

Children with coordination difficulties: issues on conceptualising the developmental coordination disorder

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Abstract: The investigation of the nature of coordination difficulties in children resulted in the identification of Developmental Coordination Disorder (DCD). The lack of consensus on the nature and the mechanisms of DCD might not be due to the apparent resilience of the disorder to scientific endeavours. On the contrary, the purpose of this study is to present a thesis by which the problem resides on the definition of DCD and on the selection of samples found in studies that do not distinguish clinical criteria from research criteria. In the conclusion, three steps for characterizing DCD are presented.

Keywords: Coordination skills disorders. Children. Developmental disabilities.

“Many theories have been formulated to explain the disorder, confirming the old medical aphorism by which the abundance of hypothesis is synonymous to ignorance.”

Synclair, M. p.12

1 INTRODUCTION

For many people, when they think of body movements they see extremely skilled individuals with outstanding performance, i.e. dance and sports professionals. However, the most prominent feature of body movement is not exceptionality, but rather ubiquity. The large majority of the

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population is capable of performing a great number of movements with relative competence to carry out routine activities. These activities go from things like getting dressed and eating, to occupational ones, e.g. driving a car, working with computers and registration machines, etc. and recreational activities, e.g. playing games, trekking, etc.). Many of these activities are acquired with little or no formal instruction.

In the face of this ubiquity, the medical and academic community noted that certain individuals, particularly children, find it is extremely difficult to perform routine activities. Individuals with this type of shortcoming have poor coordination skills compared to most of the population, considering not just the performance expected for each age bracket. At the same time, they do not have the classic neurological signs and their condition is resilient to routine interventions. This condition is characterised by difficulties organising and producing movements and the causes of these shortcomings are so far unknown. For this reason, the academic and professional community, e.g. physical educators, doctors, occupational physiotherapists have acknowledged since 1980 that there is predominantly, a coordination disability and that it has a negative impact on the individual's overall development. This condition is called Developmental Coordination Disorder (DCD) by the American Psychiatric Association (DSM – IV (2002) and Specific Coordination Disorder by the World Health Organisation (WHO) CID-10 (1993).

Despite the many research efforts to explain and intervene with this problem, advances in both cases have not been encouraging. There are more hypotheses explaining what would be reasonable, but the effort to resolve the problem via intervention in general does not yield the expected successful result. In both cases, research and remedial actions are attributed to the heterogeneous nature of this population. However, there is yet another underexplored cause in relation to the classification or categorisation criteria adopted to

identify children with coordination deficiency. Originally, these criteria that were originally created for clinical purposes would not be adequate for research purposes, especially in relation to the formation of experimental groups. Consequently, selecting experimental groups would yield great internal variability, which would limit interpretation, comparison and the generalisation of accumulated research findings. Hence, heterogeneity attributed to DCD (condition) could actually reside in the categorisation criteria to identify it. The purpose of this study is to present the thesis that Developmental Coordination Disorder lacks valid criteria to define it as a research tool, which has a negative impact on investigations into the nature of this disorder and on the development of intervention methods.

2 THE BIRTH OF A DEVELOPMENT DISORDER

The history of the concern with children with coordination shortcomings is long and diverse. Since the beginning of the last century, researchers from a broad spectrum of fields of knowledge and professional fields, from Physical Education to Medicine and Psychology have identified and investigate coordination problems in children.

Hulme and Lord (1986) reviewed two references about the phenomenon in the first half of the last century. Collier¹ was the first to coin the term ‘congenitally maladroit’ in the early twentieth century to refer to a particular group of children that showed distinctive coordination problems, where the cause was unknown. According to Orton (1937), who reported on some children with coordination maladroit (compromised locomotor skills and to handle objects) there is no neurological condition.

