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Developmental Coordination Disorder: A Discrete Disability

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Abstract

Children with Developmental Coordination Disorder (DCD) have a motor learning disability that reduces their ability to interact with the environment and compromises their social and emotional development. Accordingly, these children should be given the extra assistance and consideration given to children with other learning difficulties. Even though many countries have well developed policies to support students at educational risk, children with movement difficulties are not widely considered to be members of this category. This paper argues for a change in education policy and practice in order to better support children with DCD or Motor Learning Disability (MLD). Improved teacher education practices, community education of professionals and parents and a greater interaction between parents, teachers and therapists will enrich the educational experiences of these children. A first step, however is to acknowledge that DCD is a motor learning disability (MLD) and consider adopting this alternative term. While focussing on the Australian perspective, this paper has implications for education policy and practice in all countries.

Children with Developmental Coordination Disorder (DCD) have a learning disability that impinges on their ability to learn and perform daily actions such as tying shoe laces and buttoning clothes, school based activities such as writing, and playground activities (Brown & Prideaux, 1988; Cratty, 1979; Gubbay, 1975; Kaplan, Wilson, Dewey, & Crawford, 1998; Morris & Whiting, 1971; Smyth & Anderson, 2000). DCD is defined and described in DSM-IV (APA, 1994). However, while it is the term most commonly used to describe these children, it can be misleading as it implies that the condition will disappear with age. In fact these children have a motor learning disability (MLD) that reduces their ability to interact with the environment and compromises their social and intellectual development. Unfortunately, a diagnosis of DCD is not usually thought to be a learning disability, rather, they are seen as awkward, clumsy or even lazy and consequently do not receive the educational, social and emotional support that is needed. Support from many sources, particularly educational sources is more likely to be offered when a child is considered to have a learning disability.

Most definitions of learning disabilities do not consider poor coordination to be a discrete learning disability. Myers and Hamill (1990), for example, describe learning disabilities as “a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning or mathematical abilities” (p. 28). Two issues have contributed to the delayed recognition of MLD. The first issue is the confounding between coordination difficulties and learning disability. Studies seeking to identify homogeneous subtypes of learning disabilities often overlook MLD as a discrete disorder (Kavale & Forness, 1987). Instead, the movement difficulty is seen as a common characteristic of other learning

disabilities. Poor coordination is thought to contribute to the learning disability (Roach & Kephart, 1966; Frostig, 1970) and not to be a discrete learning difficulty (Wedell, 1970). However, there are clear cases of MLD. It is seen in children who have excellent intellectual ability and no other comorbid conditions (Symes, 1972).

The second issue that has curbed recognition of MLD is the assumption that children grow out of their movement difficulties. These difficulties are regarded as a motor delay. This attitude still limits the understanding of many professionals (Fox & Lent, 1996). Motor delay is not compatible with the idea of a learning difficulty that is responsive to appropriate educational strategies.

The purpose of this paper is to argue that some children with DCD have a motor learning disability and the condition should be given the same recognition as other specific learning disabilities. Renaming the condition commonly known as DCD to Motor learning Disability (MLD) would be a first step, and this term is adopted for the rest of the paper. This concept is not new but it is not widely acknowledged. Here we extend the argument by emphasizing the implications of having MLD for the physical, social, and academic aspects of daily life. In particular we address the issue of educational support for children with MLD. This support needs to encompass a change in educational policy and practice. We need better community education of professionals and parents so that there is early identification and improved social support for these children. Teacher education at the tertiary level needs to be more inclusive so that we have knowledgeable teachers working with these children. Inservice programs should be provided for teachers already in the field. For the child, in addition to individual teaching, there

needs to be improved physical education teaching in pre-primary and primary education to facilitate motor learning, and avoid some of the secondary problems that arise in the social and academic domain during these early years. Additionally better interaction between parents, teachers, and therapists will enrich the school experience for the child with MLD. Finally we conclude that these improvements are contingent on widespread recognition of this learning disability and changes in public policy.

Movement Problems as a Learning Disability

For many years clinicians, educators and theoreticians have recognised that there are children and adults with a motor learning disability (Cratty, 1979; Hall, 1988; Haubenstricker, 1982; Keogh, 1982; Lafuze, 1951; Larkin & Hoare, 1992; McKinlay, 1988; Morris & Whiting; 1971; Wall, Reid, & Paton, 1990). Orton (1937) indicated that some children not only have difficulties learning complex body movements but also movements necessary for speech and writing. Keogh (1982) used the term movement learning disability to describe children without a diagnosed neurological disorder and with average intelligence but unable to perform motor skills to a level expected of their age. Haubenstricker (1982) also identified a group of children “whose learning disability is manifested primarily in inadequate or inappropriate motor behavior” (p. 41). As with all learning disabilities, MLD is a heterogenous disorder (Hoare, 1994; Miyahara, 1994; Wall et al., 1990). While there is some precedence for the acknowledgement of this condition as a learning disability, the current term agreed upon by professionals working with these children is Developmental Coordination Disorder (Polatajko, Fox, & Missiuna, 1995). This term does not have the same implications for policy or practice.

