

Sprinkle & Hammond - Family Relationships of Motor Impaired Children

Family Relationships of Motor Impaired Children : A Case Study

Paper presented at

AUSTRALIAN ASSOCIATION FOR RESEARCH IN EDUCATION CONFERENCE

November, 1994. Newcastle, New South Wales

by

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ABSTRACT

Motor impairment influences the psycho-social outcome for children. With lowered perceptions of physical competence, heightened anxiety towards participation in physical play, sport and the social implications of being the last one to be chosen for teams and exclusion in the playground, the motor impaired child has a lower global self worth than their normal peers. Although this self assessment occurs within the school setting, each child arrives at Kindergarten with a self concept, a reflection of oneself and the relative competency in athletic, social and academic domains. From birth to age five, children have been given a picture of themselves by the people they spend the most time with - their families. This paper will address the possible influence of family relationships of motor impaired children. Are there common features in the relationships of families with motor impaired children? The behaviours and attitudes of parents and siblings to the motor impaired child may of impacted on the self-concept and self-esteem of these children. Multiple case studies explored the relationships of parents and siblings with the motor impaired child. From the parents perspective, has the motor impairment influenced and affected those relationships? There was a lack of parental play with the children, a lack of understanding of the deficiencies their children were experiencing, consequently a misinterpretation of the symptoms of this disorder and the relationships with siblings were also

affected.

INTRODUCTION

The incidence of clumsy children is between 5-15% of the population. For the average classroom, there will be approximately two to three children who are clinically clumsy, motor impaired, or uncoordinated (Larkin & Hoare 1991). The heterogeneous nature of clumsy children makes it difficult to give a concise definitive statement of the characteristics of developmental clumsiness. Commonalities do exist for clumsy children as they display normal behaviour traits, until they begin to walk, run, throw a ball, hold a pencil, write, draw, dress, and feed themselves (Larkin & Hoare 1991). Although they have no

apparent physical impairment, as soon as they start to move they become inefficient and appear awkward. Hulme and Lord (1986) have adopted a broader definition for clumsiness as impaired motor performance of a degree sufficient to interfere seriously with many activities essential to daily life, such as feeding and dressing, school tasks involving motor activity and physical play activities.

When first entering school, children's physical abilities are crucial to their adaptation and learning of skills used in drawing, writing and physical education. Sovik and Maeland (1986) recognised the start of school as a crucial period for the learning of motor skills, as it is during this period that motor dysfunction, impairment or coordination problems will be exposed. Not only is the motor impaired child's ability to adapt and learn basic skills at risk but clumsy children can be slower, less precise in their motor behaviour and indicate a higher frequency of learning difficulties with subsequent emotional problems due to frustration (Sovik & Maeland 1986). However, Larkin and Hoare (1991) suggest motor impaired children are not necessarily compounded with learning difficulties. School is also the setting for the informal play whereby clumsy children are often ostracised and the last one chosen for games (Adler 1981, Short & Crawford 1984).

Cermak (1985) viewed behaviours of clumsy children as often whiny, manipulative and somewhat adversarial, creating a negative self-concept and leading to a lack of emotional stability. Clumsy children have been observed as poorly behaved and less socially accepted than their well coordinated peers (Henderson & Hall 1982; Kalverboer, deVries & van Dellen 1990). Some clumsy children exhibit the behaviours of either class clown or bully to compensate for their feelings of inadequacy. Rose (1994) suggests that the negative behaviours of clumsy children are often misinterpreted by teachers and parents as wilful acts of disagreement when they are more accurately manifestations of motor impairment.

Clumsy children may experience frustration at home with the

difficulties of performing daily tasks. Dressing involves fine motor coordination with manipulating buttons, tying shoes and coordinating body segments to dress and perform daily care of their body. The dishevelled appearance of some children is an outward manifestation of their lack of coordination. Frustration at the dinner table where clumsy children have difficulty manipulating cutlery, and a tendency to spill drinks, may lead to stressful dining situations. These daily tasks are sources of great frustration for clumsy children and the reactions of parents have an impact on the self-concept of these children. High frustration and hostility towards parents, peers and teachers coupled with distractibility compounds social difficulties for some motor impaired children (Gubbay 1975; Ayres 1979; Gordon & McKinlay 1980).

