Doping: a product attached to competition?

Definition(s)

It was not until the 20th century that the terms 'doper' and 'dopage' appeared in the French language, in 1903 and 1921 respectively. They derive from the English terms 'to dope' and 'doping' used from 1889 onwards to designate, in the context of horse racing, the techniques used to modify the performance of a horse. The absence of a universal and unambiguous definition of doping requires a clarification of the concepts that characterise doping practices. First of all, it should be noted that the use of methods known as 'doping' takes place in the context of a sporting activity, even if societal developments have led to a broadening of this qualification to include all human activities.

In fact, doping has no legal meaning and is only punished in sport. Doping was formalised in the 1960s with the first laws prohibiting and sanctioning it. What does have legal meaning is defined by the World Anti-Doping Code of the World Anti-Doping Agency (WADA) in its articles 1 and 2 [WADA, 2020, p.18-27]. Doping in the legal sense is proven if there is a violation of one or more of the eleven listed anti-doping rules, such as; testing positive, unable to be located for a test, falsifying or attempting to falsify a test, evading a test, possessing a prohibited substance or method.

The act of doping is characterised by three criteria: the effectiveness of the device used (unfair practice), the damage to health (in the short, medium and long term) and ethics (contrary to sporting spirit). However, all high-level athletes use artificial devices – whether legal or illegal – in response to the IOC's supreme injunction "faster, higher, stronger". Like physical or mental preparation, dietetics or technical training, doping is one of the many ways to 'get the job done'. The determination of what is or is not authorised, relating to the three criteria already mentioned is both mutable and questionable.

Legal and illegal forms of doping

The division between legal and illegal doping is somewhat arbitrary and underlies several issues. With the basic principle of the WADA World Code that doping only occurs in relation to a rule indicating the prohibited devices, all substances or methods not on this list are permitted, including doping products that, although not prohibited, are effective and dangerous. In addition, all the anti-doping test results are negative as long as the thresholds are not exceeded, even if prohibited products have been consumed. In addition, since doping substances have differing detection windows, athletes can stop their use in time to avoid a positive test.

In addition, some substances are prohibited in competition, but accepted in training (cocaine, corticosteroids). Many illegal products are tolerated - even though the health problem may be fictitious - when they are covered by a therapeutic use exemption (TUE). Prohibited but still undetectable substances are widely used (autologous blood transfusions, generic EPO). Unknown products, or those in the clinical trial phase and therefore not having received marketing authorisation (MA), are much sought after by athletes.

There are several forms of doping: known and identifiable doping; legal doping with TUEs, non-prohibited doping processes and illicit substances tolerated up to certain thresholds; doping processes that are undetectable or masked by other legal or unknown products; undetected doping with unidentified substances; and doping that is not sanctioned because of a technicality or failure to prosecute.

The extent of doping depends directly on the definition given to the phenomenon. For 'official' doping (offences recorded in the application of the World Anti-Doping Code), the average proportion of 'abnormal test results' recorded by WADA varies between 0 and 2%. Alternatively, for 'functional' doping (medicalisation of sports performance outside of any therapeutic indication), the vast majority of the professional elite seem to be involved.

The framework for economic analysis

Doping can be considered as one of the inputs of a production function, complementary to talent, physical, physiological, psychological and mental aptitudes, the output of which is the performance obtained thanks to an illicit external contribution. Sporting excellence comes from the combination of these production factors, which are complementary rather than substitutable. Indeed, training patterns, season preparation and goal planning are closely associated with doping protocols.

The professional athlete confronted with the issue of recourse to drugs evolves in a particular environment. Their career is short, precarious and uncertain. The winners, benefiting from worldwide media exposure, are endowed with an exceptional market value and have access to the best performance products in minimising the risks. All athletes know that they competing within three categories of athletes: those who do not or no longer dope (a minority), those who dope in an artisanal, imprudent and not very effective way, and those who dope scientifically with undetectable and effective synthetic molecules (the majority of the elite).

The athlete must make a choice: use some of the methods listed by WADA, with the risk of being caught during a test and sanctioned, or not use them, which means that the athlete is handicapped insofar as victory and records are determined by a very

small difference, less than 0.5% in most disciplines, whereas the use of certain doping methods can increase his or her performance by 3 to 10 %.