The consequences of having this disorder have also been speculated, at least empirically, since the early twentieth

¹ Non-revealed source

century. The description of Kien, a character in Elias Canneti's *Die Blendung* (The Tower of Babel or Auto-da-Fe in the English translation (1935) is worthy of notice:

At the second half of the visiting time Kien was moaning in apparently forgotten old pains. Since his childhood, his legs had never been steady. In fact, he never learned how to walk properly. In the gym class he'd fall off the bar. Despite the length of his legs, he was the worse racer of his course. His teachers believed his physical impairment went against nature. Kien was the best student in his class in all subjects, thanks to his excellent memory. But what good did that do? Actually, nobody respected him because of his pathetic body. They would trip him and he would invariably fall. In the winter he would be made into a snowman, until his body went back to its normal thickness.

In December 1962, the editorial of the British Medical Journal was dedicated to discussing the origins or causes of coordination difficulties faced by some children in the school milieu. They raised the hypothesis that such problems were caused by a primary medical condition. The editorial pointed out to four independent studies that suggest there is a syndrome with unknown causes. According to this publication, Annell (1951; 1959), in Switzerland described a group of children considered coordination maladroit. They were characterised as unskilled in performing functional movements (particularly in relation to writing), playing games and engaging in physical activities, as well as having problems with concentrating. In relation to the nature and prognostics of the problem, Annell speculated that it was caused by maturational issues and that recovery would not be spontaneous. Unfortunately, presently one knows that this hypothesis was not confirmed. There is a report from Holland Prechtel and Stimmer (1962) describing a group of maladroit children, where they displayed not only difficulty in concentrating but also a series of coordination problems. The

editorial also mentions a study from the United Kingdom where researchers Walton, Wellis and Court, in 1962, describe a group of five coordination maladroito children. The authors carefully studied this group and identified the following features: difficulty to perform a series or routine coordination actions, e.g. eating, getting dressed, walking, etc.; perceptive-coordination problems, e.g. tasks that requires fitting pieces, simple copying activities; and tasks requiring coincidental timing, e.g. catching a ball, to mention but a few. The editorial also pointed out to a conference on child neurology sponsored by the Spastics National Society, in 1962, where Illingworth² described (and also showed a film) of a group of children referred to get medical assistance due to their outstanding coordination shortcomings, despite contrasting evidence of normality, i.e. walking normally, normal or above average intelligence quotient). The journal concludes making clear the concern that the medical and educational milieu is acknowledging this syndrome, suggesting the urgent need for studies that address this population.

Currently, this problem is acknowledged in medical references and is classified in two of the most important reference systems. According to APA – DSM – IV (2002, p. 88), DCD is diagnosed as follows:

Criterion A. The performance of routine activities requiring coordination is substantially below the expected level, considering the subject's chronological age and recorded intelligence. Clinical conditions can appear in outstanding delay to attain the cornerstones of coordination, e.g. crawl, walk, sit; propensity to drop objects, clumsiness, weak performance in sports or poor handwriting.

Criterion B. Disturbances under Criterion A interfere significantly in school productivity or routine activities.

² Non-revealed source

Criterion C. Disturbance is not due to overall medical condition, e.g. brain palsy, hemiplegia or muscular dystrophy, nor does it meet criteria of Development Invasive Disorder.

Criterion D. Mental Retardation causes coordination difficulties to exceed those associated to this disorder.

The term ‘disorder’ is suggested as a means of differentiating this type of medical disorder to avoid even greater problems ensuing from expressions such as ‘illness’ or ‘infirmity’ (WHO, 1993). WHO admits that it is not a precise term, but also points out that there is a group of symptoms or behaviours clinically identified, associated in most cases with the outstanding difficulty in performing routine coordination, occupational and recreational activities.

The term ‘development’, on the other hand, shows that the problem appears in the early years when coordination skills are acquired, which impacts the whole subsequent development process, i.e. the continuous specialisation and diversification of these skills (RISPEN; VAN YPEREN, 1998).

