

KNOWLEDGE PRODUCTION IN KINESIOLOGY AS VIEWED THROUGH THE TITLES OF PAPERS PUBLISHED IN AN ACADEMIC JOURNAL – A LINGUISTIC APPROACH

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Abstract:

The aim of this research was to try to present, on the basis of titles of papers published in an academic journal, knowledge production in kinesiology. The sample consisted of 781 titles of papers published in the journal *Kinesiology/Kinesiology* from 1971 to 2011. The list of lexical items used for this investigation to analyse, both diachronically and contextually, knowledge production connected with the science of human movement consisted of the following: *structure, structural; movement, motion, motor, motor ability; activity, exercise, sport; change, transformation; influence, impact; and effect, effectiveness*. The analysis has shown the listed lexical items to appear in a multitude of combinations and contexts, i.e. linear combinations of words, thus indicating their meaning and reflecting the body of research, which consequently shapes knowledge in the scientific discipline in question.

Key words: *scientific knowledge, epistemology, human movement, language*

Introduction

Language is a means by which thoughts are articulated to describe concepts by means of definitions, etc. In science, which is by definition a body of knowledge (*Encarta World English Dictionary*, 1999, p. 1680), language is a vehicle that conveys knowledge production. Subsequently, since language is furthermore regarded as a means necessary for the interpretation of reality, ongoing practices in academy in general, and consequently in a particular domain, are therefore reflected in it. Academic texts thence reflect the realm of the body of research through which the development of a discipline and adjacent fields, as well as science in general, may be considered both synchronically and diachronically. Academic texts may also serve to demarcate a scientific discipline in question and to detect past and present practices in the research domain, thus providing the platform for knowledge production within an epistemological region, to use the term as explicated by Foucault (2006, p. 389).

Knowledge, says Fumerton (2006, p. 12), “is the paradigmatic subject of epistemological investigation”. It may also be understood as a “highly valued state in which a person is in cognitive contact with reality”, and can hence be regarded as a relation (Zagzebski, 2004, p. 113). Since knowledge production may be considered as a linguistic process that

contains a myriad of influences, such as paradigmatic ones, but also historical, methodological and disciplinary ones communicating ideas between each other, scientists build up a canon of accepted knowledge (Belhassen & Caton, 2009) which in turn reflects their understanding of reality. The opinion that knowledge bases are frequently constructed from texts (Basden & Klein, 2008) is only the mirror image of the same notion. Hence, Belhassen and Caton (2009) express an accepted notion that reality is mediated by language.

Language consists of words, and words convey meaning through their content. It is through words, or, as expressed in terms of logical positivism, propositions that meaning is transferred from a sender to a recipient. According to Sankey (2000), one of the foci of the philosophy of science has been, and still is, an interest in the features, both semantic and epistemic, of scientific discourse. Consequently, the issues of referring to meaning of scientific terms and to their reference arose regarding the two kinds of vocabulary to be identified in scientific discourse – observational vocabulary, denoting observable objects and phenomena, and theoretical vocabulary denoting “unobservable entities which are postulated by scientific theories to explain observable phenomena” (Sankey (2000, p. 118), i.e., as Darling (2002, p. 511) put it, “concrete language

of observation and the (abstract and symbolic) mathematical language of science". The body of scientific knowledge relies on theories. A theory consists of constructs, i.e. of theoretical concepts, and in sciences such as human movement science the relationship between empirical and theoretical levels of scientific knowledge exists and is solved through the rules of correspondence between them (Blahuš, 1996). From the point of view of the philosophy of science, one of its main foci lies in the identification of theoretical concepts (Blahuš, 1996).

Scientific explanations have *empirical content* (Rosenberg, 2005, p. 84), and the meaning in science, according to Sanitt (2011), is the result of the integration performed by scientists of questions and answers to those questions within the created networks. It is this empirical content that is expressed by the meaning of words – namely, a scientist “puts forward statements or systems of statements, and tests them step by step” (Popper, 2002, p. 3). Further, in terms of Popper, the logic of knowledge hence represents the logic of scientific discovery, which further serves to test the universal statements, be it hypotheses or theories. In other words, discursive practices, to use the words of Foucault (1972, p. 191) again, are actually the *episteme*, i.e. the “total set of relations”, which “give rise to epistemological figures, sciences, and possibly formalized systems”. In other words, the *episteme* may be understood as the constantly “moving set of articulations, shifts, and coincidences”, i.e. as the totality of these relations, prospectively to be discovered, “between the sciences when one analyses them at the level of discursive regularities” (Foucault, 1972, p. 191).

Any scientific discipline that tends to become one, and stay one, must fulfil the basic epistemological features, or, in other words, prerequisites (Milat, 2005, p.) – it must have the research domain which represents the teleological demarcation of a science, the subject matter of research, the methods of research, research methodology and terminology, i.e. the system of notions and terms (names) used in a particular scientific discipline – in other words, a terminological system in which the terms, that codify the set of concepts to which they are assigned, specific for a scientific discipline have been unambiguously and accurately defined. As postulated in Aristotle's *Metaphysics* (Eco, 2000, p. 23), “definition is the notion (*logos*) whose name (*onoma*) is the sign (*semeion*)”.

The understanding of a text written in a particular type of discourse depends on the basic communication channel prerequisites – both the sender of a message and its recipient must operate with the same system of signs, in other words, they must both be able to code and decode a transferred message. For a scientific community this actually means that such a community must use the same type of discourse, both in terms of its style and in terms of

terminology specific for a scientific discipline, to be able to convey research results, thus attempting to refute the theory tested by the research in question. According to Graybeal, Isenor and Rueda (2012), a community uses collective terminology which identifies the key concepts used by this community. In this context, there are authors who distinguish between insiders and outsiders to the discourse (Chavez, 2008; Broyles, 2011). The former are people who work within the same discipline and who either engage in science communication based on the established norms on a regular basis or are likely to fully follow the discourse, whereas the latter are people who work in other scientific disciplines and who are unfamiliar either/both with the vocabulary of a discipline in question or/and the concepts upon which the discipline in question operates (Broyles, 2011).

Epistemic communities, i.e. groups of subjects who focus their work on a set of commonly recognized topics within a particular body of knowledge (Cowan, David, & Foray, 2000), use an identical set of concepts and their interpretations (Roth & Bozrgine, 2005) to mediate knowledge. The nature of discourse used by a certain community to address this body of knowledge is, however, to a larger or lesser extent, a prerequisite for the discourse's understandability. It is through language that concepts, their definitions, various models and methodologies of a scientific discipline are conveyed.

Scientific knowledge can also be viewed through the prism of syntactic and semantic levels (Blahuš, 1996). Semantic level implies meaning. That language shapes thought is one of Wittgenstein's postulates (Proudfoot, 2009), so he asserts: “The limits of my language mean the limits of my world.” (Wittgenstein, 1961 [Reprint 2004], p. 68). One of the important roles of language is that it is a means to represent ideas and concepts (Dong, 2006). The notion of *concepts* is understood by philosophers to be constituents, or units, of thought (Xu, 2007), or, in terms of Dahlberg (1986, p. 10), a concept is a unit of knowledge. Malmgren, Radovic, Thorén and Haglund (2010), who addressed a philosophical view on concepts in psychiatry, argue that in modern philosophy concepts are equated with the meanings of words, and also phrases, and the determinants of their extensions. As for linguistics, the common assumption identifies meaning as a conceptual representation in cognitive processes, a point of view that is currently under scrutiny as for its adequacy (Riemer, 2013). This is in compliance with the difference between philosophical and linguistic concept modelling—philosophical semantic theories focus on an extensional or a set model approach to concepts (the concepts being classes of objects falling into a category), whereas linguistics considers concepts in terms of mental representations (Cohen & Murphy, 1984). Conse-

quently, Malmgren, Radovic, Thorén and Haglund (2010, p. 68) postulate a definition of a concept as being “the sum of our tendencies to use a certain linguistic term in epistemically transparent situations”. Further, to use the words of Goddard (2011, p. 41), the meaning of a word is revealed “in the company it keeps”. In other words, it is the co-occurrences that provide indices of the word’s semantic content (Firth, 1957; Goddard, 2011). Although there are scientists who consider concepts and meanings to be similar if not even the same notions, generally a distinction is made between the two. Concepts, as previously explicated, are units of thought – in other words, they are mental representations of various categories. Meaning, however, is regarded as consisting of two components – sense and reference. According to Sanitt (2011, p. 560), meaning is to be understood “in terms of relationships and interactions”. It is created on a continuous basis within a process which Sanitt (2011) specifies to be an open-ended process of relationships to ultimately form networks of these relationships. By assuming that science is a collection of ‘answer/questions’, he then concludes (2011, p. 560) by saying that “meaning in science thus arises out of scientists integrating (...) their answers and questions within the networks they create”, rather than from the identification of objects.

