Applying Complexity to Make Practical Decisions About Evaluation: Part 1 of a 3 Part Series

AEA Coffee Break
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Use complexity to make actionable decisions about

- Metrics
- Methodology
- Program theory
- Data interpretation
- Interaction with stakeholders

Now	My vision of the future
RCT	RCT
Regression	Regression
Causal reasoning	Causal reasoning
	Complex behavior
Outcome harvesting	Outcome harvesting
Text content analysis	Text content analysis
Formative evaluation	Formative evaluation
Evaluability assessment	Evaluability assessment
Developmental evaluation	Developmental evaluation
And many, many others	And many, many others

Complex system (crossed out)
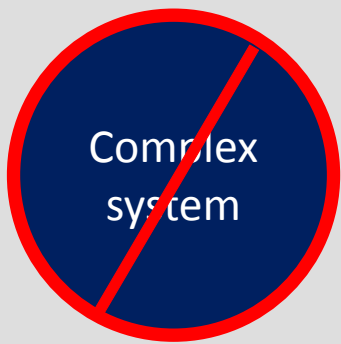
Complex behavior

Themes in complexity science

- Predictability
- Feedback loops
- Patterns of change
- Evolutionary behavior
- Where change comes from

**Some complex system behaviors that an evaluator can do something with**

- Scaling
- Network effects
- Growth patterns
- Realistic timeframes
- Discontinuous change
- Unpredictable outcomes
- Unpredictable outcome chains
- Consequence of small changes
- Feedback loops among outcomes
- Inequitable distribution of benefits
- Joint optimization of uncorrelated outcomes

Justice Potter Stewart on defining pornography in Jacobellis v. Ohio
"I shall not today attempt further to define the kinds of material I understand to be embraced within that shorthand description; and perhaps I could never succeed in intelligibly doing so. **But I know it when I see it**, and the motion picture involved in this case is not that."

