Organised Chaos: Seeing with New Eyes

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Abstract

Organised crime is a complex phenomenon. If it was simple, it would be easy to understand and prevent, but it is not. Chaos theory is a subset of the family of complexity theory. Given the nature of organised crime, one would expect that a subset of the family of complexity theory, such as chaos theory, might lend itself to explaining organised crime. The article explores this notion and critically examines organised crime through the conceptual lens of chaos theory. It begins with a brief overview of chaos theory, its use in criminology and the study of organised crime. A critical examination of how chaos theory is or might be used to explain organised crime follows. A new area of research by the author is presented in the form of a framework and methodical approach to further develop, understand and better apply chaos theory to the study of organised crime.

Introduction

> 'The real voyage of discovery consists not in seeking new lands, but in seeing with new eyes' (Proust).

The article seeks to change the way we see organised crime through the eyes of chaos theory. Theory provides a critical foundation for understanding crime and criminal behaviour and represents the building blocks for organising knowledge. As noted by Garland (1990:277), 'theoretical work seeks to change the way we think about an issue and ultimately to change the practical ways we deal with it'.

Chaos theory is the science of systems that appear random due to their complex behaviour, but in essence are deterministic and are sensitive to initial conditions (popularly referred to as the butterfly effect). Organised crime may be described as a group of individuals with an identified structure that engage in criminal activities. At a macro-level, organised crime may be observed from flows of money, assets and people around the world. At a micro-level, organised crime may be observed from individual deals or events. The closer one gets to the individual deal or event, the harder it is to see the bigger picture. Applying chaos theory to organised crime is an attempt to identify sensitivities at a micro and macro-level and to create a more useful picture in understanding and preventing organised crime.

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Chaos Theory

In everyday use, the term 'chaos' means 'utter confusion or disorder, wholly without organisation or order' (*Macquarie Dictionary*); however, 'chaos theory' is not about randomness, which is often misleading given the everyday use of the word chaos. Chaos theory may be described as the study of an orderly disorder where 'both order and disorder can coexist' (Milovanovic 2003:55). Chaos theory also belongs to the family of complexity theory — in complexity theory, a 'complex system' may be defined as a system 'whose properties are not fully explained by an understanding of its component parts' (Gallagher and Appenzeller 1999:79). Chaos theory 'is a science of the whole rather than of the parts' (Young 1997a:40). In other words, 'chaos is concerned with the behaviour of systems' (Walters 1999:136) and hence the unit of study within chaos is a system.

The building blocks of chaos theory are described by a set of seven principles that describe the progress of a chaotic system (Gleick 1987; Smith 2007). Williams and Arrigo (2002:57–8) have conveniently grouped these seven principles under three stages of a progressive chaotic system: order to chaos (i. iteration, ii. sensitive dependence on initial conditions, iii. bifurcation); order within chaos (iv. attractors and phase space, v. fractals); and order out of chaos (vi. self-organisation, vii. dissipative structures). An explanation of these core principles may be found in Smith 2007. The fundamental nature of a chaotic system is that it is dynamic and nonlinear (Gleick 1987:23). A dynamic system is simply one that moves or changes over time (Williams and Arrigo 2002:3). The term 'nonlinear' is defined by what is not linear. Linear systems always respond proportionately between cause and effect; nonlinear systems respond disproportionately. In short, chaos theory is the science of systems that appear random, due to their complex behaviour, but in essence are deterministic. In a random system, the current state does not define its future state. In chaotic systems, it does (Gleick 1987).

Chaos Theory in Criminology

Although chaos theory remains a relatively new science in its own right (since late 1970s), its core principles have been borrowed and applied by criminologists since the early 1990s (Milovanovic 1997a; Elliott and Kiel 1997; Williams and Arrigo 2002). It was following the publication of James Gleick's book *Chaos, Making a New Science* in 1987, that catapulted chaos theory to the attention of criminologists (Williams and Arrigo 2002:3) and the general public alike. Until then, chaos theory had predominately lurked deep within academic papers. In the context of social sciences, Williams and Arrigo (2002:3) sum up the application of chaos theory as directing 'our attention to those previously disregarded factors of human social interaction, defined as anomalies, inconsistencies, or "noise" in a system'. Since then, chaos based ideas have pushed the envelope of research and reconfigured our understanding of what is 'normal' and what is not. In the early 1990s, TR Young emerged as the leader in applying chaos theory in the area of criminology, law and sociology (Milovanovic 1997a:viii). His work significantly influenced the work of others through the 1990s and into the 21st century, notably Bruce Arrigo, Dragan Milovanovic, Hal Pepinsky and Robert Schehr (Milovanovic 1997a:viii). The development of chaos theory in the social and criminological world coincided with postmodernist thought and 'emerged as one of the key threads of postmodernist analysis that fundamentally challenges the assumption of an orderly world' (Milovanovic 1997a:vii). In the field of criminology, Walters (1999:141–3) argues that the application of a theory which reconciles

polar opposites (order and disorder) has provided criminologists with a useful tool to reconcile and integrate a number of long standing polar opposites in criminology — such as the classical-positivist view (free will versus determinism) and the micro-macro view (individuals versus wider social influences). In the world of chaos theory, free will and determinism not only coexist, but complement one another — determinism plays a role in the evolution of criminal behaviour, but there are points where free will chooses behaviour. In relation to the micro-macro view, instead of conceptualising them as mutually exclusive methods of study, in the world of chaos, viewing them together produces a more complementary view.