A linguistic approach to analysing knowledge production in a particular domain may rely on various types of text, titles (Tribe & Airey, 2007) being one of the varieties. Analyses of titles of scientific papers address a wide range of topics, from those dealing with their structural construction (Hyland, 2002; Haggan, 2004; Hartley, 2007), to those considering their informativity (Yitzhaki, 1997), to those regarding their content (Harmon, 2009).

Following the notion of a linguistic approach to epistemology of a particular domain (Tribe & Airey, 2007; Belhassen & Caton, 2009), the aim of this paper was to diachronically and contextually analyse, through the titles of papers published in the academic journal *Kineziologija/Kinesiology*, knowledge production, connected with a set of key terms in human movement science. To realize this aim, two aspects were taken into account – the linguistic knowledge, which served as a platform for inferences regarding the semantic level of knowledge production in kinesiology, and the philosophy of science point of view, which provided the frame thereof.

Methods

The sample consisted of 781 titles of papers published in the academic journal *Kineziologija/Kinesiology* from the year 1971 to 2011. From the year 1971 to 1996 the papers in this journal were published in the Croatian language – however, each

paper was complemented with a title and an abstract (key words included) written in English. From 1996 to 2000 the papers were published both in Croatian and in English, and since the year 2000 the papers are published only in English. Consequently, the titles written in English were selected as cases for the purpose of this analysis.

Word meaning, i.e., within the context of language for specific purposes, the meaning of terms and the formation of concepts are crucial elements that make knowledge production and dissemination possible. Hence, a set of lexical items was used for this investigation to analyse, both diachronically and contextually, knowledge production connected therewith. In linguistics, a multi-word term implies the co-occurrence of two or more words. Hence, the elements of multi-word terms are referred to as *words*. However, in this research the lexical items under consideration are mostly terms, since they are used as such within the science of human movement. Consequently, the word *term* is used both to refer to the single- and multi-word units serving as bases of compound terms and to refer to the resulting combinations with various modifiers, i.e. as noun-modifier relations. Additionally, the terms belonging to the set under scrutiny are sometimes also presented in wider contexts, which might be regarded as possible varieties producing a range of less entrenched occurrences. At the same time, the fuzzy border between collocation and term requires a much closer look into the nature of lexical relationship matching the notion of collocation or that of the termhood.

Therefore, the list of lexical items under consideration consisted of the following: *structure, structural; movement, motion, motor, motor ability; activity, exercise, sport; change, transformation; influence, impact; and effect, effectiveness*.

The term *structure*, together with the adjective *structural*, was selected for the investigation because, if it is understood as a term denoting an aggregate of parts organized into a pattern to produce a coherent form, then structure is a concept that underlies models, theories, etc.

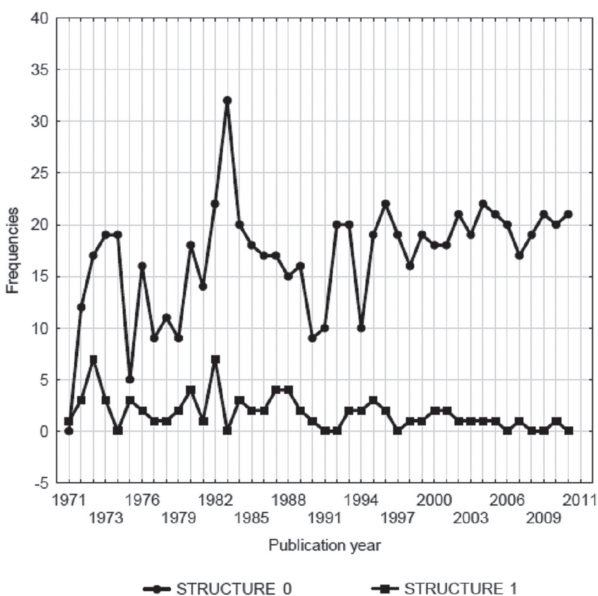
A further concept addressed in this investigation was *movement*. The concept of *movement* was viewed through the prism of two terms—*movement* and *motion*, and the analysis was thence supplemented by the third one—the term *motor*. Since *motor* combines with *ability* to denote another key concept in kinesiology, the examples of modifiers of the multi-word term *motor ability*, i.e. an abstract or theoretical concept as formulated by Blahuš (1996), were then listed and analysed. No references, however, to specific motor abilities—e.g. speed, strength, coordination, flexibility, etc.—were included in this set. A more extensive investigation which would address only the concept of motor abilities is a topic for a future inquiry.

Application and manifestation domains of movement in kinesiology literature are referred to as *physical activity*, and as a *sport* and *exercise* dichotomy. For the purpose of this analysis, the terms *activity*, *exercise* and *sport* were regarded as adequate to realize the aim of research.

Transformational processes, as postulated by kinesiology's definition by Mraković (1971) in the first issue of the journal *Kineziologija/Kinesiology*, imply *change* and *effect*, wherein movement constitutes the affecting factor, its agency denoted by the terms *influence* and *impact*. Hence these four terms were also considered in the analysis. Change was analysed with respect to being denoted by the terms *change* and *transformation*. The concept of *effect* was supplemented by the term denoting the state of having effect, i.e. with *effectiveness*. *Influence* and *impact* were considered jointly to refer to the notion of *affecting*.

The selected terms are presented in their co-occurring relations, i.e., to use the words of Foucault (1972, p. 191), they are presented in sets of various articulations that result in certain discourse regularities, thus denoting the knowledge production connected with them. Subsequently, one may infer some epistemic notions of the linguistic terms under consideration. Without affecting the analysed corpus and consequently the yielded results, the titles have been shortened for the purpose of graphical presentations.

As for graphical presentations, collocations as well as terminological chunks are preceded by interaction plots to indicate the diachronic distribution of research into a particular focal point.



Legend: STRUCTURE 0 – the terms structure and structural not used in a title; STRUCTURE 1 – the terms structure and structural used in a title

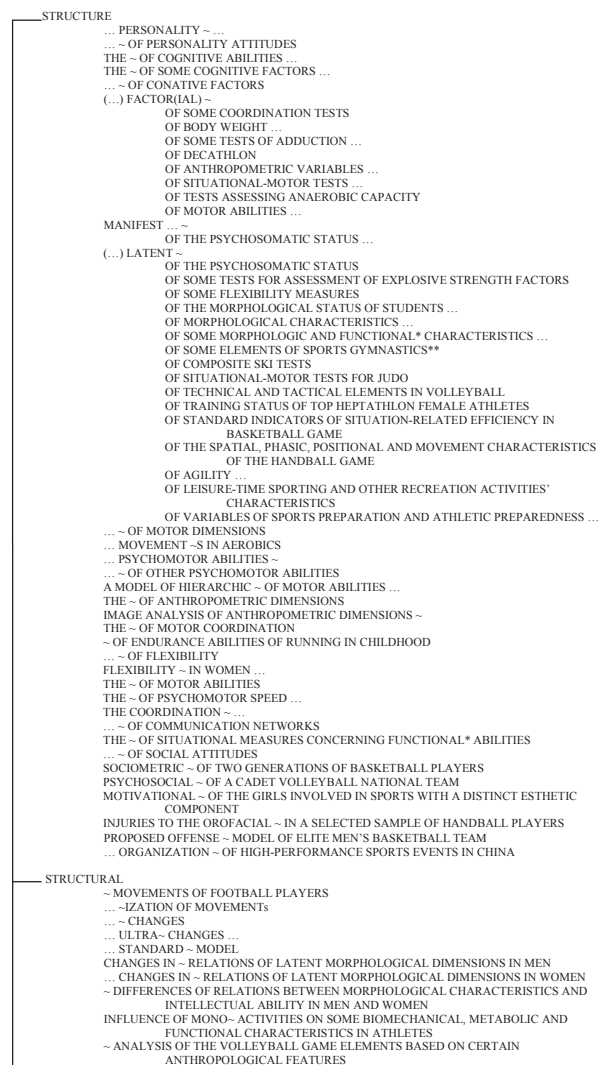
Figure 1. Interaction plot of publication year and frequencies of titles (not) containing the terms structure and structural.

Statistica for Windows, ver. 10 (Statsoft, Inc., 2011), was used to process the collected data.

Results

Figure 1 shows that the concept of *structure* seems to have been in the focus of research more frequently until approximately the year 2000.

The concept of structure is composed primarily of investigations into the structure of motor space, to use the term that is frequently utilized in the titles to refer to the domain of movement in its totality, followed by the structure of psychological categories, such as cognitive abilities and personality traits (Figure 2). Further structure-related research addressed morphological characteristics, play/game-related concepts, e.g. performance, etc.



