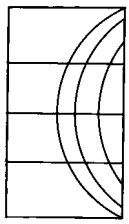


Shelton A. Gunaratne

Public Diplomacy, Global Communication and World Order: An Analysis Based on Theory of Living Systems

Quantum 'Nonsense'

In this article, I attempt to unravel the intricacies of public diplomacy, global communication and world order through the lens of the theory of living systems and Eastern philosophy. However, for those who are steeped in the Enlightenment's view of science and rationality, both Eastern philosophy and the new physics (quantum mechanics and relativity) may appear to be nonsense. Therefore, to justify my 'nonsense', I must begin with a summary of the new physics. As Zukav (1979: 207) explains, 'Like measurements of space and time, the concept of nonsense (itself a type of measurement) is relative, and we always can be sure when we use it that from some frame of reference it applies to us'.

Particle physics sees no distinction between empty, as in 'empty space', and not empty. The universe is fundamentally dancing energy, which assumes diverse forms. What we call matter ('particles') is also energy. Thus, cells, molecules, atoms and subatomic particles are all patterns of energy. Quantum possibility waves appear as 'particles' when one attempts to observe them. This 20th-century discovery has some similarity to the third-century Buddhist philosopher Nagarjuna's concept of *sunyata* (emptiness), which affirmed the relativity of all conceptions, including the basic elements of existence (*dharmas*), such that ultimate reality is neither existence nor non-existence, neither permanence nor impermanence, and neither identity nor difference.[1] (Parenthetically, one may wonder whether 'postmodernist' constructionism began with Nagarjuna.)

The nature of the universe has defied science and rationality. Is it the

Current Sociology, September 2005, Vol. 53(5): 749–772 SAGE Publications (London, Thousand Oaks, CA and New Delhi) www.sagepublications.com
DOI: 10.1177/0011392105055014

Brahman (Ultimate Reality) in Hinduism, the *Taiji* (Supreme Ultimate) or *Dao* (The Way) in Chinese metaphysics, or the *Tathata* (Suchness) or *Dharmakaya* (Body of Being) in Mahayana Buddhism? Or is it the Buddhist–Hindu–Jain concept of *samsara*, the perennial cycle of birth, death and rebirth resembling the perennial creation, annihilation and recreation of subatomic particles? For we know that people are made of trillions of cells, which are patterns of molecules, which are patterns of atoms, which are patterns of subatomic particles (or waves of possibility). So are all things, living or otherwise, that we call matter. Inasmuch as physicists have failed to refute the quantum hypothesis since Max Planck presented it in 1900, we have every reason to defer to the view of Eastern philosophy that everything in the universe is (potentially) interconnected.

The new physics implicitly chides what Tu Weiming calls the Enlightenment's 'arrogance of rationality' (quoted in Yu and Lu, 2000: 379). Both the new physicists and the ancient sages of the East appear to view the nature of the universe in similar fashion. They hold parallel views on several fundamental concepts: the unity of all things, the unity of opposites, the illusory nature of space–time, the dynamism of the universe, and interpenetration (Capra, 1999). If all things in the universe are indeed (potentially) interconnected or structurally coupled, then we see the drawback of nomothetic empiricism, our main scientific method. Because this method is simply inadequate to study universal interactions, we tend to focus on the micro scale and create for ourselves an unrealistic closed system wherein all variables other than those we study remain constant.

Conventional quantum physics explains matter, both organic and inorganic, as the outcome of a bottom-up process originating in the subatomic world, where mind-boggling multitudes of putative 'wavicles' (dual particle–waves) perennially make decisions every fraction of a second. This interpretation considers our consciousness/mind/awareness to be an epiphenomenon of matter. Goswami (2000), on the contrary, considers consciousness to be a transcendental phenomenon that preceded space–time. In his view, consciousness initiates a top-down process that makes matter the epiphenomenon. The quantum-self component of our mind/awareness draws heavily from consciousness (Figure 1). The 'wavicles' at the subatomic level react *instantaneously* to decisions made elsewhere – even in another galaxy – at superluminal (faster than light) speed, which attests to their transcendent dimension.

Bohr's concept of complementarity explains the wave–particle duality of subatomic phenomena[2] while Heisenberg's uncertainty principle shows that one cannot observe a phenomenon without changing it[3] (Russell et al., 2001). Bohm argued that quantum phenomena required physics to start with the whole and reverse the Cartesian order of starting with the parts. The basic approach of world-systems analysis conforms to Bohm's argument. Bell's

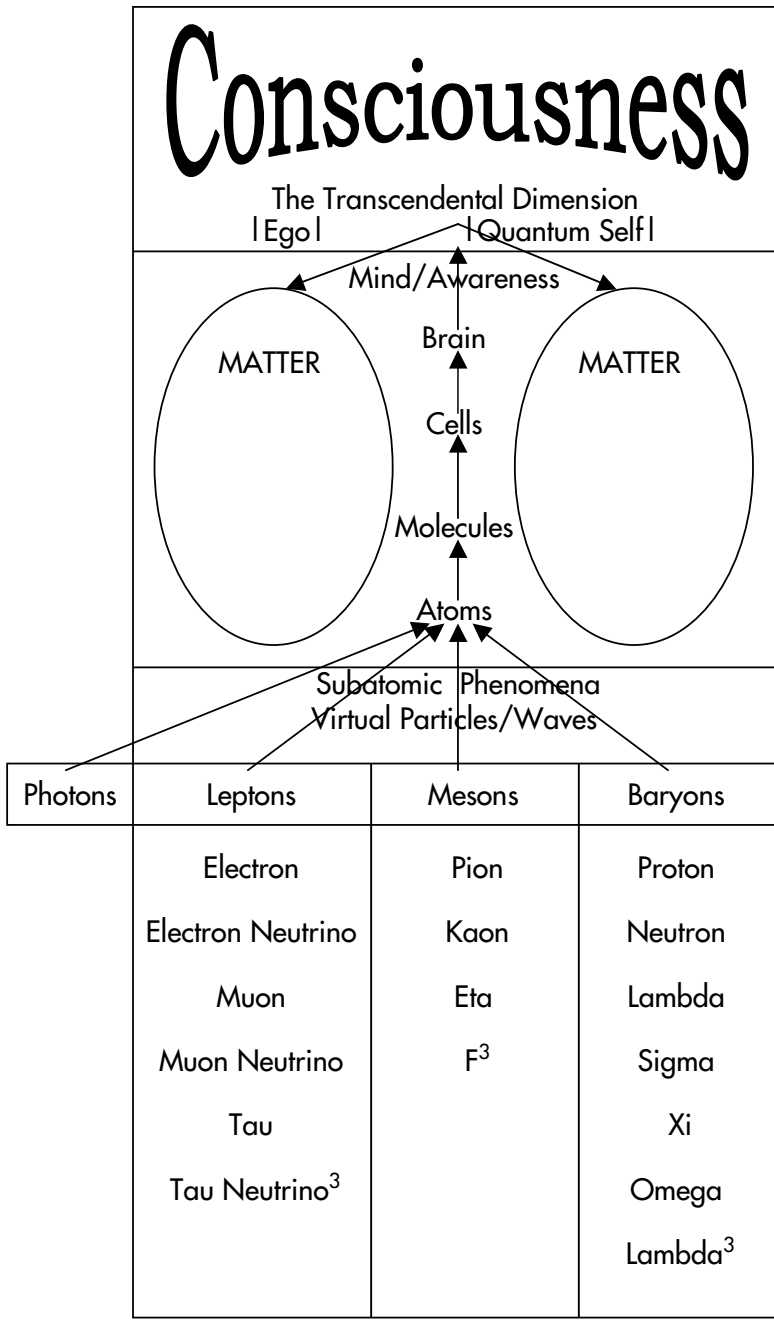

Consciousness
The Transcendental Dimension
Ego
Quantum Self
Mind/Awareness
Brain
MATTER
MATTER
Cells
Molecules
Atoms
Subatomic Phenomena
Virtual Particles/Waves
Photons
Leptons
Mesons
Baryons
Electron
Electron Neutrino
Muon
Muon Neutrino
Tau
Tau Neutrino3
Pion
Kaon
Eta
F3
Proton
Neutron
Lambda
Sigma
Xi
Omega
Lambda3

