The Selfish Gene as a Possible Driving Force Behind HIIT

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ABSTRACT

Purpose: High-Intensity Interval Training (HIIT) is a training method aimed at increasing the fitness of individuals. It is based on a combination of periods in which high-intensity alternate with low-intensity exercise or passive rest. The topic of this paper is a reflection on the benefits and risks of HIIT health use in recreational athletes. We investigate humans' conscious and unconscious motivations for choosing this specific method in the philosophical discourse. Problem: HIIT is a method that, in some ways and with particular approaches, strongly reflects the imperative of the postmodern age - to get as much as possible, as quickly as possible. Martin Heidegger perceives three fundamental existentials in the context of temporality – historicity, everydayness, and within-time-ness. Here conscious motivation may be linked to the temporal characteristic of human being. As Richard Dawkins presents, unconscious motivation may be related to the application of the selfish gene theory. The philosophical approach to the problem: The Heideggerian concept of temporality leads us to research the authenticity and inauthenticity of the Dasein phenomenon. Some features of motivation for applying HIIT can be examined as inauthentic forms of being. In focusing on possible elements of unconscious motivation, the concept of evolutionary biology, namely Dawkins's theory of the selfish gene, provides a unique platform. It is primarily (a human) effort to spread genes. Here, in connection with HIIT, we build on the concepts of replicator and vehicle and deal with the basic selection unit of evolution and its form. Conclusions: HIIT presents an exciting training method that is examined in the context of effectivity of sports training, social benefits, or health aspects. Here we would like to offer the HIIT concept as the reflection of philosophical (mainly ontological, partly ethical) discourse.

Keywords: selfish gene, High-Intensity Interval Training, replicators, vehicles

INTRODUCTION

In this article, we try to look for some possible elements of motivation of individuals for the selection and implementation of the HIIT training method (high intensity interval training) and explore the philosophical background of this motivation. HIIT method is physically demanding. It also carries some health risks. At the same time, it contains a kind of impression of our times: to get as much as possible in the shortest possible time and to achieve maximum profit with as little time as possible. However, the use of this method by recreational athletes, who are not usually under systematic medical supervision, can lead to short-term successes while at the same time posing certain long-term health risks. However, as part of our article, we will not be looking at the analysis of health risks. Still, we will be looking at possible deeper causes that lead to the growing popularity of this training method and its uptake within the general population.

PURPOSE

We believe examining the motivation for using the HIIT method in philosophical discourse makes sense. Such reason can be both conscious and unconscious. As Martin Heidegger explains in his book Being and Time (Heidegger, 1996), the temporal characteristics of being human can be used to place conscious motivation in a particular frame. The time frame may present one of the keys to understanding the elements of authenticity and inauthenticity of being human, through which one can see an effort to make as much profit as possible in a short time. As Cimino (2019) emphasized, Heidegger attempted to grasp the phenomenon of the truth of being (Heidegger, 1996, 208) differently from Kierkegaard and reinterpreted questions of existential analysis through, among other things, temporal characteristics of human being.

In this regard, Martin Heidegger refers to three temporal aspects, which he describes as existentials. This is about Historicity, Everydayness, and Within-Timeness. The Within-Timeness (Heidegger, 1996, 371–390) characteristic is strongly associated with measuring time (ibid, 382–384) and falling into the instant mode of everyday caterers. There is a danger of ceasing to be ourselves and losing authenticity because everything we do is for us pre-programmed and planned. In effect, we are carrying out some instructions which have already been finished and which we cannot continually correct in their form.

Simple examples of situations where we are trying to accelerate processes requiring more time by default artificially could serve as a lay first-plan explanation for why being in such a mode can be a problem. This directly touches on our theme: to profit as quickly as possible from the HIIT training method. However, we believe that the root of the problem is much deeper here and that the temporal issues of being in a more sophisticated context can be perceived. The preference for choosing hard-line scientific and technologically conditioned methods to achieve maximum effect can also be seen as a philosophical problem, which Heidegger paid attention to in his late work and is directly linked to his term Gestell (Roozbahani & Moinzadeh, 2020). Undoubtedly, there are more reasons why Heidegger's analyses may present a good platform for a better understanding

However, the aim of our article is not to assess the motivation for implementing the HIIT method from the perspective of the authenticity of human being. This would be an issue for a much more comprehensive study. We use the aspects of temporality described by Heidegger only as a starting point for our reflections on the potential influence of the selfish gene on this motivation. Temporality, and in this case the existence of within-time-ness, seems to us only to draw attention to the fact that trying to make a quick profit with as little time as possible can not only be counterproductive in its outcome but that it carries problems relating to the meaningfulness of our actions. In other words, this problem has a strong philosophical dimension.

