Thinking on a Higher Plane

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Thinking on a higher plane, as the title of this article suggests, isn't a reference to some metaphysical state of existence, or something you achieve after sitting in a contorted position for an extended period of time while chanting the same phrase over and over for hours on end. It instead refers to the process of thinking and problem solving in multiple directions, at the same time in order to isolate the logic of a situation, so that you are empowered to do something about it. Now I imagine that explanation might sound a bit odd as well, but it's true.

Performing such a task as multi-directional reasoning, as you might surmise, is a rather complex mechanical and methodological process, but (almost) anyone can do it. These forms of differential diagnosis take practice to master, along with imagination, vision, persistence and the ability to see the entire playing field like a Grand Master in chess, but trust me when I tell you that (almost) anyone can do it. The more you do it, the better at it you will become.

As a young graduate student who devoted years to learning these analytic techniques, I was mistakenly of the opinion that everyone in a leadership position throughout the nation knew something that I had yet to learn about decision making and as a consequence I devoted my energy toward mastering these techniques. I must admit that I incorrectly presumed that within the hallowed halls of Congress, the West Wing of the White House, and in the anterooms of the County Commission resided teams of people like me preparing comprehensive analyses and strategic plans that pointed out all of the contributive factors necessary to render an informed decision and derive public policies that made sense. I also thought that debates and arguments presented within these institutions of government would be structured in a purely logical fashion, devoid of bias, with a clear articulation of the variables at play, the possibilities available for affecting change that resulted in a strategy that was carefully manufactured to effectively position our nation to meet the challenges it faced. Time and experience in dealing with these institutions has proven to me that I was apparently very wrong in my view of the world back then, but I remain hopeful that future generations will get it right.

There are a select few people who actually do this type of work every day, who endeavor to point out the logic of a situation, and who try to provide guidance that is predicated upon sound logic, but I haven't seen too many executive level people doing it, or even asking the tough questions that come with such an endeavor like "what is the correlation coefficient between the dependent and independent variables", or "what percent of shared variance did you compute for these factors", and "which variables in the equation serve as cost-effective factors that can be manipulated to form public policy alternatives"? There is a very good reason for this that I suspect rests primarily in the fact that this type of reasoning is very difficult to achieve and this form of deliberation requires a significant amount of time to complete. It's also not taught extensively in our collegiate criminal justice and law programs. Additionally, this decision making process is an extremely transparent endeavor that places your analysis, value judgments, and public policy decisions front and center for all to see (and criticize). That shouldn't be a deterrent however for those genuinely devoted to the task of providing effective leadership. Instead it should serve as incentive for making sure that the issues remain the focus of the argument, and not the biases, predispositions, suppositions, prejudices, and hidden agendas of those engaged in the debate.

The intent of this article is not to bestow mastery of this approach, but rather it is offered instead to create a spark that hopefully ignites a fire in the minds of those who read it regarding how they might use such an approach to go about thinking through complex issues, so that they can break apart the logic of the situation and address the challenges of the law and justice professions into manageable elements, in order to create decision models that support their efforts to formulate conclusions, which culminate in effective leadership strategies and sound public policy. My goal here is to enlighten and expose those who review this article to the essence of such processes. Mastery of these techniques requires a considerable level of devotion by those who attempt it, many years of practice, an open mind, a firm grip on your ego so that you are receptive to the notion that you might actually be wrong from time to time when presented with new factors for consideration that you hadn't thought of yet, and above all, a level of tenacity about doing the work required to produce a meaningful result. Or, you could simply make sure there is a person on your staff that knows all of the intricacies of this approach and that you listen to their recommendations and ask those tough questions, so that you can attend to the duties of leading the organization.