An evaluation model of a healthy eating program that I might very well use
- Additive
- Unambiguous outcomes
- Conducive to an effective methodology
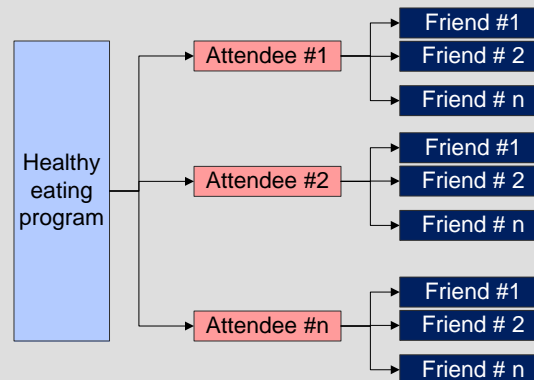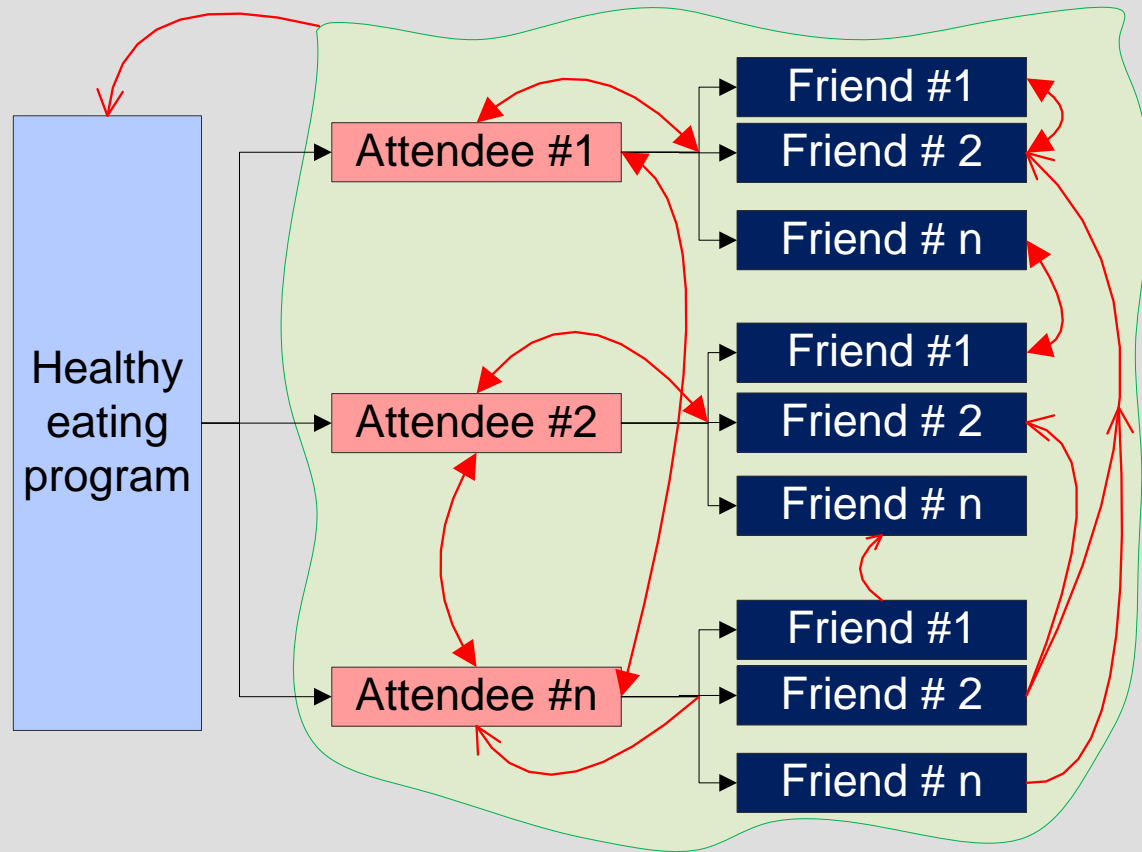- Reasonable view of program operations
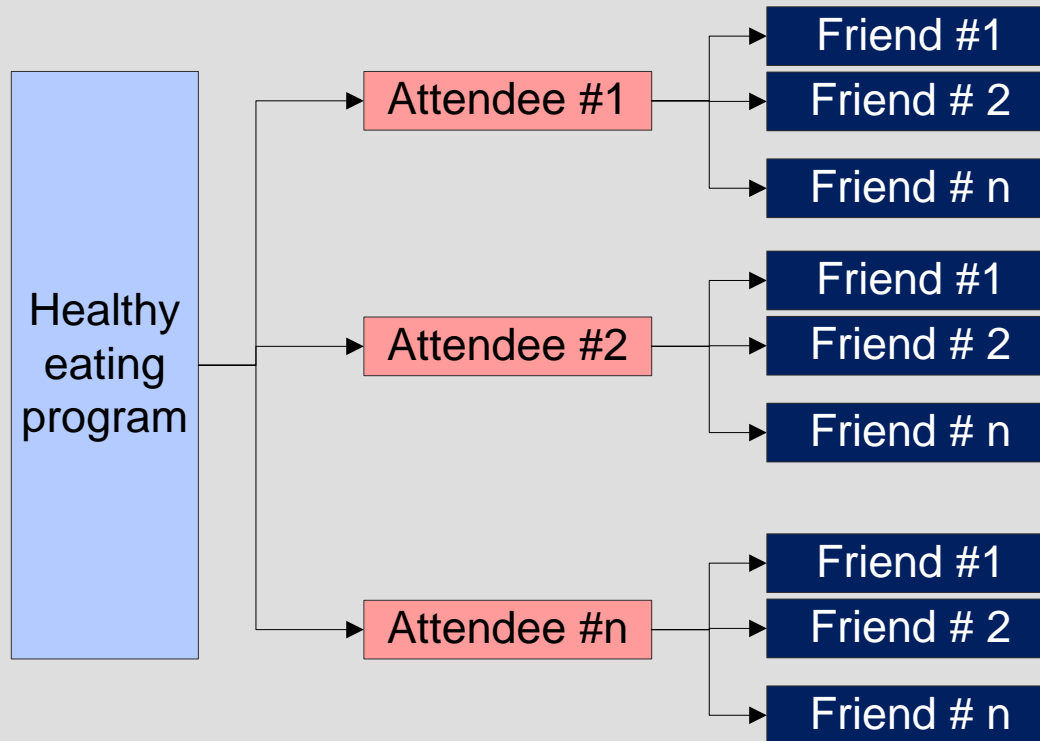
But what if we recast the model to capture complex behavior?

