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A Conflict Analysis Methodology for Formulating Security Policy and Strategy

by Salvador Raza

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ABSTRACT

This work proposes a conflict-analysis methodology, supported by a solid conceptual framework for formulating security policy and strategy. The differential in the methodology, already successfully applied in several countries, lies in a sophisticated deconstruction of the decision-making environment along seven axes of analysis and its subsequent reconstruction, while simultaneously developing trend projections, to identify the critical dynamics of areas of insecurity. The methodology was developed to be applied collaboratively by specialists in the various fields of expertise connected with security, and is easily adaptable to each country's specific policy and strategy-making practice.

Introduction

There is no irrefutable limit to the scope, scale and reach of security, nor is there a way to ensure an equitable distribution of its effects and consequences. Nevertheless, we are forced to problematize security matters either to prevent conflicts or to manage the transition towards non-conflict situations, in a world in which new types of product, process and information technology are ever-faster propelling the structure of uncertainties away from the conditions and ways in which defense communities try to meet likely security demands.

Attempting to provide a scientific basis for problematizing security is bound to fail. Security problems are classed into the category of complex evolving problems, and science has not yet developed strict criteria for structuring such problems in this category, which contain all those occurring within the fabric of society, where plausible responses are built within political dynamics.

Reforming security systems to deal with complex problems is an admittedly controversial matter[1]. Currently employed approaches to determining demands for security reform prescribe three procedures:

(a) objectifying the state desired as a result of the attainment of national interests;

(b) demarcating a perceived set of threats to this achievement that limits the scope of the security goals set out in the previous process, and

(c) assessing the gap between the state desired in the process (a) and the restricted environment in which it is planned (b).

These approaches have failed to support policies being designed to deal with the real structure of causality in insecurity. The weakness lies in the need to stabilize ("freeze") the insecurity differential so that currently practiced methods can be applied, which means that policies are always designed to deal with a past situation— reactively—whereas the security environment is evolving dynamically at every moment, potentially (and in practice almost always) being completely different, before the process of implementing policy has even begun.

This work proposes a two-pronged methodology in seven analytical dimensions towards a problematization of security, identifying critical variables and their causal relationships, with a view

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[1] For a wide overview of the problems with reforms in the security sector, see http://www.ssrnetwork.net/topic_guides/general_te1.php

to contributing towards the creation of policy and strategy that are dynamic and simultaneous with developments in the environment from whence the problems emerge.

The hope is to provide a modernizing reference in analytical procedures for government institutions and agencies involved in the complex and important task of providing security, principally in our Hemisphere, where many countries, emerging from periods of relative conceptual immobility, are making quick progress in constructing their own procedures and processes to enable them to build a better peace.

The problem with security problems

The policy and strategy-designing process, understood as the "construction of integrated systems of decisions"[2], must guide the achievement of an expected result, identifying and prioritizing suitable, practicable and acceptable paths for resolving expected uncertainties and resistances to achieve this result. The process seeks to incorporate learning mechanisms for prompt correction of both the purpose and the paths for its achievement, resolving unknown or irresolvable uncertainties and resistances[3] at the planning stage.

There is a problem—the object of policy and strategy formulation—when three conditions simultaneously pertain: (1) there is a purpose, (2) the elements that define it are classified as in a given area of application, and (3) the state of these elements or the condition of the desired relationship between these elements has not yet been dealt with. To problematize is to classify the purpose, the things that define it, and to determine how wide the gap is between this purpose and the current state of affairs.

Given this understanding of the problem, a condition for meeting (or knowing) the purpose of security and the state of the elements and relationships that define it, requires configuring security problems as complex adaptive problems, with three basic features: indeterminateness, specificity, and inexhaustibility.

Indeterminateness. It is not possible to establish a definitive, final assessment for a security problem. To fully assess the problem would require a full definition of all conceivable solutions to the problem, a logical impossibility given that the additional information required to fully understand the problem would require questions be posed that would depend on understanding the problem itself.

Let us consider for example what would be necessary to classify the nature of a problem generating public insecurity. As an example, we may consider the assumption that poverty causes individuals of a given social and psychological profile to use violence or the threat of violence, individually or in groups, or organized in gangs, to satisfy their needs and ambitions, generating a sense of insecurity among the population that looks on impotently for want of a police response to prevent the violence from turning them into victims.

Yes, perhaps! But in order to deal with poverty we must recognize that its causes are rooted in economics, or in people being unqualified for employment, which would steer responses to the problem towards educational alternatives, or to development alternatives, depending on the prevailing understanding in the analysis. Or we might consider that the cause of the insecurity derives from aberrant behavior, thus shifting the focus to a need for psychological treatment for people displaying potentially deviant behavior, which is subsequently associated with the capacity of the health system

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We broaden Mintzberg's conception of strategy to also cover that of policy (as regulatory rulings), seeing the difference between them in terms of the nature, instrumentality and function of their object. Mintzberg,, H. *The rise and fall of strategic planning*, London: The Free Press: 1994.
Adapted from Cyert and March (1963), apud Shimizu, T. *Decisã o nas organizações (Decision-making in organizations)*, at http://www.empresario. com.br/artigos/artigos_html/artigo_280700.html taken fromWeb site on 3 June 2010.

to provide the physical, financial and staff resources necessary to offer suitable care to this sector of the population, which in turn relates to the State's capacity to finance these programs, in addition to all the remaining programs concerning the necessary infrastructure to run the economy.

The value of the solution varies according to the sub-system of reference for developing performance criteria and the effects that this solution generates, unlike structured problems, are not independent or reversible. We cannot easily dismantle a railway built to carry strategic minerals (as an alternative to sea transport) after discovering it does not meet performance criteria. Once begun, many financial resources will have been committed and once its effects have begun the railway will affect the lives of thousands.

This effect of propagation and irreversibility of the effects of security problems is common in defense, large infrastructure projects and business projects. Decision-makers responsible for complex problems cannot experiment and then reverse the solutions they've implemented. There are no "test runs." All actions count as final.

Specificity. Every security problem is unique. There are no recurring security problems. Every state faces different security problems, so that successful or unsuccessful experiences, techniques or methods cannot be directly transferred from one case to another.

Defining security problems is subject to the limits of the system under analysis. To deal with the problem in all its ramifications we need to broaden the system. The larger the system, the greater are the number of cross-impacts between the system's components. Selecting the critical impacts defines the problem within the system containing those impacts. If we change the system or change the critical impacts, we need to redefine the problem.

A security problem is configured within the relationship between a purpose and a condition of the environment in which this problem is defined. The environment's conditions are established in contingent fashion by the current state of the variables, the relationships between the variables, and the relationships between these relationships, within a given field of possibilities. The environment's condition provides a reference for measuring the gap between the current state of things and the future state of events, or the purpose considered.

Inexhaustibility. The long causal chains that define the nature of the complex problems also explain why they differ from structured problems in terms of the fact we can not a priori know when we have found "the" answer or solution. In a game of chess, capturing the opponent's king determines the result, regardless of moves and strategies.

With complex problems there is no way to define where the causal chain ends, and so there is no way to define "the" right answer. Greater efforts, increased resources and more people will produce stronger, more comprehensive alternatives, but there won't always be more resources available, and a sub-optimal solution is not always conditional on more resources. The challenge is to always find an acceptable solution, efficiently using fewer resources than in previous attempts at dealing with the problem.

Judging a result as sufficient will always be contingent on the time allowed or useful, further subordinating the possibilities of a response to an interpretation of developments in a given significant segment of the structure of causality. But a complex problem may, in the end, have no solution that does not run counter to the system's current conditions. A conceptual solution cannot require X and not-X to occur simultaneously.

Brief overview of practices

In security, the risk is ever-present with policies and strategies approaching the "wrong problem" in the right way, or dealing with just a portion of the real problem. Ackoff[4], in discussing problems in formulating problems, correctly points out that identifying the real problem is a result of properly formulated hypotheses.