As will be noted later in the paper, a diagnosis of DCD is not sufficient in many countries, including Australia, to qualify for additional educational or remedial support.

Physical Implications of MLD

These children have difficulty performing many motor skills that are important for everyday living. There is general agreement that they have a motor learning difficulty. Their movements are not simply unskilled they are inefficient. They lack control and rhythm, and simple fundamental motor skills such as jumping, running, throwing or catching are difficult. Learning how to move well requires much more time and effort (and effective teaching) than for well coordinated children. With increasing age, the demands of tasks and activities change. Play becomes more complex, and games are more open and challenging. More information, therefore needs to be processed and responded to in a variety of ways. Because movement is difficult for these children and they struggle to respond quickly and appropriately to environmental information, many choose to withdraw from movement opportunities. Consequently they do not develop the broad repertoire of skills that many of their peers acquire.

The difficulty of performing physical activities has implications for growth and development. The child who withdraws from motor activity does not have the same opportunities for development of the musculo-skeletal and cardiorespiratory systems and subsequently general fitness is compromised (see Hands & Larkin, 2001 for review). The long-term consequences of this inactivity, although well documented, has yet to be formally linked to DCD/MLD.

Psycho-social Implications of MLD

These children also suffer in other domains. Many studies have shown these children have low self esteem and social effectiveness (Losse et al., 1991; Rose, Larkin, & Berger, 1994, 1997; Symes, 1972) and their participation in social physical play may be limited (Smyth & Anderson, 2000). As these children get older, their problems do not necessarily reduce (Cantell, Smyth, & Ahonen, 1994; Kirby & Drew, 1999). Older children with movement difficulties usually view themselves more negatively than younger children (Cratty, 1979). Longitudinal research indicates that children with motor dysfunction are at greater risk of anti-social behaviours in early adulthood, particularly if they have a comorbid disorder such as ADHD (Hellgren, Gillberg, Bagenholm, & Gillberg, 1994; Rasmussen & Gillberg, 2000).

Academic Implications of MLD

Longitudinal studies have shown that many children with MLD fail to achieve their educational potential (Cantell et al., 1994; Hellgren, Gillberg, Gillberg, & Enerskog, 1993). Apart from the relationship between cognition and action, there are other reasons why this might occur that are directly related to the physical and social limitations of MLD. The MLD can contribute to poor performance or failure in the academic domain. For example, the early school years will be extremely difficult for a child who has difficulty learning manipulative skills. McHale and Cermak (1992) explored the time that children spend with fine motor skills during the early school years. Up to 60% of the children's time was spent on these skills with the majority of the time spent on writing. A child who is experiencing difficulty learning and performing these motor skills will be exposed to frustration and early failure in the school system. To avoid this negative introduction to school life there must be recognition of the motor problem, and provision of social and educational support to allay the frustration.

The increasing recognition of the importance of integrating learning areas in education and the concept of multiple intelligences (Gardner, 1983) has meant that more teachers are placing a greater emphasis on the development of kinesthetic intelligence when planning and implementing learning experiences. Movement is a powerful learning medium for many children (Frostig, 1970; Humphrey, 1992). In particular this method of learning has been useful for children with other types of learning difficulties. However for the child with MLD, this teaching medium can contribute to further problems as the child does not have the basic movement skills available. In fact the child will be seriously overloaded as he/she attempts to cope with new information using a compromised motor system.

These children often experience continual failure in the classroom. For example, some children are unable to attend and sit quietly in a classroom. Children with MLD therefore require extra assistance and the same consideration from their teachers given to children with other learning disabilities. The reduced involvement in learning opportunities and lack of practice impacts on learning and skill acquisition and therefore teachers need to carefully plan the child's teaching and learning program.

Current Educational Policy

Estimates of the number of children with MLD in Australia range up to 15% (Larkin & Hoare, 1991; Larkin & Rose, 1999) indicating that every teacher might have a child with MLD in their classroom. This estimate is similar to those for children with literacy or numeracy difficulties (Rivalland & House, 2000). Many education systems, however do not as yet

recognise that children with movement difficulties probably have a motor learning disability. Children considered to be at risk are usually the ones who are experiencing difficulties with literacy or numeracy.