Clumsy children have a lower global self-worth than their normal peers (Rose 1994). Self-worth evaluation is based on the four domains of the Harter (1978) and White (1959) model; athletic, academic, social and physical competence. Within each of these domains, a self-esteem or evaluation of competence is produced. This is an important facet of the child's psyche, as a child may have high self-esteem in the academic domain and low self-esteem in physical domain which may impact on the social domain. Clumsy children have a lower athletic and physical self-esteem (Kielhofner 1985). Rose (1994) suggested a lower perceived physical competence and lowered social self-esteem which is manifested by clumsy children being socially isolated (Shoemaker & Kalverboer 1994).

The lack of physical competence is expanded by Coakley (1993) as impacting on a clumsy child's social development. The formation of a healthy self-concept and the subsequent accomplishments in later stages of life are influenced by physical competence (White 1971). Weiss (1987) discussed the limitations of self-evaluation/esteem. If a child performs beyond their own expectations of themselves then they attribute this to external forces such as a fluke or to the role of luck. If they perform below their perceived self expectation then they attribute this to internal factors such as innate ability, or lack there of. This has limiting consequences for children as they tend to keep themselves from non-growth and non-challenging situations (Bandura 1977). Covington and Beery (1977) found that children with low self-esteem adopted strategies such as avoiding participation, not trying hard, and setting unrealistic goals to create a situation whereby they could preserve what little sense of self-worth they possessed. Over time, children with low self-esteem tend to adopt failure-prone strategies and attribute unsuccessful outcomes to lack of ability and successes to environmental causes beyond their control (Dweck & Elliott 1984).

The psycho-social implications for motor impaired children are agreed upon in the literature. From a variety of setting of home and school,

clumsy children face the consequences of lowered physical competency in the forms of; frustration, anxiety, lowered global self-worth, and social isolation. Teachers, peers and parental reactions to the symptoms of motor impairment contribute to the self-concept of the child. This study investigates the influence motor impairment may have on the family relationships. A case study approach was adopted to provide in-depth information of family interactions and the case chosen was considered to be representative of the population of motor impaired children.

METHOD

A population of motor impaired children were identified using the McCarron Assessment of Neuromuscular Development - MAND (McCarron 1982) and were receiving a remedial intervention program (Gymstart), conducted at the University of New England. A number of cases were selected for in-depth analysis to ascertain the impact of motor impairment on the relationships of the family. Information readily available on these children as part of the remedial program was : a physical capacities profile; the results of the MAND; and self-concept ratings available through the Self Descriptive Questionnaire - SDQ-1 (Marsh 1990). The physical capacities, motor proficiency and self-esteem profiles, all contributed important background information on each of the case studies.

A two-step interview process was implemented involving a broad questionnaire style initial interview and a second in-depth interview to elicit a deeper understanding of the family involved. The first interview employing a highly structured technique, exposed the need for a more flexible approach to be adopted. Consequently, during the second interviews the use of open-style global questions, with prepared prompts to probe were utilised to provide a more effective tool in answering the research questions. All interviews were conducted in the homes of the children, during periods of time when the children were absent. All questions were directed to, and answered from, the perspective of the parents. The questions focused on parental behaviours and attitudes to their child during two periods of their child's development, i.e. birth to age three and three years to the present. This report is based on information gathered in both

interviews.

The selection of children and families for the study was subject to them being involved in the Gymstart program and that the parents were willing to participate in the second round of interviews. Luke was selected for reporting here as being both representative of the study group in many aspects and the analysis has exposed some interesting trends in his family background.

RESULTS OF THE CASE STUDY

Luke is eight years old, is first born, with a sister three and a half years his junior. Luke is an amiable freckle-faced boy, with a shock of red hair and a shy manner. He has changed his name and is known to his friends and teachers by an assumed name. His parents still call him Luke at home, however, they are neutral regarding teachers and friends calling Luke by his adopted name. Both parents live together in the family home which is located in a semi-rural setting, ten kilometres from town. Luke's parents are tertiary educated. Luke was referred by his classroom teacher to the intervention program from a participating school in Armidale. His "best" friend is a boy his own age who was also referred to the intervention program and Luke occasionally plays with his two neighbourhood friends who are older and younger than him.

Luke's Physical Capacities Profile

Luke was assessed on a number of physical capacities and the results of these anthropometric and fitness tests are presented graphically in Figure 1. Analysis of these measures reveal Luke as a tall boy, with weight and level of body fat (15% of total body weight) in a normal healthy range (Hills 1990). These three indicators reflect Luke as neither advantaged nor disadvantaged in the performance of movement tasks, based on anthropometric measures. Luke is rated low in fitness on the three components of : stamina (cardiovascular endurance); power/strength; and flexibility. Luke's inability to work continuously at the whole body level, is demonstrated in his low ranking on the test of stamina (800 metre run). In the more localised muscular endurance level his performance is also low, as indicated by his abdominal strength rating (from a 60 second sit-up test) and his explosive muscular power is limited as shown by the leg power results.