There are a number of related issues with multi-directional reasoning that are prudent to consider as well, including deliberations over;

- What are the factors and variables that might combine to influence the outcome of the situation?
- Are these factors (direct) or (indirect) influences?
- Which factors possess the highest degree of influence over the outcome?
- Do I have any degree of control of over these factors?
- Is control over these variables cost-effective?
- Are changes in the value of these variables instantaneous to the outcome or is there a lag in time present that gives me a decision making window?
- If the value in one variable that I don't have control over changes, can I tweak a variable in the same model that I do have control over to mitigate unwanted results?

The list of strategic considerations goes on and on but you get the general idea that even after we break apart a complex model into identifiable elements, there are all sorts of "gaming" questions and value judgments that we need to consider in order to change the outcome from merely an academic exercise of interesting things to know, to a very practical model that we can use to guide the agency in overcoming the challenges we face as an organization.

To keep things simple and provide a basic example of how this form of thinking is attained, let's examine a situation that we contend with every day in our profession, which can be expressed as the number of reported instances of residential burglary in the community. At face value this community experience would appear to be predicated upon a host of things that occur during a particular period of time. That assessment would be correct and the next step in the process would be to theorize, or hypothesize if you prefer, as to which factors might be highly correlative to the residential burglary rate of your jurisdiction. Let's assume for the sake of explanation that we have decided to consider the following factors as potentially contributive to the frequency of burglaries that the jurisdiction experiences in a calendar year. These might include; unemployment rate, population density, the frequency of truancy for local area high schools, and the prevalence of drug dependency among area residents. In a real-world analysis there are an innumerable number of factors like these that might be partially influential in such a model and

which should be considered, but these will serve our purpose for explaining how such an analysis is constructed.

The next step in the process would be to compose hypothesis statements for each factor that was included in the study. Hypothesis statements come in pairs (a Null Hypothesis and a Research Hypothesis). We begin by embracing the Null Hypothesis so that we avoid the possibility of accepting something as true, that has yet to be proven true. As applied to this example we would have four pairs of hypothesis statements, one for each "independent" variable or factor that we believe might be correlated to the residential burglary experiences of the community. They might be expressed like this;

- The Null Hypothesis (NH) for the first variable might be stated this way. "There is no statistically significant relationship between unemployment and residential burglary frequency experienced in the city."
- The opposing view or Research Hypothesis (RH) would be just the opposite and could be expressed by saying, "There is a statistically significant relationship between the region's unemployment rate and the frequency of residential burglaries experienced during a calendar year".

The underlying theory supporting the RH would be that if people were gainfully employed they would have the monetary means of acquiring those things they desire and would subsequently have no need to burglarize other people's residences. It might also infer that they have something to lose for committing criminal acts and would therefore not engage in such behavior. The same hypothesis approach would be used for the remaining variables in our example and each factor we elect to consider for inclusion in the study would need to be examined independently before being included in an aggregate equation, later on.

The remaining RH hypothesis statements might be expressed like this;

- There is a statistically significant relationship between population density for a region and the experiences of residential burglary realized within that community each year.
- There is a statistically significant relationship between the truancy frequency each year by local high schools and the frequency of residential burglaries in the area.

- There is a statistically significant relationship between the number of people within a specific region who are drug dependent and the frequency of residential burglaries experienced in that region.

Each of these hypothesis statements needs to be based on a speculative premise that asserts a possible relationship to the number of residential burglaries that occur, given the logic of the interrelation. At this early point of the study we always accept the Null Hypothesis that states **there is no relationship** between the variables in order to make sure that we don't fall victim to a fallacy of reasoning that includes something in the equation that is untrue. In other words, we never accept the Research Hypothesis until it is proven true by our evaluation of statistical data beyond what is need for validation.

