Quantophrenia

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A revised version of a paper delivered at a breakfast meeting debate organized by the IPAC Toronto Regional Chapter at Victoria College (University of Toronto) on November 18, 2008 on the general topic of measurable results and public policy. The kindness of Amanda Parr — the architect of this event — and the courteous intellectual provocation of my wise colleague Ralph Heintzman have been immensely appreciate, but they should not be tarred by association.
“If it cannot be measured, it cannot be controlled”
Lord Kelvin
“Not everything that counts, can be counted, and not everything that can be counted, counts”
Albert Einstein
“It is better to solve the right problem the wrong way than to solve the wrong problem the right way.”
Richard Hamming

Introduction

This paper addresses some concerns raised by Pitirim Sorokin some 50 years ago (Sorokin 1956). At the time, Sorokin was somewhat distraught by social sciences falling prey to all sorts of manias and foibles – mindless application of methods in use in experimental sciences to social sciences issues, sterile formalization, useless number-crunching, and the like – that were in danger of derailing socio-economic inquiries away from the purposes that had given rise to social sciences to begin with – which were to respond to une fringale de sens.

Sorokin’s book attacked a variety of pathologies, but spent two chapters on what he called quantophrenia.

It should be clear that Sorokin’s attacks were not directed at quantification per se. Quantitative methods have been used from times immemorial as a powerful instrument of reasoning. The problem arises when the use of such tools becomes the basis of a cult roughly captured by the motto that if it cannot be measured, it does not exist. Such a cult distorts the appreciation we have of socio-economic phenomena, and this mental prison acts as blinders that have toxic unintended consequences for public policies when they are shaped by an apparatus thus constrained.

Sorokin’s mise en garde has generated some prudence in the use of quantitative methods in most social sciences, as experience revealed the deleterious nature of this cult, and as it has become clear, over time, that crippling epistemologies generate governance failures (Paquet 2009a).

Public management (and management in general) have resisted for a long time this sort of contamination, but it has been infected by numerology in recent decades. Reading Chester Barnard (1938), Herbert Simon (1947) or Geoffrey Vickers (1965), one might not have anticipated that management studies would become obsessed by quantification as a result of the viral influence of operations research. But it has happened.

In this note, on the occasion of Ralph Heintzman’s subtle provocation, I only wish to reiterate the Sorokin message that some prudence is de rigueur in public governance.
Crippling epistemologies and policy pseudo-sciences

Quite sensibly, Sorokin ascribes the propensity to quantulate to some fundamental deficiencies at the philosophical and epistemological levels.

It all began with the quasi-theological fundamentalism echoed by words like objectivity or truth when they began to serve as reference in the mushy world of public administration. Under the influence of Emile Durkheim and others, it was argued that “les faits sociaux sont des choses” and that one should generalize the application to them of the sort of scientistic methods in use in the physical sciences.

This has percolated, after quite a lag, into the promises of the so-called policy sciences, erected on the model of management science. Those policy sciences are based on the presumption that public, private, and social organizations are directed by omniscient leaders who have a good understanding of their environment, of the future trends in that environment if nothing were done to modify it, of the inexorable rules of the game they have to put up with, and of the goals pursued by their own organization.

Policy sciences were and are starkly Newtonian. They postulate a deterministic, well-behaved world, where causality is simple because the whole is the sum of the parts. Given the well-defined goals of the organization, and the more or less placid environment, the challenge is purported to be the design of control mechanisms likely to get the organization to where it wants to be. Many issues were and still are tractable with this approach, but most are not.

In the last few decades, the pace of change has accelerated, and the issues have grown more complex. Private, public, and social organizations have been confronted more and more with wicked problems (Paquet 1999: ch. 2). In this quantum sort of world, there is no objective reality, the uncertainty principle looms large, events are at best probable, and the whole is a network of synergies and interactions among the different parts of the system that is quite different from the sum of the parts (Becker 1991). To deal with these wicked problems, a new way of thinking about governing is required.

In this quantum world, nobody is fully in charge (Cleveland 2002). This has forced the governing system to evolve. It has been transformed (through a number of rounds of adaptation over the years) so as to accommodate the presence of multiple stakeholders, to respond to a plurality of groups in possession of part of the resources, the power and the information, and to provide the requisite flexibility and suppleness of action. The ultimate result of these changes is a multi-stakeholder governance system built on unreliable control mechanisms, in pursuit of ill-defined goals, in a universe that is chronically in a state of flux.