According to Young (1997a:44), chaos informed criminology is a theory of crime 'of alternatives in a changing mix of order and disorder. In such a view, crime and its dynamics are relocated from the separate person to changes in constraints within the larger environment' — meaning one must study the interaction of the system as a whole, rather than of its parts. To apply chaos theory to criminology, Young (1997b:95) offers a five step framework and methodology:

1. locate the attractors hidden in complex data sets;
2. determine how many attractors exist in the data set;
3. find the change points(s) at which new attractors are produced;
4. identify the key parameters which drive the system into ever more uncertainty (for purposes of social control);
5. determine which setting of those key parameters is acceptable to the whole society (for purposes of social policy).

Step one in Young's approach proves to be the real challenge in criminology — ie, obtaining available and meaningful time-series data to apply the mathematics of chaos to. However, just because social science lacks time-series data, does not mean that 'social science ought to downplay mathematical chaos theory and its insights' (Dendrinos 1997:242). 'At some point in time, all scientific things must be measured and calibrated — even chaos' (Brown 1997:53). Moreover, the software tool 'Chaos Data Analyzer' is a mathematically driven program that usefully analyses data, detects attractors and chaos, and predicts future behaviour in seemingly random time-series data — essentially 'physics isn't just for physicists anymore' (Physics Academic Software 2010). In the world of social science, Kiel and Elliott (1997) have been pivotal in applying the mathematics of chaos to the social world — such mathematical detection provides empirical criminologists with interesting and novel insights into the behaviour of social systems. Putting the mathematics aside, chaos theory may still be applied conceptually (see Walters 1999:148).

To date, chaos theory has been applied to a number of areas of criminology, such as rural crime, banditry, gender violence, racial violence, property crime, organised crime, corporate crime, white collar crime, blue collar crime and delinquency in general (Milovanovic 2003:82). In law, chaos theory has been applied to better understand areas such as the American legal system (Simons and Stroup 1997), legal decision-making processes (Milovanovic 1997b) and mental illness within the court system (Williams and Arigo 2002). It has also been used to develop notions of Justice (Capeheart and Milovanovic 2007:139). Today, chaos theory is being swept up and integrated into the latest criminological trends, such as critical and constitutive criminology (Milovanovic 1997a:viii; Milovanovic 2003; Schwendinger et al 2002) and more recently, philosophical criminology, including ontology, epistemology, aesthetics and ethics (Arrigo and Barrett 2008).

Criminological study of organised crime

The original concept and term 'organised crime' was coined by the Chicago Crime Commission in the 1920s in relation to what was perceived at the time as a Chicago only phenomenon (von Lampe 2001:104). At this time, the concept did not refer to criminal organisations; instead, it referred to a much broader sense of the 'orderly fashion in which the so-called criminal class of an estimated 10,000 professional criminals in Chicago' allegedly pursued 'crime as a business' (von Lampe 2001:104). Over the past 90 years, the concept and term organised crime has developed significantly.

Defining organised crime

According to Cohen (1977 cited in Levi 2007:777) 'the term organised crime denotes not just a set of criminal actors, but also a set of criminal activities'. From both a legal perspective and a criminological perspective, a literature review reveals no universal agreement on how to define organised crime; this view is supported by a number of key authors (van Duyne and van Dijck 2007; von Lampe 1999; 2002, Levi and Maguire 2004; Levi 2007; Paoli and Fijnaut 2004). According to van Duyne and van Dijck (2007:101), organised crime is still 'something we know so little about that we are still struggling with its very definition'. Levi and Maguire (2004:397) note that 'organised crime is a notoriously difficult concept to define and measure, and relative to the confident claims that are made about it, little is known about its operation in practice'. A pertinent question posed by Paoli and Fijnaut (2004:7) is 'where exactly does organised crime begin?'.

Despite the difficulty in defining organised crime, a number of academics and organisations have attempted to define organised crime, by avoiding the dictionary-style definition, and instead by identifying a set of common characteristics shared by organised crime groups (Holmes 2007:12; Ransley and Prenzler 2007:136). As pointed out by Sheptycki (2008:26), 'when it comes to a criminological theorising about organised or professional crime, what remains constant is the deployment of organised violence and the pursuit of illicit wealth'. One of the most comprehensive sets of characteristics of organised crime groups has been developed by Canada's Royal Canadian Mounted Police's Criminal Intelligence Directorate (CID), whereby 14 common characteristics have been identified (Richards 1999:4): corruption, discipline, infiltration, insulation, monopoly, motivation, subversion, history, violence, sophistication, continuity, diversity, bonding and mobility. According to the 2009 Australian Crime Commission Report (Australia Crime Commission 2009:4), these characteristics are still valid today.

In summary, organised crime may be described as a group of individuals with an identified structure that engage in criminal activities. The fundamental characteristics of organised crime include organisation, supporting networks, substantial planning and the use of sophisticated methods and techniques.