This is an important requisite, showing the need for analysis methodologies to include systematic critical reflection processes and mechanisms rooted in theory. Current conflict analysis methods provide a limited scope for recognizing the structural causes of real problems, providing a scarcely consistent reference for security policy and strategy formulation. None of the methods recurrently employed for security analysis explicitly, systematically and consistently include the question of formulating hypotheses at the core of the analytical process.

The Stability Assessment Framework method[5], for example, employed in Mozambique (June 2002), Rwanda (October 2002 and November 2003), and Kenya (October 2003) places emphasis on organizational requirements in facing security problems.

The Framework for Conflict Analysis method[6], developed by the UN in coordination with the World Bank, lays emphasis on identifying the players involved in the conflict and on organizations that can resolve said conflict jointly with the UN.

The Swiss Peace Foundation, in cooperation with the Austrian Development Agency (ADA), the Canadian International Development Agency (CIDA) and the Swedish International Agency for Development and Cooperation, for ten years developed and applied a method known as FAST, or Early Recognition of Tension and Fact-Finding[7], on the basis of an assessment of the factors promoting or inhibiting conflict development in the political, historical, social, economic and international spheres.

The World Bank uses the Conflict Analysis Framework[8] (CAF) method, which examines relationships between poverty and potential conflict, whereas the method used by the United States Agency for International Development and the Office of Conflict Management and Mitigation is the Framework for Strategy and Program Development[9], with an emphasis on motivation towards conflict, the mobilization and expansion of violence, institutional deficiencies, and regional factors.

Britain's Department for International Development (DFID) uses the method described in the publication *Conducting Conflict Assessment: Guidance Notes*[10] to interpret the structure and players involved in the dynamic of conflicts for the purpose of determining what international assistance the country considers it necessary to provide.

There are at least nine other methods developed by organizations with a global reach, such as the United States Institute for Peace (USIP), U.S. Department of Defense (DoD), the Fund for Peace, and the State Department. There are also a growing number of national agencies using capabilities-based methods. The multiplicity of methods contributing to central decision-making processes in these agencies and organizations demonstrate the importance of the topic. In each case, the methods are geared towards instrumental functions in the agencies for support, intervention, or promotion that developed them or systematically employ them.

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[4] L. Ackoff, Some unsolved problems in problem solving. Opl Res. Q.13,1-11, in R.N. Woolley and M. Pidd, *"Problem Structuring – A literature Review"*, *J. Opl Res. Soc.* Vol 32, UK, 1981. pp. 197-206.
[5] http://www.clingendael.nl/publications/2005/20050200_cru_paper_stability.pdf
[6] http://www.undg.org/archive_docs/5329-Comon_Inter-Agency_Framework_for_Conflict_Analysis_in_Transition.doc
[7] http://www.swisspeace.ch/typo3/en/peace-conflict-research/previous-projects/fast-international/about/index.html
[8] http://siteresources.worldbank.org/INTCPR/214574-11128835084/20657757/CAFApril2005.pdf
[9] http://www.usaid.gov/our_work/cross-cutting_programs/private_voluntary_cooperation/conf_conflict_assessment.pdf.
[10] http://www.dfid.gov.uk/Documents/publications/conflictassessmentguidance.pdf

The common thread among these methods is an espousal of the outlook that sees security problems as complex evolving problems, with an attempt to provide a suitable analytical treatment for problems of this nature. The problem lies in a shortfall in methods.

None of these explicitly or strictly states the reference analytical framework, in the form of a system of articulated concepts with their own assumptions that provide conditions for continuous critical assessment of the processes employed to generate, verify and validate the expertise and practices derived from this construct. Neither do any of them explicitly state having specifically designed a self-assessment tool, made available widely to all countries, centered on governability and public management needs, by means of policies and strategies that deal with the causes of dynamically-considered security problems.

Analytical framework

Policies are vehicles for transmitting the general directives and rules necessary to bring about an intended result in time, to its various degrees and in its various designs, enabling all parts of the organization to contribute to a shared effort, even where acting independently in a rapidly-changing environment.

Although this general description can be further developed, detailed or modified, there are no substantial discrepancies in the role of public policies: to maintain, reform or transform variables, or the state of variables, that define a state of security and/or the relationships between these variables and, further (or also), the relations between these relationships. The difficulties emerge, first, in understanding the mechanisms of action by which a policy generates its effects on the environment, developing and modeling self-regulating inferences and judgments to promote systematic and sustained formal changes. They also appear in assessing the axes of propagation of the chains of effects to be achieved.

The former difficulty concerns a security policy's formal requirements; the latter regards functional requirements. Formal requirements have a synthetic basis, while functional ones have an analytical basis.

Normative Components

To deal with the formal requirements, those designing policies and strategies define and integrate five normative components that must be displayed by the resulting products in fulfilling their decisions:

1. Defining the conditions in which they are applied, specifying the elements required for an autonomous unfolding of the initiatives authorized by the policy and achieved by the strategy.

2. Specifying the results to be achieved, indicating valid and invalid actions for their implementation by means of normative elements (goals) that simultaneously meet four requirements[11]:

Intelligibility: The connotative content of the goals must be clearly defined and presented in such a form as to create no ambiguities or doubts (that may lead to mistaken or tendentious interpretations). Intelligibility is crucial to the development of plausible hypotheses under conditions in which the State's capabilities are liable to be brought into play (scenario) and to enable an assessment of the results achieved.

[11]These requirements were originally set out in Raza, S. "Projeto de Força: o elo ausente em reformas de defesa"(Force Planning: the missing link in defense reform), discussed in a panel on Strategy and the Use of Force in the "Research and Education in Defense and Security Studies" Seminar (REDES), held in August 2002 in Brasilia, Brazil.

Purpose: The results to be achieved must form part of a chain of causality that points towards achieving security goals while the latter point towards national interests. The compatibility requirement is what ensures the link between strategies and results (aims).

Practicality: The goals must be achievable within practical possibilities, by means of rationally informed acts. This condition seeks to prevent the potentially damaging risk of goals being set beyond States' capacity to deliver, avoiding goals becoming just empty words, compromising security possibilities. The practicality requirement ensures the link between means and strategies.

Measurability: The results to be achieved with the goals must be quantitatively or qualitatively measurable. Non-measurable goals do not make it possible to assess how sensitive alternative capabilities are to changes in the security environment.

3. Specifying the scope of the authority of the institutions and individuals responsible for security actions, stipulating the authorized limits for possible decisions.

4. Detailing the criteria and metrics to use in assessing the results reached.

5. Defining procedures to employ for controlling and supervising the processes brought about by implementing the policies and strategies.

Formulating these normative components is the result of a collision between different perceptions and priorities imagined by the various players acting together in a concrete political scenario, translated into a concept which materializes imposing "compromise solutions" on the normative components of security to deal with the simultaneous presence of players with different functions to fulfill, each to some degree pleading for the achievement of their demands.

Descriptive Components

To deal with security's functional requirements we use the concept of "variety" that defines the distinct elements in a system, independently of their order of occurrence, that are necessary and sufficient to describe the essential features of the subject under investigation at the level of abstraction established for analysis.

Defining a system's variety marks out boundaries (establishing functional categories) between interrelated elements which, cooperatively, fulfill a given common purpose.

To establish these boundaries, criteria are necessary to identify the elements propagating security – that promote its continuous generation, spread and reformulation, as the system that defines it constantly evolves, while it defines itself and evolves jointly.

Employing concepts from Systems Theory, formulated by M. D. Mesarovic[12], that proposes a set of axioms to explain the general formal properties of the elements making up open systems by means of an analytical treatment, we may define seven axes of security propagation.

Each of the seven axes of security propagation designates a set of elements making up the environment, which submits to given criteria; each of these axes making up something like a portion of the system that can be seen as a whole in itself. The concept of arrangement brings with it the idea of recursion, the idea of a sub-system, in itself a system within a larger system. Thus, it makes it possible to cut back the elements making up a given axis and treating it separately, with a certain degree of analytical independence, having its contribution to the whole as a reference.