Figure 1

theorem (confirmed by the Aspect experiment of 1982) states that all 'parts' ('particles'/'wavicles') of the universe are potentially connected in an intimate and immediate way.[4] Thus:

> The philosophical implication of quantum mechanics is that all of the things in our universe (including us) that appear to exist independently are actually parts of one all-encompassing organic pattern, and that no parts of that pattern are ever really separate from it or from each other. (Zukav, 1979: 72–3)

Herbert (1985) points out that in contrast to the Newtonian model, quantum theory gives us at least eight metaphors to guide our understanding of reality:

1. There is no deep reality. Quantum phenomena and the measuring device produce quantum attributes (Bohr and Heisenberg).
2. Reality is created by observation (Wheeler).
3. The world is an undivided wholeness (Bohm and Capra).
4. There are an ever-increasing number of complete universes: the many worlds interpretation (Everett).
5. The world obeys a non-human kind of reasoning or quantum logic (Finkelstein).
6. The world consists of ordinary objects that exist even when not observed – neorealism (Einstein, Schrödinger, Planck and de Broglie) but which are connected by faster-than-light fields (Clauser and Aspect).
7. Consciousness creates reality (Wigner, von Neumann, Stapp and Goswami).
8. Unobserved entities have tendencies to exist but are not completely real – 'duplex universe' (Heisenberg).

The new physics has challenged the fundamental presumptions of Newtonian physics: strong objectivity, causal determinism, locality, physical or material monism and epiphenomenalism (Goswami, 1993).

Despite these questionable presumptions, the social sciences continue to rely heavily on the Newtonian model's single metaphor of the universe as a giant clock. The Newtonians presume a world of matter passively amenable to human manipulation (DiZerega, 1991). Several political scientists – including Barber (1984), Dator (1984), Landau (1961), Schubert (1983) and Slaton (1991) – have acknowledged the limitations of the Newtonian-influenced political theory. Barber (1984) has argued that the Newtonian model's flawed axiom – materialism – has produced equally flawed corollaries upon which the liberal democratic political system operates: atomism (individualism), indivisibility (hedonistic psychology), commensurability (equality), mutual exclusivity (power and conflict) and sensationalism (unitarianism and interest theory).

Because of the flaws of the Newtonian approach, I have chosen Capra's

(1996) brainchild of the theory of living systems, which owes much to quantum theory, as the theoretical framework for analyzing the issues related to public diplomacy, global communication and world order. At the very outset, let me present a few pertinent propositions extracted from a combination of complexity science, quantum mechanics, classical mechanics and world-systems analysis:

- The hierarchical world order (or the non-linear, far-from-equilibrium world-system) is the outcome of the competition by networks of human beings occupying definable boundaries (nation-states) to arrogate the supply of energy (both matter and information being composites of energy) to achieve the utilitarian instrumental (rational) ends dictated by the ego component of their minds, which work on the basis of Newtonian principles: linearity, rationality, individualism, determinism, reversibility, predictability and so on.
- Our ideologies (e.g. capitalism, socialism and so forth) are coherent superpositions of possibility waves that we collapse into manifest reality through our observation. Quantum consciousness, which all sentient beings share through the transcendent principle of non-locality, enables the observer, via his or her own mind/awareness, to create the illusion (*maya*) of subject–object duality and collapse the superposition that lies *in potentia* into manifest reality. The uncertainty principle prevents the observer from accurately measuring the position and momentum of any quantum phenomenon. Thus no two observers can see the identical manifest reality, except an approximation, of any phenomenon.
- The coherent superpositions that we call ideologies, just like other superpositions *in potentia*, are the result of punctuated encounters between antinomic energy forces that Chinese metaphysics identifies as the *yin* and the *yang*. Such encounters are a dynamic feature of the world order as evident in the drive to promote one ideology against another (as in public diplomacy conducted through both global and national media of communication). In the long run, no winners can emerge out of public diplomacy because the world order follows the natural pattern of punctuated encounters between antinomic energy forces.

Theory of Living Systems

The theory of living systems (Capra, 1996) provides perhaps the best approach to study the unity of all things – the third quantum metaphor listed in the preceding section. It incorporates the models of autopoiesis (Maturana and Varela, 1980; Luhmann, 1992, 1995, 2000), cognition (Maturana, 2002; Maturana and Varela, 1980) and dissipative structures (Prigogine and Stengers, 1984). (Dissipative structures are evolving systems that are able to

import energy from the environment and export entropy.) This approach, which comes under the rubric of complexity science or chaos theory, is highly congruent with quantum mechanics. Becker and Slaton (2000: 42) maintain that these two approaches 'share miles of common ground'.

Capra (1996, 2002) provides the justification for conflating the three discipline-bound models of autopoiesis (from biology), cognition (from cognitive science) and dissipative structures (from thermodynamics) – into a dynamic metatheory. Gunaratne (2005) has demonstrated the illumination this approach can provide to explain how nation-states (regions/societies) can maintain their 'sovereignty' through the pattern of autopoiesis (at the micro level) notwithstanding the forces of globalization engendered at the macro level of the world-system. Although Luhmann (1995) too uses the concept of autopoiesis, his highly abstract theory conceptualizes social systems as primarily meaning-processing systems of communication in the phenomenological sense. He conceptualizes society not as a living system but as a composite of autopoietic function systems. Thus, Luhmann does not use the notion of autopoiesis in the same sense as in biology. Luhmann does not see autopoiesis (the pattern of organization) as an essential facet of cognition (the process of life).

The theory of living systems presumes that the world as a whole is a far-from-equilibrium dissipative structure as opposed to the atomism and individualism posited by the Newtonian model. It also presumes that societies and the individuals who constitute these societies are subsystems of the all-encompassing dissipative structure called the world-system. It follows, therefore, that the parts cannot operate in isolation without recourse to the emergent properties of the world-system.

Autopoiesis and cognition are two fundamental phenomena inherent to all dissipative structures corresponding to supramolecular organizations. (Luhmann does not subscribe to this view.) They are thermodynamic systems that interact with the outside world. Such interaction coupled with irreversibility of time produces increased entropy (disorder) and non-equilibrium conditions. Being non-linear systems, they go through either self-organization or entropic disintegration following periodic bifurcations resulting from the recursive effects of positive feedback. Although they exhibit deterministic characteristics between bifurcations, they become extremely sensitive to random positive feedback engendered by the slightest perturbation at the threshold of bifurcation (Prigogine and Stengers, 1984). Cognition, the process of living, interconnects the individuals and their nation-states with the world-system. Autopoiesis, coupled with cognition, enables these subsystems to recursively reproduce themselves as operationally closed but structurally and cognitively open entities.

