Making Sense of complex dynamic Spaces: The wicked Problem of Doping Control in Sport

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Some of the problems shared by the world's citizens are 'wicked'! 'Wicked problems' are persistent with incompletely-known and contradictory elements that are interconnected and constantly changing (Rittel & Webber 1973). Contemporary 'wicked problems' that reside in the dynamic context of the global environment include climate change, economic and political refugees, epidemics, drug trafficking and disasters of immense proportions, some natural and others brought on by human activities.

Although multifaceted, dynamic and persistent, wicked problems need resolution. Drawing on various types of expertise, attempts to solve these problems bring together the multiple perspectives of professionals as well as stakeholders from the government, non-government and civil society. These efforts cross multiple boundaries and require cooperation between diverse types of organisations with different objectives and cultures. Overall, they present a convoluted workspace that is not easy to make sense of, but whose comprehension will promote effective action.

Anti-doping efforts in sport present a manageable instance of the phenomenon of global organisation in response to the wicked problem of doping in sport. A universal human activity, sport is normally associated with healthy living and notions of fair play. However, sport at the elite level is much more problematic as competition, prestige and money pressure athletes to perform 'faster, higher, stronger' (IOC, 2013) and sometimes to win at any cost. The use of performance enhancing drugs is a response to these pressures, a response that is seen as problematic by many of sport's stakeholders including national governments, sports federations, medical practitioners, and the wider community. The World Anti-Doping Agency (WADA) works to harmonise global efforts by the International and National Olympic Committees (IOC and NOCs), the International and National Paralympic Committees (IPC and NPCs), international and national sporting federations and associations (IFs and NFs), national and regional anti-doping agencies (NADOs and RADOs) to address this problem. The Court of Arbitration for Sport (CAS) and WADA-accredited anti-doping laboratories (Labs) are also part of global anti-doping efforts as shown in Figure 1.This globally organised response was not immediate, but evolved over time as a number of partial solutions.

Figure 1. WADA's depiction of anti-doping work

Reflecting the multiple perspectives on and various strategies for solving the problem of doping in sport, we find that anti-doping efforts draw on the expertise of professionals from many fields and concerned individuals. Using a compound lens forged by integrating the Cynefin framework and CHAT (Hasan, Kazlauskas& Crawford 2010) we describe five *strategic activities* that have evolved over time and continue to evolve as a means of controlling doping in sport:

A. Sporting Bodies regulating against doping in sport
B. Scientists detecting doping by athletes
C. National Agencies conducting testing and educational programs
D. WADA harmonizing global anti-doping efforts in sport
E. Agencies authoritatively investigating doping and sports associated trafficking

Within each *strategic activity*, stakeholders generate numerous micro-level *activity systems* (hereafter *activities)* to execute their strategy. These focused micro-level *activities* occur in the various *knowledge domains* of the Cynefin framework, encompassing routine work, expert problem solving and new knowledge generation and mobilisation. The *actions* and *operations* of these *activities* change in response to new demands from the context and are achieved through stakeholders *vizibilising* new *activity systems* and crossing *zones of proximal development* to achieve them. Changes to stakeholders' *tools*, *community*, *rules* and *division of labour* enable these changes. Interaction between stakeholders at the macro-level also leads to change as stakeholders modify their *activities* to cross other *zones of proximal development* to resolve shared *tensions*, negotiate and reach new or evolving shared *objects* within their daily work. As micro-level *activities* change to move towards solving an aspect of the doping problem, meso-level *Strategic Activities* evolve and the overall efforts to solve the wicked problem evolve. Figure 2 attempts to capture our richer interpretation of anti-doping efforts, and, attempts to capture the diversity of both the overall context and *strategic activities* in it. The absence of hard boundary lines between *strategic activities* points to the interaction between stakeholders as they *co-configure activities* directed towards a *shared object.*

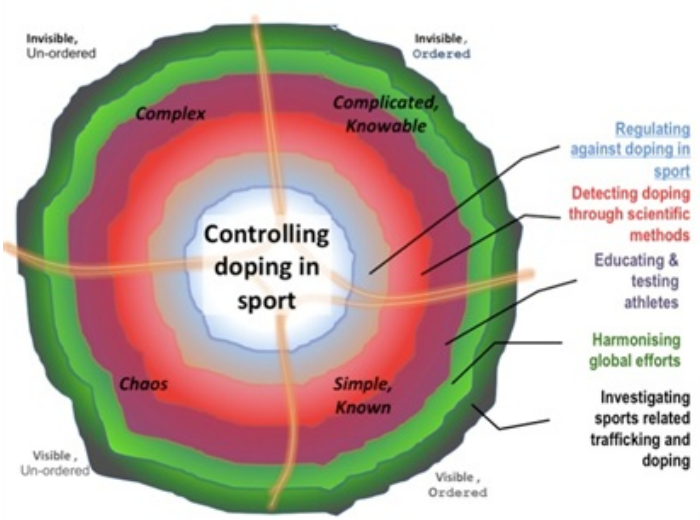

Figure 2. Strategic activities make up the dynamic and multi-faceted global anti-doping workspace

