

## The Network for Peacebuilding Evaluation Thursday Talks “Intelligent ToC: Using a Means Ends Objectives Network to Represent Non-Linear Theories of Change?”

Dave Davis, Professor, George Mason University



### Part One: Overview

Dave Davis gave a presentation on using a Means Ends Objective Network to represent Theories of Change as an engine of evaluation. The discussion, which was quantitative in scope, was different from previous Thursday Talks that have been narrative in scope. A Means Ends Objectives Network (MEON) is a way to mathematically describe a Theory of Change, to explore how robust it is and what the second or even third level implications of an action might be. A MEON is a significant part of a larger system – a Value Focused Metric (VFM) model. VFM models have been used to support evaluation and decision modeling in defense and disaster response applications with some success.



The validation of Theories of Change is a difficult process as almost all the objectives and intermediate aspects of a Theory of Change are of a social nature and not subject to physical testing. Theories of Change are tested in group processes, or based simply on previous reports and the experience of experts. Using MEONs complements these techniques and allows the group to ‘what if’ various outcomes – thus getting a taste for the dynamism of the social processes. MEONs can be quantified using the numeric technique based on the Bayesian Belief Networks that use the tool [GeNIe 2.0](#).



The VFM modeling approach of first developing Fundamental Objectives Hierarchies is almost identical to that described as Outcome harvesting. Although the biggest difference between this approach and other types of evaluations is its reliance on the mathematical sciences to represent the social sciences, there are similarities between the research being conducted using MEON and other evaluation techniques. While the application of this approach in the peacebuilding field has previously been limited, there is scope to refine it and explore how it can be directly applied to peacebuilding.



MercyCorps



Watch the recording [here](#) (including audio and slides) to listen to Dave’s full talk.

Here is a list of the resources mentioned in the talk:

- *Value Focused Thinking: A Path to Creative Decisionmaking* by Ralph Keeney, 1992, Harvard University Press
- *Thinking, Fast and Slow* by Daniel Kahneman, 2011, Farrar, Straus and Giroux
- **GeNIe 2.0**, free ware from the University of Pittsburg  
<http://genie.sis.pitt.edu/>

- *Value-Focused Thinking for Measuring Success in Complex Operations  
A Model for Evaluating Mercy Corps' 'Local Empowerment for Peace  
Project' in Kenya*

[http://www.thecornwallisgroup.org/cornwallis\\_2013/C18/IqbalSlainArchibald.pdf](http://www.thecornwallisgroup.org/cornwallis_2013/C18/IqbalSlainArchibald.pdf)

## Part Two: Question-Answer Section

Participants in the Thursday Talk posed many great questions. The following includes the questions posed, and a summary of the answers. For Dave's full responses, please listen to the recording.

1. **Utilizing tools at evaluation stages:** How do the Theories of Change evolve through the application of the GeNIe tool or the Value Focused Metric Model?

**Dave Davis:** These are participatory processes. We go through the literature to identify an initial model, and present it to a group or a client. The Bayesian advantage is, you can do it one node at a time. It is similar to a brainstorming approach where you start all over the screen and by the time you are done you have whittled it down to a focused picture. We used this approach in the case of disaster management with the Canadian Directorate of Security Science and with Mercy Corps' LEAP program.

2. **Applications of the method:** Can you give an example of how applying this method altered an existing Theory of Change?

**Dave Davis:** This method has altered an existing Theory of Change every time we applied it. By the time we came up with the Theory of Change with the Canadian Directorate of Security Science and they had discussed it internally, it was altered dramatically. It was a scenario for earthquake response on Vancouver island, and the main objective that emerged was: shelter in place. This had not been a part of the original planning process. Similarly, George Mason University's emergency management group changed their snow closing process based on a model using our approach.

3. **Mercy Corps LEAP program model:** Based on your Mercy Corps experience, what did your model end up telling you about the LEAP program? Were you able to demonstrate if these Early Warning systems led (or failed to lead to) better issue resolution?

**Dave Davis:** That is hard to answer. LEAP was well in place by the time we engaged with Mercy Corps. Their primary question did change as we went through the process with people in DC. What came out in the model was different from what was in the documentation. By the time we were done with the analysis an important issue related to Early Warning systems was no



MercyCorps



longer an issue. Although we did not impact their planning we do consider our engagement a partial success.

In general it is not only the graphics that are important but also the underlying mathematical theory beyond the graphics. We can use this approach to test a Theory of Change, whether it is behaving the way you hope it would.

4. **Working with probabilities:** Did I understand correctly that you are able to work with probabilities, and if yes, how can you get estimates for these probabilities?

**Dave Davis:** Yes, but it is hard to do so. We started out 20 years ago simply asking questions about probabilities and likelihoods but we were not very successful. Folks have difficulties estimating probabilities. When we were creating the model for emergency management, people did not like working with probabilities but when we began eliciting numbers they really began to engage and that is how we found our way around.

5. **Acquiring key resources and understanding software:** What is the learning curve for software like GeNIe in programs that are implemented in conflict and post-conflict areas? Are there key resources that need to be in place?

**Dave Davis:** At George Mason University we offer a class for graduate students on ‘Measuring success in complex operations’ and these are folks with a background in peace operations, and not necessarily mathematicians. We first focus on elicitation and group processes and then we apply the template. We try to reduce the amount of mathematics involved. Since all the number crunching can be done on computers we just have to teach students appropriate basics. We have made basic mathematics and statistics online tutorials available for students and that has been effective, although we haven’t received a lot of feedback from students at the end of the 15 week course. In other instances, with the Canadians it took us four days but they were trained mathematicians. But yes, the technique does take time for the users to understand.

6. **Implementation of the Bayesian model:** What is your experience with getting policy-makers or Congress to understand and feel confident in the output of something so arcane as Bayesian modelling? What capability does it add versus more straightforward approaches that makes it worthwhile to take on that barrier?

**Dave Davis:** This model has been around for a while in the diagnostic world. I have no experience with the Congress. But it is a problem, the technique cannot be put down on paper and handed over to the users, it needs a lot of preparation.



7. **Interacting with users and stakeholders:** How do you then manage conversations in complex environments with a variety of users such as practitioners, beneficiaries and decision-makers?

**Dave Davis:** For our AFRICOM planning model, we had different players with different mindsets. They came to us with a set of matrix that they had collected earlier. As each stakeholder came in, they had to explain to us what their objective was and how the matrix relates to that objective. Only then was the matrix included in the model. So it was an objective based approach. In a peacebuilding oriented world, my expectation is that groups will be very different from one another. How that will relate to cutting down on matrices is something for all of us to learn. For example, Mercy Corps' LEAP program had 16 matrices, which was a third of what they had in their documentation. Overall I think a matrix is useful as a category.