All of this relates to a conscious motivation in which the individual is reasonably well aware of what they provide and want to gain from it. However, we felt it necessary also to mention the need to go under the first-time profit-versus-loss perspective. We wanted to draw attention to the fact that, in the context of the pursuit of a meaningful human being, processes tend not to work as quickly and as simply as they might look based on a kind of balance sheet of individual segments of these processes.

As part of our study, we focused on a possible subconscious motivation for the implementation of the HIIT method, which may be related to the theory of the selfish gene by Richard Dawkins. Since the first publication (in 1976) of The Selfish Gene (Dawkins, 1989), this theory has become a highly influential and, at the same time, frequently criticized concept, explaining the splenetic evolution from the gene-centered view.

For the needs of our text, we first tried to define the typology of people practicing HIIT. We know that exact scientific research would need to be undertaken for a relevant practical empirical study. However, the core of our text is not empirical; we are merely creating a particular model construct here as a starting point for subsequent abstract imaginings. This construct is based on practical experience and observation directly in the specific conditions of the gyms. Such a construct cannot be flat-lined, and we also have no intention of doing so; we are concerned about the disability of some selected distinctive personality aspects.

Therefore, based on instructors' observations and practical experience, specific typical attributes can be given, which (from the point of view of many instructors, typically) are the characteristics of HIIT practitioners. These are often those in a dominant society (possibly with an epoch attempting to gain dominance), competitive and trying to break out of the mean and gain a specific advantage over a particular rage by their admission. They are also often maximalists, sometimes with a tendency to megalomania. These are purposeful people, continually pursuing benefit and effect in a shorter time frame. The Choleric temperament predominates. About the opposite sex (concerning Dawkins's theory, it is a substantial thing), these are attractive individuals or individuals trying to gain some attractiveness. This may be accompanied by an additional attribute, an above-average number of partners in relationships where a dominant role often prevails.

It is the specific experience with HIIT seekers under the background of this study.

PROBLEM

We will now try to present a direct link between the issue of the selfish gene and exercising by HIIT method. For Dawkins, as an ethologist, observing the behavior of animals is a fundamental starting

point for explaining ontogenetic and phylogenetic development, innate and acquired behavior, and their patterns for species survival. In the context of attractiveness, he cites as an example the garish color and long tail in males, which attracts attention and gives males a better chance of reproducing. This is true of patterns that also run a greater risk of being eaten by predators. However, the male is willing to take the risk, even at the cost of being eaten, as he may have a more significant number of offspring in the relatively short time of his existence. By contrast, an unobtrusive, unattractive male can live as long as a female but will not pass on any genes.

It should be pointed out that the HIIT method is not only a means of increasing physical fitness (this part may not always be visually apparent) but, above all, promotes muscle growth, physique formation, and body fat loss (which are already visually noticeable aspects). On the non-visual side, the individual becomes more attractive and gains a more dominant position through their higher fitness over others, for example, in group exercise. It is typical of HIIT that exercise tends to be mixed (often in the representation of men and women, which is close to 50:50). He gains dominance through his superior performance and "pays" for it by making a big effort, possibly by damaging the locomotor apparatus in an effort to do more repetitions, lifting heavier weights, etc. Devolved, such behavior may work favorably in the short term from a reproduction perspective, and here an analogy to Dawkins' concepts can be observed. This example may work within a limited group of people in which an individual tries to gain a certain status and refers to a non-visual component (performance).

The second plane is the visual aspect (musculature, well-developed body), which can also work externally outside a limited group of individuals. Also, here, of course, is the pursuit of targets in the short term, the spending of large amounts of energy, etc.). This idea is supported by the fact that HIIT is practiced overwhelmingly by people who are reproductive and capable of reproduction.