Capra (1996, 2002), Gunaratne (2005), Urry (2003), Walby (2003) and others have explained the details of this theoretical approach encompassing

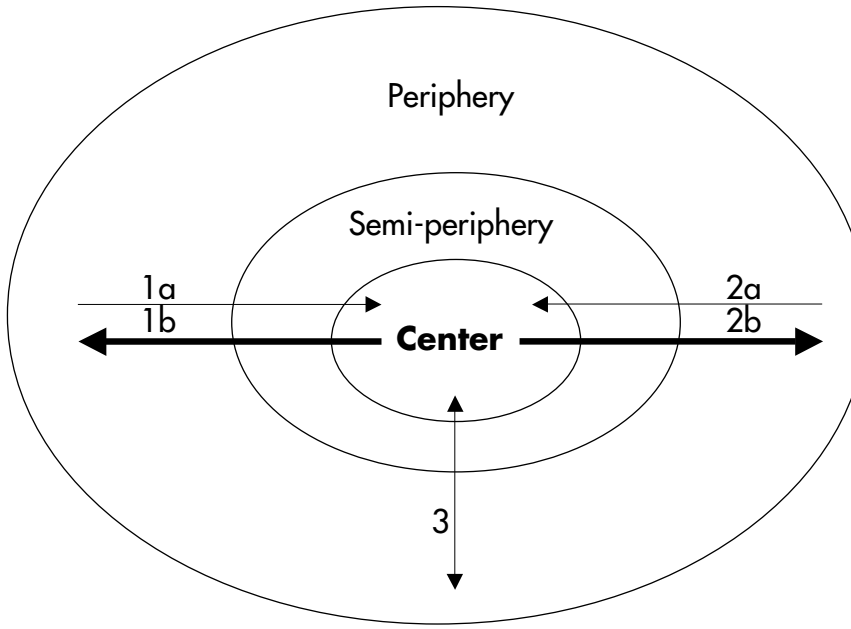
complexity.[5] Complexity science (both 'order-out-of-chaos' and 'order-in-chaos' approaches) affirms the findings of quantum theory that the universe is chaotic, unpredictable, paradoxical and holistic. The differences are mostly philosophical. The metaphors arising from the Copenhagen Interpretation – that there is no deep reality and that reality is created by observation – are implicit in the theory of living systems, which places heavy emphasis on non-linearity and irreversibility. Uncertainty provides only for estimation of probabilities. Just like the subatomic particles that are engaged in a continual dance of reproducing themselves, so are the molecules (or elements) that keep on reproducing themselves autopoietically within each cell (society or nation-state) comprising the totality of the sentient beings (or the world-system).

The nation-state (region/society) is a subsystem of a much broader totality called the world-system, which is more than the sum of its subsystems because of 'emergence'. Emergence refers to something unique to the totality that each of the parts by itself cannot have. Economic, political and cultural links bind the micro systems to the world-system (Figure 2).

The foremost human-engineered emergent characteristic of the world-system is the Global Information Infrastructure (GII), which connects every nation-state with the global financial networks, the global mass media networks, the non-governmental organization networks, global public diplomacy and related activities. Another emergent characteristic is world trade (the export and import of goods and services), which allows every nation-state to reap economic benefits in varying degrees. Note, however, that the primary beneficiaries of both these characteristics are the center countries, which dominate the modern capitalist world-system. A third emergent characteristic interconnects all people and the nation-states through the United Nations and its agencies, the various regional economic/political/cultural blocs and the 'wavicles' of transnational corporations.

Because of such obvious interconnections and interdependence of all people and nation-states, we have to study the world-system as a single unit of analysis. Co-evolution is the hallmark of the world-system. Therefore, it makes good sense to merge the broad analytical framework of the world-systems analysis as developed and later revised by Wallerstein (1974, 2004) with the theory of living systems.[6] Wallerstein identified two types of totality – *world empires* marked by a single political center and *world economies* with multiple centers – as world-systems. Wallerstein drew the center–periphery notion from dependency theory but added a semi-periphery layer. His analysis used the concepts of unequal exchange, capital accumulation, division of labor and international state system (denoting imperialism, hegemony and class struggle).

Wallerstein (2004) later clarified that since 1450, the secular trends of the



1a Global Information Infrastructure (periphery to center): financial networks; mass media networks; NGO networks; global public diplomacy.
1b Global Information Infrastructure (center to periphery): financial networks; mass media networks; NGO networks; global public diplomacy.
2a Exports and imports of goods and services (periphery to center): raw materials; textiles and low-end manufactured products; tourism.
2b Exports and imports of goods and services (center to periphery): high-technology manufactured products; intellectual property.
3 Network of the United Nations and its agencies; regional networks within and across the three layers (e.g. APEC, ASEAN, SAARC, EU, NAFTA); private transnational networks.

Figure 2 The World-System: Emergent Characteristics

capitalist world economy – e.g. the *longue durée* rise in real wage levels, in costs of material inputs of production and in levels of taxation – have impinged upon the possibilities of capital accumulation. Moreover, the historical waves of anti-systemic movements have seriously dented the legitimacy of state structures. These threats are subverting the political pillars of the existing world-system. Because of this structural crisis, 'the struggle between the spirit of Davos and the spirit of Porto Alegre' (Wallerstein, 2004: 88), the modern world-system has entered into a period of chaotic behavior, particularly since the world revolution of 1968 – the revolt against US hegemony and Soviet collusion, which coincided with emergence of the

Third World. This will cause a systemic bifurcation and a transition to a new structure whose nature is as yet undetermined and, in principle, impossible to predetermine, but one that is open to human intervention and creativity. This line of reasoning shows that Wallerstein considers the world-system to be a dissipative structure.

As Barton and Hunchuck (2000) have elucidated, Wallerstein saw the basic economic organization of the world-system as a single worldwide division of labor that unified multiple cultural systems into a single economic system. The political framework in which this division of labor prevailed – a series of sovereign nation-states – was a product of the world economic system. No single state could dominate the world system because of political fragmentation. The world market followed a laissez-faire model within a highly ordered, political environment that reflected a division of economic entities each of which had a distinctive function and met a specific set of needs of the world-system. These divisions constituted the center, the semi-periphery and the periphery.

Baker (1993) combined the elements of non-linear dynamics with those of the world-systems analysis to construct a provocative sociological theory. World-systems analysts presumed competitive capital accumulation to be the motor force of the world-system that recursively created the center–semi-periphery–periphery structure. Baker presumed the 'continuous exchange of energy and information between the elements of different spheres of reality' (Baker, 1993: 136) to be the motor force that produced this structure. By conceptualizing individuals and human collectivities, including cultures and nations, as *autopoietic* (self-maintaining) *dissipative* (environmentally dependent) structures whose essential features involved transformation of *energy* and release of *entropy*, Baker elevated elements of the world-systems paradigm to encompass non-linear dynamics. Baker used the term *centering* to describe the various centripetal strategies that humans, individually and collectively, used 'to bring the world into their orbit of control' (Baker, 1993: 139). Centering was an 'attractor' that created order by funneling energy – 'material goods, services, personnel' – and information toward itself and disorder by peripheralizing its environment. However, the accumulated entropic effect would, 'at some point or other, lead to sudden change' (Baker, 1993: 141).

