Complexity Thinking in the Fight Against Corruption: Some Perspectives From South Africa

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ABSTRACT This article argues that corruption and the efforts to curb it can be explained in terms of some elements of complexity thinking. The authors find that corruption is comparable to a social virus that continuously mutates and adapts to new environments to counter anti-corruption strategies. On the basis of its omnipresence, myriad manifestations, causes and impacts, corruption is found to be a complex, dynamic and ever-changing social phenomenon. It is impossible to totally eradicate it, and one can only strive to consistently reduce its intensity and scope over time. A holistic anti-corruption policy approach that continuously empowers all sectors of society (starting at the level of the family) and all levels of administration has to be encouraged.

Introduction

Contemporary South Africa was founded on a corrupt apartheid system characterized by secrecy and patronage (Geldenhuys, 1991, pp. 48–49). The internal workings of apartheid, devoid of a sufficient accountability system, and its various Acts were fertile ground for corruption (Hyslop, 2005). In post-apartheid South Africa it was stated that the financial cost of corruption far exceeded the value derived from all streetcrimes. According to the Corruption Perception Indexes of 1995 and 2008, the perception of corruption has been worsening since 1995 (Transparency International, no date). A more recent assessment by the African Peer Review Mechanism (APRM) shows that corruption in South Africa is still one of the country’s biggest challenges (Mail & Guardian, 2007). The extent of economic crime in the private sector is also high, as indicated by a survey conducted by PricewaterhouseCoopers (2005). To turn this situation around, the South African government has taken various initiatives to set up institutions with exclusive responsibility to combat corruption. However, these efforts have been counterproductive.

Despite their complexity and proliferation, the understanding of corruption and anti-corruption systems has been approached from a mechanical point of view
based on a belief in cause and effect and control and prediction. This article is a departure from this traditional perspective and addresses the problem of corruption and the efforts to curb it from a complexity thinking paradigm. Especially during the digital era and globalization, where intense interconnections are conducive to the emergence of new forms of corruption, this new approach looks promising for a better impact to be made on the anti-corruption industry.

This article analyses corruption and anti-corruption efforts, the level of interconnectedness, organization, and co-ordination involved in fighting corruption in South Africa, and its implications as seen from perspectives of complexity thinking. The article intends to provoke thought and lay the ground for future studies to test the applicability of complexity thinking in the endeavour to curb corruption in the public service.

Overview of complexity thinking, corruption and anti-corruption

Complexity thinking

Most of the definitions of complexity thinking emphasize its characteristics as nonlinear, dynamic, interactive, turbulent, unpredictable, self-organizing and fractal (Capra et al., cited in Livneh and Parker, 2005, p. 19). Complexity science has its roots in well-developed disciplines including physics, mathematics, biology, chemistry, engineering, geography, meteorology and astronomy (Livneh and Parker, 2005, p.19). It is because of this diversity of sources that it has not been easy to formulate an integrated theory of the concept. Essentially, '[c]omplexity science is the study of complex adaptive systems. It is a science that encompasses many theories and ideas including chaos theory, self-organization and fractal geometry' (Zimmerman, 1999, p. 44).

Rouvray (2003, p. 3) suggests that the idea of complexity is not new. According to him, the argument of the philosophers of ancient Greece, notably Parmenides and Plotinus, was that:

our world is not as simple as it might seem... it is not totally separated into non-interacting parts since any conceivable separation process would always leave the parts connected together in some way. Thus, [...] the world is intrinsically holistic in nature and [...] to reflect reality accurately a holistic frame of reference had to be adopted.

Checkland (1999, p. 60) similarly observes that, even though our knowledge of the world is divided into different 'disciplines', it is not nature that divides itself up into physics, biology, psychology, sociology and the like; it is humanity that imposes its divisions on nature. After analysis, one therefore needs to integrate the knowledge accumulated by the different disciplines and perspectives in order to hold a holistic view of the problem and situation (Gell-Mann, 2006, p.76). All variants of the theories of complexity share the idea that the whole (the system) is more than the sum of the parts (the individual agents), while, at the same time, developments of the whole stem from the (interaction of the) parts (Klijn, 2008, p. 301). It is this 'systems' view of the universe that is being
promoted by complexity science. In this regard, complexity science has proved to be an important bridging discipline between the arts and the sciences (Rouvray, 2003, p. 23).

**Corruption and anti-corruption**

In daily parlance, 'corruption' is such a common word that few are worried about its concrete meaning and subtleties. Over the years, various unacceptable activities that are closely associated with corruption have been categorized and labelled as unethical, immoral, criminal and illegal. Conceptually, corruption is a form of behaviour which departs from ethics, morality, tradition, law and civic virtue (Udombana, 2003, p. 461). However, if one tries to classify all misconduct as corrupt behaviour then corruption would be indistinguishable and would include everything that is not ethical. Hence, for policy makers and implementers the issue is of such concern that ongoing research is necessary to ensure a clear and tangible understanding of the problem in order to effectively address it.

The current formal definitions of corruption more or less rest on four approaches. According to the public office-centred approach, corruption is behaviour that deviates from the formal rules of public office (Nye, cited in Johnston, 1998a, p. 18). The public interest-centred approach defines corruption as bribery or other rewards leading a functionary to favour those who offer bribes and damage the public interest (Heidenheimer, cited in Sangita, no date). The market-centred approach sees corruption as a situation in which an official considers their position as authority to maximize personal gain (Heidenheimer, cited in Johnston, 1998b, p. 18). Finally, the public opinion-centred approach indicates that corruption is based on what public opinion believes is corrupt (Kurer, 2005, pp. 222–223). That is, a person, process or regime is corrupt if a significant proportion of the population regards it as corrupt (Johnston, 1998b, p. 89).