The lack of recognition of MLD at the system level can be attributed to a number of factors. First, no known specific disability classification exists for children identified with MLD (Ulrich, 2000, personal communication). At the moment, for a child to receive additional educational support or funding, they need to have a disability classification. For example, in Queensland, Australia, children in state schools get special support only if they are category 6 and 7. These categories equate to disabilities such as severe cerebral palsy, intellectual disability, and legal blindness (O'Brien, 2000, personal communication).

Secondly, there is no definition of learning disability that is widely agreed upon and many terms are used in the literature to describe children with learning disabilities. These include 'learning difficulties', 'at risk', or 'with special needs'. In Australia these terms have different meanings and consequences between schools, school systems and between states (Rivalland & House, 2000). For example, in some systems each school is expected to develop its own policy, process, procedure, and practice with respect to children with learning difficulties, whereas schools in other systems are given more specific direction and support. Most Australian education systems have adopted the definition put forward by the Department of Education, Training and Youth Affairs. It describes children with learning disabilities as "a heterogeneous group of students who have significant difficulties in the acquisition of literacy and numeracy and who are not covered by the Commonwealth's definition of a student/child with a disability"

(Louden, 2000, p. 4). Not unexpectedly, this definition contains no reference to movement difficulties. The state of Western Australia has adopted the term 'students at educational risk' which is more inclusive and requires schools to consider the possibility that all children may be at risk. Schools are asked to identify the barriers to a child's learning and to plan programs that address each child's needs. In this instance, children with MLD are not explicitly excluded, nor are they explicitly included.

The variability in the definition of learning disabilities contributes to the third factor which is the variability in identification procedures used for learning disabilities. A range of standardised and informal early identification methods is used. The more common method involves mapping a child's development against continua or individual profiles. Once again, these strategies are primarily targetting children with literacy and numeracy difficulties. Early identification strategies for children with MLD are inadequate (Hands & Larkin, 1998), even though research has shown that the early identification and subsequent implementation of remediation will reduce the severity of the consequences (Short & Crawford, 1982). There are a few Australian screening tests for early identification (see Hands & Larkin, 1998 for a review) and one screening test to identify 5- to 7-year-old children with gross motor coordination difficulties (Larkin & Revie, 1994) has been made available to all teachers in Western Australia.

A fourth reason for the lack of recognition of MLD in the education system is that political and educational support for teachers and programs in the health and physical education learning area is minimal. In this learning area, however, the difficulties experienced by children with MLD will be most evident, and therefore it is very important that they are given social,

emotional, and educational support and encouragement. Although physical education is a mandated learning area in many countries, the time and money allocated to the area is often less than other subjects. Additionally development of the area of adapted physical activity has not proceeded in any systematic way in Australia, consequently there has been no concerted effort to address the issue of MLD.

Teacher Education

Preservice education courses in Australian universities most frequently focus on literacy and numeracy difficulties. Further training in special education is often variable, and sometimes optional (van Kraayenoord, Elkins, Palmer, & Rickards, 2000). Consequently, many teachers lack knowledge or understanding about individual differences and ways to modify and adapt learning, teaching, and assessment material (van Kraayenoord et al., 2000). These strategies are important when dealing with children with MLD. Even with some preservice training in physical education, many generalist teachers in the primary sector lack the confidence and training to adequately teach in the learning area and incorrectly identify children in need of extra assistance (Revie & Larkin, 1993a). In Australia, only some primary schools have specialist teachers of physical education, therefore generalist teachers need some training in the physical education learning area in order to understand the importance of early intervention for children with MLD. Many teachers do not appreciate the impact of MLD on children and their families and are not aware of methods they can employ to support the child with movement difficulties. Research has shown that teachers can successfully identify then help these children when they are exposed to the appropriate experiences as student teachers (Revie & Larkin, 1993b).

Ideally, all primary schools should have a specialist teacher of physical education who has the knowledge and training to identify and support children with MLD and their classroom teachers. The learning area is highly specialised and the benefits to be gained by supporting system wide physical education specialists are wide spread and well reported (Blanksby, 1995). Generalist and specialist teachers would benefit from training in collaborative skills, as in many instances teachers can work together to optimise the learning experiences of children with MLD thereby minimising the potential for negative experiences.

Any additional pre service and in service training needs to support teachers in creating an optimal environment to maximise the child's opportunities to learn. Specific strategies that take into account the child's motor difficulty when planning the learning, teaching and assessment process are important. For example, when setting homework, teachers may require shorter pieces of work, work completed on a computer, or offering the child a choice of an oral presentation rather than a written one. When leading hand writing activities, teachers may need to provide additional support and time. After a group session, it may be a more positive strategy for the teacher to send the child with movement difficulties to the next task before the rest of the class. Teachers also need to recognise and deal with avoidance strategies used by children with MLD. These include off task, antisocial or uncooperative behaviour, particularly during physical activity sessions. At present many teachers inadvertently support the avoidance strategies by allowing the child with MLD to run errands, score instead of play and accept mild excuses for non-participation in classroom and playground activities.