The term ‘coordination: is used to identify the core of the disorder, i.e. it tries to explain the difficulty in organising and performing skills. Coordination, in its turn, can be construed as the ability to have control over multiple relations that occur between the elements that comprise the coordination system. According to Bernstein (1996), the coordination system that controls the body is a complex and multi-faceted problem, which even in a limited version cannot be resolved by the most cutting-edge technology currently in place. This problem became known as the problem of the degrees of freedom. According to Bernstein (1996, p. 41): “Coordination is having control over a high number of degrees of freedom of the locomotion system, i.e. to turn it into a controllable system.”

In the specific case of DCD, the term denotes that there is a problem in developing this skill, which would impair the continuous reordering of elements that comprise the coordination system at the intra-articular, intra-member and inter-member levels. Individuals that suffer from this disorder are not characterised by the manifestation of uncoordinated (without coordination) movements, but rather by a problem in regulating or controlling coordination, taking into account restrictions related to the environment, the body and the coordination action itself. A factor that casts doubts on DCD is that it presupposes a development problem where none is actually diagnosed. This disorder is presupposed because the child's behaviour falls short of what is expected for his or her age. In other words, a normative rule is used to say that it does not fit under the norm of what is "abnormal", i.e. with "disorder". Longitudinal studies of children with DCD are rare. Hence, it is not possible to know if coordination difficulties arise because development was affected or if when coordination difficulties exist, it hinders the development of coordination, which would cause even greater coordination problems in a positive feedback mechanism.

Before any phenomenon can be understood it must be able to answer three questions: What is it? Why is it? What are the possibilities? (LACEY,1998). When these questions are applied to the DCD study, the first question refers to the characterisation and identification of the disorder; the second refers to the nature, and the third focuses on its development and intervention. The relationship between defining the object (in this case the disorder), explaining its nature and possibilities of intervention is direct. Lacey (1998, p. 16) affirms: "Depending on how the object is assessed, the answer to the questions – What is it? Why is it? What are the possibilities? – takes on different forms and reflects different interests."

According to the logical reasoning proposed by Lacey, there are some difficulties in characterising the disorder from the conceptual and theoretical point of view. In this sense, it

should be noted that Hopkins (2005) considers some points as nuclear in characterising development disorders. One refers to the notion of ‘normal development’, which has changed with time and is different between cultures. Another point relates to establishing the limits of development with disorder and development without disorder, which is performed based on fallible deviation indicators set up from a set of idealised and arbitrary norms. If that were not enough, specifically in the case of DCD, Hopkins mentions two additional problems: (i) the disorder’s comorbidity (it generally comes with other disorders); (ii) descriptions focus on common traits regardless of the age bracket. In the case of the latter, disregarding the age factor implies neglecting the passing of time and changes ensuing from it, where the quest to identify the disorder becomes ‘non-developmental’. But there are yet other factors that will be addressed further on in this study.

3 A MISUSED DEFINITION

The categorisation of DCD and the possibilities of applying it are aspects not always taken into account by researchers that focus on this problem. For research purposes, particularly in terms of selecting subjects for an experimental group, criteria used to identify this medical condition (represented both in WHO’s CID-10 as in APA’s DSM-IV da APA) are not satisfactory. Cermak, Gubbay and Larkin (2002, p. 7) show clearly the purpose and the original scope of the DCD category:

DCD can be perceived as a temporary term used by professionals and researchers to reach a deeper understanding of this complex condition. The advantages of using this term are more practical than theoretical. It is not tainted by historical controversy, such as dyspraxia nor does it implicitly presuppose an ethyology, which occurs with the expression ‘minimal brain dysfunction. There is a practical consequence that stems

from the acknowledgement and diagnostics criteria provided by APA (1987, 1994). In countries with a public health system in place, children diagnosed with DCD are eligible to government financial assistance to fund their treatment.

In the same study, Cermark, Gubbay and Larkin (2002, p. 22) affirm that:

Developmental Coordination Disorder is an obscure term that lacks accurate definition. It can be used to define a broad spectrum of moderate coordination problems that researchers and professionals strive to fine-tune.

