COLLEGE QUALITY, STATE STANDARDS, AND DOMESTIC VIOLENCE: USING SYSTEM DYNAMICS TO GUIDE PRACTITIONERS TO "BETTER QUESTIONS"

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Conventional thinking suggests that an academic team of an oceanographer and a religious historian have little useful role in conversations with school administrators searching for answers around the financial and human impact of new state-mandated graduation standards, with college administrators over enrollment and financial management concerns, or with criminologists seeking to stem the tide of domestic violence. Recent experience, however, suggests otherwise. Our use of a full range of systems tools has been enthusiastically embraced by practitioners to productively wrestle with "mental models," to illuminate core issues traditionally overlooked in the conventional definition of the "problem," and, ultimately, to forge a better collective understanding of the factors and relationships which affect their "systems." Positive, productive, and expanding collaborations reflect a conscious desire not to assert expertise or provide answers but rather to build a productive framework within which to challenge experts to identify and contemplate "better" questions.

A common starting point for engaging practitioners asks, "What Stock(s) is(are) at the core of your concern?" This launches discussions about the system's behavior over time, distinguishing the "real" from the "perceived" and "historical" experience from the "future" expectation. Behavior over time graphing, while seemingly mundane, yields tremendous insights into differing mental models: their components, boundaries, behaviors, scales of measure, as well as time frames.

We can then guide the conversations smoothly into simple causal loop diagramming and, more powerfully, into simple stock/flow diagrams. It is, at this level, that unforeseen stocks and relationships can raise questions typically ignored in conventional problem-solving. Facilitation of a discussion involving college administrators thus came to center on a stock of "perceived quality" which transcended the traditional boundaries of finance and enrollment.   In the case of state-imposed learning standards, a stock of "newly designated student non-achievers" focused an insightful discussion of unforeseen personal as well as financial costs. Finally, in discussions with academic criminologists and social-service providers in the field of domestic violence, identifying two stocks, "perceived male privilege" and "his new incoming control" literally redefined how discussants conceptualized the "problem" of accelerating rates of violent behavior.

The model of Jay Forrester, challenging experts in a variety of fields--engineers, urban planners, economists and, most recently, educators, to use the tools of system dynamics to alter the "habits of mind" is one which resonates deeply with us. Our experience in working with practitioners in fields remote from our own specialties, by deliberately refusing to provide answers but by guiding systemic reconsideration of the issues and in identifying better questions, underscores growing opportunities for system dynamics to find its way into a variety of new arenas and, if properly exercised, for engaging the experts in exploring some "better questions" for the 21st century.

Introduction:

Educators with whom we primarily work speak of "teachable moments" when a particular situation or question renders students especially responsive to learning. Having had occasion over the past two years to engage experts in fields far different from our own in extended use of systems tools to reconceptualize their thinking, we have become particularly attuned to a common set of situations and questions which facilitate "teachable moments." Our intent here is to share our experiences and, as you might expect from a team comprised of two academicians, one a scientist and the other an historian, to retrace our steps and highlight the common approaches and common themes used in all three instances while also acknowledging some of the humanistic elements associated with our uncommon interactions with experts far outside our own fields.

We begin by citing a common aspect of the three scenarios which captured our initial attention. Each scenario involved an immediate crisis and a proposed immediate solution which underscored little, if any, appreciation for the dynamics associated either with the rise of the crisis or the proposed solution. In the case of the educational reformer from Minnesota, concern focused on a new state-mandated graduation standard that had been recently passed by a state legislature reacting to public uproar following a report critical of achievement levels for its high school graduates. The crisis at our own institution, a small, poorly endowed college which relies on tuition as its primary source of income, revolved around diminishing enrollments which translated into significant financial shortfalls, and the proposal to spend more on marketing as the logical cure. Finally, conversations with an academic colleague, a criminologist who works with practitioners in the area of domestic violence, revealed a concern that a disciplinary

overemphasis on profiling the characteristics of male offenders seemed largely unresponsive to the practitioners' focus on the dynamics involved in repetitive offenses.