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[12]Mesarovic, M. D. *Foundations for a General Systems Theory.* New York: John Willey & Sons, 1964, pages 1-24.

Table 1: Axes of security propagation

Fields	Axes of security propagation
1.Technological	Increase in the Degree of Complexity
2.Political-Economic	Dynamically Supported Priorities
3.Energy	Controlling Degree of Autonomy
4.Social-Human	Comprehensiveness of Purposes
5.Geostrategic	Building Self-protection
6.Information	Enhancing Decision-Making Cycles
7.Environmental	Increasing the Flow of Diversity

Table 1 differentiates the fields of responsibility of these seven axes, which are set out below, without the order of their appearance having any significance in terms of priority, preference or value.

Axis of propagation in the Technological Field

Aside from techniques that create or limit the possibility of doing something to a required amount, or qualitatively better, the events in the technological security axis of propagation create conditions for the possibility of doing something differently to generate a better result, or otherwise to create the need for something that doesn't exist yet, but which, when available, becomes appreciated for the value it adds.

Technology's capacity for generating security appears as an accumulation of expertise instrumental in overcoming given forms of production and social relations, enabling the overcoming of the pragmatic-immediate. This leads the technological dimension of the security problem to deal with the capability to: (a) ensure the crossing of cognitive, cultural, and technical barriers, (b) perfect expertise, products, processes and systems, (c) develop innovative expertise, products, processes and systems to meet efficiency and effectiveness requirements distinct from those existing, and (d) conceive organizational environments that structurally integrate the conception of the new in all processes on all levels of action, both public and private.

This definition dismantles artificially constructed distinctions between product, process and information technologies, combining them into a single axis of propagation, classifying the nature of technology as a process for overcoming the states of security that it promotes at each historical moment, constructing and reconstructing commercial, industrial and agricultural production and public services standards as government and management practice advance in maturity. This enables the system to remain stably balanced as it progresses towards greater degrees of complexity by adjusting, modernizing, or transforming its elements, relationships and relationships between relationships[13].

Axis of propagation in the Political-Economic Field

Converting politically championed conceptions of security into pertinent sustainable development action plans requires mechanisms and rules with substance to construct criteria with which to overcome disputes on the efficient allocation of scarce resources on what, how and for whom to produce.

The area of sustainable security lends and applies non-contradictory concepts and arguments that inform the formulation of public and economic policies to shape these criteria, without transferring those decisions on what one wishes to construct onto the criteria for creating rules.

Then, questions and decisions on sustainable security are eminently political, informed by

economic criteria, concerning changes to existing power structures, development of new mechanisms for shaping political will, and resolving problems concerning efficient resource creation and allocation, particularly as concerns the use of shared resources, which are generally controlled by the State, and as concerns the removal of structural constraints in the process of creating the driving force to promote politically-sustainable economic and social development.

Axis of propagation in the Energy Field

The importance and significance for security of the impact of setting up energy matrixes does not bear simplifying. In the events leading up to the First World War, Britain had to decide whether or not to adopt oil as a means to fuel its naval transport. In guaranteeing security, converting the energy matrix from coal to oil proved a strategic move[14].

Oil doesn't deteriorate like coal, has a 78% greater yield and occupies 30% less volume in storage, enabling refueling on the high seas, increasing the strategic scope and the travelling speed of naval transport to conflict zones, and facilitating greater acceleration in tactical maneuvers. But to abandon coal in favor of oil meant abandoning secure energy sources that were abundant in Great Britain, and having to move onto ensuring continuous access to oil where it lay, in Persia. Winston Churchill convinced the House of Commons to adopt oil as a primary energy source for the British Navy, altering the course of 20th-Century conflicts.

The events defining the Axis of propagation of the Energy Dimension are harnessed to the design of countries' national energy matrixes; by their nature interlinking national security interests in a network of shared goals, which unfold in security and defense alliances, diplomatic agreements and other mechanisms for ensuring access to and maintenance of supply chains.

The Axis of propagation of Security's Energy Dimension covers all current and anticipated forms of energy use. These include potential accumulated energy in food, necessary to sustain life, widening the concept of Energy Balance, which supplies the national matrix with renewable and non-renewable energies. These cover: (a) the structure of the internal energy market (sectored supply and demand); (b) building up and changing stocks; (c) means of distribution, and (d) processes for waste and depleted sources recovery and treatment in value chains that extend to points of intersection and fusion with the chains developed in the remaining areas of security.

Axis of propagation in the Social and Human Field

The interlacing of social processes in security production and reproduction creates the necessary conditions to overcome a given historical moment. Security, while it is built by social relations, generates the conditions for overcoming patterns it has itself produced[15].

For each question answered for the social being by security, new needs are generated to overcome insecurity in pragmatic day-to-day life, determining all the remaining measurements, as this is a matter of overcoming the primordial relationship between man and nature.

In this sense, human security becomes a process for objectifying the social being in a praxis geared towards meeting its needs in the wider reach of its social relations. To meet them, various forms of mediation are created and recreated in man-man and man-environment relationships for the full exercise of citizenship in a context of the rule of law, creating stabilized relationships between

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[14]Yergin, Daniel. *The Prize: Epic quest for oil, money and power*. New York: Free Press, 1991. See: "Speed!", pp. 155-6.
[15]This approach reflects Lukáks' thinking on the centrality of work in defining the ontological statute that explains human nature. Although useful for the pragmatic composition of analytical variables, the methodology does not result in Marxist praxis or thinking, since Lukáks himself creates analytical categories that would favor the understanding of movement in the real and refutes the existence of either a theory, or of even an epistemology in Marx. For a more in-depth view, see Lucacs, Gyorgy. *Ontologia do ser social: Os princípios ontológicos fundamentais de Marx. (On the Ontology of social Existence)* Portuguese trans. Carlos Nelson Coutinho. – São Paulo: Ciências Humanas, 1979.

man and the social environment. Thus a perception emerges of security as the result and condition of possible praxis in the form of: (a) access to information sources and the possibility of expressing one's preferences and political and personal options; (b) the capacity to come and go and to organize in groups without risk to life or property; (c) self-regulated and self-sustained development of political and legal statuses that govern relations between individuals and capital, and (d) the possibility of progressing between levels of potential access to public and private goods and services to meet autonomously determined needs.

Axis of propagation in the Geostrategic Field

The geo-strategic field reflects dependency between national force planning and the strategic context of the national and international security systems. This context is permeated by a dense network of alignments of implicit or codified interests forged into alliances, arrangements and treaties, and other relationships not yet subject to regulation, where decisions to be taken give rise to new and specific situations for security[16]. In this context, force planning defines the potential capacity of defense capability arrangements in order to integrate material and human means, as well as those which are information-based and organizational, to execute defense tasks, according to previously specified conditions and with a given expectation of success.

These capabilities are planned to meet demands for the use of force to achieve politically determined goals. The nature of these capabilities—instrumental in the practice of violence under the authority of the State and the Law—define the powers that its components must assume, and limit their use under the guidance of political directives that draw from and are joined together in the network of alignments making up the strategic context for the defense of State interests by means of dissuasion or, when dissuasion fails, by the use of force.

The capability to generate dissuasion will always depend on the enforceability of actions and the credibility of intentions, inasmuch as use of force will always be conditional on the balance that the adversary's dissuasion produces in our suitability, enforceability and acceptability analyses in terms of costs and risks, creating a condition of mutual dependency of perceptions that interpret the potential for the self-defense of states in the international security system.

This condition makes the intensity and speed of the propagation of security in the field of geo-strategy contingent on the political context of the society in which it occurs and on the former's position in the hierarchy of decisions where alternative uses of force are formulated in keeping with three levels of readiness[17].

Operational readiness. This informs the levels of training and maintenance necessary for a prompt response to security demands. High levels of operational readiness demand that means of response remain manned and available for immediate use, generating fatigue among personnel and increased equipment failure rates, requiring logistical demands which, if unmet, can compromise the expected degree of tactical success.