Clearly there are flaws in the above definitions. For example, if acts which are not illegal are not corrupt, then the public-office definition is unable to deal with legislative corruption. As there is no general consensus of what public interest is, the public interest-centred definition fails an operationalization test (Scott, cited in Kurer, 2005, p. 226). The market-centred approach overlooks the non-monetary benefits of corruption, like prestige and promises of political support (Johnston, 1994). Finally, in the public opinion-centred definition it is difficult to pin down public opinion (Kurer, 2005, pp. 222–223) because of citizens' inadequate awareness of services that they are entitled to and the dynamic nature of public opinion. There are major differences in what counts as corrupt conduct across different societies and over time (Anchiarico and Jacobs, 1996, p. 4). Hence, how corruption is understood depends on the point of view, in which connection and in what context it is discussed. Therefore, a unanimous attitude to it is lacking.

A more general definition that overcomes the above limitations comes from Transparency International (no date), which conceptualizes corruption as the 'misuse of entrusted power for private gain.' According to this view, corruption emerges at the private-public interface and is a pervasive cancer that infects all
sectors of society and is not limited to the public sector. As with the definitional problem of corruption, there is widespread disagreement on what the most effective anti-corruption policies are. Nevertheless, whatever policies are pursued, 'effectiveness to control corruption is partially influenced by the diversity and nature of corruption and approaches taken by analysts' (Doig and Riley, 1998, p. 55). The approaches themselves depend on the magnitude of the hatred of corruption and vary from place to place and from time to time. As a reflection of this hatred, people begin to respond spontaneously and, with the accumulation of experience, systematically. This response, which reflects humanity's endeavour to create a corruption-free administration, did not emerge in its current form, but has evolved through many stages.

Framework of analysis

Before analysing corruption and anti-corruption from the point of view of complexity thinking, it is necessary to provide an overview of some strands of complexity theory that are relevant to the purposes of this paper, with regard to nonlinear dynamics, power law, self-organizing, attractors, complex adaptive systems, and fractal.

Nonlinearity (nonlinear dynamics)

The mechanistic (Newtonian) view of nature, that was dominant for a long period of time, states that systems are causally closed (only mechanical or material causes are legitimate), deterministic (given precise initial conditions, the future and past states of a system can be specified with precision), reversible (laws governing behaviour work the same in both temporal directions), atomistic (they are strongly decomposable into stable least units, which can be built up and taken apart again), and physical laws universal (they apply everywhere, at all times and in all scales) (Depew and Weber, cited in Ulanowicz, 2005, p.15). However, these postulates do not provide the whole picture of the operations of the universe. Even though it can be observed that part of nature is linear and can be comprehended by classical physics, much of it is nonlinear and cannot be addressed through traditional scientific methods—a challenge to Newtonian hegemony. 'Even systems which exhibit purely deterministic dynamics can behave in nonlinear ways' (Young, 1991). The instability and unpredictability of economic and ecologic systems are good examples that highlight the nonlinearity of phenomena that result from the heterogeneity and interconnectivity of nature (Stacey, 1996, p. 206; Goldspink and Kayb, 2003, p. 462; see also Livne and Parker, 2005, p. 20). In social and other systems, small input can lead to dramatically large consequences, i.e., the relationship between input and output or between cause and effect can be disproportionate. Minor inputs might set off a chain of actions that can end up in a tremendously chaotic situation (Lewin, 1992, p. 11; Cilliers, 1998, p. 120; Kiel and Elliott, 1999, p. 4; Goldspink and Kayb, 2003, p. 462; Heylighen, 2002).
According to Livneh and Parker (2005, p. 20), such an occurrence is usually referred to as 'sensitive dependence on initial conditions.' That is, small, more or less accidental, unconscious disturbances during complex policy processes can have far-reaching consequences which overshadow the planned, intended and predicted outcomes (Kickert, 1993, p. 199).

**Attractors in systems—order from chaos**

The trajectories and processes where systems develop are irregular, giving the feeling of randomness, although they are compelled by determinism (Heylighen, 2002). When a nonlinear system is thrown towards a chaotic state, it begins to gravitate towards a point or set of points (attractor/s), self-organizes and acquires a new order. Albrecht (2000, p. 413) points out that attractors pull a complex dynamic system out of instability into order, or vice versa. The School of Wisdom (1995) indicates that '[t]he world is not really totally ordered as previously believed. It is fundamentally disordered, chaotic, but it contains forces or attractors of cosmos that create patterns of order over time. They are anchors of order in an otherwise stormy sea.' Hence, it can be said that '[a] violent order is disorder; and a great disorder is an order' (Stevens, cited in Lucas, 2004).

As an ordering force, Livneh and Parker (2005, pp. 22–23) identify several types of attractors towards which a system gravitates: fixed-point attractors (when a system’s movement settles towards a point), limited-cycle (periodic, cyclic) attractors (when a system’s movement alternates between two points), torus attractors (when there is complex cycling which moves forward and so is different while it repeats itself), and strange attractors (when the dynamics of a strange attractor are chaotic and result from a series of bifurcations). As foundations of self-organization, strange attractors depend on sensitive initial situations and display fractal dimensions and self-similarity. Although strange attractors look disorderly, they in fact exhibit subtle orderliness (Juarrero, 2000, p. 53). Adam Smith’s concept of the ‘invisible hand’ in economics corroborates the social order that emerges as the unintended consequences of individual human actions (Levin, 2003, p. 4).