Criteria used to diagnose DCD have been useful in acknowledging this condition in order to put in place a multidisciplinary effort to investigate the phenomenon (the creation of an International DCD Research Society) and communication among researchers. However, it can be considered an obstacle to building and validating identification tools, understanding the cause or causes of CDC, comparison and generalisation of results, and even the search for therapeutic solutions for this type of developmental disease. Before proceeding to the analysis of this study, a few aspects related to the categorisation and classification of objects should be noted.

The ability to classify objects into categories is a basic characteristic of the brain and refers to the process of grouping objects within a generic representation. This presupposes a certain purpose and criteria in which the objects are grouped.

Investigation carried out by cognitive psychology on the categorisation of the phenomenon points out to at least two forms of classification of objects (HAHN; CHARTER, 1997). The first form is based on the principle of similarity. This means that categorising an object involves assessing its similarity to another model object (prototype) or a group of model objects. The second form of creating categories is not a

direct reference to the principle of similarity, but rather is based on theoretical definitions and assumptions. It is called the classical vision and presupposes that every category is defined by a group of necessary or sufficient characteristics or properties (LAMBERTS; SHANKS, 1997). The classification process can be described as the investigation of an object in the attempt to determine if it has characteristics considered necessary and sufficient in order to belong to category X. Manuals CID-10 (WHO, 1993) and DSM-IV (APA, 2002) try to follow the second classification strategy named classic but with clinical rather than research purposes.

In the view of science, the classification of objects has three main purposes: (i) Organisation carried out in a manner that eliminates the need to apply models and concepts for specific objects, which in the face of a great variety of existing objects in any given field is a critical necessity. (ii) Generalisation carried out in a manner that identifies unity in apparently different objects, which gives margin to build theories and to deduct laws that are applicable to a great range of phenomena. (iii) Application to enable that the knowledge that is generated is valid in the face of the nature of the object, giving margin to developing processes that change reality based on this knowledge.

The degree of success in reaching these purposes is directly dependent on the maturity of the categorisation and researcher's understanding of the limits of the categorisation he or she uses. A category is not static, which after it has been defined remains unchangeable. Based on the initial determination, often supported by vague and superficial criteria, the scientific investigation process can be started, and consequently, may change criteria initially determined, whereby the category becomes more valid and functional.

As previously addressed, the purpose proposed by the classification system must be taken into account, and in the medical field this implies making a distinction between research purposes and clinical purposes. For research

purposes, the extreme end point of any distribution is chosen with little or no concern for the limitation of category examples. In other words, the purpose is to restrict the category as much as possible, i.e. with the greatest degree of homogeneity as possible for clinical purposes the practical considerations can have priority over scientific considerations. The guiding outlook for clinical classification is intervention or providing services for the population. Hence, in the clinical purpose category that aims at addressing all the examples, homogeneity is secondary.

In the scientific study of any behaviour, categorising this type of behaviour (classic approach) is a great step. Only after this category has been determined will it be possible to address it experimentally, i.e. to manipulate it in order to attempt to explain its nature and dynamics. Investigating DCD based on obscure and vague criteria could lead to mistakes. Postulating mechanisms and speculating on the causes without previously building a precise definition for the phenomenon are non-conducive to understanding this disorder. Under these conditions the communication between researchers will be compromised rather than facilitated, and the generalisation of findings will generate controversy and confusion rather than increase its scope. Hence, it could be that the progress in understanding and intervening with DCD is “timid” due to the classification system for research purposes being out of step.

It has been acknowledged that part of the drawback of the investigation and intervention on dysfunctions displayed by individuals is due to inaccurate concepts associated with the dysfunction (AMIRALIAN; PINTO; GHIRARDI; LICHTIG; MASINI; PASQUALIN, 2000). Understanding the nature of a disorder could benefit from the analysis of three concepts ensuing from the classifications of WHO, e.g. in the International Classification of Impairments, Disabilities and Handicap. Amiralian *et al.*, 2000, based on this classification presents the following definitions:

Impairment: loss of or abnormal structure or psychological, physiological or anatomic

structure, temporarily or permanently. This includes the occurrence of anomaly, defect or losing a limb, organ, tissue or any other body structure, including mental functions. It represents the exteriorisation of a pathological condition reflecting an organic disorder and/or an organ dysfunction.