That brings us to the next step in the process of developing the Probability Statement. The Probability Statement specifies exactly what correlation coefficient is needed for statistical significance, given the number of pairs of data included within our study. I always recommend using equal sample sizes to make the analysis easier, but this isn't always possible. Let's presume for this example that we use historical data for all the factors that we plan to include in the study for the past ten years. Each set of pairs would have an N = 10, and a Degree of Freedom equal to 8 (N-2) [*because there are two variables or pairs for each factor examined]* and as a result we could derive a Probability Statement that might look something like this:

Probability Statement: Ten years' worth of data was collected that reflect the local unemployment rate and the frequency of residential burglaries for the period from 2004 to 2014. Therefore df = N - 2 or 10 - 2 = 8. For df = 8, a Pearson's R (correlation coefficient) of plus or minus .632 is needed for significance at the .05 level, and plus or minus .763 is required at the .01 level of significance.

What this statement means is that in order for us to conclude with any degree of statistical reliability that unemployment and residential burglaries are related, the data we examine must result in a correlation coefficient of at least .632. This would translate to being 95% certain (.05 level) that as unemployment increases or lowers, residential burglary frequency follows suit. We could also infer, if we were using sample data, that this trend would be present in 95 out of 100 samples that we examine. If we computed a Pearsons' R of .763, then we would be 99% certain (.01 level) that as unemployment increases, the instances of residential burglaries experienced in

the city also increases. If the correlation coefficient were negative (-.763) it would suggest that as unemployment increases, burglaries decrease, which seems illogical but we'll keep an open mind. The point here is to remain objective and assess the results of the analysis after the correlations have been calculated.

Once we have this element of the study completed, we assemble our data into a spreadsheet; run it through our statistical program (I recommend WinStat for your Excel spreadsheet) followed by an evaluation of the correlation coefficients. Let's presume that every comparison generated a Pearsons' R greater than .632, so all of the variables have some statistically significant degree of influence over the residential burglary rate. Unemployment and burglary might (for example) generate a correlation of .86 which would be well above what was needed for statistical certainty at the .01 level, or 99% level of certainty.

Now to find out how often these two variables fluctuate together all you have to do is multiply .86 times itself to derive the Coefficient of Determination and then again times 100 to compute the Percent of Shared Variance. In other words, .86 x .86 = .73 x 100 equals 73%. This means that as unemployment increases in the region, residential burglaries increases with it 73% of the time. Conversely, 1 - .86 x 100 (or the Coefficient of Non-Determination) tells you that they vary separately 27% of the time. This is a fairly valuable thing to know. This same (univariate) analysis is conducted for every variable we included within the study to make sure that all the factors have a statistically significant level of relation to the dependent variable (residential burglaries). We then can reject the Null Hypothesis for each variable and accept the Research Hypothesis for each factor. This confirms to us that there are no fallacies in our reasoning and that all of the variables we have theorized that might have influence, in fact do have an influence in determining residential burglary rates. That's a pretty valuable piece of information to know as well.

You will soon discover that none of them has the same correlation coefficient which suggests that some are more influential than others relative to their influence over burglary rates when contained within an aggregated or multivariate equation, which is the next step in the process. I don't have the time within this article to go into great detail about the multivariate computation step but essentially it involves using your statistical package to compare each factor against the dependent variable (burglary frequency) to derive an array of values for each independent variable against the dependent variable, and a subsequent computation of the regression coefficient for each factor than can be used in an aggregate equation. I told you that (almost)

anyone can do it. The Winstat program will generate "regression coefficients" that you can use to build a multiple regression equation similar to the one below.

Let's presume for simplicity sake that based on our analysis we derive the following multivariate equation:

$$Y' = a + bx1 + bx2 + bx3 + bx4$$

Which means that Residential Burglary Frequency = Slope Intercept + Unemployment + Pop Density + Truancy + Drug Dependency

The [a] part of the equation is a number that is produced by the statistical software and is the Constant for this equation. It refers to the Slope Intercept or that point where the aggregate regression line crosses the Y axis. The [b] values are those base values (regression coefficients) computed for each variable (they never change), and the [x1,2,3,4] values are those you can substitute into the equation based on your anticipation of the expected frequency for each variable. This approach gives you the ability to anticipate change for the independent variables, and the capacity to model the outcome mathematically, in order to predict the impact that changes in unemployment, population density, truancy, and drug dependency might have on the burglary rate.

