Using the tools of economics: can they enhance the S&C cognitive toolbox?

By ***Ian Jeffreys,*** *PhD, ASCC, CSCS*D, RSCC*E, FUKSCA, FNSCA,*
University of South Wales

INTRODUCTION

As strength and conditioning coaches our primary activities revolve around enhancing physical performance, but it could also be argued that we are ultimately problem-solvers, using a range of tools to find solutions to the training challenges our athletes face. In all problem-solving activities, the ability to look at a problem from a range of angles is advantageous and this capacity can be enhanced by developing a diverse cognitive toolbox. This cognitive toolbox can be viewed as a range of thought methods and approaches which can be used to frame and solve the challenges we face. Thus, a useful addition may come from wide-ranging disciplines such as philosophy, logic, economics, jurisprudence and need not be limited to traditional fields of enquiry.[1] Indeed, any analytical method, providing it is a rigorous tool that can be summed up succinctly and has broad application to understanding the world, could contribute to the solution of a problem.[1] This multi-disciplinary approach can provide widely applicable templates which may help in solving problems that challenge traditional strength and conditioning thought processes.

Economics – you must be joking!

The mere word 'economics' typically conjures up images of the Chancellor of the Exchequer with his red case, outlining government policies on taxation, subsidies, tarifs and reporting on figures such as national GDP, projected growth, etc; or alternatively the governor of the Bank of England outlining the fiscal strategies the Bank will take to regulate the economy. These abstract – on the surface predominantly financial – worlds seem light years away from strength and conditioning: what could they possibly teach us? However, the key is not to consider economics in terms of its content, but instead in its frames of references and the thought processes by which it frames problems.

What is economics?

Despite many misconceptions, economics is not truly about finance, but instead is a science directly related to the decision-making process. The American Economic Association defines economics as the study of scarcity, the study of how people use resources, or the study of decision-making. When viewed from a problem-solving perspective, economics could have more in common with the thought processes in strength and conditioning than would at first seem apparent and may be a fertile ground for auxiliary concepts to assist in our problem-solving activities. Indeed, it could be argued that economics is one area whose thought processes could be utilised across a range of disciplines.

AUTHOR'S BIO

IAN JEFFREYS,
PHD, FNSCA, ASCC, CSCS*D, RSCC*D, FUKSCA

Ian is professor of strength and conditioning at the University of South Wales, and the proprietor and performance director of All-Pro Performance. He is a former board member of the UKSCA and an assessor and tutor with the Association. He is currently a board member of the NSCA.

'the only way to increase the cost (wage) for an individual will be to increase the relative scarcity by developing added value'

When considering the wide-ranging definitions of economics, it could be argued that as strength and conditioning (S&C) coaches our activities closely resemble these: we are involved in decision-making daily, with many of these decisions based upon how best to deploy our scarce resources of time and athlete energy to elicit our short, medium and long term performance goals. Given this emphasis on decision-making in relation to the allocation of scarce resources, then a field underpinned by these processes may provide insights and methods that could, potentially, assist our decision-making processes.

Given the extensive and diverse field of economics, it would be beyond the scope of this article to discuss every economic concept and its potential role in our cognitive toolbox. Instead, I will discuss a selected number of major concepts, all of which could be a potentially useful addition to our thought processes when making decisions as to how to allocate our scarce resources.

An adjunct, not a core discipline

It is important at this stage to note that the intention of this article is not to promote economics as a core tenet of strength and conditioning. Instead, the aim is to investigate whether the analysis methods used in economics can supplement a more traditional method of enquiry, especially where these methods fail to give clear answers.

Undoubtedly, the traditional methods of enquiry and knowledge associated with strength and conditioning will form the cornerstone of any problem-solving process. However, given the complexity of athletic performance, these methods often cannot provide clear-cut solutions and coaches will often have to take an educated guess as to the best means and methods to deploy at any given time. Indeed, scientific enquiry is often inconclusive and the scientist can rightfully conclude this and outline how more research is required. Unfortunately, the coach does not have this luxury and must

often decide there and then on a course of action. In these circumstances, having additional tools in their cognitive toolbox may assist the decision-making process.