**Self-organizing and emergent**

However turbulent and unpredictable it may look, a chaotic system can self-organize and arrive at a new level of stability. One distinguishing characteristic of a complex system is the ability of its parts to self-organize rather than being subdued by a central control (Kaufman, cited in Sheriff, 2006, p 73). Self-organization in social systems is ‘a process in which the components of a system in effect spontaneously communicate with each other and abruptly cooperate in co-ordinated and concerted common behaviour’ (Stacey, cited in Bovaird, 2008, p. 320).

The interactions between the components of a system have the capacity to bring about unforeseen collective behaviour—emergent properties (Albrecht, 2000, p. 413; Klijn, 2008, p. 306). According to Prigogine and Stengers (1984, p. 313), organizations are ‘complex adaptive systems composed of agents (people) who
experiment, explore, self-organize, learn and adapt (in varying degrees) to changes in their environments.' Hence, behaviour patterns can emerge without being intended and, in fact, often emerge contrary to intention, producing unexpected and counterintuitive outcomes (Albrecht, 2000, p. 407).

The universe itself is believed to be a product of these self-organizing processes. According to the Big Bang theory, the universe was formed as a result of the explosion of very dense hot matter about 15 billion years ago. Since this explosion, the universe has been undergoing continual change and has evolved from a state of featureless simplicity to increasing complexity. This demonstrates that nature has creative power and can progressively produce a richer variety of complex forms and structures. It is emerging rather than vanishing (Davies, cited in Rouvray, 2003, p. 4–5).

The self-organizing behaviour takes the form of a power-law distribution. That is, according to Bovaird's (2008, p. 323) observation, 'there tends to be a very large number of relatively small changes in the system and quite a large number of moderate-scale changes, but there will also be some large-scale changes—more than would be predicted...' Anti-corruption efforts, as complex phenomena, can also be shown in power-law relationships. For example, there are only a couple of big programmes—such as the International Anti-Corruption Conference (IACC), which is run only once per annum—in the anti-corruption industry, but hundreds of local events are organized hundreds of times a year (Michael, 2004, p. 1076).

Complex adaptive systems

It is a common observation of nature that all elements form part of complex adaptive systems—from microscopic cells to macroscopic societies (Levin, 2003, p. 3). The behaviour of complex adaptive systems includes the following: nonlinearity and dynamism that do not inherently reach fixed points of equilibrium; adaptability to each other's conflicting behaviour; and the emergence of patterns of behaviour. Moreover, in complex adaptive systems no single point of control exists—their behaviours can usually be influenced more than they can be controlled (Anderson et al. cited in Rouse, 2000, pp. 143–144; Bovaird, 2008, p. 326).

From the perspective of adaptive complex systems, one way to move away from the narrow view of organizations as machines is to see them as biological, cultural and political entities (Rouse, 2000, p. 145). The self-organizing property of a system that results from its diversity, localized interaction and feedback increases its capacity to be more flexible and creative. So for organizations to survive in turbulent situations they must retain their internal variation and not necessarily stick to uniformity of operations (Klijn, 2008, p. 300). Accordingly, organizations can be metaphorically described as living organisms which have built-in self-regulating mechanisms to enable them to survive a continuous struggle to cope with the challenges that they face.
The nature of corruption from the perspective of complexity thinking

Corruption is evolutionary, and new forms of corruption and mechanisms emerge in response to the various anti-corruption programmes. It is a complex phenomenon, where corrupt agents are like viruses that mutate and adapt to new environments. Corruption exhibits some properties of complex adaptive systems, self-organization, various forms of attractors, self-similarity, and non-linearity.

A growing volume of literature indicates that the concept of corruption is not static, and that it exhibits some properties of complex adaptive systems. Given its changing meanings, manifestations, proliferations, and perceived causes and impacts (Anchialarico and Jacobs, 1996, p. 6), corruption is considered a dynamic and complex social phenomenon. It is a complex and elusive term which means different things to different people in time and space, and manifests in many different ways. To some, corruption is country-specific and must be understood in relation to given cultures; others contend that there is a transnational understanding of corruption and that there are universal elements to corruption, irrespective of time and space (Transparency International Hungarian Chapter, 2004). That is, despite its complex nature (including meaning, forms, types, and locus), a universal understanding (order out of chaos) of corruption has emerged, which has become the basis for all regional and international agreements—a self-organizing property of anti-corruption agents. Unless there is a common worldwide understanding of what corruption is, the signing and implementation of such a convention is problematic.

This self-organization is the result of human distaste of corruption, as reflected in various ethical principles and religious teachings. Religious writings suggest that there are many common features in the traditional ethics of different societies (Lynch and Lynch, no date). Osborne (1997, p. 11), referring to bribery in the writings central to several religions and cultures (the Hebrew scriptures, Hindu and Confucian writings, the teachings of Buddha, Ancient Greece, Christian, Islamic and Western culture) shows broad areas of convergence. These ethical views have a tendency to lead to a universal application of rules and regulations as exemplified by various international and regional conventions. ‘Beneath the surface of cultures are fundamental human needs, characteristics, and qualities that humankind can morally satisfy only with universal virtues’ (Garofalo, Gears, Lynch and Lynch, 2001). Hoffman (cited in Ali and Gibbs, 1998, p. 1556) holds a similar view and states that the ‘real ethical solid building blocks or principles of most cultures are the same’. These views give a strong foundation for an ethical approach to fighting corruption.