The risk of a positive doping control is very low because information asymmetries are a permanent feature of doping behaviour, with a time lag between the start of the use of illicit drugs by athletes, the date of their suspension by the sports authority and their possibilities of being tested. Information is both imperfect and asymmetrical since the athlete knows their doping protocol much better than the doping control authority. Finally, the risk of being sanctioned athletically and criminally is very low.

The microeconomic analysis of doping

The characteristics of doping are captured by two bodies of standard theory [Dimant and Deutscher, 2019; Daumann, 2018; Harms and Kaiser-Jovy, 2018]: an illegal action with the transgression of a rule by the theory of the economics of crime [Andreff, 2019]; a strategy to gain a competitive advantage by game theory [Eber, 2018, 2008].

The theory of the economics of crime

According to the classical approach of consumer rationality, which seeks to maximise an objective function (utility) under budgetary constraints (scarcity), the athlete is led to choose the optimal allocation of his or her resources based on a cost-benefit calculation. Gary Becker's work on the economics of crime [1968], makes it is possible to say that each athlete - assumed to be free and independent - will evaluate the costs of doping against the risks of testing positive and consequently being sanctioned or of becoming ill, as well as the financial gains and notoriety obtained, and compare them with the costs and benefits of an alternative and legal allocation of his resources.

The athlete will commit this cheating if the net expected utility (difference between benefits and costs) is greater than the disutility of doping (risk aversion, fear of dishonour and unethical behaviour). According to rational choice theory, depending on the results of this cost-benefit calculation, the athlete decides whether to dope or not.

Such a method underlines the existence of a choice to be made between the return on this investment in human capital (doping protocols, preparation schemes) and that which would be obtained by using these resources for other activities. Between personal interest and morality, between the successful sporting career and the length of lifespan, between the short term and the long term, between present, immediate and future goods.

Game theory

Game theory can be defined "as the mathematical tool for analysing strategic interactions between individuals, especially when they have divergent interests..." [Eber, 2018]. Game theory sheds new light on the utilisation of the individual rationality postulate. Individual rationality always commands an economic agent to adopt the best response to the environment in which he or she is placed. The 'common knowledge' of this rationality allows each actor to anticipate the rational behaviour of the other agents while anticipating the fact that the latter are capable of rationally anticipating theirs.

In the sporting domain, the performances obtained depend on the behaviour of all the competitors, oriented in their choice by a search for competitiveness so as to obtain a differential advantage. Several hypotheses are put forward based on the application of game theory and the 'prisoner's dilemma' to doping [Eber, 2018; 2008]. The athlete has a choice between doping and not doping. Doping is efficient, or at least the athlete imagines it to be. The athlete acts rationally to achieve a goal. The preferences and strategies used by athletes, regardless of their ethics, lead to widespread doping when athletes are unaware of the actual prevalence of doping, when the probabilities of detection and sanction in case of a positive test are low, and when the financial, media and symbolic incentives to perform are strong.

Doping thus becomes the dominant strategy, with everyone anticipating that the other will dope. The health risk is uncertain and remote, and the probability of being found out and punished is low. Then again, not doping is equivalent to a certain exclusion from the competition for victory. Without doping, the winner would be the same and the various financial and health costs could have been avoided. Each athlete would have an interest in avoiding illegal behaviour but adopts it anyway despite everything to protect himself from a possible betrayal of the agreement.

The institutional analysis of doping

According to this heterodox approach, the primary fact is not the freedom of individuals to act rationally, but that their behaviour and the consequences of their choices are overdetermined by macroeconomic constraints. The aim is not to understand the logic of the economic process from the perspective of the rational behaviour of individuals, but to understand how the institutions governing the economic system limit the social actors' room for manoeuvre.

In the field of sport, the collective takes precedence over the individual, because the participants are rooted in a highly structured and relatively stable environment. The act of doping appears to be

the consequence of a complex chain of events generated by the collective organisation of the sporting spectacle [Bourg, 2019; Bourg and Gouguet, 2017]. Additionally, the act of doping is the translation of an incompressible and unavoidable risk linked to the very nature of the sporting competition. In this new age of televised and commercialised sport, the professional athlete attempts to obtain material and symbolic gains, while equally trying to respect sport's internal logic. They make the necessary sacrifices to be recognised, overcome the difficulties of their profession, pursue their dream and thus fulfil the terms of their (implicit) work contract.