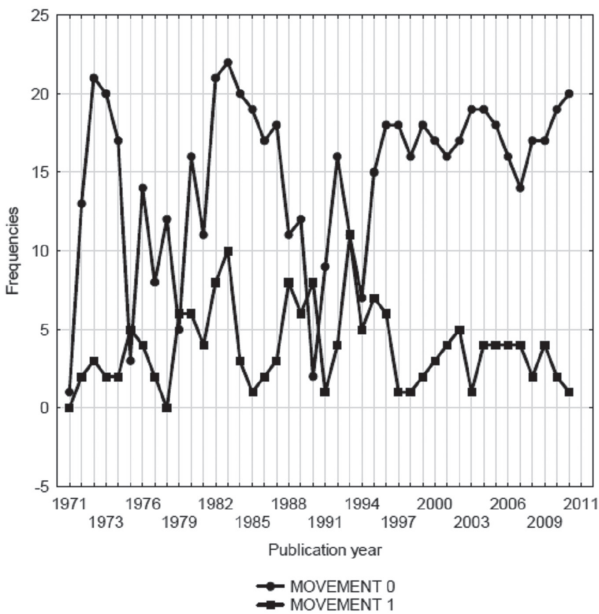
* The term is actually an incorrect ad litteram translation into English of the term which in Croatian refers to oxygen transport system-related physiological capacities.

** The term is not to be found in standard English and is frequently used by non-native English speakers to refer to artistic gymnastics.

Figure 2. Examples of co-occurrences of the terms structure and structural.

Interaction plot in Figure 3 displays the diachronic distribution of research focusing explicitly on movement. The concept of movement, as already explained, was regarded to be denoted by three terms: *movement*, *motion* and *motor*. Activity, sport and exercise, although undoubtedly connoting movement, were considered separately. The plot shows that *movement* was more frequently referred to in the titles between the years 1977 and 1996.

However, for technical reasons the schematic presentation was done separately for the terms *movement* and *motion* on the one hand, and the word *motor*—complemented by *psycho-*, *loco-* and *bio-* combining forms—on the other. Unlike the term



Legend: MOVEMENT 0 – the terms *movement*, *motion* and *motor* not used in a title; MOVEMENT 1 – the terms *movement*, *motion* and *motor* used in a title

Figure 3. Interaction plot of publication year and frequencies of titles (not) containing the terms *movement*, *motion* and *motor*.

- MOVEMENT
 - DEVELOPMENT OF HUMAN ~ SCIENCE ...
 - HIERARCHIES OF SYNERGIES IN HUMAN ~S
 - MAXIMAL MANIFEST STRENGTH OF SOME ATTEMPTED ~
 - ... THE SPEED OF SIMPLE ~S
 - DYNAMIC ANALYSIS OF THE ROTATIONAL PART OF HUMAN BODY AIRBORNE ~
 - ... SPEED OF ALTERNATIVE ~S
 - POSITION-RELATED DIFFERENCES IN VOLUME AND INTENSITY OF LARGE-SCALE CYCLIC ~ OF MALE PLAYERS IN HANDBALL
 - 3D KINEMATIC ANALYSIS OF THE OVERARM ~S FOR DIFFERENT SPORTS
 - GROSS ~ PATTERNS IN ELITE FEMALE BEACH VOLLEYBALL
 - AN INVESTIGATION OF THE INFLUENCE OF BILATERAL DEFICIT ON THE COUNTER~ JUMP PERFORMANCE IN ELITE SPRINTERS
 - ... STRUCTURALIZATION OF ~S
 - DEVELOPMENT OF ~ COORDINATION
 - ... BODY MASS ~ ...
 - ... IN ATHLETICS
 - ... IN SPORTS BIOMECHANICS
 - TIME ANALYSIS OF THE GOALKEEPERS' ~S IN WATER POLO
 - ~ VELOCITY IN STUDENTS POPULATION
 - ... STRUCTURES
 - ... KINEMATIC SIGNALS OF ~
 - ... DEVELOPMENT OF SPECIFIC SPEED OF VOLLEYBALL PLAYERS' ~ WITHOUT A BALL
 - ... CHARACTERISTICS OF THE HANDBALL GAME
- MOTION
 - ... ~ STRUCTURING ...
 - METRICAL CHARACTERISTICS OF TESTS FOR ESTIMATING STEREOTYPED ~ REORGANIZATION FACTOR
 - THE INFLUENCE OF STRENGTH EXERCISES UPON SPEED AND FREQUENCY OF ~

Figure 4. Examples of co-occurrences of the terms *movement* and *motion*.

structure, these two terms seem to have produced less complex sets of multi-word expressions, but appear to be more dispersed as for their modifiers (Figure 4).

The word *motor* combined with a number of other terms thus pointing to the variety of aspects of the concept (Figure 5), ranging from more general ones, e.g. *motor space*, to more specific ones, e.g. *motor abilities*, to testing/measurement-related *motor tests/testing*, *measure*, etc.

Since *motor abilities* are among the key concepts in kinesiology, the co-occurrence scheme of the *motor ability* collocation was additionally worked out (Figure 6). However, no interaction plot with publication year is provided since it would be redundant in that it would inevitably coincide, to a certain extent, with the frequency distribution presented in Figure 3. It is obvious that epistemologically the concept of *motor abilities* has been addressed from various points of view to infer their structure, development, modelling and types, thus producing extensive knowledge into the subject matter.

- MOTOR
 - ... ~ VARIABLES ...
 - ... ~ SPACE
 - ... ABILITIES ...
 - ... QUICK AND PRECISE PERFORMANCE OF COMPLEX ~ TASKS
 - ... PERFORMANCE ...
 - THE STRUCTURE OF ~ COORDINATION
 - ... ~ TESTS ...
 - MANIFESTATION OF SPORT TALENT IN ~ TESTING ...
 - ... ~ DIMENSIONS ...
 - ... ~ PARAMETER ...
 - ... ~ STATUS
 - ... PRIMARY ~ FACTORS ...
 - ... ~ CHARACTERISTICS
 - RELATIONS BETWEEN HYPERSENSITIVITY DIMENSIONS OF MECHANISM FOR ENERGETIC REGULATION OF ~ OUTPUT
 - ... ~ EFFICIENCY ...
 - ... ~ KNOWLEDGE ...
 - ... ~ SKILLS ACQUISITION
 - ... ~ PROFICIENCY ...
 - ... LEARNING ~ EXERCISES BY PRE-SCHOOL CHILDREN
 - ... ~ LEARNING
 - ... ~ COMPONENTS ...
 - ... ~ DEVELOPMENT OF 7-TO 10-YEAR-OLD CHILDREN
 - ... SPEED OF ~ REACTION ...
- PSYCHOMOTOR
 - ~ ABILITIES ...
 - ~ SPEED ...
- LOCOMOTOR
 - ~ SYSTEM ...
- BIOMOTOR
 - ~ DIMENSIONS
- MOTORICS*

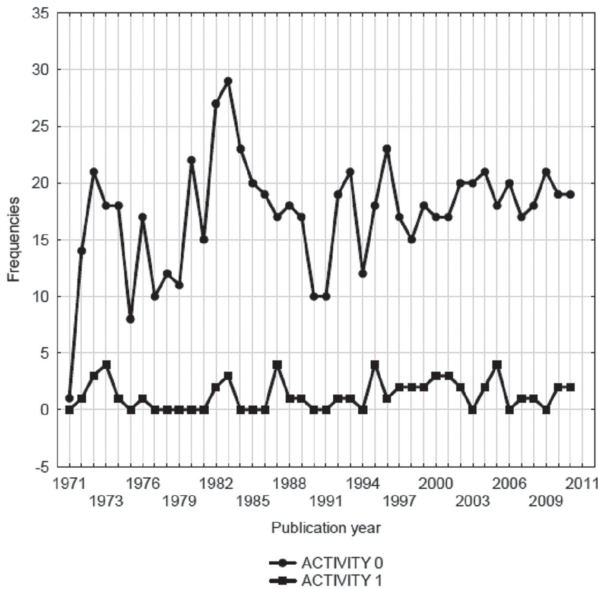
* The word is not to be found in standard English; it is frequently used by non-native speakers of English, e.g. speakers of Slavic languages, or speakers of German (both English and German belong to Germanic languages), to refer to the concept of motor behaviour.

Figure 5. Examples of co-occurrences of the term *motor*.