When dealing with such a universe in a reasonable and practical way, the scientistic apparatus proves pretentious and inadequate, and Fukuyama (2004) could recently refer to the black hole of public administration without generating much outraged reaction.
In this world of small g-network-governance (that has replaced the world of top-down big G-Government) – labels that apply equally well to organizations in the private, public and civic sectors – organizations govern themselves by becoming capable of learning both new goals and new means as they proceed. This can only be done through tapping the knowledge and information of all the citizens but also by ensuring the collaboration of members of the organization that have a relevant portion of the resources, power or information, and by allowing them to invent ways out of the predicaments they are in (Sullivan & Skelcher 2002; McCarthy et al 2004; Parker & Gallagher 2007; Bradwell & Reeves 2008).

Such a governance system deprives so-called leaders of any illusion that they have a monopoly on the governing of the organization. For the organization to learn fast, everyone must take part in the conversation, and bring forward each bit of knowledge and wisdom that he or she has that may have a bearing on the issue (Paquet 1999, 2005). We are in a world of governing by experimenting and prototyping, of "governing by learning" (Michael 1993).

This process of social learning requires new governance structures (more modular, network-like, and integrated informal moral contracts). Yet this is only one half of the learning process. The other half is the work of stewardship. Instead of building on the assumption that the leader is omniscient and is guiding autocratically top-down, the new distributed governance process builds on the critical dialogue with the stakeholders, ensuring that everyone learns about the nature of the problem, and about the consequences of various possible alternative initiatives (Paquet 2008b).

The citizenry learns in this manner to limit unreasonable demands; managers and administrators learn to listen and consult; other stakeholders learn enough about one another's views and interests to gauge the range of compromise solutions that are likely to prove acceptable and workable. The distributed governance process predicated on social learning builds on the answers to four questions posed to all stakeholders: is it feasible? is it socially acceptable? is it too destabilizing politically? can it be implemented? (Friedmann and Abonyi 1976; Taylor 1997).

This is the world of public policy in which the essential fuzziness of goals and targets and the essential uncertainty of means-ends relationships force the adoption of the social learning mode, a strategy of learning by doing, of learning by monitoring.

Whatever may be done to improve this process of learning must therefore be applauded: (1) the more outcome-oriented the focus of the conversation, (2) the more timely and performance-related the reporting/monitoring processes, and (3) the shorter the learning loops, the more effective the social learning process. It is not a matter of objectivity, truth, or testing of hypotheses, but a matter of experimenting, designing mechanisms, and disclosing and designing new worlds (Spinosa et al 1997; Paquet 2008a,b; Hubbard & Paquet 2009).
Words of caution about the quantophrenic cosmology

The public policy process as a social system is composed of three elements: structure, technology, and theory. The structure consists of the set of roles and responsibilities of, and relations among, the actors involved in this process - citizens, stakeholders, officials, etc. The technology refers to the tools used by these actors. The theory is the view held by members about the process, its purposes, environment and future. These dimensions hang together, and any change in one affects the others (Schon 1971).

The capacity to transform is a measure of the organizational learning: the speed with which the public policy process is able to ensure the requisite restructuring, retooling, and reframing in order to enhance its triple-E performance: effectiveness (doing the right thing), efficiency (doing it right), and economy (doing it Spartanly) while carefully maintaining due process and fairness, not only in the outcomes, but also in the very process through which these outcomes are generated.

One may usefully stylize the public policy process as a funnel – a funnel that ranges from a broad taking into account of the socio-technical environment to be regulated, through the mediating lenses of ideology, culture, institutions, and the structure of power, toward program definition, and service delivery.

The new quantophrenic cosmology has tended to simplify somewhat this very complex public policy process and to approach it in a rather parsimonious way: (1) by truncating the policy process and zooming on the sub-process of delivery of services, and (2) by focusing within the service delivery segment mainly on the way to clarify goals and to sharpen reporting/monitoring indicators to increase, through clarity and transparency, the efficiency of the delivery process.

This approach has undoubtedly proved useful in some cases at the service delivery end of the public policy funnel – for example, measuring how much time it takes to have cheques mailed and delivered, and improving this sub-process. It is less clear what this clarification/reporting improvement is contributing or may contribute at the other end of the funnel – i.e., at the environment scanning/policy formation end of the spectrum.