Theorising organised crime

Following on from the difficulties in defining organised crime, it is not surprising to note the challenges presented in theorising organised crime. According to von Lampe (1999), while there is a 'variety of alternative, definitional approaches to organised crime', there is 'no comprehensive theory that can reconcile the confusing and at times conflicting understanding of the term organised crime'. Based on this statement, von Lampe (1999) argues that a 'framework which distinguishes various levels of complexity and accounts for the fact that the issue of organised crime has social, economic and political dimensions' is a more useful way of theorising organised crime. Over the past 30 years, a number of models

of organised crime have emerged. Most of these models sit in one of three categories as proposed by Jay Albanese (1989): i. hierarchical model; ii. patron-client model; or iii. enterprise model. More recent theories may be categorised under social, political or environmental models. A useful way of looking at all these models is by applying Turner's classification of either a causal or analytical model (Turner 1991 as cited in von Lampe 2003:4). A causal model is where a dependent variable is explained by the interaction of one or more independent variables in a simple linear view. An analytical model is where a complex array of variables interact in a non-linear way and correspond to complexity and multi-dimensionality. Based on the analytical model concept, von Lampe (2003:6) argues that any meaningful model of organised crime should include six basic elements: three core elements and three environmental elements. The three core elements are i. actors who cooperate in rational, non-impulsive criminal activities, ii. structures that connect these actors; and iii. criminal activities these actors are involved in. The three environmental elements are i. society, ii. government; and iii. media (realm of public discourse).

Von Lampe (2003:7) points out that even at this high level of basic elements, a variety of connections can be made. For instance, there is no organised crime without organised criminals and these organised criminals are, in part, due to their social environment. In turn, the types of crime the criminal actors are engaged in will depend on their individual skill sets. The structures formed are also influenced by the type of criminal activities carried out — for example an extortion gang will require a different type of structure to say that of running an illegal casino. Society, government and the media will all play a part in the emergence of organised crime groups. Society controls the supply and demand of certain goods. The government controls the adoption of certain crime prevention policies and also the increase of tax on certain goods like alcohol and tobacco which may create more criminal opportunities. Finally, the media as a feature of the modern world plays a crucial role in raising or shifting attention to certain phenomena.

Another way to look at and understand organised crime is by considering the tasks that need to be performed to commit organised crime. Levi (2007:781) has usefully come up with a six step approach: i. obtain finance for crime; ii. find people willing and technically/socially competent to commit crimes (although this may not always be necessary); iii. obtain equipment and transportation necessary to commit the crime; iv. convert, where necessary, products of crime into money or other usable assets; v. find people and places willing to store proceeds (and perhaps transmit and conceal their origin); and vi. neutralise law enforcement by technical skill, corruption, and/or by legal arbitrage, using legal obstacles to enforcement operations and prosecutions which wary between states.

According to Levi (2007:781), these six procedural steps may be further broken down when analysing the dynamics of particular crimes and/or criminal careers. Levi's procedural steps and von Lampe's basic elements of organised crime are not too dissimilar from the approach taken in the European Commission's 2000 Falcone programme (van de Bunt and van der Schoot 2003a:9). The Falcone programme was an organised crime research project commissioned in a small number of European countries — its purpose was to explore the possibilities of preventing organised crime by first identifying opportunities that facilitate organise crime. Part of the approach taken was to select case studies from files of closed police investigations and identify 'red flags' based on a series of questions to identify organised crime opportunities; the questionnaire (van de Bunt and van der Schoot 2003c) includes questions covering Levi's procedural steps and also von Lampe's basic elements of an organised crime model. The results of the case studies (van de Bunt and van der Schoot 2003b:21, 2003d) revealed 'certain aspects or events which facilitated organised

crime'. In particular, close attention was 'devoted to the "contact points" between the licit and illicit environment' (van de Bunt and van der Schoot 2003b:21).

A key finding was that criminal networks 'always require the cooperation or services of the licit environment' and that these necessary contact points form "bridges" between the two worlds (van de Bunt and van der Schoot 2003b:21). More recently, another European Project comprising 13 European countries and 33 scholars (including Levi and van de Bunt) involved a 'systematic comparison of organised crime patterns and control policies in Europe' (Paoli and Fijnaut 2004:9). This project 'represents the first attempt to systematically compare concepts of organised crime' in Europe of which the findings are presented in a lengthy and comprehensive 2004 book *Organised Crime in Europe* (Paoli and Fijnaut 2004:1). The interface between the licit and illicit environment was also found to be a key finding across the 13 European countries studied.

In summary, theorising organised crime is not easy. One of the most popular and recent areas of focus is the nexus between the licit and illicit worlds — to further complicate this, organised crime is both a dynamic and global phenomenon. To sum up in a few words by van Duyne and van Dijck (2007:101), organised crime is perhaps 'a subject of art?' — ie, you need to go beyond the scientific facts to really behold the 'seriousness of organised crime'. In other words, the whole of organised crime may be seen as more than the sum of its parts.

Applying chaos theory to organised crime

The study of organised crime is still a much untapped area by other disciplines (von Lampe 2006:4) — perhaps the criminological difficulties in defining organised crime, yet alone theorising organised crime, provides an unattractive framework for other disciplines to tap into. A few exceptions include economics, politics, psychology and neurobiology; each have either drawn metaphors or analogies to the concept of organised crime or more elaborately applied their own theories — it is usually the former. In applying the discipline of physics (by the use of chaos theory), three areas are presented in this article: i. common features between chaos theory and organised crime, ii. a review and examination of existing research; and iii. a new area of research by the author.

