This is a preprint of a chapter forthcoming in: *Myths of Sports Performance,* eds. Amy Whitehead & Jenny Coe
All authors have read and approved this version of the manuscript. Please cite as:
Steele J., Fisher J., Loenneke J., and Buckner S (2023). The Myth of Periodisation. In: *Myths of Sports Performance,* eds. A Whitehead & J Coe. Preprint DOI: 10.51224/SRXIV.323

The Myth of "Periodisation"*

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Introduction

"…science must begin with myths, and with the criticism of myths; neither with the collection of observations, nor with the invention of experiments, but with the critical discussion of myths, and of magical techniques and practices."

Popper, 1968[1]

Few realise that, as Karl Popper noted, myths are often the starting point of our science; the bold conjecturing of explanations for the phenomena we observe in the world. Indeed, myths begin in origin with ontology in that they are about what is purportedly real, and often serve the function of explanation of observations and inferred phenomena[2]. As such, whilst not one and the same, myths and scientific theories are more closely related than most typically appreciate[3,4]. Though Popper felt that induction – the inference from particulars to generalisation - could not succeed as a scientific epistemology, he realised that the myths which often arose from this and what is called abduction as explanation[a]:

> *"…may be developed, and become testable; that historically speaking all--or very nearly all--scientific theories originate from myths, and that a myth may contain important anticipations of scientific theories."*

That is, they can become such that the formal logical consequences of them can be deductively inferred, and thus the conditions for their testing and possible falsification are clear i.e., *Modus tollens* can be applied. Indeed, the more precise the deductive consequences of a theory are the 'riskier' the conjecture is said to be, and the stronger the subsequent test[7].

The world of sport, exercise, and health is rife with so called 'myths'[8,9]. Within this chapter we will discuss what we believe is a highly prominent myth within the sport and exercise sciences: periodisation. Our aim is to first introduce periodisation and discuss its definition and historical development. We will then consider the common argument that strength and hypertrophic

[a] Indeed, Francis Bacon even wove myth and allegory into his work in the development of his inductive reasoning in the *Novum Organum*[5]. Abduction is also considered to be the process of inferring possible explanations for observations and phenomena[6]

adaptations are optimised through the application of periodisation, and provide alternative interpretations that we think likely reflect more parsimonious explanations than appeals to periodisation 'theory'. Lastly, we will consider its structure as a myth vs as a scientific theory.

What is "Periodisation" Theory[b]?

The more consistent components of modern periodisation theory – the planned variation in a training process with the aim of achieving specific goals – are recognisable long before attempts at formalisation of the concept[10]. However, modern conceptualisations of periodisation theory emerged in the 1960s and developed over the latter part of the 20th century with authors in many countries publishing seminal texts; Russia (e.g., Matveyev[11], Ozolin[12], and Verkhoshanksy & Verkhoshansky[13]), Germany (Harre[14]), Hungary (Nadori[15]), Ukraine (Platonov[16]), America (Stone et al.[17]), and Romania (Bompa[18]). It appears to have emerged in its early modern form from observation and inductive inferences of how successful athletes trained, particularly in Eastern bloc countries[10,19], and observation of successful athletes continue to be cited as a primary source of evidence[10,20]. Accompanying the inductive inferences from successful athletes was abductive inference and the borrowing of a host of auxiliary theories as possible explanatory mechanisms stemming from those conjectured in other areas of physiology. The primary theory adopted was Hans Selye's General Adaptation Syndrome[21–23c] from which concepts such as "adaptation energy" had seeming plausibility for explaining the process of adaptation to exercise stimulus. Notably, this continues to be cited as an instructive framework for understanding this mechanistically[28]. Often emphasised too have been the primacy of the coach and their ability to plan and predict based on their inductive inferences from their trial and error experience of varying the training plan[13] which is also leant on to this day[20].