Controlling doping in sport

Whilst the use of substances to enhance athletic performance harks back to the ancient Olympic Games (Houlihan 1997), the history of anti-doping efforts is not a long one. Beginning with regulation by sports bodies against doping in the early 1900s, efforts to control doping have expanded over time to rely on the *activities* of various motivated professionals including sports and government agency administrators, educators and investigators, analytical scientists, sports medical practitioners and sports lawyers. *Motivated* by their desires to protect the integrity of sport, to promote the health of athletes and to ensure fair play has led these professionals to become stakeholders who share the *object* of controlling doping in sport through developing *strategic activities* suited to their particular expertise.

Sporting bodies regulating against doping in sport

Concern about the use of stimulants by cyclists and other endurance athletes in the late nineteenth and early twentieth centuries triggered the introduction in 1928 of anti-doping regulation by the International Association of Athletics Federations (IAAF). Other sports' bodies followed the IAAF's lead. Concerns triggered by athlete deaths resulting from doping prompted some governments and additional sporting bodies, including the International Olympic Committee (IOC), to support *activities* with the *object* of regulating against doping. Over the years, sports lawyers acting for sporting organisations have used their expertise in the ongoing *complicated activities* necessary to ensure that the regulatory framework prohibiting doping is legally sound and that cases of doping brought against athletes are based on sound and sufficient evidence and thus prosecutable. Other *complicated activities* worked towards informing athletes and their entourage about what constitutes doping, devising and now regularly updating a list of substances and methods whose use is prohibited. Committees of sports medicine practitioners utilise their expertise in the *complicated activity* of assessing athletes' applications for Therapeutic Use Exemptions that allow them to use a banned substance to address a medical condition.

In the 1950s and 1960s, continued instances of doping and the public's perception that doping was rife in sport pointed to the ineffectiveness of *activities* focussed solely on regulation. In the

public's eyes, doping in sport was out-of-control. Efforts to control doping remained in Cynefin's *chaos domain*.

Scientists detecting doping by athletes

In the 1960s, a small group of concerned scientists formed the *object* of developing techniques to detect the use of banned substances by athletes. Using scientific *tools*, *community* and *rules* they initiated the *complex* and/or *complicated activities* associated with the *strategic activity* of detecting doping through the use of robust, validated analyses. The lengthening list of prohibited substances and methods prompts the expansion of anti-doping science. *Activities* to develop methods to detect a new substance or doping method takes place in Cynefin's *complicated* and/or *complex knowledge domains* with multiple groups of scientists *knot-working* as they unravel and test the patterns that point to doping (Kazlauskas & Crawford 2007). This work is demanding, time-consuming, allows for partial solutions and mistakes and is best supported by a trusted space where it is safe to share and safe to fail. Beginning with the detection of stimulants, anti-doping scientists continually *visibilise* new and improved analyses for steroids, peptides such as Erythropoietin (EPO) and other hormones, growth factors, beta 2 agonists, diuretics and other masking agents, as well as blood and gene doping.

Scientists interact with regulators and lawyers to achieve the *object* of prosecuting athletes whose samples have returned an adverse analytical finding. Interacting with scientists, first the IAAF and the IOC and now WADA administer an accreditation system with the *objects* of achieving the highest analytical and ethical laboratory standards aswell as promoting research.

The scandal associated with 100m gold medallist Ben Johnson's use of steroids in the 1988 Summer Olympics suggested that regulation and detection were not enough to solve the problem of doping in sport. For the public, efforts to control doping in sport remained in *chaos*.

National agencies developing and running testing and educational programs

Drawing on the expertise of public health administrators and educators, formal testing programs and education became the third *Strategic Activity* for anti-doping efforts. Whilst some countries, including France and Italy, already had legislation making doping in sport a criminal offence, other governments had yet to act. Australia, New Zealand, United Kingdom and Canada instigated national programs with the *objects* of testing and, if need be, penalising their own athletes for doping. *Activities* with the *object* of developing and running athlete education programmes were also introduced.

However, the variation between national and sports based efforts led to both athletes and the public perceiving that doping in sport remained out of control on a global basis: some countries and sports were making an effort, others were not. The discovery during the 1998 Tour de France (Schneider 2006)(of large amounts of banned substances galvanised governments and sporting bodies to take action on a global scale.