Common features between chaos theory and organised crime

Common features or similarities may be identified by looking for notions of chaos theory in the language of organised crime. Chaos theory is concerned with 'the behaviour of systems' meaning that 'any single part of [a] system can only be understood with reference to the entire system' (Walters 1999:136). In addition, chaotic behaviour requires a consideration at both the local and global level as chaotic systems are 'globally stable, but locally unstable' (Elliott and Kiel 1997:7). Moreover, 'chaos theory does not give primacy to local or global; rather it focuses on the intermingling of the two' (Forker 1997:73). In the description of organised crime by the Secretary-General of the United Nations (1993 cited in Richards 1999:3) 'organised crime is nothing less than a massive attack on the fabric of society affecting practically all of its components at the individual, collective and institutional levels' — ie, organised crime affects an entire society at all levels and at a transnational level. Moreover, Findlay (2008:68) argues that organised crime 'requires comparative analysis from the local to the global if the complex nature of criminal enterprise is to be understood at all the vital phases of its organisation'.

Chaos theory may be described as the study of an orderly disorder. In reference to organised crime, van Duyne and van Dijck (2007:101) argue that 'empirical research repeatedly demonstrates that "organised crime" is plagued by much disorganisation'. Another key feature of chaos theory is that a system is dynamic and non-linear. In the description of organised crime by Levi (2007:795), organised crime is considered as a 'dynamic process that evolves as offenders adapt (or fail to adapt) to their changing environment' — ie, criminal behaviour evolves over time. In Turner's classification of organised crime models, into either a causal (linear) or analytical (non-linear) model (Turner 1991 as cited in von Lampe 2003:4), the analytical model corresponds to the best analyses of organised crime as it considers both complexity and multi-dimensionality.

In chaos theory, the concept of a fractal is useful for identifying patterns that are easy to see at one scale, but not at another — for example, micro and macro-levels — a pattern easily identifiable at one level may demonstrate fractal tendencies and therefore be replicated at another level, albeit with a smaller or larger scale (Pepinsky 1997:102). With regard to organised crime and the two tiered structure of organised crime groups, Levi and Maguire (2004:398) note 'although small organisations and even individuals may be socially dangerous … larger criminal organisations develop reputational benefits as well as economies of scale … creating a cumulatively greater social threat'.

Finally, the concept of a Lorenz attractor (also known as a butterfly attractor (Lorenz 1993:9)) in chaos theory has perhaps the most striking commonality to organised crime. According to Young (1997a:38), the butterfly attractor 'is most interesting to criminologists' as the shape of the two wings or outcome basins is twinned with a clear juncture in between. Given a similar set of circumstances, an individual over time may fluctuate between the two wings. The 'point of most uncertainty occurs just at the juncture between the two wings' (Young 1997a:39). In organised crime, the nexus between the licit and illicit worlds is a key area of focus in understanding organised crime (van de Bunt and van der Schoot 2003b:21; Paoli and Fijnaut 2004:1). As Sheptykcki (2008:24) points out, organised crime 'thrives in the interstices of power that exist in the grey area between licit and illicit markets'.

At first glance, without any serious analyses, the application of chaos theory lends itself well to organised crime. The common features between chaos theory and organised crime are surprisingly many: a system operating at both a local and global level, the co-existence of order and disorder in a dynamic and non-linear fashion, the application of the concepts of fractals and attractors, and in particular, the notion of a juncture or nexus between two outcomes or two worlds.

Existing research: in applying chaos theory to organised crime

Based upon a literature review, existing research in the application of chaos theory to organised crime appears sparse and superficial at best. There are few direct references (such as Young 1997b:90) and few indirect references (such as Milovanovic 2003:71).

According to Young (1997b:88), there are four types of attractors when considering society and crime in general: social power, economic power, physical power and moral power. Social power arises from social relationships, be it family, friends, colleagues, church, recreation or the community. Economic power arises from one's income and can be used to shape the behaviour of others. Physical power arises from the use or threat of violence and moral power arises from shared values, such as religion or professional ethics. Young suggests that the life of any given individual or group can be mapped to each of these attractors and that each form of crime entails some combination of the four. In organised crime, Young (1997b:88) argues that economic power is the key attractor — for example,

the sale of drugs, auto theft, property theft, arson or prostitution. As young people move into adulthood, they undergo a lifestyle change and desire and want more: eg, cars, fashion, separate accommodation and travel. Allowances and part-time jobs may not be enough to cover their desire, and most are too young to access other income sources such as property or portfolio income. Organised crime is the opening for some of these people with low incomes to experience higher incomes. In chaos informed organised crime, the bifurcations between the 'desire for consumer goods and services on one side, and legal sources of income on the other' (Young 1997b:87) is the point where economic attractors come into play.