Experts within their respective fields, of course, possess enormous detail knowledge, and possess deep-seated "mental models" for how their systems work. What is significant, in each case, is that each was responsive to our first question, "How well do we understand the core dynamics generating the problem you describe?" That was followed by a challenge: Tell us the "story" of the problem using a behavior over time graph, identifying the key variable within the system. That seemingly simple challenge provoked some powerful discoveries. If, in the case of educational standards, the issue was student achievement, what exactly do we know about the changing dynamics of student achievement over the past 10 or 20 years? Has achievement shown a steady slip, or a sudden and dramatic fall, or, for that matter, do we have data that allow us to study achievement over this time frame at all, given changing curricula, tests, etc?

The problem was different in the other two cases in that data sets were more immediately recognizable. In the case of college enrollments and finance, the number of students enrolled at the college could be plotted on a graph, as could college finances. Yet a direct relationship could not immediately be ascertained: in some years, steady or even declining enrollment yielded higher income, in others, lower income. In the case of domestic violence, the largest share of information, drawing correlations between certain personal characteristics and the likelihood a male might become a batterer, is not dynamic and, as such, cannot really be plotted. What does lend itself to plotting on a graph, however, is an oscillatory behavior indicating that the rate of individual acts of domestic violence in a relationship accelerate over time.

A heightened interest in the dynamics of each respective situation led to a second question: "What Stock(s) is(are) at the core of your concern?" While admittedly simplifying the

system to what might appear to be a totally unrealistic level, the question challenges practitioners to reflect carefully upon the central dynamics with which they are most concerned and then highlighting the accumulation(s) associated with these dynamics.

In some instances, the challenge generated an immediate response. "Acts of Domestic Violence" was obvious, growing out of some level of "Anger" associated with perceived failings in the relationship (see later illustration); "Students Meeting the Current State Standard" was almost equally so, while, in the case of the college, a pair of stocks, "Enrolled Students" and "College's Finances" seemed to provide a useful focus.

At this juncture, we consciously focused attention on the ability of the identified stocks and their flows to address the dynamic storyline. What is significant is that the practitioners began to recognize the high degree to which their mental models were fabricated on static profiles rather than on a solid understanding of the dynamics through which circumstances evolve. When asked to attach flows to the stocks and, more significantly, connectors between stocks, substantial new questions evolved, powerful questions unfamiliar to each of the practitioners. To their credit, they were willing to address the questions and, in so doing, to move significantly away from their initial "answers" of how the system worked.

College Quality:

While the story of fewer students translating into less income seemed, at first glance, a comprehensive one, consideration of the dynamics associated with the stock of enrolled students revealed the necessity of looking closely at graduation rates. A simple stock/flow diagram raised issues about how students move through the system. In the case of graduation, disaggregating that stock revealed that irregular admissions (years with especially good or bad recruitment success) yielded significantly varied enrollment; one strong year, for instance, can boost

enrollment for 4 years; but can also, if not matched by comparable matriculation, lead to significant declines, when that class graduates from the student stock.
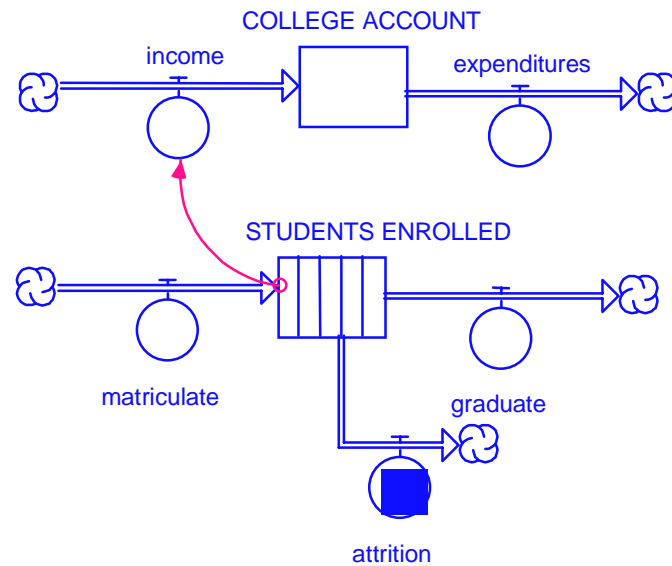
More dramatic, however, was an examination of the second outflow from the student stock, attrition. Significantly, amid all the impressive data collected by the College, persons building spreadsheets continued to use a constant rate for that attrition. Yet an examination of the data revealed that, in fact, there was significant variation, most dramatically in the recent past when attrition rates had risen significantly. That led us to consider, how do we ascertain who stays and who leaves? Everyone involved in the discussions agreed this constituted a "better question," requiring some rethinking of everyone's initial mental models.