Complexity - informed model

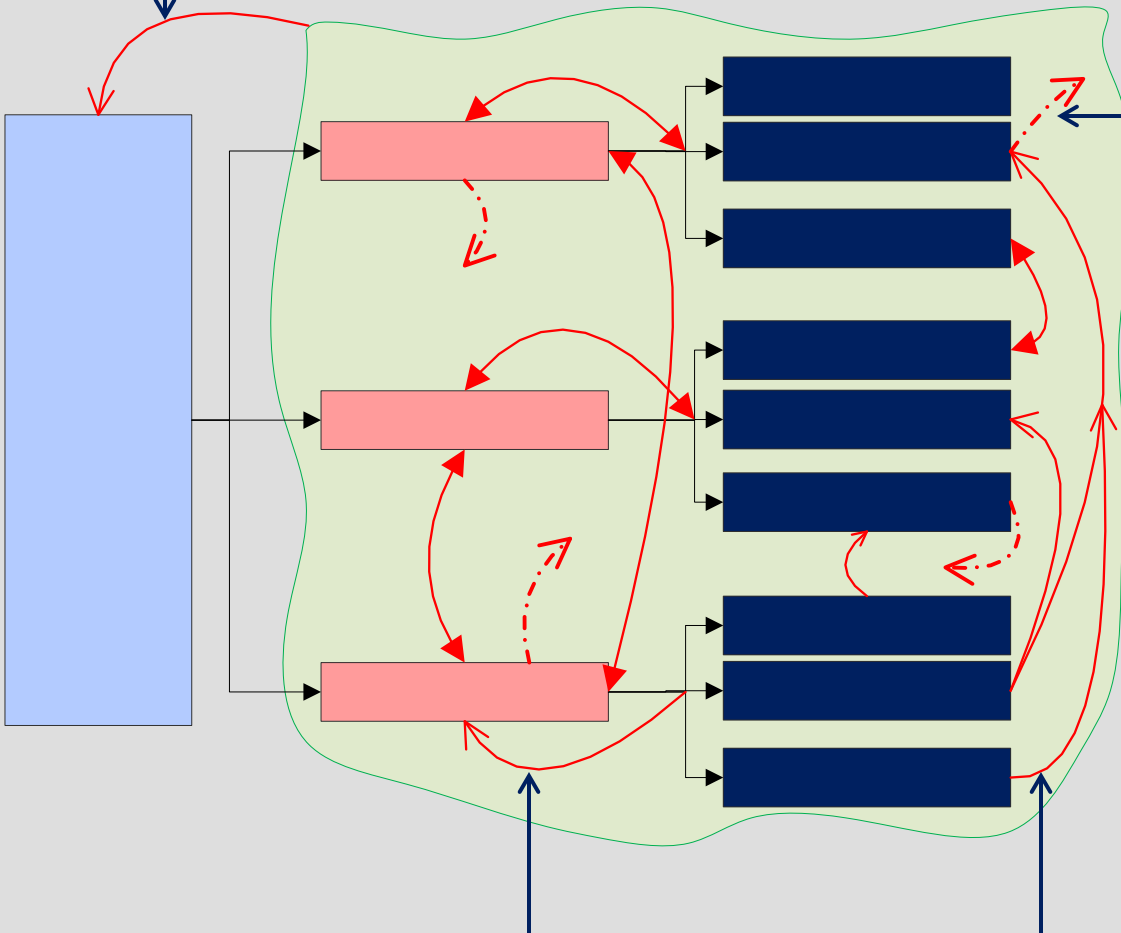Some behaviors of complex systems that I can **do** something about.