The concepts of energy and entropy enable us to connect the world-systems approach with the theory of living systems. The world-system (Earth) depends on two sources – solar and terrestrial – for its supply of low-entropy energy. Although solar energy is presumed to be unlimited in quantity, it is limited to its flow or rate of arrival on earth. The terrestrial source, viz. minerals and fossil fuels, is limited in supply but is variable in its flow depending upon the economic decisions of those who are in control of the resources.

Within the world-systems model, it is the center that controls the rate of flow of the terrestrial supply. The periphery, while it may house the majority of the low-entropy stocks, has only a limited ability to control the flow. The periphery, then, is limited to the solar flow that arrives on its surface, which relegates it to a subsistence level of economic activity. Thus, in the world-systems model, the periphery is not only a source of low-entropy resources for the core; it is also a sink for the inevitable high-entropy byproducts. Current accounting systems do not consider the disorder created in a system by the various economic processes. The standard measure of economic welfare, the GNP, measures only production (Barton and Hunchuck, 2000).

Prew (2003) explains that entropy refers not only to increase in disorder, but also to depletion of 'useful' energy. Once low-entropy energy is converted to heat for production, the resulting product represents a high-entropy resource with some 'useful' energy 'wasted'. The first law of thermodynamics established that in the known universe (presumed to be a closed system), the amount of energy/matter remained constant; and, therefore, energy could neither be created nor depleted. But the second law of thermodynamics established that the amount of 'useful' energy that can perform work is reduced when energy/matter is converted to heat. Entropy, which can never decrease because of irreversibility of time, refers to the 'used up' component of energy/matter. Prigogine, however, presumed that dissipative structures (organisms) are open systems, which absorbed energy/matter from the environment and released entropy into the environment without having to reach the point of heat-death. Prew (2003) argues that 'development', production, etc. also generate entropy in the form of ecological degradation and social and other disorder, such as alienation, crime, civil and political strife and even war.

We can now see the intimate connection between the ceaseless accumulation of capital and the energy–entropy phenomenon. Capital accumulation invariably entails the ever-increasing use of 'useful' energy that generates a never-decreasing amount of entropy. Far-from-equilibrium dissipative structures are able to achieve a dynamic balance between order (negentropy) and disorder (entropy) across space–time. Once they reach a bifurcation point engendered by (non-linear) positive feedback ('turbulent chaos') of an unforeseen perturbation, one of two unpredictable outcomes would occur: self-organization into more complex dissipative structures or disintegration into confusion.

As Boswell and Chase-Dunn (2000) interpret the world-systems approach, world order and world polity are the dynamic outcomes of the ceaseless competition for capital accumulation by the people constituting the nation-states. Capital represented primary exploitation (profit derived from unequal exchange with labor) and secondary exploitation (rent and interest). The tripartite structure of the world-system could end only with a systemic

bifurcation at the edge of chaos. Thus, the theory of living systems enables us to see how each nation-state (and its people) is (are) interconnected with and interdependent on one another and the whole. Processes of interactions by the parts maintain the stability of the whole. Autopoiesis is the reason why nation-states are able to preserve their distinct cultures and will not succumb to westernization in the guise of globalization. This model is consistent with the fundamentals of Eastern philosophy: diversity within unity, complementarity (*yin–yang*), impermanence, dependent co-arising, harmony (dynamic balance) and so on.

Nature of Public Diplomacy

The *ontological* presumption – that everyone and everything is interrelated across space–time – and the *epistemological* presumption – that everyone and everything becomes meaningful in relation to others[7] – of the theory of living systems should be clear from the preceding two sections. Public diplomacy implicitly recognizes such 'relationships with people' (Fitzpatrick, 2004: 416), coexistence and mutual interdependence of all the actors in the world (Snow, 2004; Gilboa, 2000). Public diplomacy, an activity of particular importance to hegemon or center countries, constitutes a substantial portion of global communication.

The GII plays an important role in global communication and in the maintenance of world order, polity and structure fostered by competitive capital accumulation. The news angles of stories disseminated through the GII implicitly or explicitly reflect varying degrees of public diplomacy. Diverse audiences (observers) interpret (collapse) the ceaseless flow of messages (possibility waves) to understand world developments (uncover manifest reality). In their respective roles, both the disseminators and the audiences are observers. Quantum theory tells us that the very act of observation changes the multifaceted actuality that exists *in potentia*. As Overman (1991: 158) puts it, 'All we can ever know are the results of our experiments themselves, not more general principles of reality.' Strong objectivity is never attainable although codes of ethics based on the Newtonian model place supreme emphasis on it.

Fortner (1993: 278) explains that 'public diplomacy aims to affect the policies of other nations by appeals to its citizens through means of public communication'. Frederick (1993: 229) affirms that the objective of public diplomacy is 'to influence a foreign government by influencing its citizens' through overseas radio broadcasts, cultural programs and related activities. Hachten and Scotton (2002: 102) too define public diplomacy as 'a government's overt efforts to influence other governments and their publics'. They use the umbrella term international political communication (IPC) to

identify public diplomacy, overseas information programs, cultural exchanges, propaganda activities and political warfare. Furthermore, they say that the international media of all nation-states play a significant role in IPC considering that 'news and propaganda are not mutually exclusive categories' (Hachten and Scotton, 2002: 104). However, nation-states in the periphery 'are mostly in the receiving end of public diplomacy because most lack the communication capability to compete effectively on a global basis' (Hachten and Scotton, 2002: 104).

Ross (2002) points out that the practice of public diplomacy has changed dramatically with the proliferation of communications technology and the increase in global mobility. Ross (2003) has proposed strengthening US public diplomacy through alliances and partnerships with global corporations, humanitarian organizations and expatriate communities. Snow (2004) has pointed out the need for a public diplomacy based on mutual learning and mutual understanding. Critchlow (2004: 88) takes the traditional view that US public diplomacy should promote 'American core values such as the importance of democracy and freedom, concern for human rights at home and abroad, and the vibrancy of a free-market economy' without overlooking the 'warts'. In contrast, Kaufman (2002), a member of the Broadcasting Board of Governors,[8] takes a highly US-centric view. He accuses some nation-states of obstructing public diplomacy efforts of others. He claims that China, for example, is 'woefully short of objective information on the United States and its people' (Kaufman, 2002: 122) because international media like the CNN and BBC are unavailable to the vast majority of Chinese.[9]

Whereas Kaufman appears to believe in the 'bullet' effect of public diplomacy, Zaharna (2003) and Nisbet et al. (2004) point out its 'boomerang' effect as evident in the declining support for the US in the Muslim world. Neuman (1996: 110) explains, 'The media, empowered with a new technology, can force the agenda but do not dictate the outcome.' Vickers (2004) argues that the new public diplomacy is blurring the traditional distinctions between international and domestic information activities; between public and traditional diplomacy; and between cultural diplomacy, marketing and news management.