Furthermore, given the dynamic and ever-evolving nature of corruption, it is impractical to identify finite categories of behaviours constituting corruption. Each corrupt actor’s involvement in corruption is manifested in a multitude of forms—a public official may fall into various forms of corruption (e.g. fraud, embezzlement, bribery, extortion, conflict of interest) at a time, showing properties similar to torus attractors—that is, they switch between different corrupt
activities, using different tactics. Here corrupt officials are attracted to the various forms of corruption depending on the situation and calculation of perceived risk. Moreover, they do make rhetorical calls to fight corruption and revert to their old ways; that is, they alternate between ‘honesty’ and corruption (cyclic attractors). The fight against corruption, therefore, seems victorious and progresses towards a better situation, but later slackens and a new cycle of corruption begins, though disguised in various forms. This process is iterative, as new forms of response will emerge as the result of intense interaction between corruption and anti-corruption forces, calling for a different strategy—and so the battle goes on.

Self-similarity is another property of corruption. Corruption exhibits fractal (self-similar) properties by operating at different levels—international, national, provincial and local. It is not limited to government structures, as every employee/employer—whether in the public sector, private sector, civil society or a non-governmental organization—has the potential to be corrupt. Moreover, as a complex social phenomenon the butterfly effect also finds expression in corruption—small changes in initial conditions result in the amplification of the final results. An example set by a few corrupt officials at the top (minor inputs) might set off a chain of actions that can end in a tremendous, chaotic situation (the proliferation of corruption in society becoming systemic corruption), demonstrating that corruption breeds more corruption. Likewise, the whole (consequences of corruption) can be indicated as more than the sum of its parts (amounts of money misappropriated by corrupt agents). The amount of money lost from projects due to corruption (e.g. leakage from the health and educational systems) will have a ripple effect that extends over generations, where the consequences are amplified and give rise not to one, but to many social ills, including poverty, low life expectancy, bad governance, crime, and terrorism. On the other hand, because of strategic anti-corruption measures, a small reduction in corruption may facilitate a significant improvement in corruption levels (Søreide, 2002, p. 10). According to Shah and Schacter (2004, p. 40), rigorous research by the World Bank also concludes that a slight improvement in corruption levels leads to a substantial decrease in infant mortality rates, increase in satisfaction among recipients of public health care, and an increase in public satisfaction stemming from improved road conditions. That is, the full positive impact of government spending could be realized when corruption was minimized in basic services.

However, the reaction to corruption has not also been linear. For example, given specific circumstances, many international donors treated corruption as not punishable (Cold War era) and at other times punishable (post-Cold War era). During the Cold War era donors’ criteria for aid did not include adherence to good governance; instead it was the geopolitical role of serving superpowers’ interests that mattered and corrupt states went unpunished. However, since the world order has changed, developing countries are required to have transparent and accountable macroeconomic policies if they are to attract aid and investment (Abed and Gupta, 2002). Similarly, the abolition of slavery in the United States (Kaufmann and Wei, cited in Gupta, Davoodi and Tiongson, 1998, p. 115) and
the acquisition of information by apartheid prisoners on Robben Island were made possible through corruption. Mandela (1994, p. 400) stated that:

News was the intellectual raw material of the struggle. We were not allowed any news at all, and we craved for it... One of the most reliable ways to acquire papers was through bribery and this was the only area where I tolerated what were often unethical means of obtaining information. The warders always seemed to be short of money, and their poverty was our opportunity.

These and the escape of Jews from Nazi concentration camps through corruption can be applauded by public opinion (Rose-Ackerman, cited in Kurer, 2005) but condemned by a public-office approach to corruption. The acceptance of a bribe in violation of rules of public office constitutes corruption, according to the public-office approach to corruption. However, even though it is unlikely to have agreement from the public at large as to what constitutes corruption, common sense has it that escaping from oppressive and illegitimate regimes is welcomed by the public-opinion approach to corruption. A case from South Africa also illustrates the nonlinearity of corruption and its consequences: an allegation of corruption which had wide ramifications in South Africa was the multi-billion-dollar arms deal that led to the dismissal of former deputy President Jacob Zuma in 2005. On the surface, this might have signalled the political demise of Zuma. However, things developed non-linearly; amidst allegations of various forms of corruption, Zuma made a surprise comeback and became the leader of the ruling party in December 2007, and then the president of the country in 2009. Due to the self-organizing capacities of societal actors, the situation developed in an unpredicted direction and with unexpected speed—former president Mbeki, who sacked Zuma, indirectly became the first casualty of the arms deal corruption allegations and was recalled from his presidency in 2008, before his term was over.

In conclusion, given the evolving nature of its forms, emergence of a universal understanding of its meaning, its fractal nature (omnipresence at various levels of society and government), non-linearity of its consequences (varying nature of its impact) and the back and forth movement of corrupt agents between various attractors (between betrayal and honesty), corruption is an adaptive complex phenomenon.

Complexity thinking in the anti-corruption system

The complexity of anti-corruption initiatives can be demonstrated by the multitude of drivers that dynamically interact with and reinforce one another to bring about an emergent public policy. These drivers include media attention and activism of civil society (Carver, 2003, p. 123); the development of corruption metrics and empirical studies that show the worsening trend of socio-economic indicators (Abed and Gupta, 2002); continuous awareness and the empowerment of citizens, which has given rise to the demand for transparency and accountability (UNPAN, 2002); donors’ demands for healthy macroeconomic policies (World Bank, 2004,
a mounting anxiety about organized crime which is nurtured by corruption; the proliferation of anti-corruption websites; and the overall interest in ethics education, mainly in the developed world (Bailey, 2000).