The terminology used within the literature surrounding periodisation can be a source of confusion when trying to discern exactly what 'periodisation theory' is, and how one might go about testing it. In particular, there seems to be a case of what has been called in the social sciences the *Jingle-Jangle Fallacy*[d]. Discrepancies between definitions of periodisation and experimental

[b] Periodisation is often referred to as a 'theory'. As such to begin, we should probably provide a definition of 'periodisation theory' for the reader; yet, we have to confess we are somewhat at a loss for how to do this. In fact, the difficulty of providing a definition highlights a key theme within the literature on periodisation that, at least from a falsificationist epistemological stance regarding the nature of scientific theories (*ala* Karl Popper, Imre Lakatos, Paul Meehl), we feel prevents it from being considered at present a strong scientific theory. We will first give a brief historical and descriptive overview.

[c] Others such as Ivan Pavlov's work on Classical Conditioning[24], Nikolai Yakolev's work on glycogen supercompensation[25], Nicolai Bernstein's Theory of the Self-Regulated Motor System[26], and Peter Anokhin's Theory of the Functional System[27] were also co-opted by various authors.

[d] Edward Thorndike[29] introduced the *Jingle* fallacy as being when two things are falsely assumed to be the same because the terms used for them are the same. Contrastingly the *Jangle* fallacy is falsely assuming that two things are different because the terms used for them are different.

investigations testing the concept seem to have created confusion between what is "periodisation" and what is "programming" in particular[30].

We will see that each of these points lend themselves to the conclusion that, at present, periodisation perhaps constitutes more myth than scientific theory. But before that we will briefly review the common claims within the periodisation literature that it presents a means of optimising training[e] to enhance both strength and hypertrophic adaptations.

Periodisation for Strength Adaptation

It has been suggested that periodised resistance training programs result in superior strength adaptations when compared to non-periodised resistance training programs[17,31]. When examining the experimental evidence testing this claim, it appears that some studies demonstrate training interventions comparing a group that employs variation in the set and repetition scheme across time experience greater strength increases when compared to a training group that has no variation in their set and repetition scheme across the same period of time. For example, Stone et al.[17] conducted a 6-week study that compared strength adaptations between a training group that had variation in the set and repetition scheme ('periodised' condition) and a training group that had no variation in the set and repetiton over the course of the trainng program. Following the 6-week training period, the authors observed greater 1RM strength increases in the periodised group compared to the non-periodised training condition. The set and repetiton scheme form this study is provided in Table 1 below. Although many would suggest that this study is actually examining different 'programming' strategies rather than the concept of periodisation[30] (see discussion below), this study is often cited as evidence that a periodised training program results in superior strength gains compared to a non-periodised training program. In the context of this study, what is thought to make the periodised program better is the variation in the exercise stimulus. Particuarly, the increase in training load, along with the decrease in training volume over time. However, it has also been pointed out that the periodisation group lifted heavier than the non-periodised training group prior to 1RM strength testing[32]. Thus, superior strength changes may simply be due to the fact that the periodised group lifted heavier weigth in the weeks leading up to strength testing compared to the non-periodised training condition. As such, studies following this design do not seem to constitute strong tests of periodisation theory generally speaking, unless it is the narrow claim that planning training to more closely reflect the outcome tested as proximity to the testing day

[e] Optimal is not easily defined in this context so it will be used here as programs that produce superior adaptations.

decreases enhances said outcome. But this can be explained more parsimoniously by the 'principle of specificity'.

Table 1: Training Set and Repetition Scheme from Stone et al.[17]

	Weeks 1-3	**Week 4**	**Week 5**	**Week 6**
Periodised Condition	5 sets of 10RM	5 sets of 5RM	3 sets of 3RM	3 sets of 2RM
Non-Periodised Condition	3 sets of 6RM	3 sets of 6RM	3 sets of 6RM	3 sets of 6RM