Other areas of research include complexity theory and organised crime. While the application of chaos theory is not readily apparent, a number of other subsets of complexity theory such as network theory and complex adaptive systems ('CAS') are. For example, Elliott and Kiel (2004:63) have attempted to apply complex adaptive system principles to better understand global terrorism. Here, Elliott and Kiel (2004:64) substitute the metaphor of networks for fluids and consider the complexity of terrorism using principles borrowed from the complexity work of fluid mechanics. Another scholar in this area is Yaneer Bar-Yam. Bar-Yam specialises in complexity and published a lengthy and comprehensive book *Dynamics of Complex Systems* in 2003, including a chapter devoted to chaos theory (Gleick 2008:323). He founded the New England Complex Systems Institute in 1997 (New England Complex Systems Institute 2009) and since then has applied computer modelling and complexity theory, including chaos theory, among other things, to 'global patterns of ethnic violence, trying to isolate patterns of population mixing and boundaries that trigger conflicts' (Gleick 2008:323).

Another scholar is Frank Madsen. Madsen has attempted to apply network theory to 'transnational organised crime and terrorism' (Madsen 2007). Although his work does not use chaos concepts, some of the concepts he has developed or used are useful in their application of chaos theory to organised crime. In particular, he uses the notion 'packets of information' to parcel up pieces of information about a case example of a terrorist. According to Madsen (2007:12), these 'packets of information' (in the context and application of network theory) if identified at an early stage, could have identified the case example (a terrorist) as a very active and clear danger to society. Madsen also notes the unresolved problem of 'packets of information' being parcelled in different ways by different countries and the problematic sharing of 'packets of information' to paint a global picture of the terrorist — ie, this comes back to the concept, 'the whole is more than the sum of the parts' (Madsen 2007:12). Madsen breaks-up his case example of a terrorist into 16 'packets of information' (Madsen 2007: 18). Examples include: i. pale skin and red hair (this packet of information conveys unusual features for a person born in Syria and would facilitate observation); ii. a member of the 'Muslim Brotherhood' (this packet of information would alert the intelligence and security communities); and iii. dual nationality that allowed him unfettered travel within the European Union (this packet of information would alert agencies to his freedom of movement). As noted by Huberman (cited in Gleick 2008:324), 'complex behaviours emerge unexpectedly in information networks'. Moreover, as pointed out by Gleick (2008:324) himself, 'chaos is a creator of information — another apparent paradox'.

While existing research in the application of chaos theory to organised crime appears sparse, the available research, including research in other areas of complexity theory, proves to be a useful basis for further discourse and development of the application of chaos theory to organised crime.

New research: in applying chaos theory to organised crime

This section provides a new area of research by the author in the form of a framework and methodical approach to further develop, understand and better apply chaos theory to the study of organised crime.

As a starting point, the variables and attributes of organised crime are considered, where variables are defined as logical groupings of attributes. As Maxfield and Babbie (2005:18) point out, 'theories describe relationships that might logically be expected among variables'. In chaos informed organised crime, these relationships will be complex and non-linear. As highlighted above, there are three frameworks one might consider in relation to organised crime: von Lampe's (2003:6) six basic elements, Levi's (2007:781) six procedural steps and CID's (Richards 1999:4) set of 14 characteristics. If we combine all of these frameworks into one, a 3-dimensional matrix may be formed where Levi's procedural steps represent the x-axis, von Lampe's basic elements represent the y-axis and CID's 14 characteristics represent the z-axis.

As chaos theory applies to a dynamic system, Levi's procedural steps are in chronological order; however, as an organised crime group develops and expands over time, these steps will be repeated, but not necessarily in this order — the order will be determined by what is necessary at the time a group develops and expands. For example, a group may have enough finance and people to expand, but not enough equipment or transportation. Overall, these steps provide a useful starting point in the matrix. Von Lampe's six basic elements may each play a role in Levi's six procedural steps. For example, taking the first step, 'to obtain finance for crime', you will need actors to obtain the finance and you may need a criminal activity, such as kidnapping or theft, to obtain the initial finance. Furthermore, these initial steps towards organised crime may depend on existing structures and relationships in place.

From an environmental perspective, society, government and the media may all play a role, at any given time, in how an organised crime group operates. Given today's global environment, each environmental element needs to be considered at a local, regional, national and global level. As noted by Findlay (2008:27), globalisation has promoted 'issues such as territoriality, sovereignty and political authority' in the context of security and a blurring of international boundaries. In particular, since the September 2001 terror attacks, the world has changed and a 'whole raft of new arrangements and legislation has been implemented' (McCulloch 2003:284). An increase in anti-terrorism legislation has not only led to an increase in surveillance by the police and military (and the blurring of lines between them), but also an increase in surveillance by society itself (McCulloch 2003:286; Mythen and Walklate 2006:392). From an organised crime point of view, these global and state factors will all play a critical role. For example, some organised crime groups will exploit the lack of control and surveillance in countries such as South America to continue their drugs trade, while others will 'use the potential of jurisdictional fragmentation to insulate themselves from arrest' (Sheptycki 2006:442). As Crawford (2002:27–8) points out, there is a 'profound relationship between globalised conditions and local circumstance'.

