POLEMICS AND DISCUSSION

SOME CRITICAL REMARKS ON THE CONCEPT OF „HEALTH-RELATED FITNESS" AGAINST THE BACKGROUND OF POLISH RESEARCH CONDUCTED OVER THE LAST TEN YEARS.

by

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For some time now, in English language publications, the concept of splitting physical fitness into „health–related–fitness" and „performance–related fitness" has been gaining more and more popularity. In particular the first of these concepts, which links fitness to health, is extremely significant since it direct researches (and politicians and consequently financial resources) towards the idea of health and its broader sense. This slogan is all well and good but is it well founded from the scientific point of view? Is its range of meaning and relationship to „performance–related fitness" correctly defined? In presenting some critical remarks below, I will also attempt to propose a different concept which originates from two Polish centres and is known as the „Cracow–Katowice School of Kinesiology". This concept appears to be clearer, more concise and more logical. Let's begin with the critical remarks:

In as much as the sense of the concept of H–RF itself does not raise any doubts (at least in the sense that the condition of the internal organs and the quality of metabolic processes are undoubtedly connected with health), then there are many doubts that remain as far as the components are concerned (Bouchard and Sheppard 1994, Bouchard et al. 1992). Of these, the following points are most often raised:

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- morphological components: body composition, fat tissue and its distribution, bones density, flexibility,
- muscle components: power, strength, endurance (?),
- motor components: agility, co-ordination, equilibrium, speed of movement,
- cardio-respiratory components: aerobic efficiency, hearth and lungs functions, blood pressure,
- metabolic components: glucose tolerance, insulin sensitivity, lipids metabolism, and characteristics of substrate oxidation.

These components, the list of which cannot be complete, are somewhat limited in other works (Skinner and Oja 1994, Wuest and Bucher 1991). In reality they cover almost the whole range of the structure and functions of the organism that pertain to motion. However if we place such notions as agility, speed etc. among them, then the range of the notion of HRF overlaps the range of PRF. According to the language of mathematical logic, these are not disjointed sets because they have common **„product of sets"**. It results form the lack of separation of the potential side (the condition of the organism) from motion effect. This is probably the cause of certain confusion arising from doubling test factors. A variety of research also indicates that agility „understood" as a separate agility (effect?) dos not exist, metabolic and cardio-respiratory components are the constituents of aerobic power and stamina (Szopa 1998), Szopa et al. 1996, Szopa et al. 1998) – therefore this division is also not justified. The approaches closest to reality and empirical research results are to be found in the ideas of Wuest and Bucher (1991) and also in Osiński's (1998) synthetic specification: however it is incongruous to use the word „fitness" for e.g. morphological components: the composition of the body is not „fitness" but **it has an influence on it** and this is an immense different. Similarly if cardio-respiratory functions belong to HRF, why are the functions of the kidneys and the alimentary system not included etc.?

2. Reducing „performance-related fitness" to achievements only (to test and sporting results) would, of course makes sense if those abilities (such as agility, speed and functional strength) which had previously been included in HR, were not included.
3. The problem of relevant HRF tests. The majority of proposal suggests those motor fitness tests, at least partially, be used for this purpose. As stressed by others including Docherty (1996) or Osiński (1998), this causes blurring in the demarcation between HRF and PRF resulting from the lack of an

appropriate theoretical doctrine and of the primary intention. These tests after all, do not **posses the defined validity** (in relation to HRF); they contain the **large and varied** content of motor skills.

Thus it seems that the concept of HRF was created with utilitarian and not scientific aims. In our opinion, an overall concept of motor activity structure is much more valuable. Polish scientists have proposed this concept for over thirty years (Gilewicz 1964), and it has been worked on and empirically verified by the „Cracow School" (Szopa 1988, 1989, Szopa and Latinek 1998, Szopa et al. 1996, 1998). According to this concept, the potential side of human motor activity (the internal condition of the organism) should be distinguished and differentiated from its **effective side** (motor effects). The potential side certainly conditions the achieved motor skill but **it can be measured by „primary sciences"** methodology (biology, physiology, biomechanics, biochemistry etc.) and not by applied sciences' methodology (physical culture sciences).

The following levels constitute the potential side:

1. Predisposition: the relatively elementary structural and functional traits of an organism (parameters of the body build and composition of the body, the flexibility of the joints, the structure of muscle fibres, the characteristics of the circulatory and respiratory systems, the efficiency of enzymatic system which is engaged into the energy releasing processes, the quantity of Hb and erythrocytes, nervous-muscle co-ordination, the efficiency of the centres that motor control and characteristics of the psyche, etc.).
2. Motor abilities: the complexes of predisposition integrated by their common biological and motor base (duration time, intensity, load, and movement structure) and remaining in the mutual interactions.

As result of the most recent research show (Mynarski 1998, Raczek and Mynarski 1992, Szopa and Latinek 1998, Szopa et al. 1998, Waszkiewicz et al. 1998) which were based on multidimensional statistical analysis covering approximately 200 properties tested in a laboratory, there are at least ten abilities. They can be measured by tests of the greatest validity (which the conception of co-ordination abilities for which there are currently not such tests). The specification of the abilities and the recommended tests are presented in Table 1.

Table 1

NO 1	ABILITIES 2	TEST 3
1.	Ability to develop an absolute static strength	Sum of the max. moments of strength developed by the greatest muscle groups during isometric contraction
2.	Ability to develop local static strength	Measurement of the max. moments of the strength of the defined muscle group (e.g. extensors of elbow joint or knee joint)
3.	Ability to develop max. alactacid anaerobic power	„Wingate test" – measurement of maximal power
4.	Ability to develop lactacid maximal anaerobic power	„Wingate test" – measurement of the work executed during 30sec.
5.	Ability to quick muscle mobilisation	„Wingate test" – measurement of the time of maximal power achievement
6.	Ability to maximal oxygen uptake V_{O2max}	Direct method-measurement of the oxygen uptake during a sub-maximal effort
7.	Muscles ability to resist fatigue	Defining of AT (anaerobic threshold) volume during a continuous effort on a mobile running track or cycloergometer
8.	Ability to space orientation	Computer tests
9.	Ability tomotor adaptation	Computer tests
10.	Ability to learn movement	Investigation of the speed and precision of new movement learning

As we can see, the first seven abilities have a structural-energetic base, and the remaining three abilities are co-ordination based. They include the condition of the body, and in our opinion, more accurately reflect the state of health than the above mentioned HRF constituents.

We have also placed the **movement skill** in the potential side due to its internal character (although it reveals itself only in movement). Together with motor abilities they condition the qualitative and quantitative aspect of movement that is **motor fitness.**

3. Motor fitness is the extend to which abilities and skills manifest themselves in concrete movement (for example motor tests). Since a human being can perform a rich range of movements, this cannot be limited merely to „sport fitness". Fitness also occurs in other motor activities; expressive motor activity (ballet, theatre), fighting motor activity (the military) or professional

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motor activity. It ought to be stressed explicitly, that no fitness test can measure motor abilities. These tests can, at the outmost, be treated as indirect methods and then only after having their validity, which is often confused with reliability.

4. Physical fitness we understand in its broader context; that is, as the whole range of abilities and skills of an individual during the execution of various tasks of movement. Therefore it is rather the fitness of multidisciplinary than that of a single disciplinarian.

In presenting the above hypothesis, we rely on evoking a broad discussion, and hope that this will permit the elaboration of a model of structure and naming based on firm foundations and not vice versa. In the first place, science requires precisely defined concepts and definitions – but this field, in physical culture sciences is treated with an exceptional lack of concern.