Figure 1: Physical Capacities for Luke

Luke's upper body strength is one of his higher ratings, although he is still considered to be low in this area of fitness. Luke's strength, power and stamina ratings are poor and he is low in flexibility (sit and reach). Overall, Luke is disadvantaged by low fitness which would adversely affect his capacity to perform skilled movement.

His Motor Proficiency

The MAND was administered to Luke as a consequence of the remedial program. Luke's level of motor proficiency is presented in the results of the MAND, shown in Figure 2. These scores for Luke indicate a motor impairment level of major concern. Luke's neuromuscular development index (NDI) or motor quotient is considered mildly disabled (within the range of scores 70-85). His kinesthetic integration rating is also mildly disabled which would affect his ability to perform tasks requiring the ability to control balance and the orientation of his

body in space. Moderate disability (within the range of scores 55-70) is the rating for both muscle power and persistent control, with severe disability in bimanual dexterity (below 55). These results indicate Luke's lack of dynamic muscular strength that may be due to

neurological dysfunction in the coordination of simultaneous contraction of muscle units (McCarron 1982). The lack of muscular power in the fitness test reinforces this result.

Figure 2: MAND Test Factors Profile for Luke

The consequence of a lack of persistent control is impaired ability to focus attention while inhibiting extraneous motor movements. Bimanual dexterity is Luke's lowest score and indicates a severe disability in performing tasks which rely on kinesthetic stimuli in order to perform differentiated movements. Luke has exhibited extraneous movements while performing manipulative tasks such as fastening buttons, and executing baseball skills. These results indicate that Luke has a motor proficiency spanning severe to mild disability and when viewed together with Luke's low fitness capacity, he is disadvantaged in coordinating and performing skilled tasks, requiring both gross and fine motor coordination. Although Luke is not disadvantaged based on anthropometric measurements (height, weight and skinfold), his lack of motor proficiency parallels his lack of fitness capacity.

Luke's Self Esteem

Four scales of the Self-Description Questionnaire (SDQ-1) was administered to Luke, to ascertain an understanding of his psycho-social profile. Results of the questionnaire are graphically represented in Figure 3. Luke's self-concept profile shows positive self evaluation. He generally likes himself and sees his physical appearance as good with a lower ranking in the peer relations and physical abilities. Implications of low or negative scoring cannot be drawn unless the scores fall below the twenty-fifth percentile rank (Marsh 1990). Therefore, since Luke is above the 25th percentile rank in all four parameters of the self-concept, it cannot be suggested that Luke has a low self-concept or global self-worth. In summary, Luke's self description reflects a global self-worth within the normal range.

Figure 3: SDQ-1 Factor Scores for Luke

THE FAMILY PSYCHO-SOCIAL ENVIRONMENT

Parental Interactions with Luke - birth to age three

Luke was born at home. This was the first birth for his parents, after considerable difficulty in achieving pregnancy. Luke was a week

overdue, and an indication of birth trauma presented itself when Luke's parents talked of his birth. His homebirth was managed by a midwife, however, she phoned the doctor due to the distress of the mother and child four hours into productive labour. Because a doctor was unavailable, the midwife inserted her hand to manipulate Luke's head in a procedure known as version (Bennett & Brown 1993). This was very painful for the mother, however, it did break the 'impasse' in the birth procedure. Luke was born with a mottled misshapen head, a big baby (9lb 8oz), with evidence of oxygen deprivation and he was left with the cord attached for forty-five minutes.

Luke's mother did not feel she had harboured any positive or negative attitudes from his birth towards her baby. She said Luke was a big baby with a big head and relied on this as a reason for him to be slow to; hold up his head, sit, crawl and walk. Even at a young age, Luke was regarded to be in a world of his own. The mother recounted a situation where she noticed Luke would lie on the bed for hours and be in a dream world. He was uninterested in the attentions of his mother

as she would come in to check on him and would look away from her face, concentrating on the ceiling. He would remain unmoved for an hour at a time and Luke's mother recalled these events occurring at the age of six months and felt rejected by him as she interpreted these actions to be shunning her attempts to give him attention.