Structural readiness. Informs the formulation of the procedures and architecture of relationships by which, where necessary, operational readiness may be increased or the number of tasks that must simultaneously be executed can be increased, ensuring that the necessary

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[16]For a breakdown of this condition, see apud. Mannheim, K. *Ideology & Utopia: An Introduction to the Sociology of Knowledge*. London, UK: Harcourt, 1936, p.112.

[17]For details on degrees of readiness, see Betts, Richard. *Military Readiness: concepts, choices, consequences*. Washington, DC.: Brookings, 1995. To identify its practical application in determining capability requirements, see the report on defense reform in the United States entitled *Bottom-up Review*, drawn up under the auspices of then U.S. Defense Secretary Les Aspin.

[17]For details on degrees of readiness, see Betts, Richard. *Military Readiness*, op.cit.To identify its practical application in determining capability requirements, see the report on defense. *Bottom-up Review*, op.cit. This report expressly recommended giving weight to degrees of readiness and decided on a revaluation of the criteria for its application for the forces. U.S. Department of Defense. *Report on the Bottom-up Review*. Washington, D.C.: DoD Printing Office, 1993, p.77.

command and control mechanisms are present. Structural readiness also has its costs. High levels of structural readiness immobilize capital and leave costly maintenance resources inactive (bases, worksites, etc.). Besides, elevated structural readiness requires a top-heavy personnel structure, on the assumption that it is more complex and slower to prepare officials than soldiers. In this sense, high levels of structural readiness are associated with concepts of strategic use that rely on availability of time to be set in motion, often incompatible with the temporal forms and dimensions that combat and crises are currently taking.

Mobilization readiness. Informs the priorities for converting peacetime social, technological, industrial and economic national resources to military use to fill the voids intentionally created in structural readiness to minimize its intrinsic costs. The costs of mobilization readiness are calculated basically in terms of the preparation and maintenance requirements of an inventory of potential conversions.

Intended states of degrees of readiness are contingent on the possibilities for financing projects (budget appropriations) and on the capability of the national industrial base (where the country's industrial defense complex lies) to sustain the effort required in time and space in meeting expectations on the use of national self-defense power, according to the strategic concepts practiced that are based in current doctrine, within the limits that behavioral norms authorize for the use of force.

The criteria for building capabilities according to required degrees of readiness will define the degrees of accumulation required of the elements making up the structure of force in the form of single systems or groups of systems to ensure homomorphism between defense capabilities and security demands, acting as agents for transforming one set of elements (condition of the capability to use force) into another (condition of no need to use force), preserving the interrelation between the components found in the former, in the latter.

National capabilities, framed as national power, are continuously reformulated in keeping with the perceived development of the strategic environment, promoting self-defense to ensure conditions are created for a potential dynamic dismantling and reorganization of the means of force (including non-military means) in keeping with the expansion and retraction of tasks. These ensure that command and control links are maintained,[19] providing the logistic flow necessary to sustain the effort in time and space, with which it lends credibility to the intention, where necessary, to use force, thus creating a condition for the possibility of geo-strategic security.

Axis of propagation in the Information Field

The axis of security propagation in the field of information covers the generation, archiving, recovery, and processing of information that enables individuals and organizations to collaborate: (a) in acknowledging and framing problems; (b) in assessing solutions found, indicating their degrees of relevance for perceived problems; (c) in managing processes for introducing decisions; (d) in efficiently interconnecting the results of complementary decisions, and (e) in communicating intentions and results, completing all these processes in increasingly complex, but ever faster cycles (decision-making cycles).

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[18]For a breakdown of the role of budgeting in defense planning, see. Petrei, H. *Presupuesto y Control: Pautas de reforma para América Latina* New York: Inter-American Development Bank, 1997 (TN: English version: *Budget and control: Reforming the public sector in Latin America* released by same publisher in 1998). See further, Gutiérrez, I.C. *El Gasto Militar (Military Spending)*, Madrid: Eudema, 1994. For a practical application, showing the relationship between planning and budgeting, see: *United States Coast Guard: Budget Estimates*. Washington, D.C: Department of Transportation, 2001. Although the U.S. Coast Guard exercises a budget model named Performance-Budget, the relationships between planning requirements and budget possibilities are clearly shown, in this case, making use of the programs describing elements of performance that Coast Guard capabilities must attain to reach its goals while balancing costs.

[19]For further details of the impact of organizational structures in operational possibilities, see Department of the Army. *US Army Field Manual 100-5, Blueprint for the AirLand Battle*. Washington DC: Brassey's , Inc, 1991. See also Deichman, P.F. der. *Spearhead for Blitzkrieg: Luftwaffe Operations in Support of the Army:1939-1945*. New York: Ivy Books, 1996. Diechman's book is relevant to illuminate the functional role of doctrine in the relationship between organizational structures and the structures of force.

The necessary acceleration of the scale on which information is processed, in order to ensure security is provided in faster and more complex decision-making cycles, must be accompanied by mechanisms to ensure dynamic incorporation of lessons learned, to enable quick recognition and explanation of processes of change, identifying the various states of the security system, and thus adjusting the alternatives to available resources.

These requirements make the field of information security intimately connected: (1) to capacity for research, invention, innovation, prototyping and development; (2) to the capacity to transmit and incorporate new expertise in transformed individual and institutional responsibilities (teaching and education), to give interconnectivity to these responsibilities in resolving problems previously not included in the technical and cognitive dimensions of possibilities; (3) to the continued widening of the computational base and the control of transmission networks for computed data, and (4) to the design of innovative forms of organization to support accelerated integrated management processes that ensure relationships between different types of means and shared goals between different agencies and organizations.

Axis of propagation in the Environmental Field

The acknowledgment of environmental security as a dimension of security was formalized in a report published in 1982 by the Independent Commission on Disarmament and Security, headed by Swedish Prime Minister Olaf Palme (ICSDI, 1982). This report defined environmental security as distinct from geostrategic security, attributing to the scope of the latter the construction of dissuasion and the provision of defense, inasmuch as it defined the scope of environmental security functionally, as a cooperative effort to deal with global problems and problems related to the future of humanity and its survival, including various types of non-military threats, such as those concerning economic problems and scarcity of resources, population growth, and the destruction of the environment.

Veiga da Cunha[20], Administrator of the Scientific and Environmental Affairs Division at the North Atlantic Treaty Organization (NATO), explains the progression of the consolidation of this axis very well, and in the following terms:

> In 1985, the publication of Gorbachev's New Political Thinking launched the notion of 'comprehensive security', the goal of which was defined as the survival of humanity. Threats to security considered in these terms included not only military threats, with an emphasis on nuclear threats and full-scale war, but also economic threats and environmental threats, especially those related to global environmental matters. The Brundtland report, published a decade ago (WCED 1987), refers to environmental tensions as sources of political tensions and military conflicts, or as a security matter. Due to the growing scarcity of environmental resources and their gradually deteriorating quality, the relationship between managing environmental problems and national and international security came to be accepted and the environment to be considered as a security concern. The Brundtland report defends a complete integration of environmental perspectives in a new understanding of economic, social and political factors and argues that the notion of security in the traditional sense, that is to say in terms of political and military threats to national sovereignty, must be widened to include the impacts of environmental tensions at local, national, regional and global levels. As is known, the solution to environmental security problems is not often found within the limits of the borders of States, as these do not normally coincide with ecological borders. The environment and ecology normally prioritize the concept of interdependency over the concept of independence.

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[20]Veiga da Cunha, L. *Segurança Ambiental e Gestão dos Recursos Hídricos (Environmental Security and Water Resource Management).* Text available at http://www.aprh.pt/congressoagua98/files/com/c11.pdf

This formalization found strong empirical support in contemporary affairs, with a conceptual contribution from Regime Theory, as a set of theoretical concepts relating to the limits of the expansion of the flow of diversity in security variables resulting from: (a) overuse of renewable resources; (b) exhaustion of the environment's capacity for self-cleaning, and (c) the impoverishment of living spaces, building governance requirements to enable or inhibit the possibility of development models.