While every individual student believes she has a unique set of needs that govern her decision, evidence indicates that students typically choose a college based upon relatively few factors that collectively define the college's "quality." Quality, as it came to be used in our conversations, referred to the College's ability to meet an individual student's needs expressed on a pair of axes: academics and living environment.
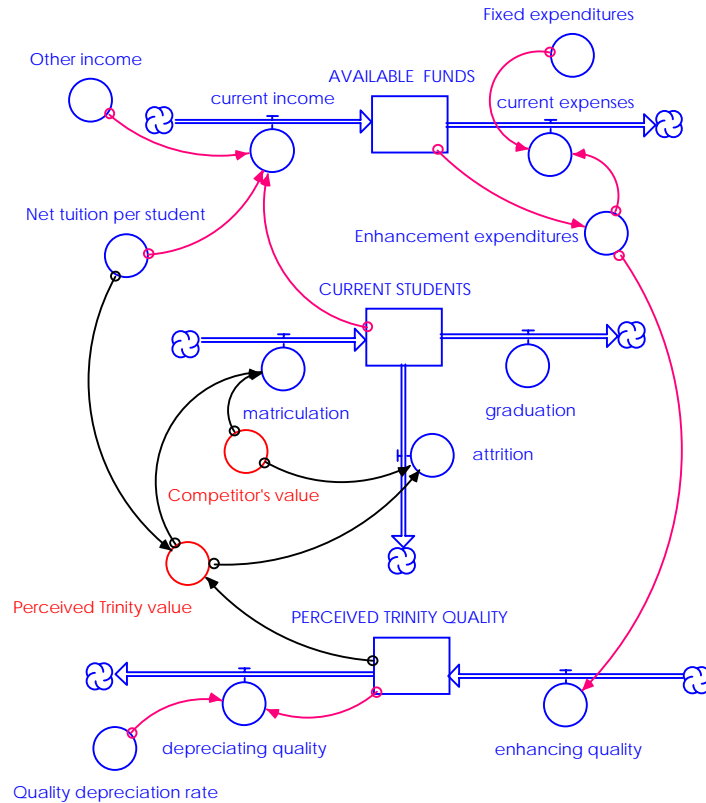
But quality, everyone agreed, does not stand alone but is merged with another factor, cost.

Tuition and fees, plus room and board, plus incidentals, less scholarships and other financial aid,

equal the cost for the individual student. Quality (or benefits) and costs combine for each student

to define "value." As all shoppers, prospective students work through a conscious or

unconscious cost/benefit analysis as they consider individual schools. Schools offering more

'quality' in their programs tend to cost more, but, as long as quality and cost both rise together,

the schools still represent good value. This value can often be further enhanced by schools with

significant non-tuition sources of income that can be utilized to support enhanced quality but

without adding to the students' costs.

Within any individual school today, however, wide variations in value may exist,

depending on the breadth of student needs and desires; the breadth of academic and living

options provided; and the breadth of financial aid offered, as many schools are differentially

discounting the costs for their desirable students through 'merit-based' scholarships. A school with a lower "quality" may be able to compete for students with a higher quality school by such price reductions, raising the first school's perceived "value" to a level more comparable to that of the higher quality college.

Our discussions led us to focus on a limited number of powerful questions:

• What is the breadth in "ability" of our student body and of the students we are trying to recruit?

• How does the college market its quality for each ability group (does the college claim to offer programs and services to meet the needs of each group)?

• What is the realized quality of the college for each ability group (does the college actually deliver the programs and services needed to meet the needs of each group)?

• What is the cost to the college to provide the programs and services to meet the needs of each group?

• What is the actual tuition cost for each ability group (how does the college distribute its tuition discounting across these groups)?