When the parents realised that Luke was slower than other children in reaching developmental milestones, the mother recalled concern. She was comforted by books suggesting each child is different in the speed of their development and by her mother's advice that all children are different and boys are slower than girls (to develop). The father said his son was just like him - that he had been slow to develop too and that there was nothing to be concerned about. During this period of Luke's development, the family lived close to the mother's sisters. They all had babies around the same age, and therefore had their own family playgroup. This intertwined sisters, babies, cousins and brothers-in-law. The mother had an available group of children to compare her son to and she realised Luke was delayed compared to her nieces. The father justified the difference by declaring that he had the "best boy of all"! - all the sisters had daughters which defused the comparative issue (for father) by depending on gender as the basis of differentiation.

The parents would play "pitch and catch" with their child, however, they believe they did not provide a physical skills learning environment. They would compensate for the inabilities of their child by performing many tasks for him, versus encouraging him to do it himself. Tasks such as dressing himself, feeding himself, tying shoelaces became situations leading to frustration and eventually execution of the task by the parents.

Parental Interactions with Luke - three to the present

"Yeah he was always bright he just has not been able to manipulate his body too well but he is getting really good at that now - he has - it started with the clinic" (Gymstart). The parent's positive attitude to their child appears to be unchanged with time and generally Luke is well accepted by his parents. Luke's father considers himself to be "clumsy" and Luke was seen to be just like his father by both parents. Luke's mother said that "Luke's dad is not one of those macho types that need his son to do well for his own ego. He just wants his children to be happy." This indicates an acceptance of Luke's deficiencies.

The parental attitude to Luke is a composite of influences from a variety of sources. The mother is seeing Luke as a boy, and therefore slower (from her mother) and being just like his dad (from her husband) and she reconciled the concern she felt for her son being slower in physical development. The father saw himself in his son and did not know what to do to help Luke. Both parents expressed concern over Luke's shyness and negative feelings about himself as they had tried to impart positive messages to their son about his abilities and qualities. It is possible that the positive messages given to Luke by his parents concerning his abilities and qualities has been a major factor in keeping his self-esteem in-tact. Although Luke has a low motor proficiency and it is reasonable to project that he would have a low self-esteem, the role his parents have played may be the significant factor that influenced the higher than hypothesised result.

There is evidence of a coming to terms with Luke's motor impairment and also a shift in behaviours. Contributing factors include an increased awareness of the problems Luke faces, by his father and mother. Luke's dad is a third year teacher training student. His father is improving

his own physical skills and is becoming aware of the implications of movement competence from a professional standpoint, which he can relate to his personal experience. Luke's mother is training to be an aerobics instructor and the family habits of movement in leisure activities have changed. Luke is now is enrolled in Tae Kwon Do classes and occasionally will participate in his mother's aerobics class. Dad is a regular runner and lifts weights. These shifts in the parents lives, have had an influence on the choice of behaviours and the increase in physical pursuits as the choice of family activities. They believe that Luke is like his Dad, and Luke has maintained similar patterns of development as his father. The father is now taking Luke to the basketball courts and the soccer fields for both of them to improve their physical skills. He is pleased that his son is now enrolled in Tae Kwon Do and he sees his son's skills have improved. Luke still continues to be in his own dream world whereby he plays with imaginary friends and will ask his parents for just ten more minutes to finish my

story as he play-acts outside with his imaginary script.

Sibling Relationship with Luke

Luke has a sister who is three and a half years younger. The behavioural impact of Luke's motor impairment is significant. The observations by the parents show that Luke does not play games in which the younger sister may eclipse him as in fine motor coordination tasks, she is more proficient than Luke. Luke controls the choice of games and only interacts with his sister in games that he can be at least equal or superior. The younger sister is seen as being physically competent, especially in fine motor activities. The parents are aware of this potential conflict, recounting a race between Luke and his sister to tie their shoe laces. Luke managed to tie just before his sister. The parents were glad of the chronological distance between the children as Alison is so close to Luke in performance of physical skills that if they were closer in age, the parents anticipate Alison being superior to her brother in fine and gross motor activities.