Lastly, each of the 14 characteristics of organised crime groups may link to an element from Levi's procedural steps and von Lampe's basic elements – for example, 'obtain finance for crime' by an 'actor' may use the characteristics of motivation, violence or corruption. As seen from this consolidated framework, organised crime is not straightforward. If organised crime was straightforward, the consolidated framework would be straightforward, but it is not, it is complex and so are the variables at play — they are all

interrelated to form a bigger picture of organised crime at both the micro and macro-levels. Moreover, to add another layer of complexity, this framework is a depiction of the variables, not the attributes. Each of Levi's six procedural steps and von Lampe's six basic elements is a variable which comprises attributes. For example, individual actors comprise attributes such as occupation, age, nationality etc; criminal activities comprise attributes such as type of activity, eg, drugs, extortion, prostitution, theft etc. Furthermore, 'obtain finance for crime' comprises attributes such as the different methods one can obtain finance for crime and so on.

Taking the first step in Young's (1997b:95) five step methodology — 'locate the attractors hidden in complex data sets' — provides a useful basis to begin. Taking Young's argument that the life of any given group may be mapped to the four attractors, it would appear reasonable that the 14 characteristics of an organised crime group may be categorised under these four attractors. As such, the following table attempts to categorise each characteristic into one of the four attractors.

Figure 1: Mapping of attractor type and characteristic of organised crime

	Type of attractor	Characteristic	Meaning
1	**Economic**	**Corruption**	The use of illicit influence, exploitation of weaknesses, and the blackmail of public and prominent figures
2	**Economic**	**Infiltration**	Continued effort to gain a foothold in legitimate institutions to further profit or gain a level of protection from detection
3	**Economic**	**Monopoly**	Control over certain criminal activities within a geographic area with no tolerance for competition
4	**Economic**	**Sophistication**	In the use of advanced communication systems, financial controls, and operations
5	**Economic**	**Diversity**	In illicit activities, to further insulate the organisation from dependence on one criminal activity
6	**Economic**	**Mobility**	A disregard for national and jurisdictional boundaries
7	**Economic**	**Subversion**	Of society's institutions and legal and moral value systems
8	**Economic**	**Insulation**	Protection of the organisation's leaders by separating them from the soldiers, cell from cell, and function from function
9	**Economic** **Moral: terrorists**	**Motivation**	Motivation is power and influence resulting from the accumulation of wealth (except terrorists - motivated by political or social gains)

10	**Moral**	**Continuity**	Like a corporation, the organisation survives the individuals who created and run it
11	**Moral/Social**	**Bonding**	Individual to individual, and individual to organisation, for solidarity and protection, often through complex initiation rites
12	**Moral/Social**	**History**	Has allowed entrenchment and refinement of criminal activities and practices
13	**Violence**	**Violence**	Used without hesitation to further the criminal aims of the organisation
14	**Violence**	**Discipline**	The enforcement of obedience to the organisation through fear and violence

As seen in Figure 1, the economic attractor dominates, with the other three attractors sharing nearly equal remaining space. If we reapply this to the consolidated framework of organised crime, we would be presented with the following table:

Figure 2: Attractors hidden in a complex data set

	Basic components of organised crime von Lampe's basic elements (y-axis)
Chronology of organised crime Levi's procedural steps (x-axis)	**Attractors within the data set** = 14 characteristics (z-axis)

Figure 2 is a representation of step one from Young's five step approach — 'to locate the attractors hidden in complex data sets'. For any given organised crime group, there will be different attractors at play depending on the type of organised crime group (ie, how it is structured/connected), the actors involved, the criminal activities undertaken and the environment it operates in (ie, local, regional, national, transnational). An example of such an attractor is where circumstances allow an individual or organisation to fluctuate between the licit and illicit worlds; such an attractor would be a Lorenz attractor. As seen in the case example in Appendix 1, circumstances can often move innocent parties across the licit/illicit boundary.

To perform step two of Young's approach — 'to determine how many attractors exist in the data set' — is where the challenge begins. As organised crime 'data' mostly comprises 'narrative information' from case files as opposed to 'numeric information', a starting point may be to organise the data set in the two-dimensional matrix of Levi's six procedural steps and von Lampe's six basic elements into 'packets of information' — similar to the methodology applied by Madsen (2007:11). Based on these 'packets of information', the data may be analysed in such a way to determine how many attractors exist in any given data set for an organised crime group — for example, the case example in Appendix 1 indicates that a cross-over between the licit/illicit boundary is often due to the economy operating as a whole, instead of two distinct and disconnected parallel economies (ie, an upper and underworld), enabling a more sophisticated organised crime system. It is

noted that the identification of attractors will be conceptual, as opposed to mathematical, unless the 'packets of information' can be presented in numbers to apply chaos mathematics. An illustration of the 'packets of information' concept is depicted in Figure 3 below:

Figure 3: Packets of information concept

	Chronology of organised crime Levi's procedural steps (x-axis)	**Basic components of organised crime** von Lampe's basic elements (y-axis)					
		1. Actors	2. Activities	3. Structures	4. Society	5. Gov't	6. Media
1	Obtain finance for crime						
2	Find people willing/technically/socially competent						
3	Obtain equipment/transportation						
4	Convert crime product into useable money/assets						
5	Find people/places to transmit/store/conceal proceeds						
6	Neutralise law enforcement by technical skill/corruption/legal						
Key: A 'packet of information' 							

In step three of Young's approach — 'to find the change points(s) at which new attractors are produced' — this will require critical analysis of the 'packets of information' within the data set to pinpoint these changes; again, this will be from a conceptual perspective, unless a mathematical perspective is possible within the data presented. Based on current areas of focus in theorising organised crime, the nexus between the licit and illicit worlds would be a key starting point to find 'change points'. In the case example in Appendix 1, a slight change in legislation, such as cross-border controls, may prove to be such a change point. Finally, steps four and five of Young's approach — 'to identify the key parameters which drive the system into ever more uncertainty' (for purposes of social control) and 'to determine which setting of those key parameters is acceptable to the whole society' (for purposes of social policy) — would follow logically based on the findings of steps one to three.