- MOTOR ABILITY
 - DEVELOPMENT CHARACTERISTICS OF GENERAL ~ IN ELEMENTARY SCHOOL STUDENTS
 - ... PRIMARY ~IES
 - ... BASIC ~IES ...
 - ANALYSIS OF THE EFFECTS OF ONE TREATMENT ON ~ CHANGES IN PEOPLE WORKING IN DIFFICULT CONDITIONS
 - ... ~ TESTS
 - ... LATENT ~IES ...
 - PERCEPTUAL ~IES ...
 - FUNCTIONAL AND ~IES DIAGNOSTICS ...
 - TENNIS-SPECIFIC ~IES ...
 - ... DEVELOPMENT OF SOME ~IES OF BOYS
 - ... SITUATION-RELATED ~IES ...
 - ... HIERARCHIC STRUCTURE OF ~IES ...
 - ... MODELLING OF ~IES
 - A TAXONOMIC ANALYSIS OF ~IES

Figure 6. Examples of co-occurrences of the term *motor ability*.

Figure 7 displays diachronic distribution of frequencies of titles in which a term denoting *activity* or the notion of being *active* was used. The plot shows relative consistency in the usage of these terms over the observed period.



Legend: *ACTIVITY 0* – the terms *activity* and *active* not used in a title; *ACTIVITY 1* – the terms *activity* and *active* used in a title

Figure 7. Interaction plot of publication year and frequencies of titles (not) containing the terms *activity* and *active*.

As shown in Figure 8, the concept of activity was viewed in terms of its modifiers such as *physical*—denoting a broader notion of the concept, *kinesiological*—addressing the fact that the activity under consideration is to be viewed as the one whose aim is a programmed and controlled transformational process, then *recreational*, *leisure* and *sport(s)*. The terms *recreational* and *leisure* address the notion of activity pursued for recreational purposes. However, the combinations with the term *sport*, without a broader context, provide little evidence on whether the combining term—*sport(s) activity*—actually refers to *physical activity* in general or to a high-performance sport.

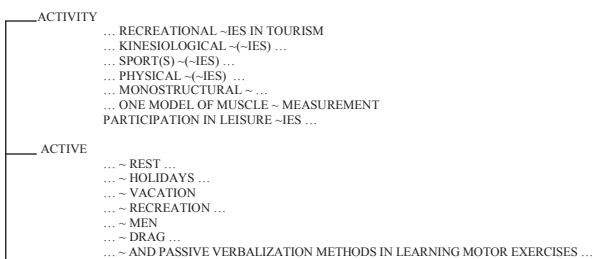
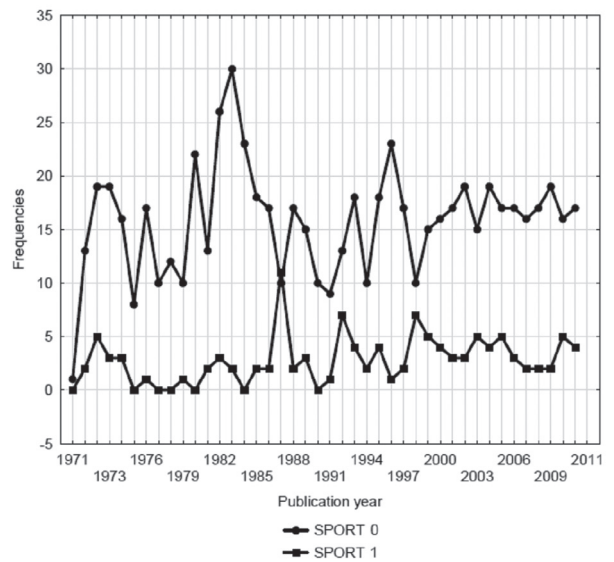


Figure 8. Examples of co-occurrences of the terms *activity* and *active*.

The interaction plot in Figure 9 provides evidence on the diachronic usage of the term *sport* in the analysed titles. It seems to have been used somewhat more frequently in the period after the year 1987.



Legend: *SPORT 0* – the term *sport* not used in a title; *SPORT 1* – the term *sport* used in a title

Figure 9. Interaction plot of publication year and frequencies of titles (not) containing the term *sport*.

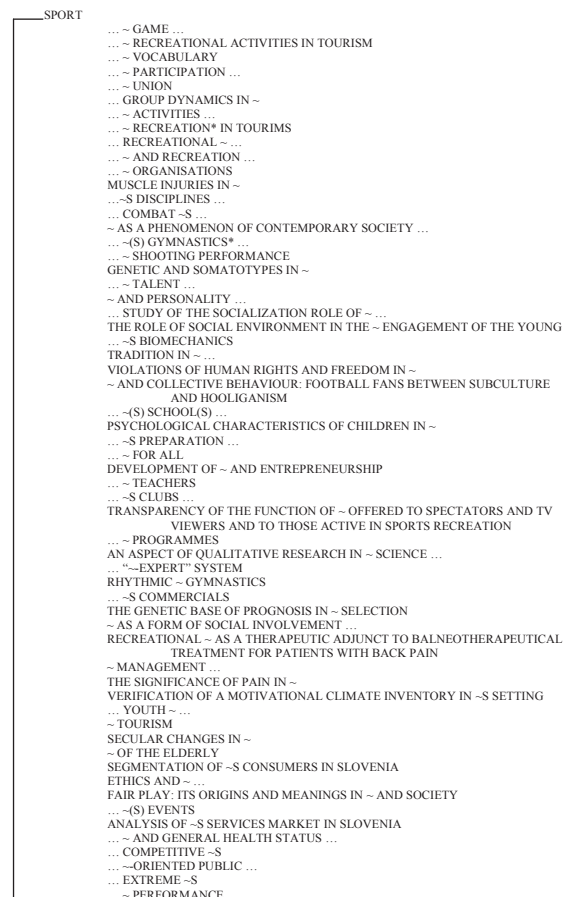


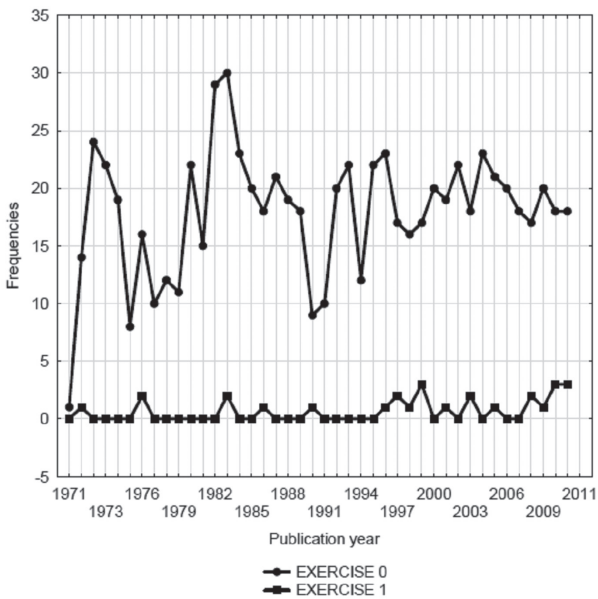
Figure 10. Examples of co-occurrences of the term *sport*.

Together with the results as evident in Figure 9, the variety of co-occurrences of the term *sport* as found in the analysed titles (Figure 10) disclosed that its concept was addressed both more frequently and in more detail than the one of *activity*.

Like *activity*, the term *exercise* seems not to have been used too frequently in the analysed titles. However, it seems to appear in them more often after the year 1996 (Figure 11). Some of its modifiers were *physical*, *chronic*, *resistance*, etc. (Figure 12).

As presented in Figure 13, explicit reference to *change* was not frequent—the term seems to have been used in the titles most often between 1982 and 1986.

The co-occurrences of the terms *change* and *transformation* (Figure 14) make it possible to infer the variety of the topics connected with the concept of change. What catches the eye is the fact that both quantitative and qualitative changes are in the focus.

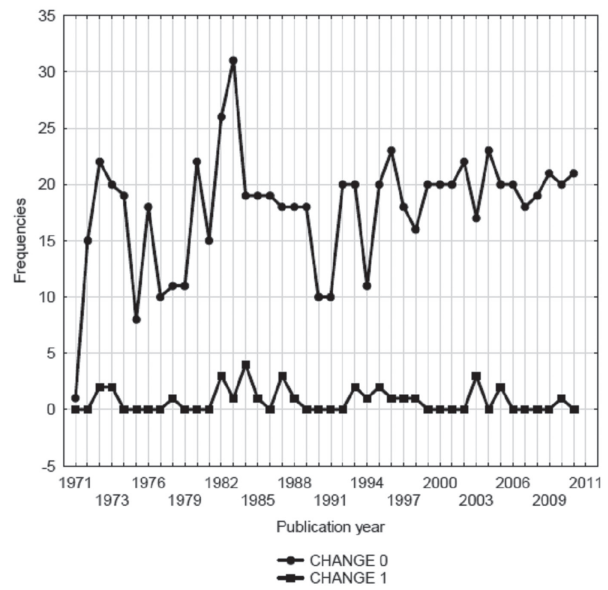


Legend: EXERCISE 0 – the term exercise not used in a title; EXERCISE 1 – the term exercise used in a title

Figure 11. Interaction plot of publication year and frequencies of titles (not) containing the term exercise.