- Feedback loops
- Network behavior
- Unpredictable outcome chains (sensitive dependence)

Healthy eating program

Attendee #1 → Friend #1 / Friend # 2 / Friend # n

Attendee #2 → Friend #1 / Friend # 2 / Friend # n

Attendee #n → Friend #1 / Friend # 2 / Friend # n

Feedback
- Track changes in services over time
- Interview staff on perceptions of need

**Unpredictable change emanating from community activity**
- Monitoring
- Observation
- Open ended interviewing
- Content analysis of community social media

Program theory
- Desired outcomes can be specified.
- Path to desired outcomes cannot be specified.
  (Sensitive dependence)

State change in network
- Stakeholder expectations
- Assessment of developing edges
- Data collection timing for unpredictable consequences

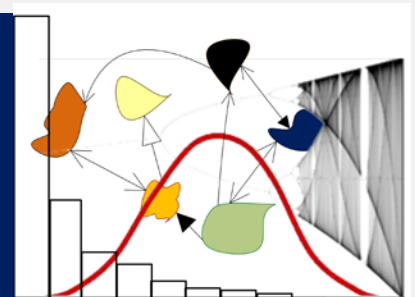% of nodes in giant component

Connections per node
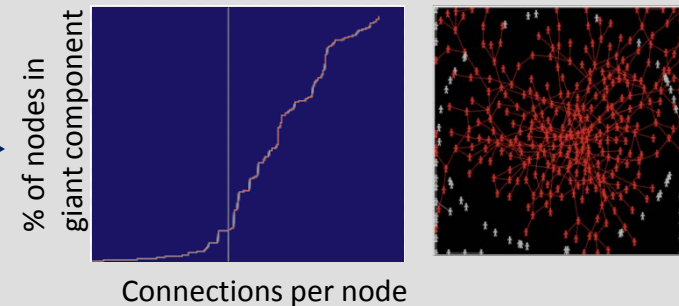
- Additive model <u>may very well</u> be the best approach
- Considering complex behavior provides insight about
  - Program theory
  - Methodology
  - Metrics

Questions? Comments? More information?

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Further Reading

Books and Articles

Morell, J. A., Hilscher, R., Magura, S., & Ford, J. (2010). *Integrating Evaluation and Agent-Based Modeling: Rationale and an Example for Adopting Evidence-Based Practices*. Journal of Multidisciplinary Evaluation, 6(14), 35 -- 37.

Morell, J. A. (2010). *Evaluation in the Face of Uncertainty: Anticipating Surprise and Responding to the Inevitable*. New York: Guilford.

Parunak, H. V. D., & Morell, J. A. (2014). *Emergent Consequences: Unexpected Behaviors in a Simple Model to Support Innovation Adoption, Planning, and Evaluation*. Paper presented at the Social Computing, Behavioral-Cultural Modeling, and Prediction 7th International Conference, SBP 2014 , April 1-4, 2014, Washington, DC, USA.

Morell, J.A. (2017) *From Firefighting to Systematic Action: Toward A Research Agenda for Better Evaluation of Unintended Consequences* Paper presented at Unintended Effects of International Cooperation: An Academic & Policy Cross-over Conference, January 16th and 17th 2017 The Hague, The Netherlands

Blog

Surprises in Programs and their Evaluations

http://evaluationuncertainty.com/

Videos

https://www.youtube.com/channel/UCqRIJjhqmy3ngSB1AF9ZKLg