Combined, the events unfolding over these seven axes of security propagation are necessary and sufficient to deal with variety in security. The absence of one of these axes tends to be erroneously filled by ideologies or doctrines, removing methodology's capacity to effectively capture and communicate the real structure of the security problem.

The events unfolding in these axes acquire analytical significance to the extent that their participation is recognized in the formation of multiple and simultaneous impacts that shape perceived reality. Reconstructing this reality, where security problems emerge, is an effort to summarize the critical dynamics governed by a set of equations which, altogether, make up the structural logic of the security system.

Structural logic

Descriptors of the security phenomenon, such as "Public Security," must not be mistaken for a rigorous and precise summary of the problem. This is a very common mistake, under the false assumption that all participants, in an effort to formulate policies and strategies, share the same understanding of the problem or use shared criteria to define it. Just as illegal migration, poverty and under-development are phenomenological descriptors, which acquire significance in the security construct in interlacing causes.

The definition of a public security problem, for example, will have as many alternative versions as there are people taking part in the process of defining the concept. As we have seen in the definition of the nature of complex problems, a security problem cannot be classified without also fully and entirely classifying the environment from whence it emerges and acquires significance. To remove the restriction in order to obtain a simple descriptor would be to accept that a single causal relationship might summarize all relationships existing within the multiple dimensions of the architecture of security causality.

The structural logic of security (LAS) is what lends significance to the state of security at each historical moment for each country in particular, explaining how and why the functioning of subsystems (sectors of causality) integrates the whole to generate a given behavior or state in the system. The innovation in the methodology proposed in this work lies in articulating processes around this concept. A metaphorical example may help to understand it.

The logic defining the concept of a motorcycle may be summarized in the descriptor "Harley Davidson", a "motor machine"[21] that projects a mental image of the machine with its typical (patented) noise. What makes a Harley a motorcycle is not the noise, obviously, despite this being the classifier of a sub-category within the motorcycle category. The motorcycle category is described by the combination, among others, of the theories that explain the combustion cycle with theories that explain power transfers, and the combination of the latter with theories that explain the dynamics of movement in equilibrium on just two wheels, in combination with the theories that explain the friction of the wheels with the ground as a limit to this equilibrium to variations in environmental conditions.

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[21](TN: The original term "motomachine" comes from a Brazilian-built, covered, four-wheeled twin-seater vehicle manufactured by Gurgel. Source: Wikipedia.)

There is no single accepted, objective criterion to categorize this architecture as true or false. The truth on the architecture of relationships depends on theories accepted as valid. Harley certainly possesses sufficient engine power to propel a small airplane; it just lacks the appropriate aerodynamics. But the category of motorcycles (at least to date), checks the flow of variety in the category, and thereby excluding causal chains relating to aerodynamic levitation.

In this context, the question--why doesn't a Harley fly?—can only be considered as valid or invalid, but cannot be judged as right or wrong. Widening the category changes the nature of the problem and, simultaneously, the nature of the answer. There is nothing to prevent us from planning, as a conceptual solution, a Harley "flying machine" with an aerodynamic structure and wings, different from the Harley "motor machine". This conceptual project will respond to the problem formulated within the limits of the system of causalities, according to the criteria drawn up to assess its performance within this system.

The structural logic of the motorcycle concept explains its function and defines its nature, deploying the effects of the solution it carries for the entire structure from which the problem emerged: fast movement in heavy-traffic urban areas or, alternatively, playful enjoyment of autonomy and speed, depending on how it is conceptualized together with the concept that explains it.

A structural logic of a given security condition remains stable while it is able to meet performance criteria (metrics) established in the simultaneous construction of the conceptual solution and the problem. These metrics will provide an indicator of the degree to which the problem has been resolved by policies and strategies, remaining valid during the period of time the field of possibilities that the relationships remain internally and externally consistent, and this field of possibilities remains consistent while the assumptions that sustain the causal relationships also remain valid.

While this chain is self-sustaining, the effects of the solution will propagate, changing the values of the variables and relationships among themselves. This implies that the solution to a security problem does not have a value in itself, but on the other hand its utility will always be contingent on the temporally defined arrangement of variables that stabilize or constantly redefine the problem within a single LAS.

Analytical errors

The two structuring concepts of the proposed methodology—axes of propagation and structural logic of security—inasmuch as they facilitate a rigorous analysis of a constantly evolving situation, must avoid four recurring methodological flaws: inertia, self-sustainment, adaptation, and induced singularity.

Inertia: This type of error occurs when the analysis of the security problem tends to extrapolate the problems and features of the present to the future; that is to say, a future environment tends to be modeled to be plausibly describable (to convince based on what we accept as true today). Thus, it involves an error from the outset in restricting the incorporation of paradigmatic changes.

Inertia leads to the construction of security problems by mere extrapolation of trends. To do so, it assumes as a premise the occurrence of a clear and linear transition from the current environment to the projected one and, in doing so, leaves out the reality expressed by "sensitive dependence of initial conditions", according to which small differences in input can quickly become overwhelming differences in results. And this is truer when the timescale is very large, facilitating the occurrence of disruptions in trends. At the beginning, there is coincidence in the series of events, but after some time, with the occurrence of crisis points, changes produce results that branch out to generate states of security that are qualitatively so different, that they bear practically no similarity to the initial conditions or even among themselves.

Self-sustaining: The error of self-sustaining occurs in framing security problems when the necessary conditions for the events defining the security environment are created and maintained by the events themselves, in a self-sustaining dynamic feedback process.

In this case, events tend to acquire a life of their own, taking unexpected forms. This occurs when the assumptions end up becoming subsumed "truths". Having qualified an event, what once was an assumption comes to be considered as fact, bringing about a natural reluctance to alter its architecture after all the work involving its drawing up has occurred; for example, in the 1960s, with the establishment of 23 days' warning for NATO's planning, ended up becoming a rigid index, even once the reference base that had been used to demarcate that warning period was changed[22].

Adaptation: Adaptation typifies the analytical error of seeking to balance (adapt) interests to availability of resources in framing the problem. That is, the security problem turns into the problem that available resources are able to deal with.

The smaller the number of parameters considered in the dimensions of the analysis, the more the expected (implicit) solution to the problem that is being framed becomes reduced to a matter of more and more financial resources. Thus, certain sectors or institutions with an impact on a specific field of security end up acquiring undue and undesirable autonomy in solving the security problem.

The implicit assumption, built on a false basis, is that given more budget resources, and left to work autonomously, a given sector will know what to do to resolve the security problem. Analysis then runs the risk of becoming a mere tool to validate maintaining decisions or centers of power, with harmful consequences to governability.

Induced singularity: Induced singularity concerns the analyst's tendency to choose variables that are strictly focused on his or her area of expertise. Induced singularity derives from the human difficulty of simultaneously cohabiting with contradictory ideas. This makes analysts feel more at home when problems are strictly focused within their areas of expertise or recognized capabilities.[23]

A security analysis supported by selected arguments exclusively linked to the geostrategic axis, for example, drawn up exclusively by military specialists, tends to make defense always need more and more resources to do more of the same, regardless of how the security problem is reconfigured. It should be noted that the grounds for the need may be entirely consistent with the problem outlined, making it difficult for the policymaker to perceive that the mistake lies in the analysis for not including other simultaneous and necessary dimensions to configuring the real problem, and not the desired one.