Disability: restriction resulting from impairment in the ability to perform a so-called normal activity. It is the direct consequence of or an individual's response to psychological, physical, sensorial or other impairment and reflects on personal dysfunctions, activities and behaviours that are essential to daily life.

Handicap: loss to the individual ensuing from impairment or disability, which limits or hinders the performance of his or her role according to age, gender, social and cultural factors. It is characterised by the discordance between the individual ability to perform and peer-expectation. It represents the socialisation of impairment and is related to hindered survival skills (AMARALIAN et al., 2000, p 98).

Impairment always refers to a given condition or dimension such as eye-sight or hearing impairment. Disability is characterised by the limitation of doing something, i.e. seeing or talking. Handicap is manifested depending on the features of the physical and social environment that can hinder or help and individual to perform in his or her environment. For example, the physical environment can decrease the handicap of a visually impaired individual when there are marks and variations on the ground where he or she walks to help them find their way. On the other hand, the social environment can worsen the handicap of an individual with hearing impairment when he or she has to live with people that are not familiar with sign language. In the case of DCD, both disability and handicap have been

widely discussed (LOSSE; HENDERSON; ELLIMAN; HALL; KNIGHT; JONGAMANS, 1991), however, the characterisation of impairment is still debatable.

It is recommended that future studies should identify individuals with DCD for research purpose in three stages. The two initial stages have already been proposed by Wright and Sugden (1996). In this study the authors propose the existence of two consensual criteria to identify DCD, both suggested by WHO (1993) and APA (2002) in their manuals (clinical). One criterion is that the child clearly performs poorly in relation to performance of the accepted norms of behaviour of a child in that age bracket (late to reach coordination markers). This condition should be evaluated by normative standardised tests. Another criterion notes that the difficulty observed has a negative impact on the child's daily life, corresponding to a disorder.

Although it is not the focus of this study, it should be noted that most studies that are published in regards to the latter criterion fail to address how coordination difficulties can impact a child's life (GEUZE; JONGMANS; SCHOEMAKER; SMITS-ENGELSMAN, 2001). One could speculate that this is due to the concept of health adopted by medical researchers. The concept of health adopted is a synonym of functional normalcy. Hence, health is perceived and measured exclusively based on statistical means (for DCD average score of coordination tests).

Hence, the difference is mistaken for pathology. If each and every anomaly were classified as pathology, athletes (with physical differences), musicians (morphological brain peculiarities), etc. would be part of that list of illnesses. The perception of health that supports the concept of disorder is other, as explained by Caponi (2003):

The starting point of a disorder is not determined by the so-called statistical means or confidence intervals but rather by the

difficulty the body has to respond to environment imposed demands. (CAPONI, 2003, p.118)

Thus, in order to be classified as an individual with DCD, standard deviation is not enough. The individual must list the suffering ensuing from the difficulty in responding to environment-imposed demands and be able to see the ensuing impact on a daily basis. It should be noted that in the long run such diagnostics are based on the notions of normality applicable to a certain group of individuals. As pointed out by Hopkins (2005), the concept of normalcy could be the result of different interpretations. Hopkins (2005) identified four notions based on the study by Offer and Sabshin (1974), where normalcy is the means (the most common interpretation) based on performances relating to normative age standards; normalcy being health based on clinical diagnostics of the lack of hindrance or incapacity; normalcy as the utopic vision based on what is valued by a certain culture or society; normalcy as a transaction based on how an individual influences other people and is influenced by them.

The third stage proposed in this study adds a new categorisation process within the sample initially identified in the two previous stages, where subjects are selected for research purposes. In this stage individuals are now sub-classified in relation to their particular deficits based on subjacent processes to the coordination action. This means formulating one or more impairments that would cause the disabilities described for DCD. Under this formula, there is also the hypothesis of possible pathologies. The construct that could be used in this stage stems from the modular approach. This approach ensues from the classic proposal presented by Fodor (1975), whereby the evolutive process of the brain would be composed of relatively stable modules that would perform specific functions independently. One module does not interfere with the performance of the other and would develop independently.