SUMMARY

Luke has a low fitness profile and motor competency, however, physiologically he is not disadvantaged. His self-esteem appears to be intact. Luke is struggling with fine motor coordination tasks in the home and dressing, feeding situations are areas of frustration for him and sometimes his family. At school, Luke exhibits fine motor coordination difficulties in a variety of tasks. He is a shy loner with his "best friend" being another child in the Gymstart program. His parents are aware of his motor deficiencies and are concerned with the social impact and long term self-esteem implications. They report a positive and nurturing attitude towards Luke in the areas of his disability, although this positivism has limits and has led to frustration for the parents, resulting in negative psycho-social implications for him. Although the parental behaviours have not provided an opportunity for Luke to improve his physical skills during his pre-school years, those trends are changing through the personal commitment of the lifestyle and leisure changes of the parents, which are having a positive impact on Luke. He remains geographically isolated due to the location of his home, however, his parents present him with frequent play opportunities, and they are limited to being with his best friend who is motor impaired. His relationship with his sister is one of control and avoidance of physically superior situations with her. Luke shows signs that he has benefited from a parental environment which has nurtured his self-esteem by focusing on other areas of achievement.

CONCLUSION

Parental attitudes to symptoms of motor impairment have a significant

effect on their reactions to the frustration of daily tasks such as dressing, eating and generally controlling their body movements. Parental interactions with motor impaired children are important as the recognition of the problem is the first step to effectively dealing with the behavioural manifestations of the disorder. If parents are unaware of the problem, then the symptoms are misinterpreted and therefore acted upon inappropriately (Rose 1994). It is concluded that Luke's parents were unaware of the extent of motor impairment, the implications of this deficiency for their child and effective strategies to deal with situations to fully support their child. It is perceived that a lack of knowledge on the parent's behalf led to the special pressure placed on Luke when they went to restaurants to "put in a special effort" and the perception that Luke was lazy when he takes so long to dress himself.

Some parental reactions to children's clumsiness is likened to Larkin & Hoare's (1991) discussion of disabilities and the understanding that elicits from parents, peers and teachers. Motor impairment is not an overt disability and parental reaction to clumsiness is often likened to the unrealistic reaction of a blind man bumping into you. Reasonable reactions would not be to shriek, "Watch out you clumsy clot!" This consideration is not made for the clumsy child. The problem is so subtle it is not readily interpreted. This study verified motor impaired children suffer from misinterpretation of their symptoms to be; laziness, slovenliness, or lack of concern for other people's space and welfare. This lack of understanding of the problem is symptomatic of the way the parents are reacting to their child's motor impairment. A number of the children studied parents' were unaware of the nature and extent of their child's problem. Similarly, Geuze & Borger, (1993) found a lack of accurate parental perception of their children's motor impairment.

Further impacting on the prognosis for the motor impaired children is evidenced by a lack of play with their children. Erbaugh (1993) concludes that 80% of play situations between parents and their toddlers are instigated by parents. Since play is an integral part of motor skill development, the children are deprived of the opportunities to practice their skills in a setting that should be non-threatening. Luke's father did not want to be involved in such play until he understood the implications of such, however, his son is now eight years old and many early years have been inactive for Luke.

This lack of knowledge, understanding and subsequent acceptance of motor impairment by parents of children with motor deficiencies is the basis for inappropriate self-deprecating comments and negative self-concepts for the children. The role of parents as mirrors to their children (Cooley 1956) is significant in the development of the assessment of competency (Weiss 1993) within the domains of self-esteem. Failure in physical settings leads to withdrawal, lowered acceptance by peers and lowered self-esteem (Harter 1978). Socially,

within the school setting children with movement difficulties have tended to be shy and withdrawn. However, within the family situations, their social dominance can be related to birth order. Reported is the perception the parents have of their children outside the home, however, within the sibling relationships, the first born exercise the power of being oldest and therefore they manage to manipulate activities which ensures success for themselves.

In summary, the sibling relationship is impacted by the motor deficiency of clumsy children. The lack of understanding of motor

impairment by parents leads to inappropriate reactions and to unrealistic expectations. The verbal and non-verbal interactions of the parents produce and affect the self-esteem of the child. Depending on the parental reactions to their child's motor impairment, the self-perceptions of competency within the physical and social domains may be affected.

BIBLIOGRAPHY

Adler, H. 1981, 'Children with Problems in Physical Education in School', *Acta Paedopsychiatrica*, 47, pp. 313-326.

Ayres, A.J. 1979, *Sensory Integration and The Child*, Western Psychological Services, Los Angeles.

Bandura, A. 1977, 'Self-efficacy : Toward a Unifying Theory for Behavioural Change', *Psychological Review*, 84, pp. 191-215.

Bennett, V.R. and Brown, L.K. 1993, *Myles Textbook for Midwives* (12th ed), Churchill Livingstone, London.

Bloomfield, J., Ackland, T. and Elliott, B. 1994, *Applied Anatomy and Biomechanics in Sport*, Blackwell, Melbourne.