The heuristic nature of decision-making

Just as in strength and conditioning, decisions made in economics have no guarantee of success. Indeed, it could be argued that much decision-making in both disciplines is often heuristic in nature, where a practical method is deployed; one that can never be guaranteed to be optimal or perfect, given the potential complexities that will ultimately determine the success or failure of the decision. In economics, despite – and sometimes due to – the sheer amount of amount of data available, intuitive decisions often have to be made to cut through the inherent complexity of the problems. Indeed, this will always be the case in fields such as economics and strength and conditioning where we are working with complex systems and where knowing all the potential factors that will influence the result is an impossibility.

In strength and conditioning, we often have to be heuristic in decision-making processes, as it is impossible to precisely predict the impact of any intervention. Ultimately, any intervention is more about optimising probabilities rather than guaranteeing success and requires the development of problem-solving shortcuts, based on intuitive judgement which is itself built upon available evidence, but critically extensively on experience.

Given the role of effective decision-making in economics, and the tools required to cut through complexity, could it be that some of the decision-making processes utilised in this field could provide effective insight to the decisions that we have to make as S&C coaches? As discussed, the two disciplines have similarities, and therefore, despite at first appearing totally separated, the role of decision-making provides a potential link between these diverse disciplines.

'in strength and conditioning, we often have to be heuristic in decision-making processes'

'from a problem-solving perspective, economics could have more in common with ... strength and conditioning than at first seems apparent'

Domains of economic analysis

One valuable lens occurs in the very way economic analysis is structured. The study of economics is divided into two broad categories: macroeconomics, which studies the function of the overall economy, and microeconomics, looking at the decision-making and functioning of an individual or firm. Macroeconomics looks at the aggregated effect of every decision made in the economy – both large and small scale – ranging from government policies, through to the behaviour or actions of firms and ultimately to every individual. Ultimately, economic performance is down to multiple factors, and one factor alone can seldom explain this performance. This categorisation of macroeconomics, and the concept of aggregation, can provide a useful insight to the strength and conditioning process. Crucially in economics, the ultimate effect of any intervention cannot be determined solely by the intervention itself; instead it depends upon the aggregate effect of multiple interactions and these can affect outcomes both directly and indirectly. Strength and conditioning is similar, in that the ultimate effects of any intervention depend upon the net effects of various training inputs, together with the potential effects of interaction with all parts of the training ecosystem.

This evaluation of the aggregated macro-effects and not simply the individual micro-effects provides a powerful tool with which to view the net effects of any intervention and is especially useful when developing a performance environment, allowing for analysis of a much wider range of factors than those solely related to the training programme itself. So, although micro-analysis is important, this macro view in itself warns against taking a purely reductionist approach when explaining the effect of any training intervention and encourages us to look on a more macro scale, taking into account the wider range of potential variables that have the capacity to influence overall performance results.

Economics – the study of scarcity

Scarcity lies at the heart of economics, referring to a situation where something is both desired and limited in supply.[2,3] Essentially, without scarcity everything would be free. In economic parlance, all resources (land, labour and capital) are limited in supply, yet desired for their use in the production of goods and services.[2,3] The greater the degree of scarcity, the more valuable a resource becomes, and this supply and demand analysis ultimately explains the price of any commodity.

In the S&C environment scarcity can refer to the limited supply of time (both of the athlete and coach), potential limited supply of resources (such as facilities, equipment) and, critically, of an athlete's tolerance to training and the available energy with which to dedicate to any training input. Economic analysis has identified a number of key processes by which scarcity can be managed and effective decisions made. Although these apply to the typical economic resources of land labour and capital, they can also be applied to the decision-making we make in strength and conditioning: in relation to the types, frequencies, volume and intensity of training we undertake. Here, economic concepts such as marginal utility and opportunity cost can be a very useful lens through which to analyse resource allocation in the form of training time and effort.