These discussions, in turn, guided us to develop a more comprehensive model which focused greater clarity on the dynamics associated both with student matriculation and attrition. Through the mapping out of key model elements, data collection now focused on defining levels of student ability, broken down both by admission test scores (SATs) and grades earned at the college.
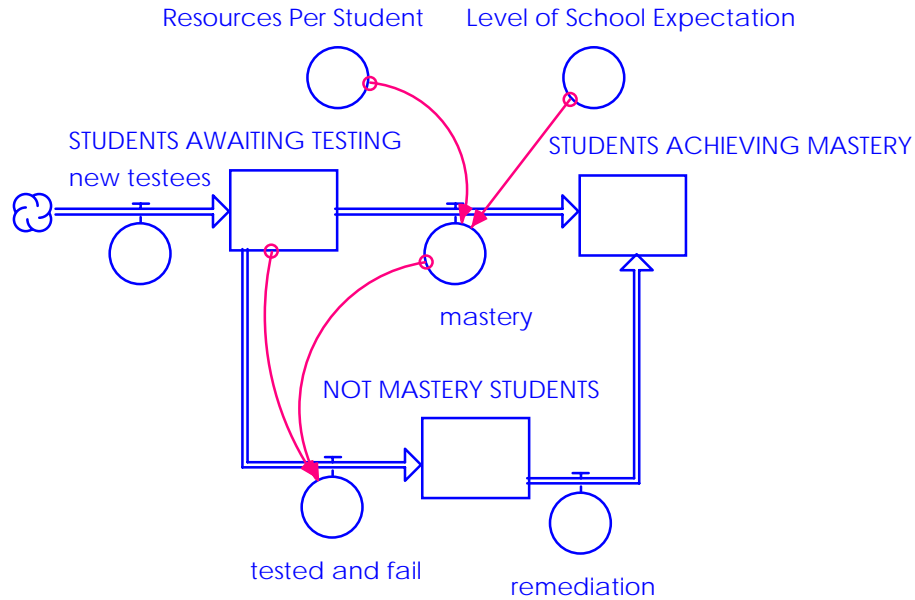
As we used the information to assemble a working model, the dynamics associated with the college's crisis began to become clearer. Over time, as student enrollments failed to grow at

a rate consistent with expenses, three patterns emerged. The first involved more aggressive marketing; the second, providing scholarships to induce students with higher SATs to attend, while the third, involved making up for student shortfalls by expanding admissions to embrace lower performing students. As a result, enrollments stabilized. However, attrition rates, delayed by a semester or more grew significantly. Why? Two likely reasons were suggested. One focused on a disparity or gap between marketed quality and real quality which led many to become disenchanted and leave. So, too, as the diversity of student abilities grew, teaching to some average level resulted in the alienation of many at the top (who were bored) and many at the bottom (who were overwhelmed. These discoveries, engaging administrators representing finance, academics, and admissions, opened up an unforeseen door for restructuring college planning and collaborating on alternative strategies for marketing and enrollment management. The conversation continues; and, ever-deeper and ever-better questions continue to emerge as we work through the layers of logic to refine this simulation. Whether we can find sufficient leverage to reverse the current trends, remains an open question.

State Graduation Testing:

The process unfolded in a similar fashion with our discussion on state testing. The initial mental model, translated into stocks and flows, involved students who took the test, those who achieved and those who failed. In the first iteration, the factors affecting the rate of student success were related to proactive stances taken by the school. At the simplest level, people's mental models suggested that the impact of a state examination would strike hardest on those schools whose traditional standards were low and/or those schools where poorer planning and/or poorer pedagogy yielded poorer results.