RM = repetitions maximum

Similar trends in strength adaptation can be observed across other studies that make up the periodisation literature. For example, O'Bryant et al.[33] examined strength adaptations following an 11-week periodised or a non-periodised training program. The set and repetition schemes across the study are provided in Table 2. Over the 11-weeks, the non-periodised training group performed 3 sets of 6 repetitions the entire time[33]. However, the periodised group gradually increased the training load across time, performing 3 sets of 2 repetitions for the final 3 weeks. Following the 11-week period, both training conditions increased 1RM parallel squat strength; however, the periodised group demonstrated greater increases in strength when compared to the non-periodised training condition. Like the investigation of Stone et al.[17], the periodisation group lifted heavier weight than the non-periodised group, particuarly in the later weeks of the training program around the time of post-testing. Thus, it is possible that "periodisation" had nothing to do with the superior strength gains, and that specificity of training load provides a more parsimonious explanation for the superior changes in 1RM strength.

The two studies reviewed in this section are intended to provide examples as to how periodisation research has typically been conducted. Regarding both investigations, proponents of periodisation will suggest that strength adaptations were superior in the periodisation groups due to the proper stress management (less fatigue accumulation) and variation within the program design. However, it seems reasonable to suggest that the periodised groups in these studies demonstrated greater strength increases because they were given exposure to lifting heavier weight (trained closer in load to 1RM) in comparison to the non-periodised training conditions which only ever performed 3 sets of 6 repetitions. If the non-periodised condition was given periodic exposure to lifting heavy weights in these training studies, it seems reasonable to assume that strength adaptations would be similar between conditions. With this in mind, it is also important to note that in the context of

periodisation, variation in the exercise stimulus is meant to serve the purpose of proper stress management[34]. Yet, in the investigations reviewed, it seems likely that there was no risk of overtraining and thus no need to introduce variation in the set and repetition scheme across time. These studies would be more interesting if the non-periodised groups would perform low volume high load training (2-3 sets of 2-3RM) for the entire study duration and see if the periodised groups still see greater strength adaptations over time[f].

Table 2: Training Program from O'Bryant et al.[33]

	Weeks 1-4	**Weeks 5-8**	**Weeks 9-11**
Periodised	5 sets of 10	3 sets of 5 (1 Set of 10)*	3 sets of 2 (1 Set of 10)**
Non-Periodised	3 sets of 6	3 sets of 6	3 sets of 6
	Monday and Friday: • Parallel Squat • Bench Press • Hyperextensions • Sit-ups		**Wednesday:** • Clean Pulls (floor) • Clean Pulls (mid thigh) • Shoulder Shrugs • Behind Neck Press • Sit-ups

Sets in parenthesis represent follow up sets performed with 70%* or 75%** the original training loads.

Periodisation for Muscle Growth

Muscle growth can occur through hypertrophy (increased fiber size) and/or hyperplasia (increase fiber number). Traditionally it is thought that hypertrophy is the dominant factor associated with muscle growth in humans, but this has been mostly inferred from small-scale cross-sectional studies[36]. Position stands for resistance training across multiple organizations recommend periodised programs in order to optimize the muscle growth response to resistance training[37,38]. That is, having a plan in place to manipulate volume and intensity across time in an effort to optimize muscle growth. If periodisation is as important as has been suggested, then evidence for this effect should be plentiful. Prior to discussing what the experimental work suggests, it might be worthwhile to briefly review how muscle is mechanistically thought to grow. When considering mechanisms, it will be important to keep the following question in mind: How could periodisation,

[f] Some pilot work has explored this type of approach in powerlifters[35] and does not appear to support the need for traditional 'periodised' training approaches to optimise strength adaptation, or indeed manage stress.

considering the manner in which it is theorised to work, impact these systems to a greater extent than traditional progressive resistance training?