This concept of scarcity, and the associated demand and supply curves, also explains some of the challenges in the strength and conditioning labour market. Simple supply and demand economics outlines how under market forces in situations where demand is greater than supply, prices will be high.[2] In these situations, producers will be encouraged to increase supply and prices will subsequently fall until they reach equilibrium, ie, where demand and supply are equal.[3] In situations where the reverse is true, and supply is greater than demand, prices will be low, and suppliers will then reduce supply until the equilibrium point is reached.

One of the great challenges for the industry at the moment is the lack of job opportunities and the relatively low wages for many posts. Unfortunately, economic analysis clearly explains why this is the case. Currently, the supply of potential strength and conditioning coaches far outstrips the demand in the form of jobs. In these circumstances prices, in this case in the form of wages, will always be suppressed. Unless market forces balance out demand and supply, this situation of low wages will continue. Given that the supply and demand markets are separated and are slow to respond – for example, training establishments only focus on the supply side – this situation is likely to continue for some time unless demand is significantly increased. In these circumstances, the

only way to increase the cost (wage) for an individual will be to increase the relative scarcity by developing added value.

The production possibility curve

As S&C coaches, we often have a bias towards certain training methods and systems, either consciously or unconsciously. Given that this is the case, a useful concept to evaluate is that of the production possibilities curve. Production possibility curves outline the various combinations of output that the economy can possibly produce, given the available factors of production and the available production technology. A key fact of the production possibilities curve is that the same production can be achieved through multiple resource allocations, with the optimal allocation depending ultimately on the factors of production available at a given location.

It is often said that economists seldom all agree on the best course of action, reflecting the range of potential solutions to any problem. This is an important concept, as recognition of this acknowledges that, although having a clear performance-related objective is critical, the means of getting to the objective can be variable, and will depend upon various resource allocation decisions that an organisation can make. In this way, different companies will be free to allocate resources as they see fit, and no one way will be optimal in all scenarios given the differences in production factors. Similarly, companies will adjust their allocation of production factors in relation to the economic climate under which they are working; successful companies are agile in their response to market forces, making rapid and effective decisions as events unfold. Thus, a single universal way is rarely the aim; instead principles are used to guide individual solutions – solutions that respond to the unique business environment faced.

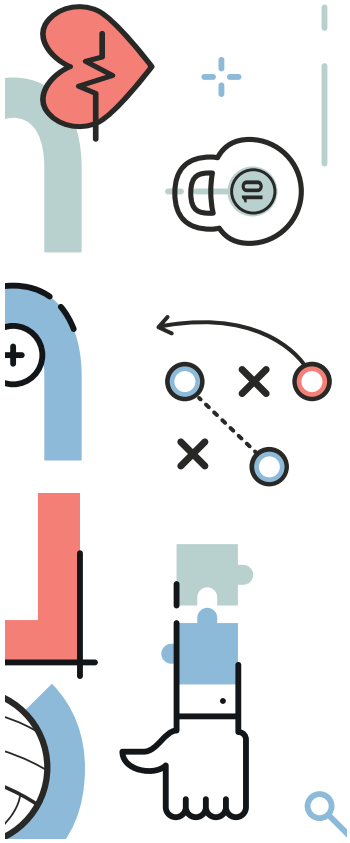
This concept has high potential value when applied to strength and conditioning. Ultimately, we use our own production possibility curves allocating resources in the form of training energy, time and so on into achieving a clear objective. At the heart of this is the fact that we have to make a clear decision as to what outputs we require, and then to allocate the appropriate resources to achieve these outputs.

However, as with some companies, we can get obsessed with means and methods and the search for the perfect way, forgetting that there are often multiple means and methods that can achieve the same objective. Here, the optimal method chosen will depend upon multiple factors all relating to the factors of production available to a coach, and to the unique training environment in which the production is taking place. In essence, the value of an output should be judged on the output itself and not necessarily by the means used in achieving this, cognisant of the fact that multiple methods are available to achieve a given objective. All too often in strength and conditioning we judge a programme by the means and methods used, and not necessarily by the outputs. We should always remember that this analysis is also often clouded by our bias towards specific training methods and systems. Similarly, successful businesses are typically agile in their ability to respond to the changing environment. In strength and conditioning we can be side-tracked by our annual plans and spreadsheets, forecasting performance into the future, and forgetting to respond to the 'market forces' evolving around us constantly. Just as firms can be overtaken by events and fail to respond to the market, we similarly need the agility to adapt and utilise the approaches that work best in the constantly changing circumstances that we face, and not get weighed down by doctrine and dogma.