The approach to the problem – the principles of the Game Theory

Now we would like to follow up on previous thoughts. As a premise, we can suggest that two types of individuals can be identified in a model construct (and understandably very simplistic). One of them practices HIIT, and the other doesn't. If we relate these constructs to game theory, we can devolve these individuals by choosing each different strategy.

Even before we start considering possible strategies in the context of game theory, referring to Dawkins, we can give an example of a study of elephant seals in which it was found that 4% of males held 88% of all copulations. For this species, there is an enormous surplus of free males who do not get a chance to reproduce, and because they use resources like other seals, they can be taken as social parasites. In the context of HIIT, the low percentage of the copulating can theoretically be thought of as those who practice HIIT. In practice, the situation is significantly more complex due to cultural influences in human society. However, in a model working with the principle of the selfish gene (the essence of which is to spread as widely as possible in the gene pool), the body can be seen as a selfish tool that tries to do as much as possible for its genes and whether females or males are trying to ensure maximum reproduction. The selection of some activities or strategies may be subconscious and may be instinctively driven. In this context, we mention the choice of the HIIT method as one of the possible manifestations.

We will now return to the choice of strategies within the Game Theory. Individuals compete for living space; according to Dawkins, nothing can stop them from spreading genes. If they are part of the same environment, they also compete for partners, and the consequence of this competence in general among organisms is evolution (according to Darwin). Thus, in an individual practicing HIIT, the choice of strategy is determined by the selfish gene and the interest in taking advantage of the short-term selfish benefit, even though it might not be advantageous in the long run. Specifically: If a person trains very intensively, he/she is likely to be more efficient than individuals who do not train intensively. This can be accompanied by a more attractive appearance, higher performance, privileged societal position, etc. An individual chooses a strategy that favors him in the short term (intensely impossible to train to infinity). Still, this strategy may not be advantageous (for example, due to damage to the locomotor system and health). Moreover, the choice of this strategy is both energy and mentally exhausting. Choosing a strategy makes a completely glamorous difference between working on your physical condition (generally sports training) and working on it through intensive training with an immediate effect but during a short application phase.

There are several analogies in Dawkins's book based on the ethological basis. See the chapter "Nice guys finish first" (Dawkins, 1989, 147). Specifically, killing a male who is also my rival will cause exhaustion, and eventual death while favoring a third rival, as well as choosing a drinking strategy by the stream, etc. Dawkins agrees with Axelrod and Hamilton that many wild animals and plants are engaged in endless games of Prisoner's Dilemma, played out in evolutionary time.

Dawkins also describes what Maynard Smith calls 'symmetric' contests in some detail. As part of a game called "Hawks and Doves," he discusses the model situations that can occur in a hawk-dove encounter.

Ridley (1996) goes on to describe a number of different model tournaments in which various strategies based on a model of "hawks and doves" faced each other. These model situations were also tested frequently in later game theory using modern IT technologies with different intentions (Yang, 2021; Deng & Deng, 2015; Feltovich, 2011).

Dawkins himself drew attention to the relatively "optimistic" feel of tournaments (1989, 172), in which cooperative strategies, typically those he calls "Tit for Tat family of strategies" (ibid, 168), tend to be more successful in the long run. In addition to ethology discourse, this topic can also be scanned in ethical discourse (Hurych, 2013, 83).

The choice of aggressive strategy (or ostentation from the point of view of the chances of spreading the gene pool) may be, and in many cases seems to be, advantageous. Especially in the short term, as a simple analysis of the scheme of The Prisoner's Dilemma shows.

However, as Dawkins stresses, this concept will be true for developmentally simpler animal species (an example of the elephant seals as mentioned above) rather than for humans, where numerous cultural influences are included, and long-term developments are also more observable. Dawkins created a "meme theory" on this topic (Dawkins, 1989, 140–148). On the other hand, the idea of memes was even more often criticized by many authors (West, 2020; Schrempp, 2009; Benítez-Bribiesca, 2001) than the theory of the selfish gene itself.

