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Publication Details

McIntyre, F. (2009). A Longitudinal Examination of the Contribution of Perceived Motor Competence and Actual Motor Competence to Physical Activity in 6 to 9 Year Old Children (Doctor of Philosophy (PhD)). University of Notre Dame Australia. http://researchonline.nd.edu.au/theses/41

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REFERENCES

- Armstrong, N., Balding, J., Gentle, P., & Kirby, B. (1990). Patterns of physical activity among 11 to 16 year old British children. *British Medical Journal*, 301, 203-205.
- Armstrong, N., & Welsman, J.R. (2006). The physical activity patterns of European youth with reference to methods of assessment. *Sports Medicine*, 36, 1067-1086.
- Bandura, A. (1977). Self efficacy: Toward a unifying theory of personality change. *Psychological Review*, 84, 191-215.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs NJ: Prentice Hall.
- Bailey, R. C., Olson, J., Pepper, S. L., Porszasz, J., Barstow, T. J., & Cooper D.M.(1995). The level and tempo of children's physical activities: An observational study. *Medicine & Science in Sports & Exercise*, 27(7), 1033-1041.
- Baranowski, T. (1988). Validity and reliability of self-report measures of physical activity: An information processing perspective. *Research Quarterly for Exercise and Sport, 59*, 314-327.
- Baranowski, T., Simons-Morton, B. G., Wislon, B. S., & Parcel, G. S. (1989).
 Validity of the observation of children's physical activity. *Research Quarterly for Exercise and Sport*, 60(1), 42-47.

- Barnett, L.M., Morgan, P.J., van Beurden, E., & Beard, J.R. (2008). Perceived sports competence mediates the relationship between childhood motor skill proficiency and adolescent physical activity and fitness: A longitudinal assessment. *International Journal of Behavioural Nutrition and Physical Activity*, 5, 1-12.
- Barnett, L.M., van Beurden, E., Morgan, P.J., Brooks, L.O., & Beard, J.R. (2008). Childhood motor skill proficiency as a predictor of adolescent physical activity. *Journal of Adolescent Health*, 44(3), 1-8.
- Bassett, D. R. J. (2000). Validity and reliability issues in objective monitoring of physical activity. *Research Quarterly for Exercise and Sport*, 71(2), 30-36.
- Bassett, D. R. J., Ainsworth, B. E., Leggett, S. R., Mathien, C. A., Main, J. A., Hunter, D. C., & Duncan, G. E. (1996). Accuracy of five electronic pedometers for measuring distance walked. *Medicine & Science in Sports & Exercise*, 28(8), 1071-1077.
- Bauman, A., Bellew, B., Vita, P. Brown, W., & Owen, N. (2002). Getting Australia Active: Towards the better practice for the promotion of physical activity.
 National Public Health Partnership. Melbourne, Australia.
- Bernstein, N. (1967). The Coordination and Regulation of Movements. Oxford: Pergamon Press.
- Biddle, S., Page, A., Ashford, B., Jennings, D., Brooke, R., & Fox, K. (1993).Assessment of children's physical self-perceptions. *International Journal of Adolescence and Youth, 4*, 93-109.
- Booth, M.L., Macaskill, P., McLellan, L., Phongsavan, P., Okely, T., Patterson, J., et al. (1997). NSW schools fitness and physical activity survey. Sydney: NSW Department of Education and Training.

- Boucher, B.H., Doescher, S.M., & Sugawara, A.I. (1993). Preschool children's motor development and self-concept. *Perceptual Motor Skills*, 76, 11-17.
- Bouffard, M., Watkinson, E. J., Thompson, L. P., Dunn, J. L. C., & Romanow S. K.
 E. (1996). A test of activity deficit hypothesis with children with movement difficulties. *Adapted Physical Activity Quarterly*, 13, 61-73.
- Branta, C., Haubenstricker, J., & Seefeldt, V. (1984). Age changes in motor skill during childhood and adolescence. *Exercise and Sports Science Reviews*, 12, 467-520.
- Bruininks, R. H. (1978). Bruininks-Oseretsky test of motor proficiency. Circle Pines, MN: American Guidance Service.
- Butcher, J. E. & Eaton, W. O. (1989). Gross and fine motor proficiency in pre schoolers: Relationships with free behaviour and activity level. *Journal of Human Movement Studies*, 16, 27-36.
- Cale, L. (1994). Self report measures of children's physical activity: recommendations for future development and a new alternative measure. *Health Education Journal*, 53, 439-453.
- Carroll, B., & Loumidis, J. (2001). Children's perceived competence and enjoyment of physical education and physical activity outside school. *European Physical Education Review*, 7(1), 24-41.
- Casperan, C., Powell, K., & Christensohn, G. (1985). Physical activity, exercise, and physical fitness: Definitions and distinctions for health-related research. *Public Health Reports*, 100(2), 126-131.
- Castelli, D.M., & Valley, J.A. (2007). Chapter 3: The relationship of physical fitness and motor competence to physical activity. *Journal of Teaching and Physical Education, 26*, 358-374.