However, the prophets of the new cosmology suggest that the clarification/reporting improvements hold the key to much more than the simple efficiency of the service delivery. This approach will soon guide, we are told, the conduct of the different programs, and determine the appropriateness of the allocation of roles and relationships in programs. We are even promised that through an aggregation of these local and partial measures (as building blocks) soon will emerge macro-machines generating indicators of performance for whole departments, and even for whole provincial or federal governments. Indeed, there are already prototypes of such mega-models and mega-measures being developed in the bowels of the Treasury Board Secretariat. The tail we are told will soon wag the dog.
This ambitious new cosmology runs into difficulties: one danger, one seduction, and one quagmire.

(a) The danger of an overly sanitized stylization of the public policy process.

The new cosmology has boldly sanitized the public policy process. The goals are presumed to be known and certain, the means-ends relationships clear, and the business plans transparent. This stylization sideswipes many of the complexities of the multi-stakeholder power game that underpins much of public policy formation. It flies in the face not only of the day-to-day experience of any Ottawa watcher, but even of the stylization of the public policy process that is presented to would-be policy-makers by the official Canada School of Public Service (Smith and Taylor 1996).

The new cosmology excises the political haggling and the socio-technical milieu from the world of public management. This view of the public policy process tends to suggest: (a) the separability of the different phases of the policy process – policy formation, program design, and delivery mechanism; (b) the sacred nature of the Westminster model of government, and the consequent assumption that accountability to the Minister must remain untouched as the process is amended; and (c) the presumption that explicit detailed contracts are sufficient to ensure that the policy intended by the senior executives (political and bureaucratic) will be carried out. All this represents an idealized world.

When it is suggested that what may be gathered from examining the service delivery portion of the policy funnel carries results that may be regarded as generalizeable to the whole policy funnel, one may reasonably claim that it is a non sequitur. The production of useful but limited observations that are merrily blended into broader aggregates may not constitute meaningful syncretic summaries of the performance of a whole cluster of arrangements as they are based on the light generated by only a few flickering clignotants.

(b) The seduction of quantophrenia

The greatest appeal of the new quantophrenic cosmology is that it is not only built on an ideal-type of public policy as rational decision-making, and reductively focuses on service delivery, but that it is also a numerical model. Goals, targets, outcomes, and results are quantifiable, and performance indicators are to be computed to ensure that what has been promised can be compared to what has been realized. This is meant to bolster the legitimacy and credibility of the stylized policy process.

This numerical magic transmogrifies reality into a numerical representation, and performance into a set of clignotants. This fixation gives a false impression of certainty, and simplifies unduly a notion of performance that is essentially fuzzy. In fact, performance in public policy making is an essentially contested concept.
W.B. Gallie has characterized a whole range of concepts as "essentially contested concepts ... the proper use of which inevitably involves endless disputes about their proper uses on the part of the users" (Gallie 1964:158) and he has identified five conditions for a concept to be essentially contested. According to him, it must be (1) appraisive, in the sense that it accredits some kind of valued achievement, (2) this achievement must be complex in character, and its worth attributed to it as a whole, but (3) variously describable in its parts, with the possibility of various components being assigned more or less importance, and (4) open in character to the extent that it admits to considerable modification in the light of changing circumstances; moreover, to qualify as an essentially contested concept, (5) each party must recognize that its own use of the concept is contested by other parties, and that the concept can be used both aggressively and defensively (Gallie 1964:161).

A good example of such a concept may be "championship" in a sport like figure skating, which can be judged in a number of different ways, with differential attention being paid to method, strategy, style, etc.

While the massaging of numbers probably provides much intellectual satisfaction to massagers, the process easily degenerates into an exercise in the management of a numerical representation of reality, rather than the governance of reality.

Again, it must be restated that there is nothing inherently wrong about quantifying anything that can meaningfully be quantified. The downside of the quantophrenic cosmology is underlined when quantification is a camouflage, or verges on being a mystification, because it is used to sweep under the carpet unpleasant (because tractable with great difficulty) issues while focusing attention on a reductive vision of the policy process. This is not unlike the pretenses of those naïve psephologists claiming to give an adequate account of politics and political behavior through counting votes, or pretending to build meteorology “on elaborate computations of the flutterings of flags” (Andreski 1974: 132).