Exercise-induced muscle hypertrophy is thought to be a local response[39,40]. In other words, training the right bicep can induce growth in the right bicep that trained but not in the opposite untrained left bicep. The contraction takes a mechanical stimulus and converts it into a chemical one[41]. This is referred to as mechanotransduction. One of the key pathways associated with exercise-induced growth is the mechanistic target of rapamycin (mTORC1). Although mTORC1 is important[42], it would be an oversimplification to imply that it is the only important pathway for muscle growth. Following a single bout of resistance exercise the muscle is sensitized to anabolic stimuli for up to 72 hours[43]. This anabolic window potentially shortens with repeated training[44], but it is still thought to last a considerable amount of time (~24 hours)[45]. When food is consumed in this post-exercise window, the protein synthetic response is augmented above levels in the absence of that resistance training bout and protein breakdown is suppressed[46]. When synthesis exceeds breakdown, growth will occur. Given that synthesis occurs at the ribosome, the ability to grow might be related in part to an increase in the number of ribosomes[47]. The majority of the ribosome is thought to be composed of ribosomal RNA (rRNA). Since rRNA is a final gene product, the only way to increase rRNA is to increase gene transcription[48]. Gene transcription occurs in the myonuclei, which can also increase in response to resistance exercise[49]. This is a simplified summary of how muscle growth can occur following bouts of resistance exercise. For periodisation to result in superior growth to that of traditional progressive resistance training, it would need to be able to enhance at least one part of the aforementioned processes. Although mechanistic work is of importance for development of theory regarding adaptation, the ultimate test of superiority is the measurement of muscle size in response to theoretically optimal training interventions (i.e., periodisation) compared to other approaches.

Muscle growth is determined by measuring the muscle size before and after a training program. This is estimated through changes in lean body mass, fat free mass, or by specifically imaging the muscle of interest. There are studies that find that periodised programs are more effective than traditional progressive resistance training, but the majority of the studies do not support this[50]. One thing to consider is that moving from phase to phase in a periodisation program may inadvertently lead to greater progression in load because some of the comparator groups in the early studies were allowed to progress load at their own pace. The inability of periodisation to consistently result in superior muscle growth is in line with how muscle is mechanistically thought to occur. The recruitment and activation of muscle fibers for a sufficient (not well defined) duration of

time appears to be one of the important factors in signalling a muscle to grow[51]. How that muscle is overloaded appears to be influenced very little by complex and precise manipulation of extrinsic variables (load, repetitions, rest, etc.) in the manner of periodised training, and can largely be selected by preference. Of course, some would argue that periodisation has never been properly studied and that the conclusions drawn in this book chapter are premature[28]. We do not necessarily disagree with this point. If that is true though, then that is even more of a reason to be sceptical of the claims made about periodisation. Still, some might argue that changing anything in a program is periodisation. If that is true, then virtually everything could be considered periodisation. That would make any comparison between periodised and non-periodised programs nonsensical.

Periodisation for Strength and Hypertrophic Adaptations

To summarize: 1) the periodisation literature does not consistently result in superior changes in strength or muscle size, 2) muscle strength adaptation is more parsimoniously explained by the principle of specificity, and 3) the lack of superiority for muscle growth can be predicted based on how muscle growth is theorised to mechanistically occur. This is not to say that periodisation programs cannot be used to produce changes in strength and muscle size. They certainly can be effective (just not superior), and one might make the argument that implementing different phases within a training cycle may be important for maintaining long-term motivation with resistance training. But that is also only an idea and to date remains untested.

But is Periodisation a Myth or a Theory?

As we have seen from this brief review, there is reason to doubt the veracity of periodisation as a theory to explain strength and hypertrophic adaptations to training. But the question raised at the beginning of this chapter remains; is periodisation a theory, albeit one likely falsified, or did it never really emerge from its origins as myth in the first place? This last section will consider this broader question and examine each part of its structure and origin to determine its status as one or the other.