Gilboa (2000) has dissected this *new* public diplomacy in greater detail. He offers a comprehensive framework for analysis of how the media (or mass communication) have affected diplomacy in the Information Age. First, he presents three conceptual models – secret diplomacy, closed-door diplomacy and open diplomacy – based on the degree to which diplomatic negotiations are exposed to the media and public opinion. Then he presents three other models showing extensive use of the media (or mass communication) as a major instrument of foreign policy: *public diplomacy* 'where state and nonstate actors use the media and other channels of communication to

influence public opinion in foreign societies'; *media diplomacy* 'where officials use the media to promote conflict resolution'; and *media-broker diplomacy* 'where journalists temporarily assume the role of diplomats and serve as mediators in international negotiations' (Gilboa, 2000: 290).

The public diplomacy model, as Gilboa sees it, is a model of one-sided communication pursued mostly in international confrontations. During the Cold War, both the US and the Soviet Union used public diplomacy to shape favorable attitudes all over the world toward their respective rival ideologies. Gilboa has expanded this basic variant to include the non-state transnational variant (to reflect interdependence among all the actors in the world) and the domestic public relations variant (where a government hires public relations firms and even lobbyists in the target country to achieve its aims).

Gilboa separates media diplomacy from public diplomacy. Media diplomacy 'refers to the uses of mass media – through press conferences, interviews, leaks, etc. – to communicate with state and nonstate actors, to build confidence and advance negotiations, as well as to mobilize public support for agreements' (Gilboa, 2000: 294–5). Often public diplomacy precedes media diplomacy, which includes the traveling diplomacy variant and the media events variant. The former refers to the use of journalists accompanying political leaders when they travel overseas to accomplish diplomatic missions, and the latter refers to live broadcasts of diplomatic breakthroughs. Media diplomacy requires close cooperation between officials and journalists.

Media-broker diplomacy, according to Gilboa (2000: 298), 'refers to international mediation conducted and sometimes initiated by media professionals'. Gilboa says this model, where journalists act more as diplomats, has three variants: the direct intervention variant (where journalists are directly engaged in international negotiation), the bridging variant (where journalists bring together representatives of rival sides for on-air discussion of issues) and the secret variant (where officials use trustworthy journalists as go-betweens).

Gilboa's elegant distinctions may befit the linear *ceteris paribus* world of Newton. In terms of quantum theory, we may identify public diplomacy as one coherent superposition that exists *in potentia* with all its shades (e.g. media diplomacy, media-broker diplomacy, etc.) until an observer subjectively collapses it.

Theoretical Analysis

The foregoing discussion of public diplomacy, including media diplomacy and media-broker diplomacy, directs our attention to the symbiotic relationship between the global mass media and the global political center. In terms

of the theory of living systems, we see a far-from-equilibrium world-system within which the global political system (dominated by the center) is operationally coupled with the global media system (the system of communication-outlets).[10] Ontologically, everyone and everything is interrelated across space–time,[11] but from the world-systems perspective competitive capital accumulation has empowered the center to dominate the emergent characteristics of the world-system – the GII and its associated global networks. World-systems analysis begins with the whole. As quantum physicist Bohm says, instead of starting with parts and showing how they work together (the Cartesian order), we start with the whole (Zukav, 1979: 323). The whole is similar to the Chinese concept of Dao, which represents the unity of the diversity that Dao itself created through its offshoots *yin* and *yang*, the two complementary antinomic energy forces. Similarly, the world-system represents the unity of the diversity that the world-system itself created through its offshoots *energy* and *entropy*.[12]

At the micro-systemic level, each nation-state (cell) functions as a geographically bounded sovereign (autopoietic) entity. Just as the molecules autopoietically reproduce themselves within each cell (Maturana and Varela, 1980), the people within each nation-state reproduce themselves autopoietically thereby preserving their unique culture and ethos. Just like the cell, the nation-state is operationally closed, but cognitively and structurally open to its environment. Although everyone and everything in the world-system is interconnected through cognition (and the manifest reality of the emergent characteristics of the totality), the people within a nation-state are more closely interconnected because of their common ethos. This intimacy produces a closer structural coupling of the various internal systems – political, economic, legal, mass media, etc. (Luhmann, 1995) – within each nation-state. Each internal system is also operationally closed but cognitively open to its environment. Just as in the case of the superstructure, the nation-state's political system is operationally coupled with its mass media system.

This operational coupling of the political and media systems becomes clear in recent analyses of the *modus operandi* of the global media by scholars like Curran and Seaton (2003), McChesney (1999) and Price (2002). They provide evidence of media–government symbiosis rather than media–government conflict. The large literature on media–government relations indicates that media–government conflicts often result in the taming of the press by the state – as it transpired in Sri Lanka (Gunaratne, 1975).[13] The media–government symbiosis is very much in evidence in the putative free-press countries. Cook (1998: 3) claims that 'American media today are not merely part of politics; they are part of government'. He asserts that news is a 'coproduction' of the news media and government. Ponder (1998: 164) points out that from the White House perspective, 'managing the press has been a primary requirement for a successful presidency, not an optional

activity'. Brasch and Ulloth (1986) show that the historical relationship between state and press has been marked by the government's desire to exercise the most authoritarian restraints and by conflicting demands of others to loosen those controls.

Various subsidy schemes also attest to this symbiosis. Hess (1984) says that one may consider the government's press-office system as a subsidy for the press to get the information to the public. The subsidy schemes of the daily press in Austria, France, Norway and Sweden (Murschetz, 1998) are also a facet of this symbiosis. Benavides (2000) documents how the *gacetilla* advertising custom in Mexico produces the sort of media–government symbiosis common in Latin America. In the US, collaboration between the media and government in the aftermath of 9/11 produced 'wide support for the antiterrorism campaign and very few stories about dissent' (Hess and Kalb, 2003: 5).

Writing about the capitalist 'free-press' countries, Curran and Seaton (2003) say that the liberal conception of the press as independent watchdog is no longer accurate because, inter alia, the press is now organized into large corporations, whose profitability is affected by the policy outcomes of a greatly enlarged government. Thus, 'calculations of mutual advantage' (Curran and Seaton, 2003: 348) have submerged the four key functions of the liberal theory: informing the public, scrutinizing the government, staging a public debate and expressing public opinion. McChesney (1999) observes that commercial values have overwhelmed the vestiges of public service in the media. He asserts the global media system has turned out to be 'one that advances corporate and commercial interests and values, and denigrates or ignores that which cannot be incorporated into its mission' (McChesney, 1999: 103).

In a book that addresses government–media relations as they are actually empirically unfolding today, Price (2002) documents the changes that have occurred as a result of new technologies, political upheavals and changing concepts of human rights. Granting the inevitability of cross-border data flow via cognition and the manifest reality of the GII, which made information control almost impossible, nation-states, according to Price, are resorting to two categories of action: inward-directed efforts to protect their own information space; and outward-directed efforts to influence or alter media space and media structures outside their borders. Price says that the latter type of action has not received much attention.

Thus, Price (2002) contends, nation-states are engaged in preserving their information sovereignty through regional or multilateral approaches to control the media. This is consistent with the theories of autopoiesis, the pattern of organization; and of cognition, the process of life. However, Price's analysis follows the Cartesian order of beginning with parts and showing how they work together. From the perspective of the theory of living

systems, it is the emergent characteristics of the world-system that stimulate the parts to adapt themselves to the whole through the pattern of autopoiesis, thereby maintaining their 'sovereignty'. The far-from-equilibrium world-system thrives on a dynamic balance of order and chaos until reaching the edge of chaos (the point of bifurcation). Because thermodynamic equilibrium means 'heat-death', the very existence of a dissipative structure depends on the clash of antinomic forces that reflects diversity. Hence public diplomacy, a product of clashing ideologies, cannot result in the victory of one ideology over its antinomy in the long run.