An example of the modular approach in coordination actions refers to the study by (1993) that purports that there are at least three processing modules subjacent to the coordination action, e.g. temporal organisation, force control and coordination sequencing. The temporal organisation module comprises two types of timing. The first one refers to elements that comprise an action that should occur with each other. The second refers to the action's timing in relation to the external timing of events external to the individual. The force control module would involve the ability to calibrate the activation of the muscular system in making an effort to move and especially to handle objects. The sequencing module would comprise the action's organisational elements in a hierarchically organised plan, (simple elements making up complex elements) and their ordering, considering the events required for performing an action. For example, to open a door, a child must understand that the action involves turning the door-knob anti-clockwise followed by moving the door towards his or her body. These events will be translated into different body movements. Turning the door-knob can be performed by the supination of the left hand or the pronation of the right hand. In any event, the door can be moved by flexing the elbow and by the abduction of the arm in the case of the left hand, or by flexing the elbow and abducting by holding the abducted arm followed by turning the body clockwise in the case of the right hand. The modular model has proved to be empirically valid (PIEK; SKINNER, 1999; SVEISTRUP; BURTNER; WOOLLACOTT, 1992; WILLIAMS; WOOLLACOTT; IVRY, 1992; LUNDYEKMAN; IVRY; KEELE; WOOLLACOTT, 1991). In order to justify and strengthen modular assessment, it should be noted that it is common to observe different problems in children diagnosed with DCD. Some have locomotion problems, others have difficulty handling moving objects, and a third type in performing tasks that involve a combination of different locomotion and handling tasks. One of the challenges posed by the modular assessment is the selection of tasks that represent each module. In another study,

the objective was to characterise the temporal organisation in order to investigate the possible shortcomings of this module in children with DCD (DANTAS, 2006). This study aims at developing tasks that would encompass the organisation of all temporal organisation functions, such as the implementation and maintenance of a preferred/comfortable rhythm; rhythm awareness (originated from external events) and the ability to reproduce them in movements, synchronisation of the personal rhythm with an externally established rhythm; temporal coincidence between a personal event (the action of touching a target) and an external event (a ball touching a target). It is a study on the taxonomy of temporal organisation of coordination actions. The construction of these taxonomies is a fundamental stage to strengthen modular assessment. There is much to be done yet to build a consistent temporal organisation taxonomy, and to build taxonomies for strength and sequencing modules.

Based on the repertoire of disabilities presented by individuals diagnosed with DCD, there is evidence of deficits or impairments under the three modules. From the anatomical and structural viewpoint, these modules are associated as follows: Temporal organisation module – cerebellum; strength control module – basic lymph nodes; Sequencing module – coordination cortex (SVEISTRUP; BURTNER; WOOLLACOTT, 1992). Under this association, it is possible to carry out a comprehensive investigation on the locus of possible structural damages that characterise the level of pathology.

If these procedures are adopted, future studies should initially seek to identify children with coordination difficulties by applying a coordination test and behavioural analysis of children's on a daily basis. The existence or not of the impact of the coordination condition in the child's routine (identified via questionnaire, interview and direct observation) would be particularly interesting under this orientation. Then, the diagnostics of a child with DCD would be based on existing criteria that is prescribed in the APA – DSM – IV (2002)

manual. With a sample of the identified DCD, difficulties are characterised with the purpose of classifying individuals under the so-called DCD subtypes, as proposed by different studies (SUGDEN; WRIGHT, 1998; HOARE, 1994; DEWEY; KAPLAN, 1994; MACNAB, MILLER; POLATJKO, 2001).