Under-specification, deductive infertility, and weak tests

As noted, from a Popperian perspective, the under-specification of periodisation limiting its testability is alone sufficient to consider it more myth than scientific theory. Over the course of its development periodisation theory has, though often accompanied in some form by various graphical

'models', typically been defined as a *verbal theory*[g]. Indeed, whilst the various iterations of periodisation have been proposed as explanatory theories of the adaptive process in response to management of training variables in certain developmental orders, explanation presumes accurate deduction[53]. A primary issue of verbal theories is their deductive infertility; that it is unclear what should indeed follow from the theory were it a true explanation of the phenomena to be explained. It is not specifically clear what exactly we should, or should not, observe if periodisation theory were an accurate explanation of the adaptive response to training, partly because it is not clear exactly 'what' periodisation theory is. Reviews note the lack of clarity conceptually in periodisation[54,55] as well as the varying definitions of periodisation that crop up in the literature noting that, whilst some loose themes emerge (e.g., that periodisation is proposed to serve as a 'macro-' management of the training process), there is inconsistency among authors definitions[h] and as a result it is not even clear what would constitute an appropriate test of the theory[56i]. At best we might deduce that training following broadly the tenets of periodisation should produce larger adaptations than those which do not, or allows for continued adaptation to occur as opposed to plateaus, or that possibly training to target adaptations of particular kinds in a specific order ultimately optimises outcomes[50].

As we have seen, in so far as it has been tested, it is not clear that periodisation as it is typically studied produces superior outcomes, at least for strength and hypertrophy. Further, it is not clear that there is any evidence that it is possible to overcome the typical plateauing of adaptation that occurs over time[59–61], or that particular ordering of training for specific adaptations enhances outcomes[50]. But, as it has typically been studied, periodisation in so far as we can discern some clarity regarding what it *is*, has not been strongly tested in that form.

For example, periodisation as it is presented typically appears to be a long-term coaching framework where periods of time are created to manage the stress of training alongside the other stressors in an athlete's life. These periods of time are intended to manage stress, avoid overtraining and acute fatigue, and peak performance at a time relevant to competition[56]. Indeed, we are not arguing that these are not sensible things to consider in planning training. However, studies have attempted to examine this concept over a relatively short period of time where there is no risk of

[g] By 'verbal theory' we mean to say a theory expressed in structure through the use of words and thus limited by the imprecision of natural language compared to computational or mathematical expressions of theory[52].

[h] There is even inconsistency in the terminology used, varying between 'periodisation' and 'programming'[56]. Some proponents of 'periodisation' have argued that criticisms have been based largely upon studies that have examined 'programming'[20,28,57]; yet even examination of this distinction highlights confusion[30]. Further, this terminological confusion appears as far back as the early debates of Matveyev and Verkhoshanksy and indeed even appears to reflect the opposite of what todays periodisation proponents argue these terms denote; see appendix 4 in Verkhoshansky and Verkhoshansky[13].

[i] Indeed, similarly to in fields such as psychology, it could be said that periodisation in this sense is *not even wrong* as its critical under specification means that empirical attempts at falsification or corroboration are doomed to fail[58].

overtraining and no competing stressors (see the previous studies given as examples). In such short studies it appears that none of the imposed training variation serves the purpose of stress management. Thus, it is important to ask the question, "what is the purpose of the variation?". Within a typical periodised program, it would be common to train hypertrophy (higher volume) when less time is being dedicated to sport. As other stressors increase (including sport specific training and competition), it would be common to decrease training volume in order to balance the competing stressors in an athlete's life. This would take place over the course of an entire training season. It appears that Stone et al.[17], for example, attempted to condense this process down to 6-week's time. However, over 6-week's time it seems that there is little risk of overtraining from performing the same set and repetition scheme and no apparent reason to change the set and rep scheme (unless the training goal has changed). This is problematic, as studies such as these have perpetuated the idea that weekly[62] or daily[63] changes in programming variables make a program "periodised" whereas no variation in programming variables make it "non-periodised". However, periodisation is more so the idea that there is an extended period focusing on hypertrophy, strength, or other attributes within a larger overall program with training tailored towards these and in order to manage stress. If a 6-8-week hypertrophy block existed within the larger plan, this would represent a period of time created with a specific intention that has considered other stressors in an athlete's life at that time. The programming within this 8-week block should be designed in a manner that would best maximize muscle growth. This goal can likely be accomplished with or without variation. With this in mind, it is important to note that nearly every experimental intervention that tests the efficacy of periodisation employs a 6-12 week study design where one group has variation in the set and rep scheme and the other group has no variation in the set and repetition scheme[56]. Thus, it is possible (and perhaps likely) that none of these studies actually test periodisation as it is broadly conceived anyway.