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[22]For an excellent perspective on the NATO decision-making process and more specifically that of the USA regarding the warning period, see Sokolsky, J. J. *Seapower in the Nuclear Age*, Annapolis: Naval Institute Press, 1991. Sokolsky argues that reformulating the concept of employing US forces, known as Flexible Response, in establishing differentiated stages and degrees of response to the possible Soviet Threat, required the reformulation of the system for mobilizing and transferring forces to Europe, with all that implied in reformulating those very escort forces and the organizational structure. The result was a reduction in the response time not only for the first stages but for the entire force. Sokolsky's analysis is important as it highlights, among the entirety of the arrangements of American capabilities, the importance of optimizing the maritime flow as effective providers of a flexible response. Applying the defense construct as an analytical tool in Sokolsky's work was extremely useful. It made it possible to come up with conclusions on the arguments set forth, showing relationships and articulations that illuminate aspects of American force planning. See, further: Gaddis, J.L. *We now know: Rethinking Cold War History*. New York: Oxford University Press, 1997. Zisk, K.M. *Engaging the Enemy: Organizational Theory and Soviet Military Innovation, 1955-1991,* Princeton, New Jersey: Princeton University Press, 1993. May, Ernest. American Cold War Strategy. New York: Harvard University, 1993. Smith, J. *Cold War. 2.ed*. Oxford, UK: Oxford University Press, 1998. Werthein, E., Bahjat, A. and Watson, B. *Chronology of the Cold War at Sea: 1945-1991*. Annapolis: Naval Institute Press, 1998.

[23]This phenomenon is explained by psychology as cognitive dissonance. That is the possibility of solving an internal conflict by denying one of its irreconcilable sides. For a detailed presentation of this phenomenon, see Lindley, Gardner, Hall, Calvin S. and Thompson, Richard F. *Psicologia*. trans. Eliezer Shneider. Rio de Janeiro: Koogan, 1977, p. 394. For an analysis of this factor in formulating scenarios, see Chuyev, Yu V. and Mikhaylov, Yu V. *Soviet Military Thought. No. 16: Forecasting in Military Affairs*. trans. DGIS Multilingual Section Translation Bureau – Secretary of State Department – Canada. Moscow, USSR: Washington, D.C.,: U.S. Government Printing Office, 1980, p. 133 These authors categorize this problem as "psychological inertia".

The possibility of the singularity error, aside from the degree of expertise necessary to deal with all dimensions of security, naturally leads to a need for teams of multidisciplinary analysts.

As Karl Popper[24] explains, the consequences of these four errors "... make it possible for convenient adjustments to be made to make conclusions meet expectations". This is an excellent summary of the need for a consistent methodology, articulated within a solid analytical framework, to deal with complex emerging problems in the security environment.

Methodology – The logic of processes

Methods do not ensure the truth of the problem or the ownership of the solution, they merely lend rigor to the execution of processes to avoid analytical errors. Methodologies are already characterized by undertaking a higher level of abstraction in dealing with phenomena, creating categories, criteria for inclusion in and exclusion from these categories, informing the process of transforming contents between successive categories[25]. Methods, therefore, are instructors on the order that must be imposed on the different processes necessary to reach a contemplated goal, where techniques describe the necessary steps to achieving the stages established by the methods.

According to this classification, the logic of processes proposed in this work is to be framed as a methodology. Its stages are descriptive of categories of processes, allowing the construction of methods that adjust to each country's specific circumstances and conditions, equipped with techniques geared towards achieving the specific purpose for each stage described by the processes.

Figure 1 shows a block diagram for the methodology. Its purpose is to graphically illustrate the methodology, enabling an understanding of the categories defined by its elements, and the transformative flows informed by the chain of processes. Details of the processes are shown in the annex.

Figure 1: Block Diagram
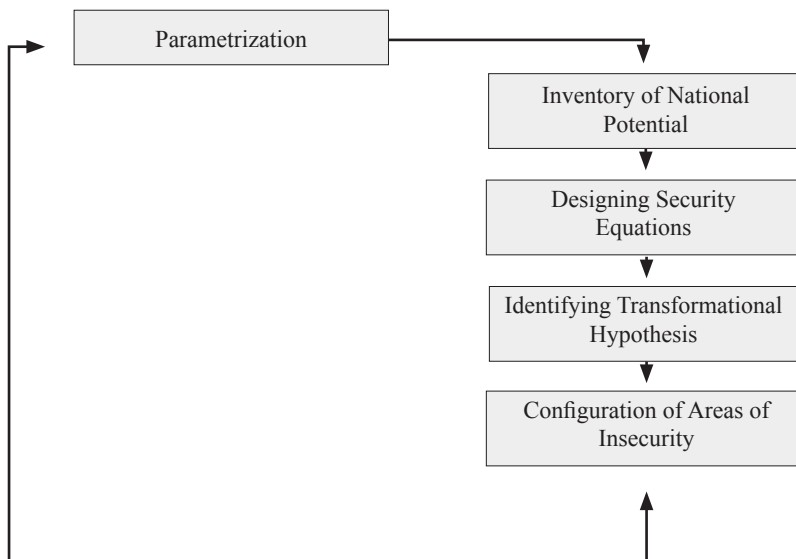
[24]Popper, K.R. *A lógica da pesquisa científica.* trans. Leonidas Hegenberg. São Paulo: Cultrix, 1972. p. 86.
[25]For other perspectives on methodology see Jolivet, Regis. *Curso de Filosofia. 13. Ed.* Rio de Janeiro: Agir, 1979. p. 71. Bunge, Mario. *La ciencia, su método y su filosofia.* Buenos Aires: Siglo Veinte, 1974, p. 55. Or even Cervo, Amado L. and Bervian, Pedro A. *Metodologia Científica.* 2.ed. São Paulo: McGraw-Hill, 1978.

Parametrization

Parametrization specifies those factors that inform and determine the analysis, scope and scale of potential and likely response alternatives to a security problem, identified by means of: (1) the purpose and the timeframe, (2) the way the problem is framed, and (3) the way the performance requirements are framed.

Intended purpose and surveying timeframe: Specifies the policy-maker and the resulting product's desired form, clarifying the transformational role expected of this product's effects on the institution (government or agencies), on the environment, and on the relationship between the environment and the government agencies within a given timeframe.

Way the problem is framed: Summarizes and assesses the perceived boundary conditions that support the intention stated in the purpose, using three components:

> *Generating factors:* Assessing the conditions that generate the need to analyze and thus, to review security policy and strategy, such as changes to the strategic environment or changes to government directives or priorities.

> *Impact:* Projecting the relevance and significance of the perceived effects of generating factors in terms of achieving national interests.

> *Commitment and resistance:* Assessing the structure of incentives and constraints on transforming the status quo.

Framing security policy and strategy design requirements: This stage is crucial to inform the reach, focus and extent to which the information to be processed in the analysis must be added/eliminated in order to properly meet requirements in devising policies and strategies. Defining these requirements occurs via correlation to levels of analytical maturity, expressed in terms of the institutional capacity to conceptualize solutions, correct deviations and dynamically update the solutions conceptualized on the basis of the deviations analyzed.

Vague alternatives: Unclear on the future state of security that alternative strategies are supposed to achieve, or on criteria to define such purposes in response to an analytically assessed problem.

Uncertain alternatives: The purposes that define the alternatives are known and there are criteria for constructing them; however, these criteria are not consistent, there are no structured data to apply these criteria, nor are there consistent procedures (methods) for such application (there are goals, but these goals do not translate to reasonable/appropriate, practicable and acceptable targets). One knows where one wants to go, but the alternatives to get there are unclear.

Inconsistent alternatives: Unknown distribution of probabilities to relate the selection of a strategic option to its impacts make it not possible to identify the most favorable alternative (there are alternatives, but there are no mechanisms for constructing preference criteria and structuring decisions on which alternative to choose).

Incompatible alternatives: The distribution of probabilities for the impacts of strategic options is known, it is possible to identify a preferred alternative, but there is an inability to assess whether said alternative offers an answer to the problem formulated (it is not known whether the choice made can actually resolve the perceived problem).

Unacceptable alternatives: There is a possibility that the implemented alternative can achieve the

purpose contemplated, but there are no procedures for measuring and correcting any skewed goals, resources and purposes, dynamically adjusting goals, resources and purposes (there are no strategic management tools of the necessary and desired magnitude and capacity).

Inventory of National Potential

At this stage the proposed methodology isolates and interprets the interlacing of phenomena that classify the security environment according to each of the axes of security propagation, extracting dependent and independent tensors, seeking an understanding of reality, which essentially seeks to reveal its movement to change it.