The costs and benefits of doping are so high that they are necessarily the result of a collective process involving various actors who invest their knowledge and their expertise. The conditions of doping practices are systemic in nature and result from the coordinated action of medical personnel, specialised chemists, training technicians, intermediaries connected to mafia networks, jurists qualified in sports law, etc. Recurrent doping scandals have highlighted the 'visible hand' of institutions through explicit or implicit collusion between all the public and private actors of the sporting spectacle industry, whether it be doping organised by the State (East Germany, West Germany and the USSR during the 1970s-1980s; Russia and China from the 2010s onwards, etc.) or by the market (Festina in 1998, BALCO in 2003, Puerto in 2006, Lance Armstrong/US Postal in 2012).

Lessons and further thoughts

Is the ultimate explanation of doping to be found at the level of the individual behaviour of athletes, assuming that they are guided by the search for the maximum or minimum of an objective function (price/cost), or even at the level of their aggregation? How can the athlete who dopes be considered as homo economicus, when the predominant behaviour is not that of an isolated agent but organised doping?

Similarly, the hypotheses of game theory through the 'sportsman's dilemma' are insufficient to determine strategic choices in interactive decision-making situations based on purely rational considerations, whereas massive doping practices organised in clandestine networks are not integrated, and doping exists in many professional or amateur sports with very low potential of symbolic or material gains.

The theorisation of doping is not yet stabilised. The microeconomic approach leads to indeterminacy and is unable to account for the complexity of the phenomenon. The market certainly offers the freedom to choose, but also to deceive and to be deceived. The challenge of understanding the logic underlying contemporary competitive sport, as well as the underlying causes of doping be-

haviour, is important to try to define more effective anti-doping policies than those that have been implemented, without any real success, for half a century [Bourg, 2019].

We can therefore hope for a deepening, an extension and a diversification of the application of the theoretical apparatus offered by economic analysis to such a singular activity. Doping in sport could thus allow a new look at the standard hypotheses of economic theory.

Further information:

AGENCE MONDIALE ANTIDOPAGE, *Code mondial antidopage 2021*, AMA, Montréal, 15 juin 2020.

Wladimir ANDREFF, *An Economic Roadmap to the Dark Side of the Sport*. vol I*: Sport Manipulations*; vol II*: Corruption in Sport;* vol III*: Economic Crime in Sport*, Palgrave. Mac Milan, Cham, 2019.

Jean-François BOURG, *Le dopage*, série économie, collection Repères, La Découverte, Paris, 2019.

Jean-François BOURG et Jean-Jacques GOUGUET, *La société dopée. Peut-on lutter contre le dopage sportif dans une société de marché ?* Seuil, Paris, 2017.

Gary S. BECKER, "Crime and Punishment: An Economic Approach", *Journal of Political Economy*, vol 76, n°2, 1968.

Frank DAUMANN, "Doping in High-Performance Sport. The Economic Perspective", in Markus Breuer and David Forrest (eds), *The Palgrave Handbook on the Economics of Manipulation in Sport*, Palgrave Macmillan, Cham, 2018.

Eugen DIMANT and Christian DEUTSCHER, "The Economic of Doping in Sports. A Special Case of Corruption", in Paul Downward, Bend Frick, Brad R. Humphreys, Tim Pawlowski, Jane E. Ruseski and Brian P Soebbing (eds), *The SAGE Handbook of Sports Economics*, Sage, London, 2019.

Nicolas EBER, *Théorie des jeux*, Les topos, Dunod, Paris, 2018, 4ème édition.

Nicolas EBER, « Le dilemme du sportif », *Revue d'Economie Politique*, 118 (2), 2008.

Markus HARMS and Sebastian KAISER-JOVY, "The Impact of Manipulation on the Global Demand for Sport", in Markus Breuer and David Forrest (eds), *The Palgrave Handbook on the Economics of Manipulation in Sport*, Palgrave Macmillan, Cham, 2018, Cham.

Related articles: economics of crime, macroeconomics of international sporting success.