Replicators and vehicles

At this point, it should be noted that we are building on Dawkins' conception of genes and memes also in the sense that we view them metaphorically. Obviously, the replicator (gene) is a molecule and as a molecule it wants nothing, it cannot want anything and accordingly it cannot be selfish. Dawkins's term for selfishness, then, is more like coding.

The basic reasoning is that replicators are genes (Dawkins, 1989, 16), and we humans are their survival tools. The genes have created us, which means they have created a particular box. The better the box, the more successful the genes are in their competencies. The clipboard can be described as a vehicle. At least again, in a metaphor, it can be broken down into parts: a part visible/tangible, invisible/intangible, and a transition between these (intersections). In the field of genetic research for grasping what this vehicle is, we find a number of problems, for example in the functioning of cell structures (Jalasvuori, 2012).

A slightly different view is also possible. The box in general may have a physical form and boundary, but it may not. Her likeness can be abstract. In terms of graspability (visibility/tactileness), the interpretation is relatively simple. The replicators themselves are not visible, and the vehicle is a tool for moving replicators. For example, it is the body as a gene broker, with its form influencing the chances of the replicator spreading (increasing or decreasing these chances). His selection and propagation of the replicator are two aspects of the same process. Animals in general have become gene tools whose basic functional unit is muscle.

In the context of HIIT and this grasping (or transition) component, the advantage of HIIT for practicing individuals can be assumed in the selection process, as musculature creates a feeling of higher chance of survival (in combat, in foraging, in the ability to work more efficiently, etc.).

Nevertheless, there is also a component that is elusive (or at least not fully graspable), which theoretically can also be considered a vehicle. Here we come more into abstract space. If a receptacle is the basis for propagating a replicator and enlarging a gene pool, and may not be graspable, a social status box, an intellectual ability, or a luxury car (or what the owner is showing the surroundings) can be. In the context of HIITs, one could then speak at this level, for example, of the will of an individual undergoing high-intensity training, purpose, the ability to organize time, competition, etc. This consideration is supported by the fact that the body's ability to respond to changes in its surroundings is often of higher importance than physiological properties. Thus, the means of persistence does not necessarily have to be material in nature. Replicators alone cannot create survival programs (because of the number of eventualities). However, they work with analogy, and survival tools need to equip more with general capabilities and, in turn, strategies. Here we return to the follow-up to the principles of The Theory of Games.

A model construct of the "hawk" as a practitioner of the HIIT method

As mentioned earlier, we will try to present a model construct of the HIIT method "client" with a setting in the context mentioned in the previous text. First, in a simple table, we show the scoring of Axelrod´s tournaments, in which the model dove co-operates and the model hawk defects.

Table 1. Axelrod's computer tournament: payoffs to me from various outcomes (simplified and adapted from Dawkins, 1989, 151).

		What you do	
		Cooperate	**Defect**
What I do	**Cooperate**	REWARD FOR MUTUAL COOPERATION **3 POINTS**	SUCKER´S PAYOFF **0 POINTS**
	Defect	TEMPTATION TO DEFECT **5 POINTS**	PUNISHMENT FOR MUTUAL DEFECTION **1 POINT**

In this constructed matrix, we can think that the hawk is the dominant in society, according to Dawkins, the aggressive type. Again, all attributes must be understood metaphorically. This is demonstrated by the orderly tournaments in which strategies free from emotion were fought, in principle it could be said to be a battle of computer programs, or if we want, programmed strategies.

A person who practices HIIT (superior with his performance, strength, musculature, etc.) so in this model construct can be considered a hawk. We can then think of non-aggressive, incongruous individuals in society as a dove. Thus (in fact, in accordance with Dawkins' theory of ethology), we pit two players equipped with a dove-and-hawk strategy, where the hawk is a HIIT practicing type and the dove is a non-athlete or recreational athlete.

In the short term, a hawk's strategy might seem preferable to that of a dove (a selfish gene predominates) in terms of attention-getting, dominance, and, by extension, gene-spreading. This corresponds both to the logical solution of the one-off situation at The Prisoner's Dilemma (when it is preferable to betray) and to the results of the meeting of the hawk and the dove in fewer matches (when the hawk gets more than the dove.