The identification of subtypes corresponds to the third stage preconized under this study. The proposition is to focus on subtypes based on the modular approach, as it would provide input for a theoretical investigation, i.e. mechanisms subjacent to the DCD condition. Hence, in the last stage, subgroups (or cluster) would be formed within the sample diagnosed with DCD, e.g. individuals that notably have difficulty to perform temporal-based tasks. This differentiation can highlight the complexity involved in categorising dysfunctions, denoting that the greatest difficulty in studying development disorders could be in the conceptualisation stage.

The proposition for the third stage could lead to advancements in “why is it?” stages (the nature of the problem) and “what are the possibilities” (intervention) in relation to DCD. These issues would refer not to the individual with DCD but to those that display problems with the temporal organisation of the movement (timing). The objective of this categorisation would enable gains in sample homogeneity, which is a basic condition for a successful causal investigation and for proposing more efficient intervention schemes.

4 FINAL CONSIDERATIONS

DCD is characterised by the impaired coordination function, which so far is not associated to any known abnormality with neuroanatomical physiological. It can be diagnosed via the identification of behavioural difficulties (disabilities) in typical coordination demands of the day-by-day and in recreational activities. Due to this disability, DCD is consequently manifests as a handicap to perform daily and school activities. Under this study, a critique was formulated

on the current thinking by which individuals are diagnosed and identified as subjects for disability-oriented research (obtained by applying normative tests such as MABC) and disadvantages (based on the check list for the same test and completed by teachers and parents). This procedure has led to a large heterogeneity of DCD-associated impairments. The profusion of impairments, instead of pointing to a complex disorder could be reflecting methodological and conceptual imprecisions. The proposal is to take both possibilities into account. The first one aims at subdividing individuals into groups with specific disabilities, in order to reach an impairment associated with inductive thinking. The second possibility proposes to subdivide individuals according to impairment using a theoretical construct called the modular approach. Hence, DCD could be understood from a deductive thinking, i.e. based on the hypothesis of how modules work, experimental tasks and conditions would be put in place to test the integrity of each together with conditions that test the tasks and integrity of each module.

Lastly, intervention should be further addressed. The work of professionals concerned with improving the life quality of individuals who suffer from disorders faces classification systems of impairment that focus on the individual's disability rather than exploring their potential and competences (MANOEL, 1986; 1996). Hence, the purpose of intervention for individuals with DCD would be to decrease the disadvantages they must overcome to live in a social environment. In other words, the intervention scheme should seek social ways (environment), individual ways (intention) and other ways that address imposed demands and help the individual to overcome disadvantages ensuing from a disability. In sum this scheme would focus on helping the individual to explore the flexibility between movements and environmental objectives that characterise every coordination-related activity.

Crianças com dificuldades motoras: questões para a conceituação do transtorno do desenvolvimento da coordenação

Resumo: A investigação da natureza das dificuldades motoras experimentadas por crianças resultou na identificação do Transtorno do Desenvolvimento da Coordenação (TDC). Pouco se sabe sobre sua natureza, embora sejam inúmeras as hipóteses formuladas sobre sua causa. O presente artigo defende a tese de que o problema reside na definição do que se entende por TDC e na seleção de amostras em estudos que não distinguem o uso de critérios clínicos dos critérios de pesquisa. Em conclusão, são apresentadas três etapas para caracterização do TDC.

Palavras-chave: Transtornos das habilidades motoras. Crianças. Deficiências do desenvolvimento.

Niños con dificultad motoras: cuestiones en el concepto del trastorno del desarrollo de la coordinación

Resumen: La investigación de la naturaleza de las dificultades motrices experimentadas por los niños ha resultado en la identificación de Trastorno del Desarrollo de la Coordinación (TDC). La falta de un acuerdo acerca de la naturaleza y mecanismos del TDC puede no ser restringida a una aparente resistencia del trastorno a las investigaciones científicas. El presente artículo postula la tesis de que el problema está en la definición acerca del entendimiento del TDC y en la selección de la población en estudios que no distinguen el uso de criterios clínicos de los criterios de investigación científica. La caracterización del TDC se presenta en tres etapas.

Palabras clave: Trastornos de la destreza motora. Niño. Discapacidades del desarrollo.

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