Dependent tensors appear, disappear or change as the researcher introduces, removes, or modifies other events. It is therefore the property or factor which is an effect, result, consequence of, or response to, something that was manipulated. Independent tensors are decisive for there to occur a given result, effect or consequence, being selected and manipulated for the purpose of discovering whether they influence or modify dependent events.

The inventory of national potential classifies these tensors in the form of tangible, intangible and state-changing resources and responsibilities. The data not available in the national potential inventory are listed as Information Gaps. These gaps are taken up again and incorporated into hypotheses on the state of analysis variables and their relationships.

There are several techniques that may be used to structure databases of qualifying elements of tensors, in the form, for example, of physical resources (strategic materials, critical industries), processing resources (education system) and ideational resources (innovation). It should be noted that in extracting tensors within each Axis, for example, the submarines variable, or combat aircraft variable possess significance solely as qualifiers of responsibility or capability, such for example, as stabilizing the regional strategic environment.

Below are a few tensors typified in the axes of security propagation[26].

INCREASED DEGREE OF COMPLEXITY
Institutionalizing the intention to innovate in government institutions.
Controlling technological matrices in strategic segments.
Mechanisms for protecting pharmaceutical and transgenic patents.
Connectivity in knowledge bases.
Energy stocks.

DYNAMICALLY SUSTAINING PRIORITIES
Resilience of political party ideological platforms.
Capacity to finance investment projects.
Strategic alignment of resources and goals in government plans.
Macroeconomic indicator acceleration rates.

CONTROLLING DEGREES OF AUTONOMY
Diversity of sources in the national energy matrix.
Degrees of power supply redundancy.
Scope of the energy-distribution infrastructure.
Self-sufficiency in generating genetically modified agricultural matrices.

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[26]For the construction of other indicators, see Tellis, A., et. al, *Measuring National Power in the Postindustrial Age*. Rand, California, 2000.

COMPREHENSIVENESS OF PURPOSES
Imbalance in the population balance.
Break in societal patterns.
Quick dispersion of immigrant cultural diversity.
Aligning of priorities and structure of political-military relations.

BUILDING SELF-PROTECTION
Permeability of access to the illegal arms market.
Generating stabilization in the regional strategic environment.
Aligning Force planning with foreign policy.
Enhancing Force planning by the National Defense Industry.
Integrating perception and agencies' decision-making criteria.

ENHANCING DECISION-MAKING CYCLES
Strategic maturity of public institutions.
Speed of state decision-making cycles.
Inclusiveness of the education system.
Mechanisms for spreading innovation.
Creating and managing actionable knowledge reserves

INCREASE IN THE FLOW OF DIVERSITY
Political commitment to international ecological standards.
Modeling ecosystems.
Processing urban waste.
Domain of brands and models (national brands).

Designing Security Equations:

Variance in the relationship between dependent and independent tensors for each country, in each historical period, defines the relationship between the meaning we attribute to something and its interpretation[27]. By this means we can explain that each perceived security condition possesses a given semantic dimension (political meaning), which depends on how we consider the interpretation of its meaning via other observers (countries) and vice-versa. In this manner, the output elements are reduced to the same political nature as the input elements, enabling the establishment of a relationship allowing treatment of both according to the same criteria.

The security equations capture the critical dynamics between tensors in narrative form, establishing an agent (individual or institutional actor), that exploits tensors, to reach a purpose (goals). For example:

Religious leaderships exploit ethnic unrest to create perceptions of asymmetries in access to forms of wealth, contributing to the breaking and replacement of national societal patterns by sectarian patterns that sustain political positions.

Or even:

The exploitation of ungoverned spaces by extremist groups, and the lack of political will to confront these groups have brought opportunities for extremist groups to travel, recruit and operate, creating self-support mechanisms in the local economy.[28]

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[27]Bruyne, P., Herman, J. e Schoutheete, M. *Dinâmica da pesquisa em ciências sociais: os polos da prática metodológica (Dynamics of research in the social sciences: Extremes in methodological practice)*. 5 ed. trans. Ruth Joffily Rio de Janeiro: Francisco Alves, 1991, P. 190.
[28]The first example was taken from an analysis of the security situation in Afghanistan in 2010 and the second from an analysis of the security situation in Bangladesh in 2008 (non confidential versions) completed by the State Department's Office for Reconstruction and Stabilization – S/CRS).

Security equations capture LAS, forming the security theory that governs the explanation of the phenomenon, its condition for manifestation and development. Determining security equations presupposes four processes, each of which with a possibility of support using countless techniques.

1. Identifying agents of change: classifying players (individuals, groups, entities, organizations, etc.), factors (agreements, alliances, etc.) and conditions (presidential elections, new technologies, economic crises), with a capacity to generate the collective perception that basic needs, lifestyles, interests or values can be turned into a condition which does not meet expectations and needs, with negative consequences.

2. Modeling Critical Dynamics: Graphic representation of the relationships between tensor-classifying variables to understand critical chains of events explaining how the security environment works. These relationships enable the identification of the occurrence of cycles bearing three characteristics:

Positive: The effects generated in the chain of dependent and independent variables strengthen the system's given trend or behavior, increasing the intensity of the consequence that the cycle defines. For examples, cycles of violence, regional migration, economic crises.

Negative: The effects generated in the chain of dependent and independent variables tend to mutually cancel each other out. For example, economic slowdown, dissuasion.

Dynamic balance: The effects generated in the chain of dependent and independent variables fluctuate in the cycle's definition of positive or negative. For example: endemics versus public health, or national unity versus preserving the identity of social groups.

There are several techniques for this modeling. Figure 1 – Diagrams of Impacts shows a notional example of the application of these techniques to model an impact diagram drawn up to identify the structure of relationships between terrorism and drug-trafficking, with a view to formulating a government strategy to confront the condition of insecurity in a region of Peru[29].

Figure 2: Impact Diagram
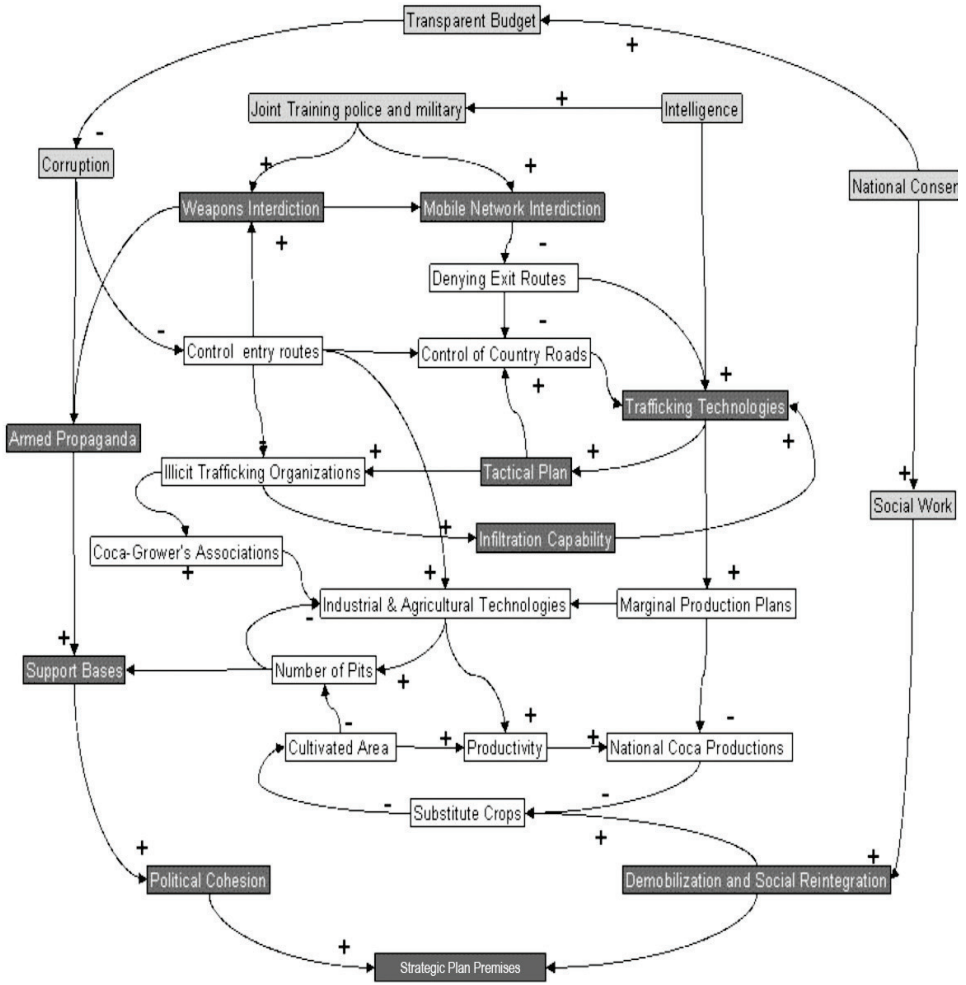
3.Extracting security equations: Identifying critical paths for spreading the effects of security. This description must avoid prescribing actions or recommendations to modify cycles, limiting itself to identifying the structure of causality in perceived phenomena.