World Anti-Doping Agency (WADA) harmonising global anti-doping efforts

Motivated by the shared purpose for dope-free activities in sport on a global basis, WADA came into existence in late 1999. WADA's *strategic activity* focuses on global harmony in anti-doping efforts and requires expert skills in international diplomacy to bring together and to obtain committed efforts by the hundreds of different nations and sports. WADA's strategy centres on

'The Code', a document that provides, 'the framework for harmonized anti-doping policies, rules and regulations within sport organizations and among public authorities' (Wada 2013). WADA describes itself as 'custodian of the Code' to which its stakeholders are signatories, and as having, 'the duty to monitor stakeholder activities in relation to the Code and to ensure the integrity of the Code.' As well as the Code document, WADA's five additional International Standards have the *object* of bringing harmonisation among anti-doping organisations in various areas: testing, laboratories, Therapeutic Use Exemptions (TUEs), the List of Prohibited Substances and Methods, and protecting privacy of personal information. The *object* of providing access to information for a global context led WADA to develop and oversee the Anti-Doping Administration and Management System (ADAMS), an information system, parts of which can be accessed by anti-doping agencies, sports federations, laboratories and athletes and which link global data for any athlete to be closely analysed. WADA also engages in *activities* that support their own and regional testing and education programs, provide funding for both scientific and social research to advance anti-doping activities, ensuring that doping control at major sporting events is of the highest standard.

The doping scandals associated with the 1998 Tour de France and the Bay Laboratory (BALCO) designer steroids case (Kazlauskas 2010; Ritter 2005) in the early 2000s pointed publicly to the involvement of the athletes' entourage and others in doping activity and the need to prosecute the 'doping underground – the traffickers, the entourages, the "upstream" organisers of doping on a broad scale' (Pound 2007).

Agencies authoritatively investigating designer doping and sports-associated trafficking

Anti-doping workers adopted the *object* of investigating designer doping and sports associated trafficking through accessing the necessary expertise and investigative powers and increasing cooperation between anti-doping and law-enforcement agencies. Whilst these links already existed in some European countries, other countries restructured existing or established new specific purpose investigative bodies which would engage in this *strategic activity*. The United States Anti-Doping Agency (USADA) and the Australian Sports Anti-Doping Authority (ASADA) are examples of anti-doping bodies with investigatory power to engage in this *activity*. Additionally, international agencies, such as Interpol, and national customs and policing agencies carry out *activities* that address the problem of trafficking sports doping substances such as steroids. An example of this is the Australian Crime Commission's report into 'Organised Crime and Drugs in Sport'(http://www.crimecommission.gov.au/publications/other/organised-crime-drugs-sport). These *strategic activities* take place in *Cynefin's complex* and *complicated knowledge domains*.

As anti-doping efforts have evolved, stakeholders work to ensure that their *strategic activities* have a *shared object* and that their *strategic activities* are achieving interpretation of this *object* as best they can.

Configuring a shared object

As the global efforts of anti-doping professionals evolved, particularly through micro-level *activities* in the *invisible complex* and *complicated knowledge domains*, there was a need for opportunities for informal and formal information sharing to *re-configure* shared *objects* and priorities for existing and emerging groups of *subjects*, who had additional expertise to take strategic action. This re-configuration *activity* is supported by World Anti-Doping Conferences such as those in 1999, 2002 and 2007, and, Regional Anti-Doping conferences such as that in Kuwait in 2009 brought together anti-doping workers and key stakeholders from various countries. Our attendance at

and evaluation of the 2006 IAAF World Anti-Doping Symposium found that the symposium provided attendees with the opportunities to meet and share day-to-day experiences, to identify synergies and discuss issues and to reflect on the evolving shared object of their activities. The volume of material formally broadcast during the symposium left some respondents with a desire for more meetings through which to advance global anti-doping work and for more time for informal discussion for *negotiating* or *co-configuring expansive shared objects* and better insights into factors shaping anti-doping work in other parts of the world and other related *strategic activities*. These results point to the high value placed by front-line workers on opportunities to engage in meta-level *expansive visibilization* of anti-doping activity through informal and horizontal information exchanges between anti-doping workers that cross traditional boundaries in this global context and allow them to 'zoom in' on the micro- and meso-level *activities* of colleagues involved in the same *strategic activity* or with stakeholders engaged in other *strategic activities,* as well as 'zooming out' to the global macro-level through formal presentations about particular *strategic activities*.

Discussion

The contextual diversity inherent in approaches to addressing globally shared wicked problems can be over simplified when placed under the ambit of an international agreement overseen by an international organisation. This approach can make it all too easy for stakeholders, managers, participants and onlookers to overlook or simply not see the diversity in the context. One way to avoid this pitfall is through the use of the CHAT/Cynefin compound lens to *expansively visibilize* the context and to make sense of the differing, expansive, fluid yet increasingly organised nature of efforts to address the globally shared wicked problem of doping in sport. By conceptualising doping in sport as a globally shared wicked problem, those working to solve the problem co-construct a dynamic *shared object* with the various stakeholders having different subjective interpretations of how they can best achieve that object.