Resources Per Student   Level of School Expectation

STUDENTS AWAITING TESTING   STUDENTS ACHIEVING MASTERY

new testees

mastery

NOT MASTERY STUDENTS

tested and fail

remediation

However, as the discussion unfolded, a new question emerged: what about the reaction of students who, having throughout their careers been labeled successful, were suddenly designated as failures? Assuming their newly identified shortcomings could have evolved at any point during their education, how and what would it take to "fix" their problem and bring these people back up to speed? The conversation shifted to a discussion of resource allocation (depicted, simplistically, below). Presuming that the impulse to impose standards was accompanied by a perception that funding was improperly being used, the expectation would be that there would be no additional resources available. The requirement to meet tougher standards, however, which would redirect resources to remediation, would, as a consequence, lead to less resources for the remainder. Short-term problems, as such, would magnify over time. The final model, developed for use not only with teachers and administrators, but with taxpayers and school board members, allows all to see the relationships and tradeoffs that result from this particular mental model.
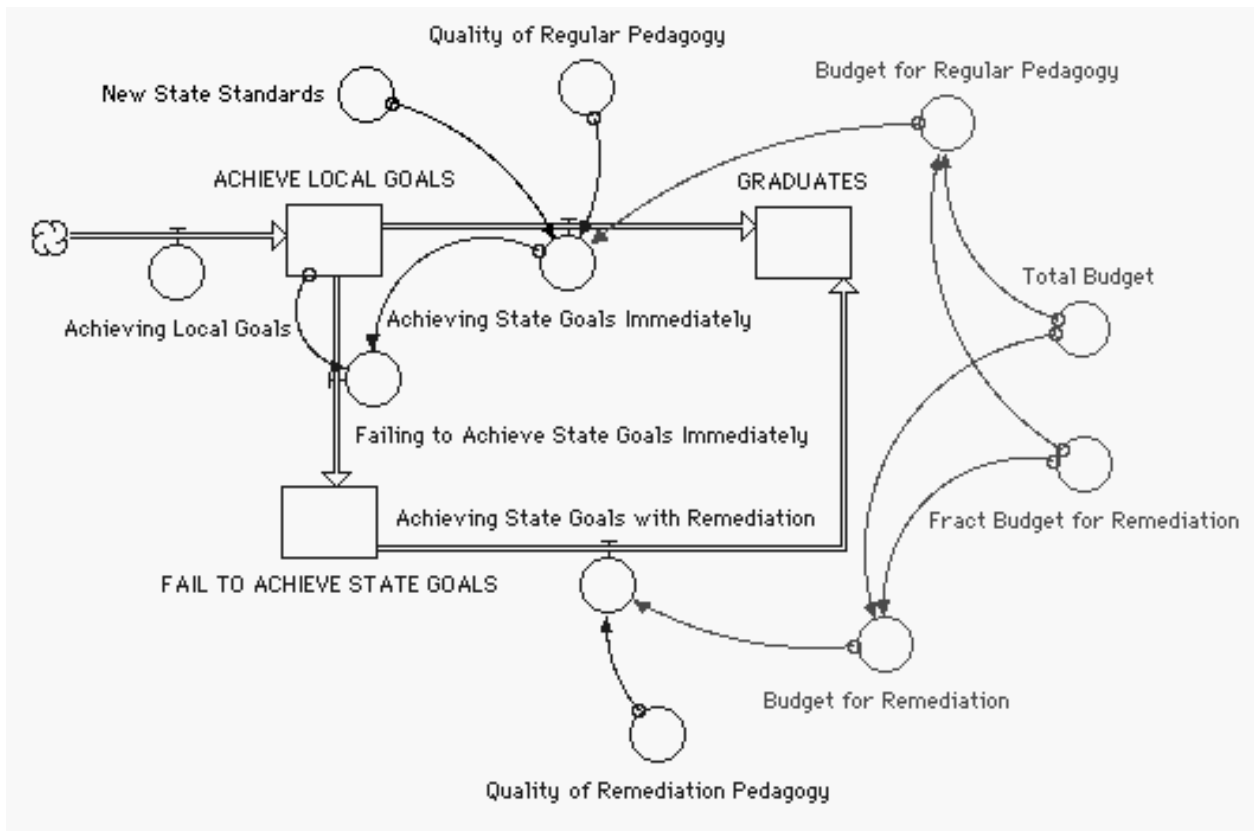
Domestic Violence:

The final issue involves domestic violence. After working with a faculty member in our Sociology/Criminal Justice program and deciding upon a relationship between acts of violence and anger (see illustration), the conversation opened to include practitioners in the field.
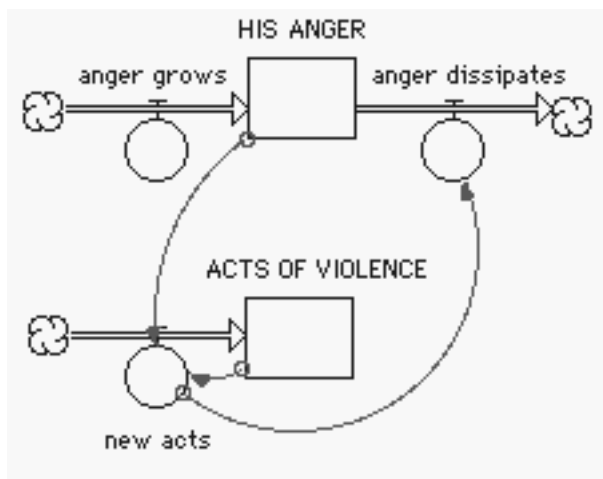
Two, in particular, pointed out that many of the males with whom they worked exhibited little or no anger. In this domestic violence scenario, the idea that anger grew, then was dissipated by an act, then grew again, made wonderful sense and, indeed, reflects part of the accepted dogma in the field. When clearly expressed as stocks and flows, however, the weakness of that mental model was exposed and opened for improvement.

If not anger, then what? Examination shifted to greater clarification of the couple's relationship. A significant breakthrough involved the recognition that, even when a male had seemingly absolute control over a women in a relationship, he was still likely (and, in many cases, more likely) to lash out. Why? Was it the total accumulation of power or the flows or shifts of power that was critical? Clearly, it appears to be the latter. It seems that he can sometimes perceive that, as she conforms, she is thus exerting significant control over him too. In other words, he can perceive that she is conforming in order to control his behavior. This perception may anger him as well. This dynamic may help explain the commonly-known phenomenon that she cannot win in these relationships -- even if she does exactly what he says he wants, she is still at risk. For all involved in the discussion, this constituted a significant conceptual "aha" or breakthrough.

Further consultation with other professionals who work with batterers and victims led us to recognize that, in addition to an actual sense of male privilege (based, in part, on traditional male dominance in class, education, occupation, and other factors), there is a powerful perception of privilege which we defined as an important stock in this model. When their sense of male privilege is threatened, whether from within or from outside the relationship, they may feel both the need and the right to defend or re-establish that male privilege, with violence, if necessary. This stock of perceived male privilege grows and diminishes throughout each day.

According to many batterers' reports when in counseling sessions, its perceived growth and loss is a key factor in the dynamics of their decision to batter. As we thought more about this aspect of batterers' lives, we realized that the "list of characteristics" (or correlations) which are commonly associated with batterers (experience with battering as a child; beliefs/attitudes favoring violence; drug/alcohol abuse, etc.) may in fact not be the most effective "leverage points" for intervention. In fact, the fluidity with which a male's perception of his level of privilege changes may make this a more effective intervention point.

Our conversations have brought us to a point where our heterogeneous group consists of an academic criminologist and three practitioners, one who works with battered women and the other two who counsel males who have been identified as batterers, along with the two of us facilitating the system dynamics elements. We now have a map to identify what we perceive are the major dynamic elements which illuminate male repetitive battering behaviors. Our conversation focuses on "GAPS" or disparities between his (the batterer's) ideal or desired world and his perceived world. These, we suggest, generate an internal "need to act." At its base, what are the factors which shape this need? Consider:

a) in terms of his relationship, the "GAP between his real and ideal control"

b) in terms of his outside "world," the "GAP between desired and perceived real entitlement.

c) and, as a moderating or, alternately, accelerating component, his "coping skills" or personal characteristics which allow him to deal with obstacles and frustration in non-violent ways.

Yet, even when the profile AND the need exist, we must consider another factor: the degree to which there are "Deterrents or costs of an initial act." Evidence here suggests

that his "actual entitlement level" may be related to how effective socially generated