Cermak, S. 1985, 'Developmental Dyspraxia'. in E.A. Roy (ed.) *Neuro-psychological Studies of Apraxia and Related Disorders*, Elsevier, North Holland, pp. 225-248.

Coakley, J. J. 1993, 'Social Dimensions of Intensive Training and Participation in Youth Sports', in B.K. Cahill & A.J. Pearl (eds), *Intensive Participation in Children's Sport*, Human Kinetics, Illinois, pp. 71-94

Dweck, C. & Elliott, E. 1984, 'Achievement Motivation', in M. Hetherington (ed.), *Social Development: Carmichael's Manual in Child Psychology*, Wiley, New York, pp. 643-691

Erbaugh, S. 1987, 'Parent-child Interactions During an Informal Swimming Session', in J. Clark and J. Humphrey (eds), *Advances in Motor Development Research*, AMS Press, New York, pp.61-74,

Gordon, N. & McKinlay, I. 1980, 'Who are Clumsy Children?' in N. Gordon and I. McKinlay (eds), *Helping Clumsy Children*, Churchill Livingstone, London, pp. 1-9.

Gubbay, S.S. 1975, 'Clumsy Children in Normal Schools', *Medical Journal of Australia*, 1, pp. 233-236.

Gueze, R.J., and Borger, H. 1993, 'Children who are clumsy : Five years later', *Adapted Physical Activity Quarterly* , 10, pp. 10-21.

Harter, S. 1978, A Model of Mastery Motivation in Children : Individual Differences and Developmental Change, in W.A. Collins (ed.), *The Minnesota Symposia on Child Psychology* , Erlbaum, New Jersey, Vol. 14, pp. 215-255.

Henderson, S.E. and Hall D. 1982, 'Concomitants of Clumsiness in Young School Children', *Developmental Medicine and Child Neurology*, 24, pp.448-460.

Hills, A. 1991, *Physical Growth and Development of Children &*

Adolescents, Queensland University of Technology.

Hulme, C. and Lord, R. 1986, 'Review Clumsy Children - a Review of Recent Research', *Child Care Health and Development* , 12 , pp.257-269.

Kalverboer, A.F., de Vries, H.J. and van Dellen, T. 1990, 'Social Behavior in Clumsy Children as Rated by Parents and Teachers', in A.F. Kalverboer (ed.), *Developmental Biopsychology* , Michigan University, pp. 257-268

Kielhofner, G. 1985, 'Occupational Function and Dysfunction', in G. Kielhofner (ed.), *A Model of Human Occupation: Theory and Application*, Williams & Wilkins, Baltimore, pp. 63-75.

Larkin, D. and Hoare, D. 1991, *Out of Step*, Active Life Foundation, University of Western Australia.

Marsh, H.W. 1990, *A Multidimensional, Hierarchical Model of Self-Concept*, University of Western Sydney.

McCarron, L.T. 1982, *MAND McCarron Assessment of Neuromuscular*

Development. Common Market Press. Dallas.

Rose, B. 1994, The Importance of Gross Motor Coordination in the Psycho-social Lives of Children, Ph.D. Thesis, University of Western Australia.

Shoemaker, M. and Kalverboer, A. 1994, 'Social and Affective Problems of Children Who are Clumsy: How Early Do They Begin?', Adapted Physical Activity Quarterly, 11, pp. 130-140.

Short, H. and Crawford, J. 1984, Last to be Chosen: The Awkward Child, Pivot 2, pp. 32-36.

Sovik, N. and Maeland, A.F. 1986, 'Children with Motor Problems (Clumsy Children)' Scandinavian Journal of Education, 30, pp. 39-53

Weiss, M.R. 1987, 'Self Esteem and Achievement in Children's Sport and Physical Activity', in D. Gould and M. Weiss (eds), Advances in Pediatric Sport Sciences :Behavioural Issues Vol. 2, Human Kinetics, Illinois, pp. 87-119.

Weiss, M.R. 1993, 'Psychological Effects of Intensive Sport Participation on Children and Youth : Self-Esteem and Motivation', in Cahill, B.R. and Pearl, A.J. (eds), Intensive Participation in Children's Sports, Human Kinetics, Illinois, pp. 39-69.

White, R.W. 1971, 'The Urge Towards Competence', American Journal of Occupational Therapy , 25, pp. 271-274.

White, R.W. 1959, 'Motivation Reconsidered : The Concept of Competence', Psychological Review , 66 (5), pp. 297-333.