4.Drawing up the LAS: narrative of security theory that explains the nature and evolutionary trends of the phenomenon.

Identifying Transformational Hypotheses

The state of each tensor in time, the relationship between the tensors, and the relationship between the relationships captured by the security equations informs the structure of causality in security, conditioned by transformational hypotheses. These hypotheses establish a test factor for the limits of inferences or speculation obtained on relationships between agents of change, tensors and purposes. They thus incorporate elements into the security analysis that facilitate an explanation of their own limits, using two types of hypothesis—parametric and relational.

Parametric: Hypotheses on the causes for transformation in tensors. For example, (1) ethnic disturbances are aggravated when the ethnic groups included in a single living space have a history of violent confrontation, and (2) societal patterns are broken when power centers do not manage to change quickly and impose new standards of behavior.

Relational: Hypotheses of transformation of relationships between tensors, supported by theories and concepts built on empirical evidence. For example, the explanation that is provided by Political Science for the correlation between ethnic unrest and break-up of societal patterns.

The formalization of each assumption must be accompanied by its control variables, in the form of metrics, each of which classifying elements that make it possible to grasp the impact of future policy and strategy implementation. In this sense, metrics are measurable elements which make it possible to identify rates of change in the environment towards an intended condition, different from the current one, according to whether hypotheses of transformation are put into place to generate or prevent effects on the environment.

Metric describes the concept of what will be assessed, whereas an indicator describes the empirical condition observed[30]. For example:

Parametric assumption: Political differences between societal groups increase with the level of systematic violence practiced.

Metric: Atrocities committed against opposing groups.

Indicators: number of kidnappings and cases of vandalism recorded in X months by group A against group B.

Configuration of Areas of Insecurity

An Area of Insecurity describes a state of balance contingent on a portion of the security environment that provides some degree of temporary predictability for the development of negative effects against State interests. Each space of insecurity categorizes a conflict, distinct in nature and structural causes from the rest.

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[30] For examples of metrics geared towards assessing success in conflict environments, see *United States Institute of Peace. Measuring Progress in Conflict Environments* (MPICE). USIP, 2010. Although the terminology is different from that used in this work, the concepts converge.

The contingent nature of areas of insecurity is a function of the occurrence of windows of vulnerability. The temporary nature of the forecast effects derives from event paths' significant dependence on initial conditions. An initial minimal alteration to the tensors can expand its effects exponentially to the point of completely changing existing security conditions by cumulative and multiplicative effect.

A security area might describe the emergence of urban violence during presidential elections, intentionally provoked by a radical but not politically representative group, to prevent a majority candidate opposed to its interests from being re-elected. In this case, the window of vulnerability is provided by the presidential elections, which reduce the degree of freedom (arbitrariness) of the manifestation of the phenomenon described, creating the space of possibility for escalating tensions, demanding large-scale responses, without any tensors being in place that might prevent or mitigate anticipated effects.

Narratives of areas of insecurity answer to requirements established in parametrization, communicating the analyst's perception of a given phenomenon, to enable those designing policies and strategies to diagnose the potential for harm to interests and security goals, building solutions that alter the causes that generate the conflict. In turn, these change relationships between the elements that build these causes or neutralize windows of vulnerability for the appearance of potential damage.

Scope and limits – Final remarks

Implementing the methodology must be the first step in formulating security policies and strategies. The expertise it produces, structures and provides not only informs, but also facilitates the very process of formulating policies to offer the points of impact required to reconfigure the tensors. It also highlights the structure of propagation of the effects of strategic actions required to transform the critical dynamics' causal structure, removing the causes of insecurity or modifying the perception of the occurrence of windows of vulnerability which give way to the possible effects of these causes.

The methodology was designed to meet a wide spectrum of demands, meeting the following design requirements:

1.Simplicity in processes. The methodology includes just five macro-processes: Parametrization, Inventory of National potential, Designing Security Equations, Identifying Transformational Hypotheses, and Configuration of Areas of insecurity. Once understood, the methodology is simple to execute. Already having been applied in several countries, such as Peru, Jamaica, Guatemala, El Salvador, Mexico and Paraguay, with differentiated scopes and purposes, with great success, providing essential elements for decision-making.

One sign of simplicity is the way the scenario-building procedures are absorbed into these mere five macro-processes. The analyst builds elements of prognosis in developing the stages prescribed by the methodology, in this sense, although simple, none of the macro-processes must be "cut", with a risk of compromising the integrity of the results.

2. Solid conceptual framework. The system of concepts supporting the methodology is consistent with practiced theoretical and methodological frameworks. Some of its elements were modeled reflecting recurring practice in public policy formulation. The conceptual basis for the methodology is wide and sophisticated, building a multidisciplinary body, principally deploying Epistemology, Logical Philosophy, Theories of Political Science, International Relations, Operational Research, Complexity Theory, Systems Theory, Production Engineering, Theories of Administration, and Information Technology.

3. Interconnectivity. The methodology can be easily deployed using methods that relate to processes for devising policies and strategies that are specific to each country. Their processes fully adhere to both Objectives-Based Planning and Assumptions-Based Planning, but particularly to Capabilities-Based Planning. Security Spaces configured at the end of the process fully outline the mission areas (areas of capability) employed by capabilities-based methods, whilst simultaneously providing the essential elements for the scenarios necessary for objectives-based or assumptions-based methods.

4.Collaboration. The methodology was conceived to be implemented with the support of an "expert" facilitator in the methodology, with multiple participants who are "experts" in various fields. Building the Impacts Diagram, for example, demands a shared understanding of the phenomenon from several perspectives, so as to be properly formulated in the amplitude and depth required to build the tensors in the seven axes of security propagation.

Lastly, the methodology was designed using "open architecture", enabling (requiring would be a better term) its continuous improvement for the inclusion/revision of new processes, greater and improved explanations of processes, recommendations for techniques, and sharing lessons learned and "good practice" in its implementation. To this end, a community of practice has been formed. If you wish to be a part of this effort, please contact razas@ndu.edu. or visit the blog http://salvadorraza.blogspot.com.

Annex - Conflict analysis methodology

Parametrization
Intended purpose and surveying timeframe
Way the problem is framed
Generating factors
Impacts
Commitments and resistances
Framing requirements

Inventory of National Potential
Degree of Complexity tensors
Dynamically Supported Priorities tensors
Controlling Degrees of Autonomy tensors
Comprehensiveness of Purposes tensors
Construction of Self-protection tensors
Enhancing Decision-making cycles tensors
Increasing the Flow of Diversity tensors

Designing Security Equations
Identifying agents of change
Modeling Critical Dynamics
Extracting security equations
Drawing up LAS

Identifying Transformational Hypotheses
Parametric hypotheses, metrics and indicators
Relational hypotheses, metrics and indicators

Configuration of Areas of Insecurity