- EXERCISE
- ... PHYSICAL ~(S) ...
- WHY ~?
- ... CHRONIC ~ ...
- ... SPORTS ACTIVITIES AND ~
- ... THERAPY IN CASES OF BACKACHE ...
- ... STRENGTH ~S ...
- ... CARDIOVASCULAR RISKS DURING ~
- ... ALL-OUT LABORATORY ~ ...
- ... WEIGHT ~ ...
- ... MOTOR ~S ...
- ... CYCLING ~
- ADDITIONAL ~ AS AN EFFICIENCY FACTOR IN PHYSICAL EDUCATION LESSONS
- HOW EFFECTIVE IS ~ IN PRODUCING FAT LOSS
- THERMOGENIC EFFECT OF A HIGH ENERGY, PRE~ SUPPLEMENT
- BLOOD OXYGEN SATURATION AND HEART RATE DURING ~ ...
- ... RESISTANCE ~
- ... HIGH INTENSITY ~ ...
- ... CONCURRENT ~ PROTOCOLS ...
- FUTURE SPORT, ~ AND PHYSICAL EDUCATION PROFESSIONALS' PERCEPTIONS OF THE PHYSICAL SELF OF OBESE CHILDREN

Figure 12. Examples of co-occurrences of the term exercise.



Legend: CHANGE 0 – the terms change and transformation not used in a title; CHANGE 1 – the terms change and transformation used in a title

Figure 13. Interaction plot of publication year and frequencies of titles (not) containing the terms change and transformation.

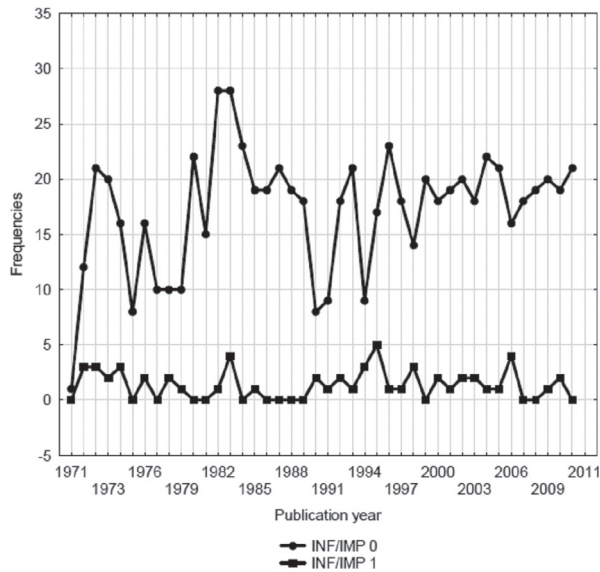
- CHANGE
- ... ~S OF SOME ANTHROPOMETRIC DIMENSIONS ...
- ... ~S IN CONDITION OF AN OBJECT DESCRIBED OVER A GROUP OF QUANTITATIVE VARIABLES
- ... QUANTITATIVE ~S ...
- ... MOTOR ABILITY ~S ...
- ... ~S OF MOTOR ABILITIES OF YOUNG BASKETBALL PLAYERS
- ... ~S IN THE MITOCHONDRIAL APPARATUS OF SKELETAL MUSCLE ...
- ... STRUCTURAL ~S
- ... ~S IN STRUCTURAL RELATIONS OF LATENT MORPHOLOGICAL DIMENSIONS ...
- ... QUALITATIVE ~S IN MEASURES OF MOTOR EFFICIENCY
- ... QUALITATIVE ~S OF SOME MOTOR ABILITIES IN SECONDARY SCHOOL FEMALE STUDENTS
- LONGITUDINAL ~S OF AEROBIC CAPACITY IN BOYS
- ... SUBCUTANEOUS ADIPOSE TISSUE ~S ...
- PARAMORPHIC AND DYSMORPHIC SPINAL ~S ...
- ... ~S IN FUNCTIONAL ABILITIES* IN YOUNG BASKETBALL PLAYERS
- ... ~S IN MOTOR AND MORPHOLOGICAL MEASURES OF YOUNG WOMEN ...
- SECULAR ~S IN SPORT
- AGE-RELATED ~S IN CONTRACTILE PROPERTIES OF PLANTAR FLEXOR MUSCLES IN PHYSICALLY ACTIVE WOMEN
- TRANSFORMATION
- A CREATINE EFFICIENCY OF TWO DIFFERENT ~ PROCEDURES

* As in Figure 5.

Figure 14. Examples of co-occurrences of the terms change and transformation.

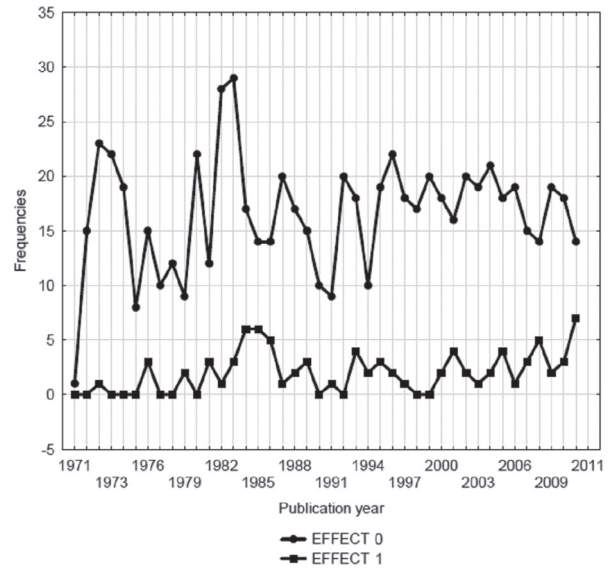
However, when the concept of *change* is implied in terms of *influence* and *impact*, their incidence in the titles is almost double than that of *change* (Figure 15) and the range of combinations of these two terms is much broader (Figure 16).

Since *effect* is the ultimate result of *change*, its expression in the titles is a logical next step in the discursive analysis aimed at researching into epistemological practices as referred to in the analysed observations. Taking into account the chain of phases in a transformation process, in which *influence* and *impact* represent the initial phase, followed by *change*, the ultimate result, i.e. the *effect*, has proven itself to be the most often expressed phase of the process in question (Figure 17). Research interest in the effects of transformational processes under the influence of movement, i.e. kinesiological activity/exercise



Legend: INF/IMP 0 – the terms influence and impact not used in a title; INF/IMP 1 – the terms influence and impact used in a title

Figure 15. Interaction plot of publication year and frequencies of titles (not) containing the terms influence and impact.



Legend: EFFECT 0 – the terms effect and effectiveness not used in a title; EFFECT 1 – the terms effect and effectiveness used in a title

Figure 17. Interaction plot of publication year and frequencies of titles (not) containing the terms effect and effectiveness.