deterrents may be.
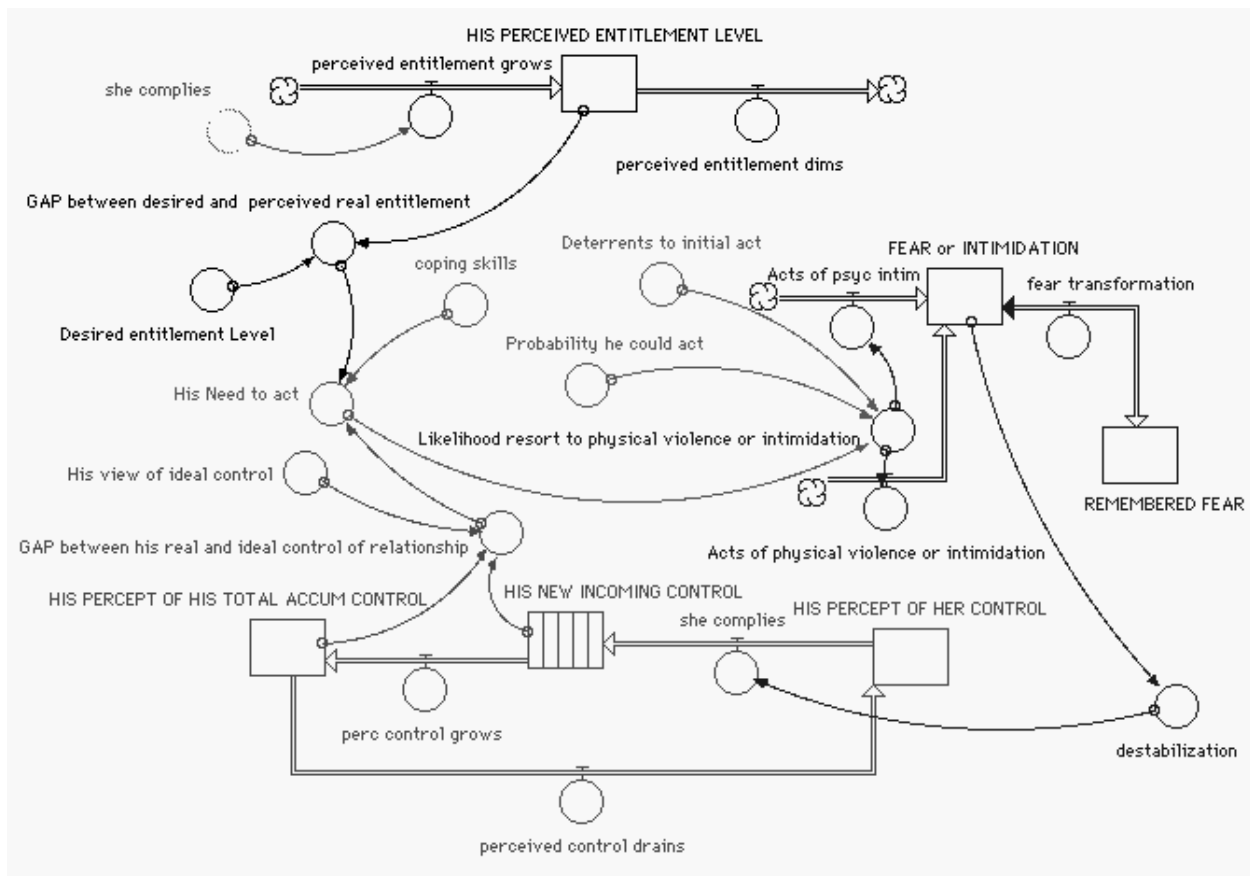
Finally, this discussion led us to consider that her level of "FEAR or INTIMIDATION"

is critical to the equation as well, in that high levels of fear generally lead her to comply with

his desire for control in the relationship. After she has been subject to psychological and/or

physical violence or abuse, she retains a memory or a "Remembered Fear." This memory may

be revived after an act of violence or intimidation, perhaps only a small act of psychological

intimidation, which triggers remembered fear to "flow" into current fear. This fear, in turn, may

lead her to comply BEFORE an (or another) act of physical violence occurs.

Conclusion:

Our efforts in working with the three disparate groups have been both exciting and illuminating. In each case, the starting point was identical and purposely simple, exposing how well each expert could identify and communicate basic behaviors over time. The next step, identifying stocks and flows, once again emphasized simple and purposely incomplete or, in some cases, erroneous understanding of the key components and relationships within the system. Still, recognition of these shortcomings provided a new and powerful dynamic for engaging each group of experts to reconsider mental models and to open up to new and better questions.

Throughout our interactions, we consciously and forcefully insist that our roles as facilitators do not include finding "answers." If we can expose and communicate our mental models to others, open ourselves to the mental models and perceptions of others, we stand a good chance of recognizing and filling gaps in our factual or perceptual foundations and, ultimately, in becoming more adept at understanding how systems do and might work.