(c) The quagmire of performance evaluation

This sacralization of numerology generates a real danger that such an ‘essentially contested world’ might trigger whimsical measurements and perverse adjustments to them. Scoreboards and social indicators of performance become the dimensions steering the game, agents adjust their behavior accordingly. And since whatever sets of indicators are chosen are bound to be partial and imperfect, social learning may be misguided, slowed down, or even derailed.

These numerical indicators are bound to attract the attention of auditors, and can steer organizations in unproductive ways, whatever the fragility of such indicators. This has been observed most dramatically in the world of ‘phynance’ (so spelled so as to remind all of its shamanic quality) where failing to meet quarterly sales or profit forecasts can generate disastrous results whatever the soundness of the organizations from an economic point of view.
It is therefore crucially important not to fall prey to indicators-for-the-sake-of-indicators, nor to be tempted to use them in complete isolation from the array of other evaluative instruments available, which, although more evasive, have had a reasonable track record at guiding the learning of organizations.

The graft onto the public policy process of a battery of performance indicators, and of a gross and imperfect monitoring protocol, without the complementary change in organizational culture to ensure that the appropriate degree of skepticism is attached to such indicators, will not produce a dramatic improvement in the process of social learning. Certainly, improvement does not automatically follow.

**The crippling potentialities of quantophrenia**

Quite clearly, the quantophrenic cosmology is quite reductive in its approach to the sort of inquiry reasonable public policy formation requires. Undoubtedly, there have been benefits derived from some of that work. Yet we have no clear appreciation as to whether the quantophrenic experiments carried out over the last decades have generated reasonable costs-benefits ratios.

The cynicism that has surrounded such discussion can best be captured by a crude comment made in yesteryears about PPBS – Planning, Programming, Budgeting Systems – the mother of all those quantophrenic experiments – launched in the 1960s in Canada (Balls 1970). The perplexing question in Ottawa in the early 1970s was – is it more PP or more BS? A less crude way to put this matter is that the general agreement in Ottawa (except among the operatives) was that the costs of this experiment had been greater than the benefits.

It would be nice if one could establish the necessary and sufficient conditions to ensure that the quantophrenic perspective would yield all the benefits attached to better marksmanship (for there are many) while avoiding the important distortion-generating impacts mentioned earlier. Unfortunately, one cannot define such necessary and sufficient conditions. One may, however, at the very least, identify a few major sources of concern.

(a) uniformization in the face of pluralism and change

In a world that is pluralistic and continually evolving, one of the great dangers of formalization and quantification is the tendency for measures of central tendency to evolve into standards and norms that are applied across the board in the name of uniformity. These uniform standards have quite differential impacts on differentiated publics, and tend to acquire a certain degree of non-negotiability over time. Indeed, it has been shown that such measures tend to foster centralization and that such a propensity to impose uniformity does result in effectively balkanizing the country (Migué1994).
The uniformity frenzy coupled with the egalitarian ideology (Kekes 2003), the folly of accountabilism (Weinberger 2007) and the passion for transparency (Bennis 1976) amount to a very toxic potion. Vibrant dynamic conservatism ensues, and extraordinary disinformation in arithmetical garb often mauls citizens into catatonic states where common sense and the fundamental argument easily get lost.

(b) steering effects

We have mentioned earlier the steering effects of perverse incentives. The fixation on certain metrics to measure the performance of manpower agencies (number of job placements) or police forces (number of crimes resolved) and the like has led such agencies to redirect their action away from difficult tasks (the placement of long term unemployed or the effective resolution of crimes) into activities that would simply make the organization look good according to the metrics in use: getting involved in routine hiring or the practice of plea bargaining with criminals to get them to admit to other crimes in exchange for reduced penalties. Metrics have often become powerful slogans (Schrage 2008).

(c) MAF as an innocuous illustration

The incentive for the regulatees, faced with such numerical targets that must be met if one is to escape blame from the regulators, is to indulge in deception and lies when they realize that such numbers are often in the realm of the unverifiable.

In a recent series of breakfast meeting with executives of the federal public service (providing a safe space for discussion of taboo topics) I was not as astounded as some colleagues to hear about the world of MAF (the Management Accountability Framework) of the Treasury Board Secretariat.

Originally, the intention at the Treasury Board Secretariat was to gauge in a very rough way (1) whether the service provider were satisfied with their job, and (2) whether the citizen was satisfied with the service provision. It was felt that if both parties felt satisfied, it might provide a rough gauge of quality.