The marginal nature of economic analysis

When evaluating resource allocation, a key term in economics is 'marginal'. Marginal refers to the addition of a single unit, and much economic analysis focuses around the costs and benefits of each additional unit.[2,3] Here, each decision as to whether to add a single unit entails a range of decision-making scenarios. This provides a potentially important concept in our role as S&C coaches, as our decisions revolve not only about to what to do, but importantly how much to do.

A useful economic principle to consider is that of diminishing marginal returns. This principle states that as more of a variable resource is allocated to one variable (land and capital), the output attributable to each additional unit of the variable resource declines as more and more is added. In this way, in terms of productivity of each unit of allocation, the amount of utility (value) derived is typically greatest in the earliest units, and the amount gained with each additional unit of allocation typically declines.



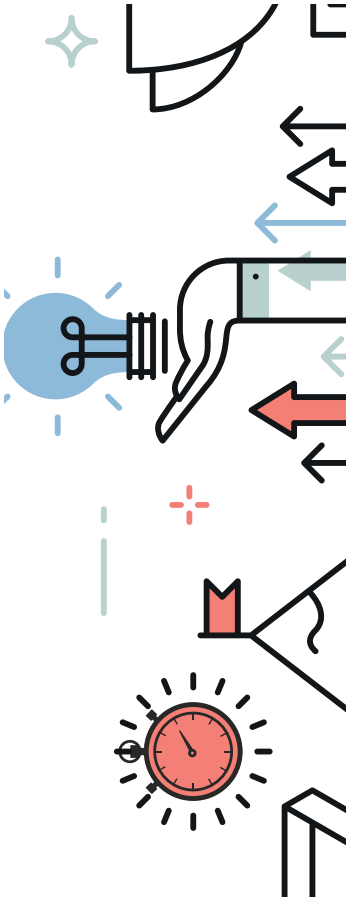
'we ... need the agility to adapt and utilise the approaches that work best in the constantly changing circumstances that we face'

'As S&C coaches, we have to decide not only what to do, but how much of it to do'

A lot of economic analysis is based around the utility maximisation rule with utility referring to the total satisfaction gained from consuming a good or service. This theorises that individuals will always aim to consume the volume that maximises overall satisfaction. In this way, we should always allocate our resources to that which brings the greatest utility. In terms of strength and conditioning the majority of our resources should be allocated to the factors that bring the greatest return – the rocks of our programme.

Once these rocks are identified, then the appropriate volume of resource allocation can be assigned. A useful concept in this analysis is that of diminished marginal utility, where the net satisfaction gained from consuming an additional unit is less than that derived from the previous unit.[2,3] Essentially, this means that the more of any particular product consumers have, the less each additional unit is worth to them. Indeed, there may come a time when an additional unit, rather than increase utility, may actually cause a decrease in overall utility, and where the marginal utility of the additional unit is negative.

As S&C coaches, we have to decide not only what to do, but how much of it to do: how many sets of an exercise, how many sprints, etc. Could the law of diminished marginal utility also apply in strength and conditioning? If so, the lens may be a useful adjunct to our cognitive toolkit. For example, this could be reflected in a weight training context in terms of the value of each set of a five-set sequence of equal work performed on each set (eg, 5 x 5 @ 85% 1RM). Here, although from an overall volume load analysis five sets are likely to bring more reward than three, from a marginal utility analysis each additional set could have slightly less of an impact, and indeed there may come a point at which performing more sets may become counter-productive. This provides a potentially useful additional lens with which to evaluate overall volume, especially useful when combined with the next concept we will look at: opportunity cost.