Now that we have created a logic model that isolates those factors that have a correlation to residential burglary, we can focus on doing something about it. As I mentioned, this model is very simple in its design and in a real-world endeavor you would likely include twenty to thirty variables (horizontally) for analysis. The more variables you have, the more flexibility you infuse into the decision model, because it gives you the ability to "tweak" the values of the [X] factors in the equation to model the effect that raising or lowering their value might have on the residential burglary experience. In other words, it builds in management prerogatives.

Given the equation we have built, let's try it.

Projected Burglaries = Slope Intercept + Unemployment + Pop Density + Truancy + Drug Dependency or;

$$Y' = 232.3 + 27.2\ (X1) + 8.2\ (X2) + 36(X3) + 12.5(X4)$$

Now let's substitute some anticipated values into the [X] factors to see the number of projected burglaries that will likely occur based on these new values. Again these are contrived values to help explain (in simple terms) how such an equation would be calculated.

$$Y' = 232.3 + 27.2(6) + 8.2(200) + 36(15) + 12.5(2.3)$$

$$Y' = 232.2 + 163.2 + 1640 + 540 + 28.75$$

$$\text{Projected Burglaries} = 2604.15$$

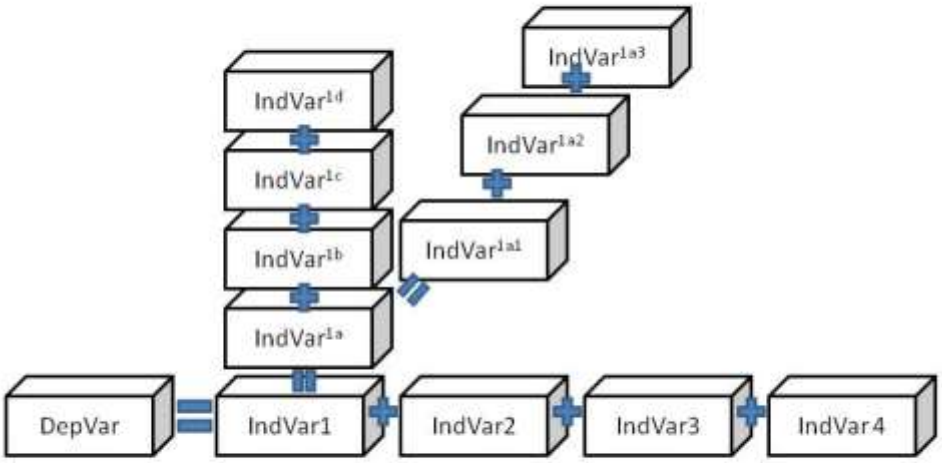
Congratulations! See how simply that was? We just calculated the number of projected residential burglaries based on a shift in value for four independent variables that are highly correlated to the dependent variable and we are now positioned to **"what if"** the equation and make some educated guesses about changes in our enforcement strategies.
Let's assume for this example that we decided to apply changes in our approach to the two obvious variables that a law enforcement agency has "some" degree of control over i.e., Truancy (x3) and Drug Dependency (x4). As part of such an effort we decide to enlist the support of the courts in using a "drug treatment diversion" program under an alternative sentencing practice that forces everyone into such a program as part of their sentence. In addition, we mount an aggressive truancy reporting program in cooperation with the school districts and an active strategic enforcement operation that seeks to "detain" any student reported as truant. We'll presume for sake of this example that we expect these changes to lower the truancy from 15 to 6, and reduce drug dependency from 2.3 to 1.7.