However when the quantophrenic enterprise was finished with this simple effort at providing a guesstimate, a framework based on 10 inter-dependent expectations, 10 series of indicators meant to convey the breath and meaning of the expectations, and 10 series of measures meant to assess the progress toward the objectives described by the indicators was in place. Responding to such requests has become a fairly demanding task, and the MAF scores have been used not only as record of what is but as a basis for evaluation and blaming, and to define what ought to be.

In a moment of candor, one participant confided that upon being chastised for having poorly maffed, and being compared poorly with another department that had maffed quite well, he felt quite surprised since he had worked for years in the other place, and did not feel that they were performing that well. Upon subtle inquiry, it turned out that the other
department had simply cooked up the numbers. And since the central bureau is flooded with such masses of numbers, it has no way to check, and the whole system becomes an invitation to deception.

(d) the unintended costs of quantophrenia

It is difficult to measure the unintended costs of quantophrenia, in the same manner that it is difficult to measure the unintended costs of the demoralization of the federal public service as a result of Gomery. Yet the fact that it is difficult to measure them precisely does not mean that such costs do not exist. The most important costs are obviously the result of a redirection of the efforts of the public service toward meeting artificial targets rather than doing their job with the maximum effectiveness, efficiency and economy through making the highest and best use of their judgment and imagination. This leads to a form of reification of the burden of office, and to the development of ever more clever methods to generate good metrics rather than doing a good job.

One may easily gain a sense of the momentous sums of waste generated by enforcing the rituals focusing on formalizing and quantifying that has been in good currency for years like personnel performance reviews. Samuel Culbert (2008) has suggested that one might usefully get rid of such perfunctory performance reviews, and develop rather more iffy and less easily quantifiable performance previews based on conversations designed to determine what an employee needs in order to be able to deliver what is expected of him or her.

Another important cost of the quantophrenic cosmology is the so-called Goodhart effect – a phenomenon akin to the Heisenberg principle that suggests that quantifying transforms the world it tries to measure. Hoskin (1996:265) has suggested a formulation of the Goodhart effect along the following lines: every measure which becomes a target becomes a bad measure. This is so because the calculative fantasies of managerialism transform the environment into which they are introduced. Individuals and organizations come to think of themselves as auditees, and quantification distorts the character of the universe to which it is applied (Shore 2008): its effects are irreversible and generate a fixation on the metric rather than on the creativity and initiative that any practice requires.

Getting results may be the explicit goal mentioned or pursued, but numerology transforms the very notion of what the goal is, of what the organization is about.

In order to engage stakeholders in action to eliminate or attenuate the malefits engendered by quantophrenia, it is not sufficient to denounce the quantophrenic perversion. One must provide an alternative cosmology, one less mesmerized and polluted by numbers. Otherwise, many stakeholders may not be willing to reconsider existing practices because they feel that some form of monitoring and performance-enhancement mechanism is necessary.
The ergonomics of the public policy process: focus on affordances

One alternative is building on the basic idea of ergonomics that “physical and cognitive affordances can help people to think about, know and use something more easily and to make fewer errors” (Rao & Sutton 2008). These are concrete ways in which one draws attention to the problem to be solved and provide easily learned and implemented tools that tend to generate a context that affords ‘action possibilities’ and not others.

The context has affordances that individuals and collectivities perceive or learn to perceive. Learning to perceive affordances is a key kind of perceptual learning (Gibson 1982; Norman 1999). But “affordances are not fixed properties: they are relationships that hold between objects and agents… to discover and make use of affordances is one of the important ways” to deal with novel situations (Norman 2007: 68-69). Learning to perceive affordances better or developing ways to improve such perception is the substance of social learning, and is at the core of innovation and innovative design.

Consequently, one can and should see the development of affordances as simple ways to lower the costs of thinking, to focus the mind and attention on key issues, to make sure that best practices and key ideas are communicated to neophytes in ways they can understand and apply.

A good example of affordance is the checklist of things to verify used by pilots before taking off: an idea that would appear appallingly simplistic to policy-makers or university professors. Yet, as Steven Tremain (quoted by Rao & Sutton) would say: would you board an airplane if the pilot were to be overheard saying “I don’t use checklists. I have been doing this for 20 years”.