The mythology of Eastern bloc Olympic success due to periodisation

One argument in opposition to the criticism that periodisation theory is under-specified is that it does in fact entail a deductive consequence; that we should observe that athletes who follow its principles and practices should perform better and be more successful. Indeed, as noted, this continues to be a source of evidence which is pointed at to corroborate periodisation[10,20]. However, this does not seem to be an appropriate test of the theory. Such logic is flawed and is a case of

begging the question or circular reasoning[j]. The initial formalisation of periodisation theory stemmed from the inductive inferences made by way of generalising from observations of successful athletes, particularly in Eastern bloc countries during the 1950-60s[10,19]. At this time, sport - and particularly Olympic success, was heavily politicised particularly between the Soviet Union and the US echoing Cold War tension and the competition between state planned communism and individualistic capitalism[10,19,64]. The success of the USSR during this time seemingly spawned a mythos in the West and resulted in the application of periodisation and other "Soviet Secrets". This likely spawned the cottage industry of research and practice we see today[10,65]. A common point of contention for this explanation was that heavy state supported use of performance enhancing drugs in fact better explained Soviet success; however, use of such substances was likely widespread in many countries during these years[10]. But, at the same time there were wider efforts to formalise sport and talent identification in the USSR[66], and during the Cold War years its population outstripped that of the US[67]. Statistically speaking the probability of the Eastern bloc countries identifying successful athletes (larger population to sample from, and focused well-resourced efforts to identify talent) would have been far greater. Indeed, population size and selection pressures have influenced anthropometric trends in athletes[68] and, as such, are strong predictors of Olympic success[69]. Thus, alternative explanatory theories exist for the success of athletes during these years. But the mythology of periodisation was taken up in the West and now is the accepted "gold standard" such that it is widely applied with modern athletes. This presents a problem for the contemporary arguments that the observations that modern successful athletes employ these practices provide evidence to corroborate the theory; almost all athletes are employing such principles whether successful or not. It is entirely possible that a sociological explanation better fits this observation. Due to the alluring mythos of periodisation and the widespread uptake of such practices it has been employed with athletes; that is, athletes are not necessarily successful because they have engaged in periodisation, but they engage in periodisation because they are athletes. Kenneth Gergen[70] wrote of the impact that social science theories had upon themselves by way of feedback loop from the public and practitioners who became aware of them. A similar point can be made here whereby the 'successes' of periodisation has meant it is so widely used that the predictions of the theory no longer bear out in observation. As is hopefully clear anyway, such evidence cannot constitute a test of periodisation theory as it is unable to differentiate between competing explanations.

[j] The logic is as follows; successful athletes engaged in certain practices, the inference being that these practices explained their success leading to development of periodisation theory, thus athletes following practices stemming from periodisation theory should be successful, and lo and behold successful athletes today follows such practices. It often goes unmentioned that many unsuccessful athletes also tend to follow such practices in modern sport, and indeed that now almost anything that includes some variation gets labelled as 'periodisation' anyway.