In response to these drivers, anti-corruption approaches have evolved through the interactions of many initiatives, as evidenced by the American Public Administration example—from anti-patronage, progressive, scientific administration, finally to panoptic vision (Anechiarico and Jacobs, 1996, p. 18). Similarly, all anti-corruption approaches that developed elsewhere have led to the emergence of universally accepted standards (strange attractor—order out of chaos), as exemplified by the various international anti-corruption conventions (Michael, 2004, p. 1081). The analysis here indicates that diversity, localized interaction and feedback are the main properties of the complexity of an anti-corruption system. The international coalitions against corruption were developed without any hierarchy of command and central controlling processes; they were self-organized through the process of emergence and the feedback of hundreds of local and regional anti-corruption initiatives and interactions.

However, as systems are characterized by nonlinear properties, the dynamics of corruption and anti-corruption cannot be defined in terms of simple cause-and-effect relationships. Anti-corruption efforts are dynamically influenced by context, and Teisman (2008, p. 357) doubts whether instances of ‘best practice’ can be repeated; Bailey (2000) and Kaufmann (2004, p. 20) echo this notion, indicating that there is no ‘one size fits all’ approach to fighting corruption. For example, many anti-corruption strategies which had been devised with good intent did not necessarily bring the desired level of reduction (non-linearity of cause and effect). Some examples of the limitations of traditional strategies follow:

- There is no conclusive argument about the correlation between democratic processes and corruption; case studies indicate the coexistence of corruption and democratic politics in developed and developing countries (Singh, cited in Robinson, 1998, p. 9; Rose-Ackerman, cited in Pope, 2000, p. 1). Likewise, Girling (1997, p. 1) argues that as countries develop and modernize, corruption does not vanish, but takes on new forms.
- In some East Asian countries corruption is likely to have boosted economic growth, but in Africa corruption has brought development to a standstill (Hyslop, 2003, p. 776).
- To curb monopoly by state organs, privatization was sought as one of the anti-corruption strategies. However, corruption is known to be rife in the private sector as well—on both the supply and the demand side of the problem (Bailey, 2000). During the transformation process of liberalizing the economy, corruption is often involved. Unless it is done in a transparent and accountable way, many will benefit from the bidding process and acquire valuable state resources at a lower cost through collusion between state officials and private buyers (Robinson, 1998, p. 8).
• Increasing salary levels in order to tackle corruption may only create new incentives and forms of corruption, instead of stopping it (Bailey, 2000). Similarly, officials meeting their economic needs by means of bribes may not stop when they reach an acceptable standard of living, as corruption has become their way of life (Sørensen, 2002).

• The ethical approach to fighting corruption is not a panacea, either. It is questioned when religious institutions who advocate ethics are themselves accused of involvement in corruption (Wraith and Simpkins, 1963, p. 137).

• Legislative oversight, media watchdogs and civil society activism are regarded as anti-corruption mechanisms, but these organs are not immune to corruption (Pope, 2000; Robinson, 1998, p. 9)—the question ‘who will guard the guardians?’ reflects the ongoing unresolved complexity of the problem (Shah and Schacter, 2004).

• Resorting to the establishment of anti-corruption agencies has proven to be a failure (Heilbrunn, 2004, p. 1). Meagher (2005, p. 86) argues that anti-corruption agencies are vulnerable to abuse by politicians and in fact become tools of corruption. According to Pope (2000, p. 104), except in countries and territories such as Singapore, Malaysia, Taiwan and Hong Kong, anti-corruption agencies have not been successful. In these territories, committed political leadership, vast popular support, sufficient surveillance capabilities, a focus on investigation and prevention through education methods are believed to have contributed to their relative successes (see Olouka, 1999, pp. 611–612).

• Donor efforts to impose anti-corruption programmes as a precondition for aid have not been successful (Pope, 2000).

• Law enforcement and punishment, especially through cracking down from above, have not been sustainable solutions to corruption (Bailey, 2000; Pope, 2000, p. 31). This has failed in countries like Vietnam and China, where this type of crackdown (and even the use of the death penalty) has often been used to silence political opponents rather than being a genuine step toward solving the corruption problem (Rose-Ackerman, cited in Johnston, 1998b, p. 93; Robinson, 1998, p. 10).

• Despite efforts to curb corruption through international coalition, multinational corporations continue to engage in transnational bribery (Kaufmann, 2004, p. 16).

• Information and communication technologies (ICTs) can be used to increase transparency and lower the possibility of corruption. However, with the increasing use of electronic communication it is empowering information experts for misconduct, and a new area of corruption is emerging—electronic corruption (George, 2004).

• ‘The long-term dynamic of a system is governed by its attractors, and the shape of the attractor determines what type of dynamics occur’ (Stewart, 1995, p. 117). Frederick (2003:18) sees values and attractors as identical. Due to the interaction between internal and external factors, employees and officials may be attracted to other emerging corrupt value systems (strange/chaotic attractors) and follow
trajectories unforeseen by the department’s anti-corruption specialists. This emphasizes the importance of a careful and continuous effort to shape the ethical values of employees, and the vigilance required to correct deviations in the unstable globalized economy. People switch between corrupt and ‘honest’ behaviour according to circumstances. When they feel they are under surveillance they pretend to be honest. They perform their corrupt activities in a subtle way. According to Klitgaard (1997, p. 501) even many adherents of the anti-corruption coalition are found to be corrupt, especially when the payoff looks attractive enough to betray honesty.