Another important strategy involves teachers finding ways for the children to share concerns and then working to ease those concerns. For example the child with MLD is often excluded in the playground (Smyth & Anderson, 2000; Symes, 1972) and this social isolation can spill over to the classroom. The teacher also needs an understanding of the well documented concerns of parents of children with MLD (Chesson, McKay, & Stephenson, 1990; Stephenson & McKay, 1989; Stephenson, McKay, & Chesson, 1991) as well as the skills to listen to and liaise with these parents to provide an optimal learning environment.

Some teacher resources to support physical education teaching and learning programs are now available to teachers. While not specifically focussing on the child with MLD, these focus on the development of fundamental movement skills (for example *The Fundamental Movement Skill Teacher Resource*, EDWA, 2001) and include observational tools to evaluate movement. The development and publication of some of these resources has been funded by state government departments, an encouraging sign. Although primarily targetting children aged 4 to 8 years, many teachers find the tools valuable with older children.

Educational Support for the Child

Additional educational or financial support for the child with MLD is not available unless their condition is severe and usually accompanied by a comorbid condition such as ADHD, dyslexia, or speech dyspraxia. Clearly, unless MLD is recognised as a disability this situation will not change. Health professionals such as human movement specialists, occupational therapists, physiotherapists, and speech therapists are now offering direct services to schools for children in obvious need of support. However, unless teachers are educated to identify children

with MLD or whole school screening is implemented, many children in need of assistance will be overlooked.

In the USA, adapted physical education services are available for children who have a diagnosis from a doctor that their poor coordination is sufficiently severe to warrant a label such as Other Health Impaired. Children diagnosed with DCD by someone other than a doctor are not eligible for support. In 1977 a law was passed requiring that physical education be available to all eligible students with disabilities (Zhang, Kelly, Berkey, Joseph, & Chen, 2000). Unfortunately, many states are yet to support adapted physical education suggesting a failure to recognise the need for specialists to run remedial physical education programs.

Programs that provide intensive motor skill teaching are conducted in several states in Australia but are usually operated by private organisations, universities, or hospitals. In Western Australia, for example, the Department of Human Movement and Exercise Science, from the University of Western Australia runs an intensive motor skill teaching program for children aged 5 to 10 years of age. Some programs have begun in other states but discontinued because programs for children with MLD/DCD still rely on the knowledge and understanding of individuals or small groups of professionals. This haphazard method of dealing with children with a discrete learning disability that can have life long implications for health and learning must be redressed through policy changes in special education.

Community Education of Parents and Professionals

The frustration that parents experience obtaining help for their child with a motor learning difficulty is well documented (Chesson et al., 1990; Chia, 1997; Stephenson et al., 1991). In part this difficulty arises from a general lack of recognition of MLD. Parents know that their child has a problem but can't articulate the difficulty clearly enough for professionals who similarly lack specific knowledge of the motor learning difficulty (Fox & Lent, 1996). Research indicates that it takes an average of three and a half years for clear identification of children with motor learning difficulties and a number of children are never identified and consequently have to struggle through their difficulties alone (Dyspraxia Foundation, 1997). Parents in other countries have worked to develop their own support and educational groups (Stephenson & McKay, 1989) and internet communication is now filling a gap for those groups privileged enough to be a part of the new technology. The Dyspraxia parents site (<http://www.emmbrook.demon.co.uk/dysprax/>) provides an excellent example of this. More extensive community education for parents and professionals is still needed to break the barrier to early intervention for children with MLD and to reduce the stress and frustration experienced by parents.

Summary and Conclusion

Clearly further research is needed to better understand MLD, otherwise known as DCD, however sufficient evidence is already available to justify the formal recognition of the condition by education policy and practices. This first step may lead to early identification of children at risk and provision of movement enrichment programs for pre-primary children. The various education systems need to raise the priority of physical education and teaching practices need to offer a range of activities that cater for the needs of all children. Other school strategies that will

support these children include social inclusion programs for children, anti-bullying campaigns, and developmentally appropriate playgrounds.

To conclude, there is now sufficient evidence to show it is costly not to provide support for children with MLD. The implications of the motor learning disability can result in less than optimal performance in physical, social, emotional and academic domains that can span across a lifetime. For example physical inactivity, which is correlated with movement difficulties, impacts on lifetime health and well being and is very costly in the long term to the individual and the community. Children with DCD should be considered to have a specific learning disability, a motor learning disability. They should be supported in the educational sector in the same way as children with other learning disabilities. In particular educational authorities should take a lead in the provision of this support.

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