Opportunity cost

Whenever there is scarcity, a choice has to be made on how best to utilise resources. The previous analysis outlined that a consumer should allocate resources in a manner that provides the greatest marginal utility – the utility maximisation rule. Critical to this is the concept of opportunity cost. Opportunity cost refers to what must be given up in order to have anything else.[2,3] Opportunity cost therefore refers, not only to monetary costs, but also includes anything else that could have been procured with the resources used to undertake that activity or exchange. Thus, the cost of purchasing one item is measured, not only in the cost of the item purchased, but also the opportunity costs in terms of what else could have been purchased with this money. This is a radically different way of looking at the costs of any activity and provides an extremely useful lens through which to evaluate resource allocation.

When this is applied to strength and conditioning, the opportunity costs of a training activity apply not only to the energy and resources expended on the activity itself, but also the activities that could have been carried out as an alternative to the chosen route. In the previous analysis of five sets versus three, utilising opportunity cost analysis in addition to diminished marginal utility, is enlightening. Here the additional two sets are not only evaluated on how much value they produced, but also on what could have been done with this time and energy. For example, would using two sets of a different exercise have produced greater returns than the additional two sets of the same exercise, or would this time have been better spent on a different activity altogether?

Opportunity cost, therefore, is a potentially valuable addition to the cognitive toolkit of a strength and conditioning coach, in that the impact of any training input is not only viewed in terms of the energy and time taken to undertake it, but additionally in relation to any other input, that could have been used instead. This is a potentially powerful viewpoint as it forces us to look at training in a broader context and evaluate any chosen input against all potential activities that could have been undertaken, rather than as an isolated activity.

For example, when looked at in isolation, it makes sense that increasing strength should increase performance, and it is often said that you cannot be too strong. When considered in isolation this makes sense as increasing force capacity can enhance a range of parameters. However, looking at this through the lens of opportunity cost can give a different perspective. Here, further strength-based activities are not viewed in isolation, but instead the additional strength work needs to be evaluated against all other

potential activities that could have been undertaken. Here the opportunity cost of these additional strength input activities needs to be evaluated against other potential activities such as speed training, skill development etc. and the potential rewards evaluated. So, although in isolation further increases in strength would seem logical, when viewed in terms of opportunity costs, a far more balanced analysis results. Again, this ultimately needs to be assessed on a macro basis, in terms of what would bring the greatest increase in performance.

Cost-benefit analysis

Another useful concept in deciding how best to invest training resources is that of the cost-benefit analysis. This analysis is another key economic analytical tool that can augment the cognitive toolkit of the S&C coach. In costs-benefit analysis, the benefits of a given situation or business-related action are summed up, and then the costs associated with taking that action are subtracted.[2,3] This analysis importantly extends across a range of domains: for example, money invested in one part of a company is money which cannot then be invested in another, and the cost-benefit analysis needs to extend across all of these potential impacts. In this way, an action that maximises productivity in one single area, although in isolation may appear the best route, may not actually be the best approach when a broader cost-benefit analysis is carried out, as the potential net costs in relation to other aspects of the business may preclude taking this action. Importantly, cost-benefit analysis is most useful when it analyses inputs in relation to their macro impact and not solely on the micro level of the single entity.

Again, this concept is potentially useful in relation to the decisions we make as S&C coaches as it allows a bigger picture to be built up. Many aspects of training decisions can be subjected to this type of analysis. For example, the concept of utilising PAP within training sessions, although possibly making sense in isolation, often makes less sense in terms of cost-benefit analysis.

To fully maximise the potential augmented force output that PAP may present requires typically long recovery periods. Planning sessions around these periods may marginally enhance force output in some athletes, but the cost may be a markedly reduced volume of training being carried out in that time period, or it may require compromising other aspects of training simply to incorporate PAP methodologies. Over time, the cost of this reduced training volume could outweigh the potential benefits of the PAP inputs and thus may not be effective when viewed in a wider cost-benefit analysis. This wider view allows a contextualisation of all training inputs and helps in making decisions that optimise productivity across a range of time scales.

Unintended consequences

At any time, an athlete will be undertaking multiple training bouts, with multiple training goals, all performed within their specific training ecosystem. A very useful economic principle to consider here is that of unintended consequences. Complex systems such as economies or training environments are highly complex and seldom conform to simple causalities. For every result, there are multiple possible causes, and the contribution of each is seldom clear, even in hindsight. Similarly, for any action there are multiple potential results. This is one of the reasons why decision-making in economics and strength and conditioning is often heuristic.