Overall, the aim of this suggested framework and methodical approach is to simply further develop, understand and better apply chaos theory to the study of organised crime. It is merely a stepping stone, if not a bridge, to close the existing gap of knowledge between

applying chaos theory to organised crime. It is also based on the assumption that organised crime may be explained through the conceptual lens of chaos theory. A case example using the above suggested framework and methodical approach is presented in Appendix 1. The example does not provide a complete analysis or clear outcome in using the above suggested framework and methodical approach; rather, it illustrates a partial analysis and suggestive outcome in the way a chaos informed analytical approach may better assist the understanding of this organised crime group. In the case example, it demonstrates how one small aspect of this organised crime group may be analysed and understood to fit into a larger picture, at both the micro and macro-levels.

Conclusion

Applying chaos theory to organised crime provides a novel perspective in understanding organised crime. It also demonstrates that this area has a large capacity for further research and would benefit greatly from further development of the suggested framework and methodical approach — both conceptually and mathematically. A key area of further research would be to apply the development of the suggested framework and approach to a greater and representative number of available case files of organised crime and in particular, to those that provide a detailed account of all the facts. With further research, this may ultimately lead to a new and perhaps better way of understanding organised crime and ways of preventing it.

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Appendix 1: Illustrative case example

The facts

The organised crime case example (Levi and Maguire 2004:430) is a transnational organised crime group, comprising at least a UK and German component. The original source of the case facts is drawn from the research of the European Falcone programme as referred to above (Levi and Maguire 2004:397). The research of the Falcone programme was based on a 'combination of questionnaires to, and interviews with, members of key agencies in European states' (Levi and Maguire 2004:397), including access to files of closed police investigations (van de Bunt and van der Schoot 2003a:9). In this case example, the overarching criminal activity is car theft. The facts of the case may be summarised as follows:

- A car theft was brought to the attention of the UK authorities by German police officers, when a stolen Mercedes car (German owned) was located on a dockside on the English south coast using a satellite tracking device.
- Upon investigation, the UK police located several additional vehicles inside shipping containers.
- It transpired that these vehicles had been stolen by an organised crime group – using both UK and German offenders – and were all destined to be shipped out for sale in Nigeria.
- The UK and German offenders each had specific roles to play.
- The UK offenders committed identity theft and credit card fraud. They used the true names and addresses of innocent individuals to fraudulently apply for American Express credit cards and redirected the mailing of the credit cards to addresses accessible by the criminals.
- Armed with the fraudulently obtained credit cards, and false passports to match the names on the cards, some of the UK criminals then presented themselves as tourists at a car rental organisation in Germany and hired the vehicles.
- The UK criminals ('the couriers') passed the hired vehicles on to the German criminals ('the drivers') who delivered them to more German criminals ('the fixers').
- The German fixers arranged for false number plates to be fixed to the cars and for another set of drivers ('fixer drivers') to take the cars to the docks and by ferry to England, delivering them eventually to a shipping company.
- A corrupt shipping clerk provided the necessary documentation.
- Innocent parties included the ferry, shipping company, container company and some truck drivers who were to deliver the cars in containers to the docks for the voyage to Nigeria.
- The UK and German police were only able to arrest the shipping clerk and the drivers who worked for the German fixers.
- These offenders refused to name (or else they genuinely did not know) any of the other members of the organised crime group.

Analysis

It is noted that the facts of this case only form part of a much larger and complex organised crime operation. The facts as presented sit in steps two and three of Levi's procedural steps; in addition, von Lampe's three core elements (actors, activities and structures) are all present in the case facts. Von Lampe's three environmental elements (society, government and media), while not present in the facts, would all still play a part in the bigger picture. The case example may be seen as merely a 'jigsaw piece' in what is likely to be a much larger and complex 'jigsaw puzzle' of this organised crime group. Based on this preliminary analysis, the case facts may be parcelled into 'packets of information' that highlight the interrelations between A through to F as depicted in Figure 4 below.

Figure 4: Case example — preliminary analysis

	Chronology of organised crime Levi's procedural steps (x-axis)	**Basic components of organised crime** von Lampe's basic elements (y-axis)					
		1. Actors	2. Activities	3. Structures	4. Society	5. Gov't	6. Media
1	Obtain finance for crime						
2	Find people willing/technically/socially competent	A 	B 	C 			
3	Obtain equipment/transportation	D 	E 	F 			
4	Convert crime product into useable money/assets						
5	Find people/places to transmit/store/conceal proceeds						
6	Neutralise law enforcement by technical skill/corruption/legal						

Based on Figure 4 above, the case facts have been reanalysed and parcelled into 'packets of information'. Figure 5 below illustrates the 'packets of information' based on von Lampe's core element 'actors'. These 11 'packets of information' would fit into either A, D or both in Figure 4 above. The next step would be to reanalyse and parcel the 'packets of information' by 'activities' and 'structures'. However, for the purpose of this illustration, only 'actors' has been completed.