- Complex systems do not only have point attractors like rules and regulations—management directives that have to be routinely followed. If they were machines they would be easier to control by means of fixed rules imposed by managers. Corrupt agents, as part of complex adaptive systems, exhibit unpredictable behaviours attracted toward different emerging values (attractors), though. These values are influenced by various factors (internal and external), and new value systems (strange attractors) emerge over time as a result of the dynamic interaction between different values and behaviours. Hence, establishing fixed norms (point attractors), like rigid bureaucratic control mechanisms, is not sufficient. Shim and Eom (2008, p. 302) observe that traditional efforts to curb corruption (e.g. enhancing professionalism, bureaucratic quality and law enforcement) have limitations.

All these are indications that tackling corruption is not a straightforward endeavour; like any other complex adaptive system, the results of steps taken have proved to be non-linear. According to Cuadrado and Arce (2005, p. 21), ‘the corruption system is [cap]able of surprising behaviours, by responding in more than one way to any change in its environment’.

Methodology

The approach of this article is qualitative with descriptive purposes and is interpretive in nature. It is an empirical study that attempts to draw conclusions from information gathered from real-life experiences of the South African public administration. Since the information required had to be elicited from knowledgeable people (experts), a non-probability sampling method was preferred. The sample was drawn from the population of managers who were active in anti-corruption work, particularly in the public sector. Having had a specific plan in mind and a defined group of respondents, the authors approached the sampling problem with a snowball sampling method, a variety of purposive sampling. Accordingly, someone who met the criteria for inclusion in the study was first identified, and that particular person was then also asked to recommend others who might meet the criteria. The shortcoming of this method is that it does not ensure representativeness, but it was the best method available. Bowling (cited in O’Sullivan and Rassel, 1989, p. 3) argues that small, purposive sampling is acceptable for a qualitative study in which it is used to interpret a social phenomenon while not
assuming representativeness. Similarly, Patton and Kuzel (cited in Eagle, 1998, pp. 207–208) note that qualitative methodologies attempt to access the richness of diverse information from fewer participants and frequently regard participant sizes of less than ten (from any population size) to be sufficient.

For purposes of triangulation, a survey was conducted in public service departments and agencies in the national, provincial and local spheres (all in Gauteng province, South Africa). For focus and ease of accessibility, the main units of study were the Department of Home Affairs, the South African Revenue Service (SARS) and the South African Security Agency (SASSA) at national level, which responded on behalf on their own departments. The other national institutions that responded on behalf of all other departments were the Department of Public Service and Administration, the Public Service Commission, the Special Investigating Unit, the Council for Scientific and Industrial Research (CSIR), the National Treasury, the Financial Intelligence Centre and the State Information Technology Agency (SITA). The Gauteng Shared Services Centre at provincial level and City Power (Johannesburg) at municipal level were also included in the survey. The 15 respondents (general and senior public managers) were from all the major race groups (black, white and coloured) and both genders. Interestingly, there were no visible differences in the type and quality of responses along racial or gender lines. Given the small number of respondents, the responses are statistically significant for analysis. The qualitative information elicited from the respondents is more meaningful than their quantity; hence no percentage of respondents is shown for all responses.

Analysis of the key findings in light of complexity thinking

In the 2008 survey of national, provincial, and local government departments in Pretoria and Johannesburg (South Africa), we tried to determine if the following entities were receiving sufficient attention to the magnitude of corruption they might have: spheres of government (national, provincial, local), sectors (public, private, civil society), and management levels (top, middle, lower, rank and file). Further, we explored the emphasis of anti-corruption effort, ethical education, and the level of co-operation within the anti-corruption system.

Firstly, these survey results show that the government’s focus on combating corruption is skewed. That is, all sectors, management levels, and government spheres are not given due attention in proportion to the magnitude of corruption that is present. Governmental effort is geared more towards the public sector, top and middle management, and national and provincial governments, according to the respondents. The private sector, civil society, rank and file in the public service, and local governments do not get the attention they require, despite corruption being rife in these entities.

This, however, is not in line with the complexity thinking approach which states that the world is intrinsically holistic (Rouvray, 2003, p. 3) and society by extension is one whole, which implies a blurred distinction between the public and the private sectors (Bailey, 2000). As indicated by Camerer (2001, p. 34), though
corruption is mostly associated with government structures, it occurs throughout society. Similarly, according to Heeks (1998, p. 2), a big chunk of the corruption in state organizations involves payments from the private sector. This is also in line with the definition of corruption adopted by Transparency International, which refers to ‘the misuse of entrusted power’ (societal focus) rather than ‘the misuse of public office’ (governmental focus).

The disparity in addressing corruption is tantamount to denying the fractal nature of society: that is, to overlooking the existence of self-similarity in various levels of management, sectors, and spheres of government. However, in dealing with the complexity of societal issues, one has to look at a system for its fractal patterns of holographic images, because the parts are miniature versions of the whole and can exhibit the dynamics operating in the whole system (Wheatley, 1999, p. 142). As a societal phenomenon, the distribution of corruption follows a power-law trend. This means that there are fewer corrupt officials at the top, where more money is involved due to the resources they control, and more corrupt officials at the lower level, which involves less money per capita. But the resources lost to corruption at lower levels add up to large amounts, given the large number of people affected (as bribe givers).