- INFLUENCE
- ~ OF THE SPORT GAMES ON SOME EDUCATIONAL VARIABLES ...
- THE ~ OF SYSTEMATIC ENGAGEMENT IN PHYSICAL EDUCATION ON THE STRUCTURE OF PERSONALITY ATTITUDES
- THE ~ OF ACTIVE REST DURING A SPECIAL BREAK ON WORK CAPACITY ...
- ~ OF THE CRITERION FOR NUMBER OF FACTORS EXTRACTED ...
- THE ~ OF PERSONALITY STRUCTURE ON THE DEGREE OF SPORT PARTICIPATION ...
- THE ~ OF THE KINESITHERAPEUTIC TREATMENT AND THE REDUCTION DIET ON THE CHANGES OF OBESITY
- THE ~ OF MANIFEST AND LATENT ANTHROPOMETRIC CHARACTERISTICS ON THE JUMP HEIGHT AND MAXIMAL HAND REACH IN JUMP OF JUNIOR VOLLEYBALL PLAYERS
- THE ~ OF SOME SOCIOMETRIC AND CONATIVE CHARACTERISTICS ON THE PLAYING QUALITY OF FEMALE HANDBALL PLAYERS
- THE ~ OF SPORT RECREATION* IN TOURISM ON FUNCTIONAL ABILITIES** OF HUMAN ORGANISM
- THE ~ OF ANTHROPOMETRIC DIMENSIONS ON THE DYNAMOMETRIC FORCE
- THE ~ OF ANTHROPOMETRIC DIMENSIONS ON THE SPEED OF SIMPLE MOVEMENTS
- THE ~ OF MANIFEST AND LATENT ANTHROPOMETRIC VARIABLES ON THE ACCURACY IN VOLLEYBALL SITUATIONS
- THE ~ OF SHOOTING ON THE FINAL SCORE OF THE BASKETBALL MATCH
- THE ~ OF SOCIOLOGICAL CHARACTERISTICS ON MOTOR ABILITIES
- THE ~ OF LATENT MORPHOLOGICAL CHARACTERISTICS ON MOTOR CAPACITIES* ...
- THE ~ OF CONATIVE REGULATORY MECHANISM ON PERFORMANCE IN BASKETBALL
- ~ OF POSTURAL STABILITY ON SPORT SHOOTING PERFORMANCE
- ~ OF SPECIFIC AND BASIC MOTOR VARIABLES ON SPRINT RACE RESULTS ...
- ~ OF INTENSITY OF RUNNING ON EFFICIENCY IN FOOTBALL
- ~ OF SPORT ACTIVITIES AND ENVIRONMENTAL FACTORS ON DEVELOPMENT OF CHILD ATHLETES
- ~ OF HOMOGENEITY QUALITY OF THE TEAM AND AGE OF WATER POLO PLAYERS ON SUCCESS OF THE TEAM
- ~ OF SOME GENERAL AND SITUATION-RELATED MOTOR ABILITIES AND KNOWLEDGE ON EFFICIENCY IN HANDBALL
- ~ OF STRENGTH AND POWER TRAINING ON MUSCLE CELLS
- ~ OF CYCLIC MONOSTRUCTURAL ACTIVITIES ON BIOMECHANICAL, METABOLIC AND FUNCTIONAL CHARACTERISTICS IN ATHLETES
- ~ OF ENDURANCE TRAINING ON THE RESULTS OF THE CONCONI TEST
- THE ~ OF DEFENSIVE AND OFFENSIVE REBOUNDS ON THE FINAL SCORE IN A BASKETBALL GAME
- ~ OF A PROGRAMMED TRAINING ON CHANGES IN FUNCTIONAL ABILITIES* IN YOUNG BASKETBALL PLAYERS
- ~ OF SOME SITUATION-RELATED PARAMETERS ON THE SCORE IN VOLLEYBALL
- ~ OF HABITUAL PHYSICAL ACTIVITY ON FUNCTIONAL* AND MOTOR ABILITIES ...
- ~ OF SOME ASPECTS OF PARENTAL SOCIO-ECONOMIC STATUS ON THE ATTITUDE TOWARDS SPORTS
- ~ OF SOME MEASUREMENT PROCEDURES ON THE STRUCTURE OF FLEXIBILITY
- ~ OF TRAINING OF RHYTHMIC GYMNASTICS FUNDAMENTALS ON CERTAIN MOTOR ABILITIES ...
- THE ~ OF ENVIRONMENTAL CONDITIONS ON THE BENEFITS OF AEROBICS GYMNASTICS
- ~ OF LATENT MOTOR ABILITIES ON PERFORMANCE IN JUDO
- ~ OF DOMINANT AND NON-DOMINANT BODY SIDE ON SPECIFIC PERFORMANCE IN TAEKWONDO
- ... ~ OF BILATERAL DEFICIT ON THE COUNTER-MOVEMENT JUMP PERFORMANCE IN ELITE SPRINTERS
- IMPACT
- THE ~ OF THE ANTHROPOMETRIC VARIABLES ON JUDO PERFORMANCE ...
- ... ECONOMIC ~ OF SPORT IN DEVELOPED COUNTRIES AND CROATIA
- THE ~ OF THE INITIAL STATUS OF MOTOR ABILITIES ON MASTERING MOTOR PROFICIENCY IN RHYTHMIC SPORTS GYMNASTICS
- THE ~ OF TRANSITION ON SPORTS MANAGEMENT
- THE ~ OF SPORTS PARTICIPATION AFTER SCHOOL ON INTRINSIC MOTIVATION AND PERCEIVED LEARNING ENVIRONMENT ...
- HEALTH ~ OF TRAINING INTENSITY IN OLDER INDIVIDUALS
- THE ~ OF THE ADDITIONAL PHYSICAL EDUCATION LESSONS PROGRAMME ON THE PHYSICAL AND MOTOR DEVELOPMENT OF 7-TO 10-YEAR-OLD CHILDREN
- ~ OF IDENTITY ON ANXIETY IN ATHLETES
- ~ OF PSYCHOLOGICAL DIMENSIONS OF PSYCHOSOMATIC STATUS ON POTENTIAL COMPETITIVE PERFORMANCE IN CROSS-COUNTRY SKIING

* Sport(s) recreation is a term frequently used by non-native speakers of English, e.g. by speakers of a Slavic language, to refer to the concept of physical/sporting activity participation for recreational purposes.
 ** As in Figure 5.

Figure 16. Examples of co-occurrences of the terms influence and impact.

- EFFECT
- ... PROGRAMMED ACTIVE HOLIDAYS -S IN A GROUP OF WORKERS ...
- ... -S OF PROGRAMMED ACTIVE RECREATION ON FEMALE HOTEL AND CATERING WORKERS
- THE ~ OF A WELL ORGANIZED PHYSICAL EDUCATION PROGRAM ON INTELLECTUAL PERFORMANCE
- THE ~ OF CHRONIC EXERCISE ON THE PERSONALITY OF MIDDLE-AGED MEN ...
- ~ OF CHRONIC EXERCISE ON THE MULTIVARIATE RELATIONSHIPS BETWEEN SELECTED BIOMECHANICAL AND PERSONALITY VARIABLES
- THE ~ OF SPORTS DISCIPLINES ON THE PUPILS PSYCHOSOMATIC DEVELOPMENT ...
- ~ OF EDUCATION AND OTHER SOCIAL FACTORS UPON THE DEVELOPMENT OF MOVEMENT COORDINATION
- THE ~ OF SOCIAL STATUS AND INTELLIGENCE ON THE CORRELATION BETWEEN EDUCATION AND MOVEMENT COORDINATION
- THE ~ OF SOME COGNITIVE AND PERSONALITY FACTORS UPON REPRODUCTION OF MELODY AS A COMPONENT OF MUSIC ...
- THE ~ OF SELECTION ON THE RELATIONSHIPS BETWEEN PRIMARY MORPHOLOGICAL DIMENSIONS AND MEASURE OF THE EFFICIENCY OF COGNITIVE FUNCTIONING
- THE ~ OF RHYTHM AS A MUSICAL COMPONENT ON RESULTS IN RHYTHMIC GYMNASTICS AND DANCING
- THE ~ OF KINESIOLOGICAL TREATMENT ON THE CHANGES OF MORPHOLOGICAL CHARACTERISTICS
- THE ~ OF DIFFERENTLY PROGRAMMED KINESIOLOGICAL TREATMENT UPON CERTAIN ANTHROPOLOGICAL CHARACTERISTICS OF WOMEN STUDENTS
- THE ~S OF APPLICATION OF ANALYTIC AND SYNTHETIC APPROACH IN TRAINING BOARD SAILING
- THE ~ OF URGENT COMPETITIVE SITUATION UPON THE MICROSOCIAL STATUS OF A TOP-LEVEL VOLLEYBALL TEAM
- THE ~ OF SOME MOTOR ABILITIES ON KARATE TECHNIQUE
- ~S OF FUNCTIONAL ELECTRIC STIMULATION ON SKELETAL MUSCLES
- ~ OF AGE ON SPECIFIC VARIABILITY OF SUBCUTANEOUS FAT TISSUE
- ... OF TRAINING ~S ON TOP-LEVEL BASKETBALL TEAM IN PREPARATION PERIOD
- ~S OF SOCIAL STATUS ON FORMATION OF GROUPS IN A TOP-LEVEL VOLLEYBALL TEAM
- THE ~ OF SOCIOLOGICAL FACTORS ON MORPHOLOGIC FEATURES IN WOMEN
- THE ~ OF SOCIOLOGICAL FACTORS ON THE COGNITIVE ABILITIES IN WOMEN
- ~ OF MORPHOLOGICAL CHARACTERISTICS ON ACHIEVEMENTS IN BASKETBALL
- ~ OF PRIMARY MOTOR FACTORS ON ACHIEVEMENTS IN LEARNING THE ROWING TECHNIQUE
- THE ~ OF SITUATIONAL TRAINING ON THE QUALITATIVE CHANGES IN MEASURES OF MOTOR EFFICIENCY
- THE ~ OF SOME MOTOR ABILITIES ON THE EFFICIENCY IN OVERCOMING INFANTRY OBSTACLES
- THE ~ OF MORPHOLOGIC CHARACTERISTICS ON RESULTS IN MOTOR ABILITY TESTS
- ~S OF PHYSICAL ACTIVITY ON THE DEVELOPMENT OF SOME MOTOR ABILITIES OF BOYS
- ... ~S OF AIMED AT DEVELOPING STRENGTH DURING THE PRECOMPETITION PERIOD
- ... ~S OF ONE TREATMENT ON MOTOR ABILITY CHANGES ...
- ... MOOD BALANCING ~S OF AEROBICS
- ~S OF SPRINT AND PLYOMETRIC TRAINING ON MORPHOLOGICAL CHARACTERISTICS IN PHYSICALLY ACTIVE MEN
- ... ~S OF GUIDED SYSTEMATIC AEROBIC DANCE PROGRAMME ON THE SELF-ESTEEM OF ADULTS
- ... ~S OF PROPRIOCEPTIVE TRAINING ON JUMPING AND AGILITY PERFORMANCE
- THE ~ OF FOOT TYPE AND LATERALITY ON ANKLE SPRAIN IN ELITE FEMALE VOLLEYBALL ATHLETES
- THE ~ OF SOCCER MATCH INDUCED FATIGUE ON NEUROMUSCULAR PERFORMANCE
- ACUTE ~S OF DEPTH JUMP VOLUME ON VERTICAL JUMP PERFORMANCE ...
- THE ~ OF TWO REST INTERVALS ON THE WORKOUT VOLUME COMPLETED DURING LOWER BODY RESISTANCE EXERCISE
- THE ~S OF LEAST-TO-MOST PROMPTING PROCEDURE IN TEACHING BASIC TENNIS SKILLS TO CHILDREN WITH AUTISM
- ~S OF CONCURRENT EXERCISE PROTOCOLS ON STRENGTH, AEROBIC POWER, FLEXIBILITY AND BODY COMPOSITION
- ~S OF LONG-TERM PHYSICAL INACTIVITY ON DEPRESSIVE SYMPTOMS, ANXIETY, AND COPING BEHAVIOUR OF YOUNG PARTICIPANTS
- THE ~ OF AGILITY TRAINING ON ATHLETIC POWER PERFORMANCE
- EFFECTIVENESS
- ~ OF TEACHING PHYSICAL EDUCATION
- ... ~ OF PLAY IN DEFENCE AND OFFENSE IN BASKETBALL
- ... ~ OF VARIANTS OF WATER RESCUE
- ~ OF SPORTS ACTIVITIES WITH AN ORIENTATION ON EXPERIENTIAL EDUCATION, ADVENTURE-BASED LEARNING AND OUTDOOR-EDUCATION