Mis-borrowing of auxiliary theory

It is not uncommon for newly emerging disciplines without a long history of theory construction and testing to abductively 'borrow' theory from other disciplines as a kind of analogy albeit one with the intention to provide explanation[71,72]. This process involves the transportation of theory from its original context in order to explain phenomena in another; or it could be said to be an expansion of the boundary conditions within which the theory is thought to apply. In the case of periodisation Selye's General Adaptation Syndrome[21–23] was the primary (though not only) theory borrowed in order to explain athlete success from the planning and organisation of the training process in specific ways[28]. Indeed, a key assumption of periodisation theory was that biological adaptation to training followed a predictable pattern[55]. The reason for its borrowing was seemingly due to an interest in not only explicating the *how*, but the *why* of periodisation; a desire to provide a plausible biological flourish for that assumption[13]. However, a key element of good theory borrowing is consideration of the original context in which the theory was formed and that testable theories are indeed constrained by this in terms of their testable consequences. The original context of the General Adaptation Syndrome (and indeed other theories of biological adaptation employed) was clearly not training processes and indeed review of Selye's original work suggests the ideas may have been misapplied[34,55,73–75]. Further, it is not clear what the application of such auxiliary theories to the training process achieves in terms of yielding deductive consequences due to their own vagueness alongside periodisation; indeed, they seem to offer little more than truisms[74]. Their application however seems likely to have furthered the mythology around periodisation similarly to other fields where the inclusion of 'sciencey' sounding biological information is seductively alluring in convincing people of a given explanation[76,77]. Use of these theories by proponents of periodisation seems more in line with pragmatic views of theory (i.e., that a theory is useful to believe to be true) as opposed to correspondence views (i.e., that a theory is true in so far as it describes the world with a high degree of verisimilitude).

The limitations of appeals to coaches' experience

Like the allure of auxiliary biological theories, appeals to coaching experience can be instinctively persuasive to many in sport particularly the experiences of those who have seemingly had a lot of success. There is the assumption that the practices employed by those coaches with their athletes *must* be at least in some part responsible for their success. But this is far from clear. Whilst it is clear that what athletes do impacts their performance, their genetics also play an

important role[78] and the selection pressures on this likely play a much larger role[68]. In fact, at the elite level deliberate practice accounts for only 1% of overall variance in performance[79]. Given this, and the fact that in countless other fields time and time again expert prediction based on induction from prior success has been found wanting[80,81], it seems overconfident to weigh professional experience so highly. This is not to say that sometimes simple heuristics used by experts can't be useful[82], but similarly to retrospective analyses of successful athletes, the input of experts' experience is better placed to inductively generalise phenomena and to abductively build theories for more severe deductive testing. Instead, in the case of periodisation there seems to have been application of the genetic fallacy (i.e., judging something as good or bad based upon the source) to shore up further the mythology surrounding it.

The structure of the myth

Mills[2] (2020a) notes that a myth must have (1) source, (2) force, (3) form, (4) object, and (5) goal. *Source* relates to a myth's attempts to answer the question of fundamental ontology. *Force* is the essence of the myth and the organising principles behind the narrative. *Form* is the organisational style, the story, the development of characters and plot within meta-narratives. The *object* of myth refers to its contents, the phenomena. and concepts it contains. Lastly, the *goal* is the purpose of the myth.

With regards to periodisation, it is hopefully clear that the source lies in ontology; an attempt to explain observable phenomena. Its force is the various vague and underspecified models employed to explain training adaptation. Its form are the stories surrounding its origins and the various characters involved in its development over the years. The goal of periodisation is hard to say without presupposing the intentions of the characters involved, but it has certainly penetrated the field widely in its application.

Does this all constitute labelling periodisation as myth? In the introduction we noted Popper's distinction between myth and theory and note that it is sufficient merely that periodisation is unclear in its testability to label it the former as opposed to the latter. Indeed, Mills[4] echoes the distinction:

> *"Theory is far more scrutinized for its validity, generalizability, and applied consequences, while the premises of myth are often historically and culturally presupposed."*

From our perspective and analysis, it does not feel unfair to label periodisation as a myth. At the very least it has strong elements of mythos about it particularly in terms of its origin and development. This is not necessarily a bad thing. Strong scientific theories begin as myths. But in the case of periodisation there was never the required strengthening and specification such that it became a strong theory. As we have seen, the vagueness and under-specification of it has made it difficult to test rigorously and we continue to see debates in the literature regarding its conceptualisation and definition to this day. If periodisation is to take a step forward into the beginnings of a scientific theory, then consensus specification and definition such that it yields clear deductively testable consequences should be the next point in its journey from mythical origins.

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