Moreover, due to the nonlinear characteristics of complex systems, a small input in one sector or level of administration can have large effects across the entire system. Most of the time, corrupt agents, irrespective of their sectors, spheres of government or management levels, work seamlessly in collusion. From complexity thinking, one takes note that the world is intrinsically holistic (Rouvray, 2003, p. 3) and society by extension is one whole, which leads to a blurred distinction between the public and the private sector (Bailey, 2000) and levels of administration. Hence, it is a universal phenomenon that the properties of corruption are to be found at all levels (spheres of administration, management, and sectors) in similar patterns, though to varying degrees.

Secondly, in South Africa there is great emphasis on the establishment of anti-corruption agencies and there is a debate about whether to have a single or multi-agency approach to fighting corruption, though the latter is practised. Most of the respondents favoured a single anti-corruption agency; few indicated a preference for the multi-agency approach. The survey’s findings indicate that the preference exhibited by the majority of respondents is a reaction to the current situation concerning the South African anti-corruption agencies: i.e., the lack of co-operation, overlapping mandates, and organizational crises that naturally lead to the desire for a single agency. However, in the fight against corruption, if the government resorts to anti-corruption agencies, the criminal justice system may lose the sense that it has a mandate to continue the anti-corruption effort and may be pushed to become part of the corruption system at worst, or apathetic at best.

Thirdly, a major theme that emerged from the respondents was that South African anti-corruption efforts are not fully integrated and do not interact as required by the general public, in most cases working in isolation. As a consequence of this fragmentation, most anti-corruption agencies do not share information. For example, the network system in the Department of Home Affairs is
not well integrated and in most cases the provinces work in isolation. This leaves the Department vulnerable to many abuses, such as multiple entry of one person into their system and duplication of work. As a consequence of this incompleteness and fragmentation, the database of the Department of Home Affairs is not clear of ghost citizens and fraudulent marriage, birth and death certificates. Apart from the weaknesses that arise from its internal working processes, SASSA is also faced with many double claimants of benefits, a weakness that partially spills over from the Department of Home Affairs because of the issuance of fraudulent certificates and identity documents.

This situation implies that efforts can be duplicated and resources inefficiently consumed. This is an inefficient method of fighting corruption, because in the absence of dynamic interaction, anti-corruption agents cannot stand the challenges of the ever-changing tactics of corrupt individuals and groups. As elements of the national anti-corruption system, the anti-corruption agencies' effectiveness depends on the richness of interaction among themselves, other regional and international stakeholders, and the people. Insufficient interaction means impoverishing the system of diversity and emergence, which are the main properties of a complex system.

Lastly, it was found that ethical education is given in universities and as part of life orientation subjects in schools. When respondents were asked to evaluate the impact of this ethical education on the current South African anti-corruption drive, they indicated that the impact ranged from moderate to low. They held similar views on the impact of codes of conduct, religious teachings and awareness-raising and empowerment campaigns. These aspects were investigated separately and the responses were similar. The reasons given concerned the inadequacy of role models at the top and lack of co-ordination of the activities, despite their similarities.

High levels of corruption in South Africa prevail despite the presence of a strong legal base; a comprehensive set of laws to promote ethics; anti-corruption campaigns; summits; conferences; forums; and establishments of various anti-corruption institutions. The problem, however, seems to rest with enforcement. From Klijn's (2008, p. 291) work it can be inferred that anti-corruption is a complex system in which anti-corruption legislation, conferences and forums (such as the National Anti-Corruption Forum in South Africa) are not strong buoys that guide processes. Although legislation and forums play important roles, their interpretation by agents and local interactions are, to a large extent, guiding processes.

As indicated above, although ethical education is not a panacea, it does have a prominent role in the fight against corruption if holistically implemented. This has to be done in all sectors of government and society to create self-similarity in all spheres of life. Monitoring and enforcing anti-corruption laws is expensive and the compliance process must be supplemented by codes of conduct from trade and professional associations (O'Keefe, 2000). As Zekos (2004: 639) puts it, 'the consequences of ignoring ethics are costlier still, in terms of foregone opportunities as well as economic inefficiency'. The development of codes of conduct can control the acceptance of gifts and misuse of public property. It could also prevent
activities that lead to conflict of interest (Asian Development Bank, 2004). Corruption is easier to control before it is widespread and deep-rooted. In fact, the overall interest in ethics education is one of the drivers in anti-corruption initiatives.

**Recommendations**

Despite the urgent need for them, theoretical frameworks and fundamental anti-corruption strategies are rare, while most traditional anti-corruption strategies focus on dealing with symptoms rather than causes and emphasize stern punishment, salary increments or establishing anti-corruption commissions. These strategies have not been successful. Corruption has demonstrated durability and flexibility by muting and adapting to new environments.

Based on the survey findings, we propose the following recommendations:

Firstly, although many approaches and anti-corruption strategies have been useful, they tend to encourage a mechanical view of combating corruption. The conventional approaches to fighting corruption rely on a linear relationship between corrupt and ‘corruption-free’ systems. These strategies suggest that proper analysis, planning and implementation can create a corruption-free society. They all focus on big interventions. Anti-corruption campaigns and punishment do not seem to have eradicated corruption, though; corrupt officials wait for the anti-corruption zeal to settle and then corruption resurfaces.

Unless the paradigm at the heart of the entire culture is changed, sustainable change will remain elusive. Combating corruption requires bringing about change in people’s minds. Such a change must be from within. It requires the enhancement of moral development and ethical values at an individual level and the reformation of social, political, economic and administrative structures at systemic levels. Ethical behaviour has to be inculcated in employees to create self-similarity to the organizational vision, which places the responsibility of fighting corruption on all parts of the system. Similarly, as society is the source of public servants, it is necessary to instil ethical behaviour in the whole range of society, from the family to the school and filtered at the recruitment stage. Unless the government and other anti-corruption actors focus more on the supply side, efforts at a later stage will be too late and more costly. As stated previously, the overall interest in ethics education is one of the drivers in anti-corruption initiatives.