Price (2002) asserts that media structures, media spaces and information policies are increasingly negotiated – the product of subtle arrangements between states and multinational corporations, between international entities and states, and encompassing other vectors. Price sees the world as 'a kind of force field where blazing technologies interact with gargantuan media entities, transforming geopolitical realities' (Price, 2002: 228). A remapping process is occurring with the concept of human rights being adjusted to the clash of national security with free speech standards. Price goes on to say that the principles of freedom of speech and of the press, the latter in particular, 'deconstruct as technological change and commercial realities wreak havoc with existing categories of "news", "journalists", and the very institutions of media that have claimed the mantle of the fourth estate' (Price, 2002: 248).

Again, contrary to Price's 'atomistic' interpretation, these changes are the reactions to the emergent characteristics of the world-system (the whole). Only by starting with the world-system as the unit of analysis can one satisfactorily explain the contemporary scenario of state–media relations. Freedom House's method of determining press freedom within nation-states or the use of normative theories as exemplars for nation-states now stands to be challenged (Gunaratne, 2002). Price's taxonomy of media–state relations requires the analysis of both unilateral and consensual actions (technology, law, force, negotiation) that nation-states adopt to alter external markets and protect internal markets.

Price contends that the information revolution has not necessarily diminished the sovereignty of the nation-state, which has regained its power to control the flow of adverse information (i.e. the public diplomacy of its rivals) through extending its area of action beyond its national borders. States are deploying a mix of technology, law, force and negotiation both unilaterally and consensually to protect their internal markets and alter their external markets.

Implicitly clarifying Price's view that nation-states have regained their sovereignty, Swyngedouw (1992) asserts that states have become more important in producing new spatial configurations. Castells (1996) identifies these configurations as the increasingly networked character of states. Hirst

and Thompson (1996) say that states have become the catalysts of forming networks operating at the regional or international level. The perspective of the theory of living systems is that cells (nation-states) invariably follow the pattern of autopoiesis ('sovereignty') as operationally closed entities. Either the cell ceases to exist through dissipation or it continues to exist as an autopoietic (sovereign) unit. No in-betweens or revivals are possible except for self-organization into a more complex adaptive system. However, cells can merge (e.g. bone marrow cells can fuse with specialized brain cells, possibly bolstering the brain cells or repairing damage). Moreover, cells can split into two and grow into the same size again. This is how cells multiply and get bigger. Similarly, nation-states can merge or split.

'Information intervention' (or public diplomacy) has become an important aspect of the center nation-states' foreign policy concerning global media space (e.g. NATO intervention in Bosnia-Herzegovina and Yugoslavia). Price (2002) also lists several techniques that nation-states use as part of their information and media foreign policy: providing subsidies, exerting pressure through the World Trade Organization, sponsoring and exporting media models and so on.

Price (2002) highlights seven main factors as determinants of a nation-state's approach to media: (1) sensitivity to international speech norms, (2) national security concerns, (3) tradition of private vs state media, (4) availability of new technology, (5) protectionism vs free trade, (6) nature and history of regime structure and (7) isolation vs vulnerability to power realignments. These seven factors fit into the internal and the external environments of the political system, which is operationally coupled with the system of communication-outlets and free expression, at the nation-state level. International speech norms, new technology, free trade and power alignments, inter alia, form the external environments that the autopoietic political system of a nation-state cognitively draws upon in determining its media space policy along the libertarian–authoritarian continuum. National security concerns, tradition of media ownership and the regime structure constitute aspects of the internal environment that are structurally coupled with the political system.

Autopoiesis of the system occurs though a continuous series of negative and positive feedback engendered by a multitude of factors giving rise to both chaos and order. The circular pattern of autopoiesis (the interaction of *yin* and *yang*) takes into account all relevant factors in the environment. Maturana (2002) points out that living systems are constitutively open to the flow of molecules (matter/energy) in the continuous realization of the recursive, closed, self-producing dynamics that constitutes them as singular entities. What applies to a human being as a singular living system is also applicable to a collectivity of human beings constituting a nation-state because they share meaning as close, structurally coupled systems.

Summary and Conclusion

From the perspective of the theory of living systems, the analysis of public diplomacy, global communication and world order must begin with the world-system as the unit of analysis. Although the nation-states (like cells) are sovereign (autopoietic), they cannot function in isolation outside the totality of the world-system, which represents the unity within the diversity of ideological and material phenomena engendered by antinomic but complementary energy forces. The world-system is a far-from-equilibrium dissipative structure, which has evolved into three porous layers – center–semi-periphery–periphery – through ceaseless competition for capital accumulation. It maintains a dynamic balance in relation to order (negentropy) and disorder (entropy) between bifurcation points. Complementarity, uncertainty, non-linearity and irreversibility are inherent characteristics of the world-system and its components, which are held together by cognition, the process of life, and autopoiesis, the pattern of organization.

Although the global hegemons and their rivals collaborate with the global and local communication-outlets to push their ideologies to recipients in the peripheries through public diplomacy, this is a battle that neither party can win in the long run. This is because the very existence of a dissipative structure depends on the clash of antinomies. Thermodynamic equilibrium (or the domination of the whole by a single ideology) would mean the total dissipation (or 'heat-death') of the system. Moreover, because of the principles of uncertainty and non-linearity, it is not possible to determine the winners and losers of public diplomacy. One cannot predict public opinion, just as in the case of weather, in the long run. Moreover, because no observer can accurately measure the initial conditions of the coherent superposition of public diplomacy, empirical science cannot predict the boomerang-and-bullet effects of public diplomacy.

Price's (2002) analysis of contemporary state–media relations easily fits into our theory of living systems. Price implicitly recognizes the oneness of the world-system and the diversity within it; and the structural coupling of all living systems – whether in the form of individuals or collectivities such as communities or nation-states. What Price says is that collectivities of human beings, in their manifestation as nation-states, are establishing closer structural coupling with one another (forming networks) to establish their own controlled information space. Thus, Price implicitly concedes the operational coupling of the political and communication-outlet systems both at the world-system and the nation-state levels. The freedom of communication-outlets depends on the shade of democracy that the pattern of autopoiesis (*yin–yang* interaction) determines for each nation-state within the context of the world-system. No system of communication-outlets is free

from the political system under which it has to operate. Hence the myth of the 'independent' Fourth Estate.

Notes

The author wishes to thank Professor Kurt Kent, University of Otago, for his helpful comments.

1 Mansfield (1990) says that points of genuine similarity exist between the Buddhist concept of dependent co-arising (*paticca samuppada*) and physical relativity. However, Mansfield warns, 'But the divergence of their views on causality and especially the status of their highest principles makes associations hazardous' (Mansfield, 1990: 70).

2 The complementarity principle states that in the special case, wave and particle theories of light are not mutually exclusive but complementary. In the more general epistemological case it holds that two descriptions of reality can coexist (Overman, 1991: 154).

3 For example, the more certainly a particle's position is known, the more uncertain must be knowledge of its momentum. Thus, it is impossible to determine the exact nature of reality.