Figure 5: Case example — packets of information

	Packet of information — by actor	*Characteristic*	*Attractor*
1	**UK forgers**: corrupt, committed forgery in the UK (counterfeited UK passports), not arrested, contact with UK couriers, ability to counterfeit documents	Corruption Sophistication	Economic
2	**UK couriers**: corrupt, committed identify theft and credit card fraud in the UK, illegal entry into the UK with a false passport, received and couriered stolen goods in Germany (Mercedes Benz/other vehicles), not arrested, contact with forgers, German car rental company and German drivers, ability to obtain credit card by deception, posed as tourists with fraudulent documentation (passport and AMEX credit card)	Corruption Mobility	Economic
3	**German car rental company:** innocent party, owner of stolen goods (Mercedes Benz/other vehicles), contact with UK couriers	Licit world	Economic
4	**German drivers**: corrupt, couriered stolen goods (Mercedes Benz/other vehicles) in Germany, not arrested, contact with UK couriers and German fixers	Corruption	Economic
5	**German fixers**: corrupt, handled stolen goods (Mercedes Benz/other vehicles) in Germany, not arrested, contact with German drivers and German fixer drivers, access to false number plates	Corruption	Economic
6	**German fixer drivers**: corrupt, couriered stolen goods (Mercedes Benz/other vehicles) in Germany and UK, arrested (known to the UK and German police forces), contact with German fixers, ferry, shipping clerk and shipping company, refused to name other members of the organised crime group (either through close bonds, obedience to the organisation through fear and violence or genuinely do not know)	Corruption Mobility Bonding Discipline	Economic Moral/Social Violence
7	**UK or German Ferry company**: innocent party, handled stolen goods (Mercedes Benz/other vehicles) from Germany to the UK, contact through German fixer drivers using route/mode of transport	Licit world	Economic

8	**UK shipping clerk**: corrupt, works for an innocent party (infiltration of shipping company), aided and abetted crime of stolen goods (Mercedes Benz/other vehicles) in the UK (provided necessary documentation), arrested (known to the UK and German police forces), contact with German fixer drivers, refused to name other members of the organised crime group (either through close bonds, obedience through fear and violence or genuinely does not know)	Corruption Infiltration Bonding Discipline	Economic Moral/Social Violence
9	**UK shipping company**: innocent party, handled stolen goods (Mercedes Benz/other vehicles) in the UK and voyage to Nigeria, contact through shipping clerk in the UK	Licit world	Economic
10	**UK container company:** innocent party, handled stolen goods (Mercedes Benz/other vehicles) in the UK and voyage to Nigeria, contact through shipping company and shipping clerk	Licit world	Economic
11	**UK truck drivers:** innocent party, handled stolen goods, (Mercedes Benz/other vehicles) in the UK, contact through container company	Licit world	Economic

As depicted in Figure 5 above, each actor's 'packet of information' has been mapped to the characteristics and attractors of organised crime using Young's conceptual approach. This analysis, when complete, would determine how many attractors exist in the data set for this part of the organised crime group. From the partial analysis, it is already apparent that a number of interrelated actors and crime events, when combined, form the overall criminal activity of car theft for this part of the organised crime group's operations. If there was more information in the case facts or more details surrounding the time of the case, one could look for attractors and 'tipping points' that impact on criminal motivation and opportunities. For example, the current life circumstances of the criminal actors to offend and the environment in which they live in; the level of security and monitoring of imports and exports at the UK, German and Nigerian borders for criminal opportunities and ease of activities, including relevant European Union legislation and transnational agreements at the time of the case; and any relevant media 'noise' during the period (ie, cross-border car theft and identity crime). However, based on the partial analysis available, a key observation is readily apparent — the nexus of the illicit and licit worlds. As depicted in the 'parcels of information', the licit world is a necessity for this organised crime group in carrying out the overall car theft activity.

Next steps

The next steps in this case example would be to reanalyse the 'packets of information' by reference to 'activities' and 'structures' and complete B, C, E and F in Figure 4 above. In the absence of further information, steps one and two in Young's approach — ie, to locate

the attractors hidden in complex data sets, and to determine how many attractors exist in the data set – would be completed based on the characteristics and attractors identified for each 'parcel of information' as partially completed in Figure 5 above. Next, Young's third step ie, to find the change points(s) at which new attractors are produced — would require critical analysis of the 'packets of information' across the data set to pinpoint these changes. In this case example, it is noted that there may not be enough information to provide a meaningful analysis. However, despite this point, the identified nexus between the licit and illicit worlds would act as the key starting point to find 'change points'. Finally, steps four and five of Young's approach — ie, to identify the key parameters which drive the system into ever more uncertainty (for purposes of social control) and to determine which setting of those key parameters is acceptable to the whole society (for purposes of social policy) — would follow logically based on the findings of steps one to three.

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