Figure 18. Examples of co-occurrences of the terms effect and effectiveness.

programmes, seems to have increased after approximately the year 1980, i.e. after initial inquiries into some other subject matters.

The presentation in Figure 18 reveals the multitude of co-occurrences of the terms *effect* and *effectiveness*.

Discussion and conclusions

Meaning is, to use the term in Polanyi's (1969) fashion, an intangible. "The meaning of a word is its use in the language" (Wittgenstein, [1953] 1967, p. 20) and "Each word must have a family of meanings" (Wittgenstein, [1953] 1967, p. 20) are Wittgenstein's two well-known dicta. Supplemented by the formulation according to which the meaning of a word becomes evident when its 'surroundings', i.e. their co-occurrences with other words/terms, be taken into account (Firth, 1957; Goddard, 2011; Sanitt, 2011), the terms that were selected for this investigation to designate the basic concepts in kinesiology were hence considered in the sum total of co-occurrences in the analysed sample of titles. Thus it was hypothesized that in such a way it would be possible to fully grasp the meaning of the selected terms to ultimately be able to analyse, from a linguistic approach point of view, the development of knowledge production as expressed in the titles.

Scientific constructs refer to theories, concepts, etc. (Díez, 2007). These constructs combine to form a body of knowledge within a scientific discipline. Such a body of knowledge is structured in that it is organized into a meaningful grid to form, to use Wittgenstein's formulation ([1961] 2004, p. 9), the 'world' which is "the totality of existing states of affairs", *the world* thus possibly being the science in question. "The determinate way in which objects are connected in a state of affairs is the structure of the state of affairs" (Wittgenstein, [1961] 2004, p. 9) [*Die Art und Weise, wie die Gegenstände im Sachverhalt zusammenhängen, ist die Struktur des Sachverhaltes. 1922, p. 96*]. In general, the word *structure* has several meanings which denote various concepts, for example, in *Roget's Thesaurus of English Words and Phrases: Body with Parts of Speech* (2004), the work that is based on Aristotle's (Aristotle [English translation released in 2000]; Studtmann, 2008) and Leibniz's (Dewey, 1902) categories. This Thesaurus categorizes the word *structure* under a) *Words expressing abstract relations—Causation—Power in operation—Production*, b) *Words relating to space—Form—General form—Form*, c) *Words relating to matter—Inorganic matter—Solid matter—[Structure] Texture*, d) *Words relating to matter—Organic matter—Vitality—Vitality in general—Organization*, and e) *Words relating to matter—Organic matter—Sensation—Special sensation—Sound—Specific sounds—Resonance -- [chemical resonance] resonant structure*. This

example shows that the understanding of a word is conditioned by context. As shown in the *Results* section, the concept of *structure* seems to have preoccupied the attention of researchers until approximately the year 2000. Such a finding substantiates the fact that a certain time period is necessary to identify and define the basic concepts, as well as to test the theories they stand for. Thirty years of publication, i.e. thirty years of knowledge dissemination through a publication such as an academic journal appear to have been necessary to research into the 'skeleton' of kinesiology's body of knowledge. What is evident is a continuous incidence decline in researching into the patterns supporting a collection of states of affairs.

The focal point of the structure-related research, the analysis showed, was motor space, *space* being a term that has been frequently utilized in the titles to refer to the domain of movement in its totality. The analysis also revealed that psychology plays an important role in kinesiology, which is in compliance with the opinion regarding the traditional components of kinesiology—psychology being one of them (Latash, 2008). However, since a human being cannot be regarded only as a physical entity, the neglecting of the psychological aspect would produce knowledge based exclusively on mechanistic foundations, thus reducing a human only to the material level. Notwithstanding the fact that sport—and sport is one category of the *exercise* and *sport* dichotomy—is a social phenomenon, the survey of results showed that inquiry into the social aspect of sport was rather scarce. Collocations of the term *structure* with the modifiers *latent* and *factor(ial)* substantiate Blahuš' (1996) efforts to show that the multivariate quantitative statistical approach lay in the basis of methodology applied to yield the results regarding the structure of the state of affairs.

Movement is the core concept in kinesiology, or in terms of Polanyi's triadic theory of knowledge (1969), a focal point—the self (i.e. a person) and subsidiaries (e.g. culture, experience, etc.) being the other two elements. In other words, it is a part of the world, *world* referring, in the case of this research, as already said, to the realm of kinesiology. The late Professor Mraković (who was also editor-in-chief of the journal *Kineziologija/Kinesiology* between 1979 and 1988) wrote in the article published in the first issue of the journal that kinesiology is a science regarding specially conditioned *movement* and that its aim is the identification of regularities of transformational processes, i.e. changes, under the influence of movement (1971). As emphasized by Twietmeyer (2012, p. 5), *kinesis* is conventionally understood as a materialistic one, which means that "motion is described in strictly mechanistic terms", and it refers to the "dislocation of mass in space". Twietmeyer (2012) further argues that this

is the reason why quantification proliferated itself to be a dominant methodological orientation in kinesiology.

Movement/motion was more frequently referred to in the titles between the years 1977 and 1996. Since until the year 1996 the access to the journal under consideration was rather limited in global terms as for the possibility for authors to read the texts published in it and to publish their own texts in it, the topics of papers were often closely related to the scientific projects done by the researchers who worked at the institution of higher education which has published the journal *Kineziologija/Kinesiology* and who were speakers of the dominant, until the year 1996, language of its publication (Croatian), thus consequently having access to the journal. Therefore, one of the possible reasons for addressing the concept of movement more frequently during the indicated time period might be the publication of the papers on topics dealt with within a scientific project which scrutinized the topic related to sports in relation to various anthropological fields (Viskić-Štalec, Omrčen, & Štalec, 2007). However, scrutiny into the multitude of possible interpretations is not in the scope of the present research. To return to the results of the present investigation – the term *motor* combined with its modifiers to form a far more intricate network of multi-word expressions than the *movement/motion* reference, so that it consequently denotes both abstract concepts, i.e. theoretical concepts such as *motor abilities* and *motor learning*, and observable ones, e.g. *motor performance*, *motor skills*, etc. This finding confirms the opinion expressed by Blahuš (1996) that in the science of human movement the relationship can be found to exist between empirical and theoretical levels of scientific knowledge and that this relationship may be scrutinized through the correspondence between them.