Nevertheless, two basic moments put the problem in a different light. The first is that "purebred" hawks and "purebred" doves represent only a fraction of the players, while the others build their strategies on a combination of collaboration and rejection. This is broadly similar to human society and the behavior of individuals in different situations, where we are also more likely to encounter quite distinct types.

The second point is that the game is played for a high number of rounds, with players equipped with "memory" which means they have a record of their hitherto flawed matches and can adapt their strategies to that. It also corresponds significantly with the reality that people experience. A typical example is the Tit for Tat strategy, which responds to the opponent's behavior in a simple algorithm (it cooperates in the first round, and reacts in the next rounds in the same way as the opponent did in the previous game).

As mentioned earlier, attributing human characteristics to strategies is only a certain type of metaphor, but one that Dawkins relates to the real behavior of animals within ethological theories and then relates to cultural patterns in human society. If we are talking about egotism or altruism in this vein, we must make yet another abstract ingratiating leap towards the realm of ethics. But this, at least in a first-line way, can be done if we accept the idea that judicious cooperation pays off in the long run (Ridley, 1996) and thus that altruism can be justified both logically and ethically (Hurych, 2013, 83).

Now we come to the very point of our text, which is a modest reflection on the motivation for operating the HIIT method through models combining philosophical, ethological and mathematical approaches.

Before we draw conclusions, we feel it necessary to draw attention to the fact that we are not concerned with assessing the suitability of the HIIT method for exercisers from the perspective of health risks. Nor, however, are we concerned with any kind of warning about the method as such. The main idea is for those who choose to implement the HIIT method to think carefully about why they want to pursue this method and what possible benefits and complications such a decision may bring. From this we exclude the issue of health risks and the changes/improvements in physical fitness or performance itself, we believe that there are enough relevant studies available in these respects, on the one hand, and on the other hand this question is quite well understood in simple consideration.

CONCLUSIONS

We will try to draw an intelligible conclusion; however, this effort, in the case of disjointed exits and mixed discourse, may seem largely simplistic. In the model case of the hawk as the operator of the HIIT method, we have attempted to point to certain pitfalls that hide the choice of this method when driven by the desire to dominate and control our surroundings. The reality is, of course, different, with almost all of us alternately assuming the roles of hawk or dove in certain situations.

Although we have largely based ourselves on philosophical and game theory, our conclusion goes into the field of kinanthropology. HIIT is one effective method and can produce very good results in some circumstances. At the same time, we consider it beneficial to take into account some of the circumstances mentioned in this text when deciding on the choice of this method.

For one thing, there is the risk in applying the effort to get the most too quickly and at all costs, and to overestimate the short-term benefit. This can lead to a lapse into Within-Timeness mode (based on the ideas of Heidegger's temporal analyses) and deficits in the authenticity of being. There is a much greater risk if such an effort is associated with taking over the position of a hawk, if the HIIT method becomes a way for us to build our dominance in society, and if we want to build our attractiveness and potentially our social position through this method. To some extent, such behavior corresponds to a model of a selfish gene, as Dawkins describes it.

The fact that dove strategies can, even within model theories, withstand hawks is then a useful reflection of some of the findings from The Theory of Games. As has been shown in specific tournaments, the meeting of hawks and doves produces different results at different stages. With doves too dominated, hawkish strategies begin to prevail, making the overall balance intricately

graspable. However, the fact that cooperative strategies have a slight edge in the long run provides a starting point for considering that altruism is not only an ethical construct (it is right to help and cooperate), but that there is also a logical basis for it, and that cooperation can be seen as a rational form of behavior.

The HIIT method itself is only a tool and, like any tool, can be both useful and harmful. What we wanted to emphasize here is the fact that while combat activities have their sophisticated anchor in the philosophical ideas of some martial arts, we do not see with the HIIT method that it has been overwhelmingly realized from the very beginning with a certain vision. Improving physical parameters should be mentally based on self-improvement in terms of understanding and cooperation, rather than trying to dominate your surroundings and control someone by force.

Bearing in mind that in the case of HIIT, this is a training method that is primarily aimed at improving physical parameters, we consider it useful to look at the context of its use from other perspectives as well and to use approaches other than, for example, the field of sports training analysis. We believe that even such perspectives fall within the challenges of kinanthropology.

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