4 Bell's theorem is based upon correlations between paired particles similar to the pair of hypothetical particles in the Einstein–Podolsky–Rosen thought experiment. Bell's theorem shows that the principle of local causes is mathematically incompatible with the assumption that the statistical predictions of quantum theory are valid.

5 Urry (2003) says that macro approaches, such as world-systems analysis, should go beyond their focus on linear entities of *regions* (i.e. societies or nation-states) to examine the recursive interactions of networks that stretch across diverse regions (e.g. scientific communities) and *fluids* (such as social movements) whose boundaries come and go. *Fluids* are simultaneously particle-like and wave-like. These quantum characteristics can be dissected in *regions* and *networks* as well when related to their interdependence with environment.

6 Some may point out that the 'no deep reality' interpretation of quantum theory – to which the theory of living systems is heavily indebted – reflects the view of postmodernist constructionism whereas the '*longue durée*' view of historical change and the epistemology of world-systems analysis reflect the perspective of critical realism. Roy Bhaskar (1999), the protagonist of critical realism, advocates the path of critical naturalism, which aims to sublate dialectical polarities to derive a general position. In retrospect, I see my attempt to conflate these two theoretical approaches as a sublating exercise.

However, one should note the many variations of world-systems analysis – labeled *continuing*, *comparative*, *evolutionary*, *engulfing*, etc. – that have emerged since Wallerstein's original formulation (Hall, 1996; Denemark et al., 2000). Disagreements exist on the definition of *world-system* and its historical beginning. For example, Frank and Gills' (1993) world system (singular and no hyphen)

approach, which claims a 5000-year history for capitalism, differs from Wallerstein's world-systems (plural and hyphenated) approach, which claims only a 500-year history starting with Europe's transition from feudalism to capitalism.

7 I owe the terminology used here to Miike (2003), who invoked the fundamentals of Eastern philosophy to derive an Asiacentric paradigm of communication.

8 Currently, the BBG oversees all US non-military international broadcasting, including the Voice of America, which broadcasts on radio and television in 44 languages around the world; Radio/TV Marti, which broadcasts to Cuba; Radio Free Europe/Radio Liberty, a private corporation funded by a grant from the BBG and which broadcasts in 25 languages; Radio Free Afghanistan (an RFE/RL avatar), which broadcasts in Dari and Pashto; Radio Free Asia, which broadcasts in nine languages; Radio Farda, a Persian-language service that complements VOA broadcasts to Iran; Radio Sawa, an Arabic-language service broadcasting 24 hours a day; Alhurra, an Arabic-language satellite TV channel for the Middle East; and VOA's WorldNet Television, a global satellite-delivered program.

9 See the quantum theory perspective on objectivity mentioned in the second paragraph of this section. Kaufman's views are incompatible with the ontological and epistemological presumptions of the theory of living systems.

10 Gunaratne (2005) uses the term 'system of communication-outlets' in preference to 'system of mass media' because the latter term has a Eurocentric bias as it ignores the output of xylography (block-printing) in China several centuries prior to Gutenberg's printing press (Gunaratne, 2001).

11 Quantum theory backs this view. Bell's theorem implies that what we see as 'separate parts' of the universe could be intimately connected at a deep and fundamental level. Bohm asserts that the most fundamental level is an *unbroken wholeness*, which is 'that-which-is,' including space, time, and matter (Zukav, 1979: 323).

12 For a more elaborate exposition of the connection between Eastern philosophy and the theory of living systems, see Gunaratne (2005).

13 The conflict between the capitalist private press and the socialist government in Venezuela shows similarities to what transpired in Sri Lanka in the 1960s. Following the failed coup against President Chavez in April 2002, public and private media have turned against each other in a low-level civil war. Venezuela's National Assembly has been debating a law of social responsibility that would nationalize all mass media.

References

BAKER, P. L. (1993) 'Chaos, Order, and Sociological Theory', *Sociological Inquiry* 63(2): 123–49.

BARBER, B. (1984) *Strong Democracy*. Berkeley, CA: University of California Press.

BARTON, J. H. and HUNCHUCK, A. M. (2000) 'All That is Solid Melts in Air: World Systems Theory', *Perspectives* 3; at: www.aabss.org/journal2000/f06Barton.jmm.html (accessed 17 July 2004).

BECKER, T. and SLATON, C. D. (2000) *The Future of Teledemocracy*. Westport, CT: Praeger.

BENAVIDES, J. L. (2000) '*Gacetilla*: A Keyword for a Revisionist Approach to the Political Economy of Mexico's Print News Media', *Media, Culture and Society* 22: 85–104.

BHASKAR, R. (1999) Interview, *The Philosophers' Magazine* No. 8.

BOSWELL, T. and CHASE-DUNN, C. (2000) *The Spiral of Capitalism and Socialism: Toward Global Democracy*. Boulder, CO: Lynne Rienner.

BRASCH, W. M. and ULLOTH, D. R. (eds) (1986) *The Press and the State: Sociohistorical and Contemporary Studies*. Lanham, MD: University Press of America.

CAPRA, F. (1996) *The Web of Life: A New Scientific Understanding of Living Systems*. New York: Doubleday.

CAPRA, F. (1999) *The Tao of Physics: An Exploration of the Parallels between Modern Physics and Eastern Mysticism*, 4th updated edn. Boston, MA: Shambhala. (Orig. pub. 1975.)

CAPRA, F. (2002) *Hidden Connections: Integrating the Biological, Cognitive, and Social Dimensions of Life into a Science of Sustainability*. New York: Doubleday.

CASTELLS, M. (1996) *The Information Age, Vol. 1. The Rise of the Network Society*. Oxford: Blackwell.

COOK, T. E. (1998) *Governing with the News: The News Media as a Political Institution*. Chicago, IL: The University of Chicago Press.

CRITCHLOW, J. (2004) 'Public Diplomacy during the Cold War: The Record and its Implications' (Review essay), *Journal of Cold War Studies* 6(1): 75–89.

CURRAN, J. and SEATON, J. (2003) *Power without Responsibility: The Press, Broadcasting, and New Media in Britain*, 6th edn. London: Routledge.

DATOR, J. A. (1984) 'Quantum Theory and Political Design', paper presented at the Dutweiller Institute conference.

DENEMARK, R. A., FRIEDMAN, J., GILLS, B. K. and MODELSKI, G. (eds) (2000) *World-System History: The Social Science of Long-Term Change*. London: Routledge.

DIZEREGA, G. (1991) 'Integrating Quantum Theory with Postmodern Political Thought and Action: The Priority of Relationships over Objects', in T. L. Becker (ed.) *Quantum Politics: Applying Quantum Theory to Political Phenomena*. New York: Praeger.

FITZPATRICK, K. R. (2004) 'US Public Diplomacy', *Vital Speeches of the Day* 70(13): 412–17.

FORTNER, R. S. (1993) *International Communication: History, Conflict, and Control of the Global Metropolis*. Belmont, CA: Wadsworth.

FRANK, A. G. and GILLS, B. K. (1993) *The World System: Five Hundred Years or Five Thousand?* London: Routledge.

FREDERICK, H. H. (1993) *Global Communication and International Relations*. Belmont, CA: Wadsworth.

GILBOA, E. (2000) 'Mass Communication and Diplomacy: A Theoretical Framework', *Communication Theory* 10: 275–309.