The analysed titles have shown that the concept of motor abilities has been addressed from various points of view. This diversity of focal points incurred the possibility of scientific inferences regarding their structure, development under various stimuli, their types, etc. Although the list of possible co-occurrences of the term *motor ability* does not seem to be as extensive as the co-occurrence list of some other terms, this appears to be so only at a glance. If the variable *motor ability* had been complemented by the modifiers of specific motor abilities, e.g. *speed*, *coordination*, *strength*, etc., then the range of co-occurrences would have been much more elaborate.

As for the usage of terms *physical activity* on the one hand, and *exercise* and *sport* dichotomy on the other, each of the terms has its proponents. Newell (1990) prefers the usage of the term *physical activity* over *sport/exercise* due to its semantic broadness.

Since *activity* is often modified by the term *sport* to form a multiword term *sporting activity*, which then makes the *physical activity - sport/exercise* discussion even more complex, to address the concept in question in full, the terms *activity*, *sport* and *exercise* were analysed and presented in their relationships with other words. Although the concept of syntagmatic scheme applied to the term *motor ability* was not complemented by reference to specific motor abilities, a different approach was applied to the concepts of *activity*, *sport* and *exercise*. Although undoubtedly connoting movement, they were considered separately from the *movement/motion/motor* set of words, and their syntagmatic schemes, unlike those such as e.g. *strength* or *flexibility* when discussing motor abilities, were presented in this analysis. The collocation *physical activity* was deliberately avoided as for the record of its occurrence in the titles due to the fact that the term *activity* would produce more combinations, which would ultimately point to the complexity of the concept as regarded in the titles. As for the concept of sport, only the combinations with the term *sport* in general were taken into account here. No reference was made to particular sports, e.g. basketball, football, volleyball, athletics, judo, etc. If more precise references had been considered, the concept of sport and the 'family of meanings', to use the words of Wittgenstein, that it subsumes would have been much broader.

The term *sport* appeared to have been rather frequently used in the titles, and the list of its combinations with other words displays the multitude of various topics that drew the attention of researchers in the field. The topics ranged from recreational sport, to high-performance sport, school sport, to sport tourism, as well as to the topics related with the economics of sport. Although the economic aspects of sport were not frequently under consideration (Viskić-Štalec, Omrčen, & Štalec, 2007), the fact will not go by unobserved that, despite a relative scarcity of research thereof, the concepts of management, consumers and services in sport are manifestations of the conceptualization of sport as business.

The terms *activity* and *exercise* were found to have appeared in the titles somewhat more frequently after the year 1996. Since significant efforts were made to make kinesiology as 'scientific' as possible, vocabulary was not an exception—attempts were made to establish the usage of more specific terms such as *kinesiological activity* and/or *sport(s)/-ing activity* to show to the scientific community that not just any activity is regarded within the scope of kinesiology. However, the usage of the words *activity* and *exercise* is rather common in kinesiology-related literature published in English, so that after the year 1996, in which the journal started to be

published in the English language thus becoming more accessible to authors from all over the world, authors who started to publish their work in the journal that is the subject of this analysis brought new/different trends and new/different vocabularies into discursive practices applied in the journal. Seemingly, prior to this time point, *sport* was a term frequently used interchangeably with the term *activity*.

For the purpose of this analysis, the concept of *activity* was complemented by the notion denoted by the term *active*. These two terms were found to refer, in most cases, to the same domain. However, whereas the first one—*activity*—is more concrete as for its reference, the second one—*active*—implies rather than explicates: *active rest*, *active holidays* and *active vacation* imply sporting *activity* participation in one's free time and for recreational purposes. The examples such as *active drag* and *active verbalization* do not belong to the scope of *activity* as conceptualized in the science of human movement. However, they were deliberately included in the presentation to show how a term can, by increasing the number of combinations which it enters, subsequently widen its range of meaning.

The analysis of the co-occurrence scheme of the term *exercise* shows some linguistically interesting combinations. One of them is the collocation *motor exercise* in which the explication of an exercise reflects a discursive practice that is typical for the German language. To explain—although the notion of exercise in kinesiology undoubtedly refers to a concept implying movement, the term has been combined with the term *motor* which explicitly refers to motion. If one takes into account the fact that the context is known, i.e. that the term *exercise* is used within the context of a science whose scope is human movement, then the modifier *motor* is redundant. However, since an exercise could be e.g. a reading exercise or a writing exercise or a mathematical exercise, then the collocation of the two terms—*motor exercise*—yields a more accurate term. Such practice is frequent in German—*Bewegungsübung* (*Bewegung* meaning *movement* and *Übung* meaning *exercise*). However, such collocations in English may sound as pleonasm. The presented list of the co-occurrences of the term *exercise* points to the already mentioned *exercise* and *sport* dichotomy (e.g. *sport activities and exercise*, *future sport*, *exercise and physical education*).

Since *effect* is the ultimate result of *change*, its expression in the titles is a logical next step in the discursive analysis aimed at researching into epistemological practices as referred to in the analysed observations. As already said, taking into account the chain of phases in a transformation process, in which *influence* and *impact* represent

the initial phase, followed by *change*, the effect as the ultimate result has proven itself to be the most often expressed phase of the process in question. All three concepts—the one referring to becoming different and the other two being two sides of the same coin, i.e. those regarding influence as an agent and effect as a result of this agency—enter a myriad of semantic relations to show the magnitude of their possible applications. This justifies the notion of meaning containing “an unavoidable empirical component” (Medina, 2005, p. 71). To continue with the words of Medina (2005, p. 45), what language does is that it “puts matters in the open between interlocutors” thus creating a platform from which they can “survey the world together”. The world is, again, the world of kinesiology and the list of syntagmatic environments of the terms *change/transformation*, *influence/impact* and *effect/effectiveness* show in the best way how the definition of the scope of the science in question, and from the point of view of philosophy definitions serve to deal with epistemological problems (Gupta, 2008), is linguistically evidenced in the analysed sample of titles.

The graphical presentations show, among other things, that the analysed time span could be roughly viewed in terms of the pre-Internet and the Internet era, which consequently implies that the publication of papers in the English language increases accessibility of the journal on the whole, thus contributing to the inflow of new ideas and new vocabularies connected therewith. As for the pre-Internet era, this is evidenced firstly in the usage of non-standard English terms in the translations of titles from Croatian into English, e.g. the terms such as *motorics*, *sports gymnastics* and *sports recreation*, to name only a few. These terms are either *ad litteram* translations of terms used in Croatian (*sportska gimnastika* and *sportska rekreacija*) or ‘copies’ of terms used in some other languages, e.g. *Motorik* in German. The usage of such non-standard English terms disappears after the onset of the Internet era and upon gaining access to other academic publications, which resulted in the usage of correct, already established and widely used terms. Secondly, linguistic evidence shows that the Internet era had another impact on scientific discourse used in the journal *Kineziologija/Kinesiology* – terms used in other cultural surroundings in other parts of the world affected the structure of the discourse to a certain extent, thus warranting the understandability of terms and underlying concepts and complying with the demands of contemporary scientific writing in the field.

The implications of this research may be said to yield the following conclusions. Firstly, the titles of papers published in an academic journal do reflect the body of research into the subject matters of

interest for the science in question. Secondly, the body of research produced the body of knowledge, since everything that exists extra-linguistically has to be translated into a codified system which conveys meaning in that it operates both on syntactic and on semantic levels. Language is sometimes taken

for granted by many and the size of its relevance may remain unknown to all who fail to grasp its substance. However, from the point of view of the philosophy of science, language is the means, i.e. the medium which provides contact with reality.

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STVARANJE ZNANJA U KINEZILOGIJI PROMATRANO KROZ NASLOVE RADOVA OBJAVLJENIH U AKADEMSKOME ČASOPISU – LINGVISTIČKI PRISTUP

Cilj je ovoga istraživanja bio pokušati prikazati stvaranje znanja u kineziologiji na temelju engleskih naslova radova objavljenih u akademskome časopisu. Uzorak se sastojao od 781 naslova članka objavljenih u časopisu *Kineziologija/Kinesiology* od 1971. do 2011. Popis leksičkih jedinica koje su u ovome istraživanju poslužile za dijakronijsku i kontekstualnu analizu stvaranja znanja vezanoga za znanost o ljudskome kretanju sastojao se od sljedećih jedinica: *structure, structural; movement, motion, motor, motor ability; activity, exercise,*

sport; change, transformation; influence, impact; and effect, effectiveness. Analiza je pokazala da se navedeni nazivi pojavljuju u brojnim kombinacijama i kontekstima, tj. linearnim kombinacijama riječi te da time ukazuju na njihova značenja i odražavaju provedena istraživanja, a time se posljedično oblikuje znanje u analiziranoj znanstvenoj disciplini.

Ključne riječi: *znanstveno znanje, epistemologija, ljudsko kretanje, jezik*