In economic parlance, any decision made will have a potential impact, not only on the intended output, but also potentially on multiple factors within the economy. For example, an increase in business taxes, although logically appearing as a sure method to increase overall tax revenue, has often resulted in a fall in tax revenue, by driving certain businesses out of the country, or encouraging the uptake of tax avoidance schemes. In this way, no economic decision can ever be seen in isolation, and its full impact can only ever be assessed after it has been implemented for a period, with these impacts typically taking a time to work through. Whenever an intervention is applied in a complex system a range of externalities will play out, all of which have a potential effect on the net result, and the net results will only be visible some time after the intervention.

The famous French economic journalist Frédéric Bastiat, writing in the early part of the 19th century, often distinguished between the 'seen' and the 'unseen'. The seen were the obvious visible consequences of an action or policy, whereas the unseen were the less obvious, and often unintended, consequences. In his famous essay 'What Is Seen and What Is Not Seen', Bastiat wrote:

'the good economist takes into account both the effect that can be seen and those effects that must be foreseen'

'there is no such thing as a brilliant programme until it works'

'There is only one difference between a bad economist and a good one: the bad economist confines himself to the visible effect; the good economist takes into account both the effect that can be seen and those effects that must be foreseen'.

This concept has important implications for strength and conditioning where the ecosystem will play an important role in the ultimate gains derived from any training input. Similarly, any planned action will often have unforeseen circumstances that may indeed differ from the original intention. For example, a S&C coach looking to increase compliance with the S&C programme may consider making the sessions compulsory. However, ironically, making S&C sessions optional rather than compulsory may, rather than reduce compliance, actually result in greater training compliance as athletes will self-select to participate and subsequently commit greater effort to the process rather than if they were forced to participate. In this way, the concept of the training ecosystem, where effects are evaluated on a macro level and not just a micro level are critical. Similarly, intervention effects often take time to manifest themselves and so evaluation needs to be carried out over the longer as well as the short term to ensure that any potential latency period is accounted for.

This also has a vital implication for the concept of evidence-based practice in our field. Only when a system is tried out will the unintended consequences become evident and ultimately these may even be specific to a given scenario. Much of what is currently termed evidence-based practice in strength and conditioning is the result of the synthesis of a number of reductionist studies, where isolated variables are analysed in closely controlled studies. Although these are useful, they can never account for overall interaction of multiple factors and will always fail to identify the unintended consequences of any intervention. It could be argued that these studies should only count as true evidence-based practice after they have been trialled and evaluated in the real world – there is no such thing as a brilliant programme until it works. Keeping all potential externalities in mind whenever applying a solution is therefore important and reminds us that in complex, integrated systems, all interventions will potentially have unintended consequences that need to be considered and evaluated. Indeed, evidence-based practice may ultimately always have an element of context specificity, given the multiple variables involved.

Summary

Although not typically considered a natural partner for strength and conditioning, economic concepts can thus potentially add some valuable tools to our cognitive toolbox. Using these tools can provide a different way of thinking and allow a further layer of analysis that can enhance our insight into the S&C process, ultimately assisting us in making effective decisions. However, another real potential for economics has ironically emerged out of areas where traditional economic analysis has failed, and where decisions made are counter to classical theories. Economics traditionally treats consumers as rational decision-makers who base decisions on the best possible information – what they term econs. However, the concept of the rational econ has often failed and decision-making has often been counter to that predicted. This analysis of what drives consumer decisions has spawned a whole new field – that of behavioural economics.

Given that, as coaches, many of our challenges involve behaviour modification, this new field may provide some valuable insights that can assist our coaching activities. This subject will form the basis of a future article.

References

1. Brockman, J. *This will make you smarter*. London, 2012. Transworld Publishers.
2. Lipsey, R and Chrystal, A. *Economics* (15th Edition). Oxford 2015: OUP.
3. Mankiw. *Principles of Economics*. Stamford CT 2015: Cengage Learning