GOSWAMI, A. (1993) *The Self-Aware Universe: How Consciousness Creates the Material World*. New York: Jeremy P. Tarcher/Putnam.

GOSWAMI, A. (2000) *The Visionary Window: A Quantum Physicist's Guide to Enlightenment*. Wheaton, IL: Quest Books.
GUNARATNE, S. A. (1975) *The Taming of the Press in Sri Lanka*, Journalism Monographs No. 39. Lexington, KY: Association for Education in Journalism.
GUNARATNE, S. A. (2001) 'Paper, Printing, and the Printing Press: A Horizontally Integrative Macrohistory Analysis', *Gazette* 63: 459–79.
GUNARATNE, S. A. (2002) 'Freedom of the Press: A World System Perspective', *Gazette* 64: 343–69.
GUNARATNE, S. A. (2005) *The Dao of the Press: A Humanocentric Theory*. Cresskill, NJ: Hampton Press.
HACHTEN, W. A. and SCOTTON, J. F. (2002) *The World News Prism: Global Media in an Era of Terrorism*, 6th edn. Ames, IA: Iowa State Press.
HALL, T. D. (1996) 'World-System and Evolution: An Appraisal', *Journal of World Systems Research* 2(4): 1–43.
HERBERT, N. (1985) *Quantum Reality*. New York: Doubleday.
HESS, S. (1984) *The Government/Press Connection: Press Officers and Their Offices*. Washington, DC: The Brookings Institution.
HESS, S. and KALB, M. (eds) (2003) *Media and the War on Terrorism*. Washington, DC: Brookings Institution Press.
HIRST, P. and THOMPSON, G. (1996) *Globalization in Question*. Cambridge: Polity Press.
KAUFMAN, E. (2002) 'A Broadcasting Strategy to Win Media Wars', *The Washington Quarterly* 25(2): 115–27.
LANDAU, M. (1961) 'On the Use of Metaphor in Political Analysis', *Social Research* 28: 331–63.
LUHMANN, N. (1992) 'Autopoiesis: What is Communication?', *Communication Theory* 2: 251–8.
LUHMANN, N. (1995) *Social Systems*, trans J. Bednarz Jr with D. Baecker. Stanford, CA: Stanford University Press. (Orig. pub. 1984.)
LUHMANN, N. (2000) *The Reality of the Mass Media*, trans. K. Cross. Stanford, CA: Stanford University Press. (Orig. pub. 1996.)
MCCHESNEY, R. W. (1999) *Rich Media, Poor Democracy: Communication Politics in Dubious Times*. Urbana: University of Illinois Press.
MANSFIELD, V. (1990) 'Relativity in Madhyamika Buddhism and Modern Physics', *Philosophy East and West* 40(1): 59–72.
MATURANA, H. (2002) 'Autopoiesis, Structural Coupling and Cognition: A History of These and Other Notions in the Biology of Cognition', *Cybernetics and Human Knowing* 9(3): 5–34.
MATURANA, H. and VARELA, F. (1980) *Autopoiesis and Cognition: The Realization of the Living*. Dordrecht: Reidel.
MIIKE, Y. (2003) 'Beyond Eurocentrism in the Intercultural Field: Searching for an Asiacentric Paradigm', in W. J. Starosta and G.-M. Chen (eds) *Ferment in the Intercultural Field: Axiology/Value/Praxis*, pp. 243–76. Thousand Oaks, CA: Sage.
MURSCHETZ, P. (1998) 'State Support for the Daily Press in Europe: A Critical Appraisal', *European Journal of Communication* 13: 291–313.

NEUMAN, J. (1996) 'The Media's Impact on International Affairs, Then and Now', *SAIS Review* 16(1): 109–23.

NISBET, E. C., NISBET, M. C., SCHEUFELE, D. A. and SHANAHAN, J. E. (2004) 'Public Diplomacy, Television News, and Muslim Opinion', *The Harvard International Journal of Press/Politics* 9(2): 11–37.

OVERMAN, E. S. (1991) 'Policy Physics', in T. L. Becker (ed.) *Quantum Politics: Applying Quantum Theory to Political Phenomena*, pp. 151–67. New York: Praeger.

PONDER, S. (1998) *Managing the Press: Origins of the Media Presidency, 1897–1933*. New York: St Martin's Press.

PREW, P. (2003) 'The 21st Century World-Ecosystem: Dissipation, Chaos, or Transition?', in W. A. Dunaway (ed.) *Emerging Issues in the 21st Century World-System Vol. 2: New Theoretical Directions for the 21st Century World-System*, pp. 203–19. Westport, CT: Praeger.

PRICE, M. E. (2002) *Media and Sovereignty: The Global Information Revolution and its Challenge to State Power*. Cambridge, MA: The MIT Press.

PRIGOGINE, I. and STENGERS, I. (1984) *Order Out of Chaos: Man's New Dialogue with Nature*. Toronto: Bantam Books.

ROSS, C. (2002) 'Public Diplomacy Comes of Age', *The Washington Quarterly* 25(2): 75–83.

ROSS, C. (2003) 'Pillars of Public Diplomacy: Grappling with International Public Opinion', *Harvard International Review* 25(2): 22–8.

RUSSELL, R. J., CLAYTON, P., WEGTER-MCNELLY, K. and POLKINGHORNE, J. (eds) (2001) *Quantum Mechanics: Scientific Perspectives on Divine Action Vol. 5.* Berkeley, CA: Center for Theology and Natural Sciences.

SCHUBERT, G. (1983) 'The Evolution of Political Science Paradigms of Physics, Biology, and Politics', *Politics and Life Sciences* 1(2): 98–124.

SLATON, C. D. (1991) 'Quantum Theory and Political Theory', in T. L. Becker (ed.) *Quantum Politics: Applying Quantum Theory to Political Phenomena*, pp. 41–63. New York: Praeger.

SNOW, N. (2004) 'How to Build an Effective US Public Diplomacy', *Vital Speeches of the Day* 70(12): 369–75.

SWYNGEDOUW, E. (1992) 'Territorial Organization and the Space/Technology Nexus', *Transactions, Institute of British Geographers* 17: 417–33.

URRY, J. (2003) *Global Complexity*. Cambridge: Polity Press.

VICKERS, R. (2004) 'The New Public Diplomacy: Britain and Canada Compared', *British Journal of Politics and International Relations* 6(2): 182–95.

WALBY, S. (2003) 'Complexity Theory, Globalization, and Diversity', paper presented to conference of the British Sociological Association, University of York, April.

WALLERSTEIN, I. (1974) *The Modern World-System: Capitalist Agriculture and the Origins of the European World Economy in the Sixteenth Century*. New York: Academic Press.

WALLERSTEIN, I. (2004) *World-Systems Analysis: An Introduction*. Durham, NC: Duke University Press.

YU, B. and LU, Z. (2000) 'Confucianism and Modernity – Insights from an Interview with Tu Wei-ming', *China Review International* 7: 377–87.

ZAHARNA, R. S. (2003) 'The Unintended Consequences of Crisis Public Diplomacy: American Public Diplomacy in the Arab World', *Foreign Policy in Focus* 8(2): 1.
ZUKAV, G. (1979) *The Dancing Wu Li Masters: An Overview of the New Physics*. New York: William Morrow and Co.