Secondly, the implications of the survey’s findings and the theoretical explanations stated in this article point to the necessity of complexity thinking and a holistic view in the efforts to curb corruption. All stakeholders (in all spheres of government, all management levels, and all sectors of society), including new entrants to the system, must come on board to challenge corruption. Pope (2000, p. xix) observes that ‘[s]mall-scale it may be, but if not vigorously attacked, small-scale, facilitating bribes can feed on themselves to produce a corrupt spiral. Frequently too, petty corruption is simply a downwards projection of much more damaging forms of corruption at higher levels’ and must not be overlooked (see also Bansal, 2004, p. 168).
Thirdly, anti-corruption efforts must focus on all sectors and levels of administration. The South African government's skewed focus on the public sector means that most of its efforts are focused on controlling the demand side (inducement by public officials) of corruption. However, this imbalance of focus in fighting corruption creates an environment of instability in the anti-corruption system. To balance the equation, the supply side (private sector and civil society, i.e. the corruptor) also must be controlled. As a consequence of government's unbalanced focus in its anti-corruption effort, corrupt businessmen are left free to do business elsewhere once they are prohibited from doing so in the public sector. Hence, combating corruption more strongly in specific sectors than in others is creating an environment conducive to corruption flourishing in a wider scale in society.

Lastly, as opposed to a single or multiagency approach to fighting corruption, we recommend a third option. This approach favours empowerment of the criminal justice system, oversight bodies (including auditors, public protectors and parliamentary committees), and anti-corruption capacity for each organ of state (national and provincial departments, local governments, agencies) and society in general—a departure from the separate anti-corruption agency approach. Arguments supporting this view include the reality that every public department must enhance its anti-corruption capability; its units, starting from the lowest hierarchy, must also be empowered to deal with corruption. As part of this organizational structure, managerial control (of the financial, human and supply chain) through management information systems must also be strengthened. The integration of information management systems with existing human resources and financial management systems can improve management's performance through timely information and systemic controls. It is the day-to-day local interactions within the anti-corruption system, combined with other influences globally, that can bring profound change. Monstrous national anti-corruption agencies at the top, however formidable they look, will not bring sustainable change. There are no conclusive success stories about anti-corruption agents so far. The success stories from Singapore and Hong Kong cannot be universal models to be replicated elsewhere; after all, these are cities, and even in these controlled entities there are reports that corruption is on the rise. Similarly, in Botswana, despite the initial successes due to the anti-corruption agency, recent reports tell of increasing corruption (Olowu, 1999, pp. 611–612).

Borrowing from complexity thinking, biological systems are presented as good examples to guide anti-corruption efforts. They are always on the alert and do not wait until disease takes root. If the immune system is weak and the germs start to attack, they will spread easily to a systemic level and have the disastrous effect of a wildfire. Similarly, with bad habits spreading faster and wider than good habits, care must be taken not to tolerate corruption even in its minimal form. An anti-corruption system is a complex adaptive system that can be metaphorically regarded as a biological system. A wound heals from within due to the 'empowerment' of the white blood cells. Hence, all spheres of government departments and levels of
management, the private sector, and civil society must be capacitiated to do anti-corruption work. According to Hasgall and Shoham (2007, p. 81), empowerment at all levels allows employees to behave as fractals: in other words, to develop self-management abilities at a local level for customized responses. Organizations must hold on to their internal variation and not necessarily stick to uniformity of operations. Doig and Riley (1998, p. 60) argue that there are problems in seeking universal strategies for solutions, given the diversity of causes and forms of corruption.

Conclusion

This article analyses corruption and the efforts to curb it from various dimensions of complexity thinking. These dimensions include: the emergence of a more universal, holistic understanding of the nature of corruption, despite cultural differences, as well as the emergence of a global anti-corruption coalition; the multiplicity of interconnections of stakeholders and emergence of anti-corruption strategies; the non-linearity of the anti-corruption efforts; and the insufficiency of a single strategy to deal with corruption. These findings, among others, are indications of the complexity of corruption and the anti-corruption system.

The complexity of the nature of corruption and its control is not a new discovery. What is new is the continuous emergence of new insights, concepts and tools to deal with this complex social phenomenon. Corruption, as a complex system, does not have a fixed set of causes and consequences. However, there is general consensus that the basic causes of the phenomenon develop from economic, political, anthropological and social situations and their interaction in complex ways, which give rise to many forms of corruption. Given its changing meanings, manifestations, proliferations and perceived causes and impacts, corruption must be dealt with as a dynamic and complex mutating social phenomenon.

One of the key characteristics of a complex system is that its parts must interact. Unless there is sufficient interaction by all stakeholders, the anti-corruption system will stagnate and signal the triumph of corrupt agents. In this regard, complexity thinking can empower public administrators to have a dynamic view and not a static picture of governance processes (Klijn, 2008, p. 288), in which the fight against corruption is key. Small flaws in the anti-corruption design will magnify resultant errors.

The war against corruption is never won; it keeps on changing in an adaptive process and tends to live perpetually in all political systems (democratic and undemocratic) at varying levels, while new aspects of corruption are always appearing due to social and technological complexities. One can never touch a corruption-free line, one can only approach it. Like a virus, it infiltrates and attacks even the control mechanisms themselves. Hence, corruption, as a complex adaptive system, tends to live constantly in societies.
Note
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