How many lives could be saved or policy failures avoided if the health care system and the public policy community were to emulate the aviation industry on this front. We already know the answer to this question from recent studies that have shown the extent to which such simple affordances as checklists in operating rooms have generated momentous improvements: “death rates fell overall by more than 40 percent and major complications by more than a third” (Priest 2009: A4)

The intent is not to provide a general ergonomics template for the public policy process in toto. This would be a futile effort. As Weick and Daft (1984) have shown in a classic article, such big daunting problems are discouraging because they seem to pose insurmountable challenges. Consequently it leads many to do nothing.

In fact, such big problems must be reframed as a series of smaller problems that can be tackled through concrete and manageable steps – issue domains and the like. Yet, one may suggest a list of areas calling for the development of affordances in the different issue domains in public policy.
First, there is a need to name the issue of interest. Naming (as many activists know) has the great merit of making the issue more tangible, and to focus attention and energy on what the issue name has identified as of prime importance.

Second, an enriched evidence-based exploration of the issues grapples with “evidence” wherever it is, and whatever form it might take, and is not restricting itself to hard material or quantophrenic evidence. It also takes into account intentionality, frames of reference, belief systems, and culture to the full extent that these realities impact on the issue at hand.

Third, a refurbished mindset would put a premium on the highest and best use of imagination, experimentalism and serious play in the exploration of promising avenues for the design of viable responses to difficult situations. In that sense, it puts at the core of its inquiries an explicit social learning machine. The issue must not only be properly contextualized, but also subjected to a probing that attempts to make explicit the partiality of the frames used by the different stakeholders in order to generate the requisite blending and blurring of frames that allows fruitful multilogues (Sabel 2001). This calls for a certain process of reconstruction: not only searching responses to the original questions, but wondering whether the original questions are the most useful ones, and exploring ways in which such questions might be modified, transformed, reframed.

At the core of experimentalism is prototyping. Prototyping means (1) identifying some top requirements as quickly as possible, (2) putting in place a quick-and-dirty provisional medium of co-development, (3) allowing as many interested parties as possible to get involved as partners in designing a better arrangement, (4) encouraging iterative prototyping, and (5) thereby encouraging all the stakeholders, through playing with prototypes, to get a better understanding of the problems, of their priorities and of themselves (Schrage 2000: 199ff). The purpose is to generate creative interaction between people and prototypes. This may be more even more important than creating a dialogue between people. It is predicated on a culture of active participation: a democratization of design and the sort of playfulness and adventure that is required for serious play with prototypes.

Fourth, this new mindset is meant to be transformative. It does not propose an exercise in hypothesis testing but a commitment to entering a process of inquiry with a view to transforming the context that has led to the emergence of the thorny issue (Chait et al 2005).

The traditional approaches, focused on attempts to falsify hypotheses about some objective reality, have generated too narrow a focus. For the social practitioner, what is central is an effort “to create a wholly, new, unprecedented situation that, in its possibility for generating new knowledge, goes substantially beyond the initial hypothesis” (Friedman and Abonyi 1976:938). This in turn calls for a different notion of “success” or “failure” that goes much beyond those in use in the usual physical-science-based process.
Conclusion

This paper underlined the foot-binding effects of quantophrenia. It has tried to exorcise the futility of the quest for certainty through quantification, but, it also has also bemoaned a major loss ascribable to the quantophrenic frenzy: the loss of the centrality of experimentalism and social learning in most non-trivial aspects of public policy.

Far from being a panacea, quantification may be a bane especially in the world of Kahneman and Tversky (1979) in which it has been shown that ‘objective’ results are elusive: when a slight change in the framing of a question, based on the same quantitative data, can generate very different responses even from experts in the field, it is clear that the pretence of absolute illumination by quantification is untenable.

Consequently, unless auxiliary conditions are in place to ensure that the requisite social learning remains the main driving force, reification, distortion and mystification will ensue (Paquet 2009b).

My main message is simple: prudence is de rigueur.

A better way to summarize this message might be to borrow this phrase from Joseph Tussman, and suggest that it be inscribed at the top of the screen on the computer of all the would-be quantulators… something that would remind them of the state of mind they have to maintain

“… the state of mind of the magician who tremblingly invokes the powers he would use, knowing that if he gets the ceremony wrong what he invokes will destroy him. Neither romantic nor puritan, merely sensible” (Tussman 1989:25).

References


W. Bennis, “Have we gone overboard on the right to know?” Saturday Review, June3, 1976, 18-21.