Examination of the progress of anti-doping efforts through the CHAT/Cynefin lens enables identification and investigation of the micro-, meso-, macro- and meta- workspaces generated by the strategic and micro-level activities of these efforts. Rather than 'a black box' the compound Cynefin/CHAT lens generates a representation of the context that captures its diversity, energy and strength (see Figures 1 and 2). The Cynefin/CHAT lens helps to make sense of the various interpretations of the *object* of controlling doping in sport. It makes sense of the multiple *strategic activities* directed towards that *object* as well as the micro-level *activities* that can and do reside in and move between different *knowledge domains*.

The Cynefin/CHAT framework makes visible the dynamic and evolving nature of each *strategic activity*. Although stakeholders may strive for the appearance of simple *order* at the macro- level, the *activities* that comprise each strategic activity vary. Those that are *complex* or *complicated* rely at meso- and micro- levels on networks and communities as they act together to *scaffold expansion* across *mutual zones of proximal development*. As each *strategic activity* develops and its effectiveness grows, there are *expansions* and *contractions* of the *complex*, *complicated* and *routine* micro-level *activities* of the various anti-doping stakeholder groups as they bring their own and others' expertise to bear on the diverse evolving challenges and unexpected problems associated with solving the wicked problem of doping in sport.

By drawing upon the energy and expertise of individual stakeholders, anti-doping work has garnered new insights and understandings of aspects of the doping problem that include respect and empathy for people working in different global contexts. These capabilities are critical for an organisation that is trying to bring together multiple strategies to address a global problem. An organisation such as WADA will need the ability to adapt each of its *objects* to accommodate the

unique conditions of each localised instantiation of activity and the purposes of the actors in that place.

Guarding against over-simplification, the use of the CHAT/ Cynefin compound lens also suggests that in the case of global anti-doping work the shift of focus away from the *ordered* and *routine* has been a necessary problem solving strategy. Despite the need for an appearance of *order* at the macro-level, the need to evolve strategically, to expand capabilities and to resolve *tensions* acts as an *attractor* as meso- and micro-level *subjects* move their *activities* into the challenging *unordered domains* to exchange information, negotiate, collaborate and expand their existing knowledge and to generate new knowledge across increasingly blurred boundaries associated with different cultures, contexts, legal and political regimes and capabilities.

Conclusion

Ashby's (1957) Law of Requisite Variety implies that only variety can master variety. The Cynefin framework (Kurtz & Snowden, 2003) stresses the importance of tailoring knowledge management and management styles to the context. CHAT uses activity as the unit as the smallest possible unit of analysis that still preserves its distinctively human quality (Vygotsky 1978) and collective activity as a minimum meaningful unit of analysis within organisational work systems (Kuutti & Virkkunen 1995). The insights afforded by our use of a compound lens that draws on the Cynefin framework and CHAT to examine efforts to address doping in sport enables deep understanding of the many levels of the multi-faceted, dynamic nature of this and other evolving wickedly problematic workspaces by stakeholders and observers. Our framework's significance, then, for working in or researching the complex dynamic spaces occupied by a wicked problem is that it provides the variety needed by those stakeholders and researchers working in and making sense of both individual and collective activities in these simple, complicated, complex and chaotic dynamic workspaces. Those leading global efforts to address wicked problems require an awareness of how to address the dynamic context in which they work. The CHAT/Cynefin framework thus makes clear that there is no single or simple way of organising in the contexts associated with addressing a wicked problem. While bureaucratic structures have often been favoured among most stakeholder organisations in the past, new adaptable organising principles will better cater for the multifaceted network-centric perspectives within emerging and evolving contexts that fall in the *complex* and *complicated knowledge domains*. In particular, they need to be aware of ways of working in the *complex domain* and the need to allow for *emergent* processes and solutions when considering how to best organise their work.

Power and authority are matters that all organisations address and one which will no doubt raise some interesting questions in relation to organisations that seek to harmonize global efforts to solve a shared problem. For example, how does the authority of an international organisation to impose penalties become accepted globally? Understanding that more interactive, exploratory and collaborative *activities* that generate and mobilize new knowledge, in less *ordered*, more subjective domains, are necessary to resolve the tensions and ambiguities of changing circumstances and address protracted 'wicked problems' could enable transformations and more strategic evolutionary pathways in many areas of future public organisation.

The recent admissions by cyclist Lance Armstrong's about his doping behaviour has once again threatened to place the public perception of efforts to control doping in *chaos*. From our perspective, we can see clearly that to avoid this, anti-doping workers will once again need to re-examine their efforts and to expansively visibilize their *strategic activities,* to cross the *ZPDs* that will lead to adjusted and new *activities* that will better achieve their joint *object* of controlling doping in sport.

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