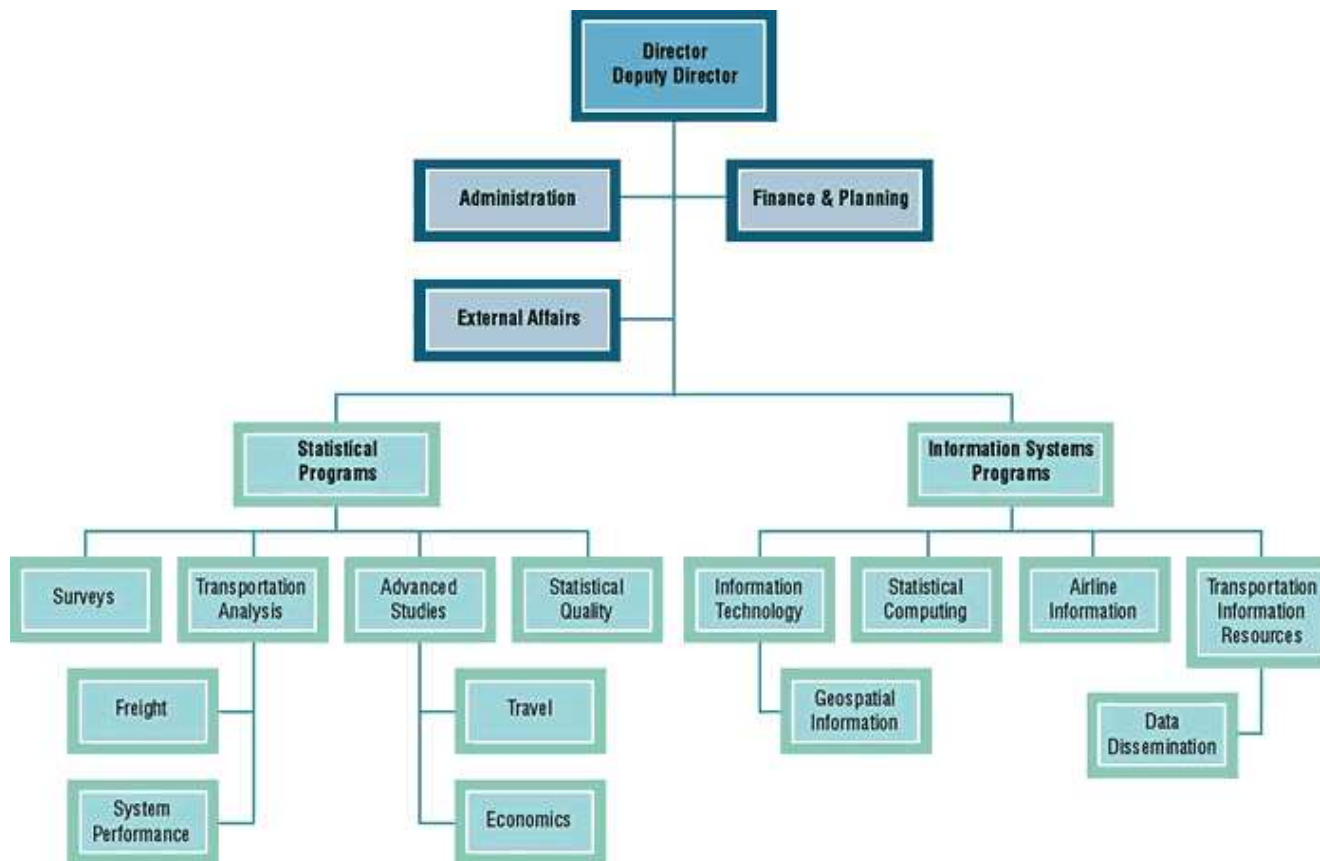
The Rimm Study



Trouble at NIST



The Bureau of Transportation Statistics



5. Closing Soundbites

For career advancement, your most important asset is social capital. You build this by doing favors and helping others. Sadly, you often get much more capital by sucking up to your boss than you do by performing honest work. People have to make their own compromise with their conscience on where the right balance lies.

Try not to judge others harshly. Hermann Hesse wrote “**We most despise those faults in others that we ourselves possess**” (Demian), but often we also despise those faults that most inflate our self-esteem.

Try not to hold grudges. A few years out, everything is less intense.

A Zen monk can be a CEO. Probably because building sand mandalas is good practice for corporate work.

Ethics matters, but manners matter more.

Always say yes. Take dares, try new things, volunteer for more work than you can reasonably handle. People have enormous capacity, and the more you do the better you can get.

Don't spam your colleagues with every minor accomplishment.

Be modest, or at least work hard to simulate it.

Don't hang on—when the weather changes, leave. (Bad weather is two put-downs from the boss.)

Build skills (“**You know, like nunchuck skills, bowhunting skills, computer hacking skills...**”, Napoleon Dynamite).

Positive steps you can take this week:

- Go **immediately after this lecture** to Session 39 in CC-401, to meet with representatives of Seattle companies, network, and perhaps hook up with a group for dinner.
- Stop by the ASA Committee on Career Development booth in the exhibit hall, level 4 of the Convention Center—they provide a number of useful services.
- Go to the Roundtable on “Making the Most of Your Degree: Opportunities and Obstacles,” organized by the ASA Committee on Membership and Recruitment. Wednesday, 12:30-1:30, also in CC-401.
- Attend a section business meeting, and talk to people.
- Go to the free job fair on the last day. It is good to practice your interview skills in a low-pressure environment.