Now with these new values, we can "estimate" the impact such selective enforcement might have on the instances of residential burglary in the community. The new value for truancy (x3) would become 36(6) or 216, and drug dependency would be represented as 12.5(1.7) or 21.25. When added to the remaining equation values the new model looks like this; Projected Burglaries = 232.2 + 163.2 + 1640 + 216 + 21.25. After we compute the equation we note that the expected frequency of residential burglaries lowers from 2604 to a frequency of 2272.65. That represents a 12% decrease in the expected number of burglaries for the community with just a simple, easy to implement, change in enforcement posture by implementing a truancy

monitoring program and some cooperation from the courts to create a mandatory drug diversion program. If you knew the average loss rate of residential burglaries you could multiply that number by the difference between the expected frequency (before enforcement) and the actual frequency to determine the cost savings of such an approach.

Once again, this is a (very) simple example designed to communicate the ideas associated with analysis-based decision making, but I think you can derive how such an approach might be very effective in giving you a logical basis for leading the organization, assuring that your approach is based solidly on logic, and even defending your decisions to those who might challenge your approach. If nothing else, it creates a level of transparency in your public policy that focuses the debate squarely upon the logic of your judgments, as opposed to conjecture by those uninformed people who might think they could do a better job than you, but who haven't the experience or credentials necessary to serve in such a capacity. This approach also is helpful in securing budgetary allocations for directed enforcement activities, as well as computing the organization's level of effectiveness at preventing crime, but that's an entirely different article.

Now comes the hard part. Every variable in the horizontal equation has its own vertical equation that causes it to fluctuate in a fully articulated Grand Equation. In other words, unemployment isn't just influential upon burglary rates, but itself is influenced by a number of factors, as is drug dependency frequency, truancy rate, and population density. This is good news however because it gives you the ability to identify subtle-level factors in a fully articulated model that you can "tweak" to see how changes in second order variables affect the outcome of residential burglary, similar to dominoes falling. You may not have direct control over the major variables like unemployment, but you might be able to affect a change in a second-order factors (job training programs, tax free zones, and other similar programs), or even a tertiary variable that contributes to a more positive outcome in the burglary rate. A conceptual representation of this idea is seen in the graphic below.



Almost every aspect of our profession, whether we think of it in these terms or not, is multi-directional in nature and can be modeled in a similar fashion. As I mentioned, it is time consuming, painful, sometimes frustrating, but always valuable endeavor in support of our efforts to isolate, identify, and determine those things that we have control over in order to develop effective public policy. It also positions us to understand the dynamics of the profession and make well-reasoned arguments in support of our decisions.

If you have an interest in finding out more about this multi-directional aspect, I recommend that you visit my profile page on LinkedIn and download the FREE book entitled The Philosophy and Science of Multivariate Reasoning. It's actually an easy read that will provide you with a fairly comprehensive overview of this analytical approach. The book available on my profile page will help you in the effort to understand what to demand.

You can also see an example of this type of complex multi-directional analysis as applied to hostage survival analysis that is currently underway through the cooperative efforts of the National Tactical Officer's Association, the California Association of Tactical Officers, and JusticeAcademy.org by visiting the link below.

http://www.justiceacademy.org/iShare/Campbell/HostageArray.pdf

As you probably have determined it isn't practical to expect executive level leaders to also be experts in this form of empirical analysis (yet), but it is well within reason for you as the executive leader of the agency to demand it of those you retain to support your organization and who provide you with counsel. It might even become a consideration for promotion to the executive ranks in the future. Many jurisdictions have people on the payroll already that can provide this level of support to you, if you know what to ask for, and what to expect in the way of a product. You might even consider it as a prerequisite for hiring Crime Analysts. If such resources are not available in-house, you might also consider creating an internship program with local colleges and universities that can provide students that would appreciate the opportunity to conduct such meaningful work in your behalf.

I trust that this article has been of some value to you in thinking on a higher plane and that it sparks an interest in applying advanced reasoning and modeling within your leadership style. It is a journey we all endure and which takes time and patience to perfect. JusticeAcademy.org greatly appreciates your continued support.