- Cavill, N., Biddle, S., & Sallis, J.F. (2001). Health enhancing physical activity for young people: Statement of the United Kingdom Expert Consensus Conference. *Pediatric Exercise Science*, 13, 12-25.
- Chen, A. & Zhu, W. (2005). Young children's intuitive interest in physical activity: Personal, school, and home factors. *Journal of Physical Activity & Health*, 2, 1-15.
- Clarke, J.E., & Metcalfe, J.S. (2002). The mountain of motor development: A metaphor. In J.E. Clark & J.H. Humphrey (Eds.), *Motor development: Research and reviews* (pp. 163-190). Reston, VA: Mational Association of Sport and Physical Education.
- Cohen, D., Scott, M., Zhen Whang, F., McKenzie, T.L., & Porter, D. (2008). School design and physical activity among middle school girls. *Journal of Physical Activity & Health*, 5, 719-731.
- Cole, D.A., Maxwell, S.E., Martin, J.M. Peeke, A.D., Seroczynski, J.M., Hoffman, K.B., Ruiz, M.D., Jacquez, F., & Maschman, T. (2001). The development of multiple domains of child and adolescent self-concept: A cohort sequential longitudinal design. *Child Development*, 72(6), 1723-1746.
- Commonwealth Department of Health and Ageing. (2007). 2007 Australian National nutrition and physical activity survey. Retrieved February 20, 2009, from http://www.health.gov.au/internet/main/publishing.nsf/Content/phd-nutritionchildrens-survey.
- Corbin, C.B., & Pangrazi, R.P. (2001). Toward a uniform definition of wellness: A commentary. President's Council on Physical Fitness & Sports Research Digest, 3, 1-8.
- Corbin, C.B. (2002). Physical activity for everyone: What every physical educator should know about promoting lifelong physical activity. *Journal of Teaching Physical Education, 21*, 128-144.

- Cossette, L., Malcuit, G., & Pomerleau, A. (1991). Sex differences in motor activity in early infancy. *Infant Behaviour and Development, 14*, 175-186.
- Cratty, B.J. (1970, 1986). *Perceptual and motor development in infants and children*. Los Angeles: Prentice Hall.
- Crocker, P. R. E., Bailey, D. A., Faulkner, R. A., Kowalski, K. C., & McGrath, R. (1997). Measuring general levels oh physical activity: Preliminary evidence for the physical activity questionnaire for older children. *Medicine & Science in Sports & Exercise, 29*(10), 1344-1349.
- Crocker, P.R.E., Eklund, R.C., & Kowalski, K.C. (2000). Children's physical activity and self perceptions. *Journal of Sport Sciences*, 18, 383-394.
- Curtis-Ellison, R., Freedson, P. S., Zevallos, J. C., White, M. J., Karmour, J. K., Garrahie, E. J., & Moore, L. L. (1992). Feasibility and costs of monitoring physical activity in young children using the Caltrac Accelerometer. *Pediatric Exercise Science*, 4, 136-141.
- Davison, K.K., Symons-Downs, D., & Birch, L.L (2006). Pathways linking perceived athletic competence and parental support at age 9 years to girls' physical activity at age 11 years. *American Alliance for Health, Physical Education, Recreation & Dance, 77*, 23-31.
- DuRant, R. H., Baranowski, T., Davis, H., Thompson, W. O., Puhl, J., Greaves, K.A., & Thompson, W. O. (1993). Evaluation of the children's activity rating scales (CARS) in young children. *Medicine & Science in Sports & Exercise*, 25(12), 1415-1421.
- Eaton, W.O., & Enns, L.R. (1986). Sex differences in human motor activity level, *Psychological Bulletin*, 100, 19-28.

- Eccles, J.S., & Harold, R.D. (1991). Gender differences in sport involvement: Applying the Eccles' expectancy-value model. *Journal of Applied Sport Psychology*, 3, 7-35.
- Education Department of Western Australia. (2001). *Fundamental movement skills teacher resource manual*. Western Australia: Education Department.
- Erhardt, P., McKinley, I., & Bradley, G. (1987). Coordination screening for children with and without moderate learning difficulties: Further experience with Gubbay's test. *Developmental Medicine and Child Neurology*, 29, 666-673.
- Ernst, M.P., & Pangrazi, R.P. (1999). Effects of a physical activity program on children's activity levels and attraction to physical activity. *Pediatric Exercise Science*, 11, 393-405.
- Eston, R. G., Rowlands, A. V., & Ingledew, D. K. (1998). Validity of heart rate, pedometry, and accelerometry for predicting the energy cost of children's activities. *Journal of Applied Psychology*, 84(1), 362-371.
- Feltz, D.L., & Brown, E.W. (1984). Perceived competence in soccer skills among young soccer players. *Journal of Sport Psychology*, 6, 385-394.
- Ferreira, I., van der Horst, K., Wendel-Vos, W., Kremers, S., van Lenthe, F.J., & Brug, J. (2006). Environmental correlate of physical activity in youth – A review an update. *Obesity Reviews*, 8, 128-154.
- Finn, K., Johannsen, N., & Specker, B. (2002). Factors associated with physical activity in preschool children. *Journal of Pediatrics*, 140(1), 81-85.
- Fisher, A., Reilly, J., Kelly, L.A., Montgomery, C., Williamson, A., Paton, J.Y., & Grant, S. (2005).Fundamental movement skills and habitual physical activity in young children. *Medicine & Science in Sports & Exercise*, 37, 684-688.

- Fox, K. R. (1990). The Physical Self Perception Profile. Dekalb, IL: Northern Illinois University.
- Freedson, P. S., & Melanson, E. L. (1996). *Measuring physical activity*. Champaign IL: Human Kinetics.
- Fulton, J. E., Burgeson, C. R., Perry, G. R., Sherry, B., Galuska, D. A., Alexander, M. P., Wechsler, H., & Caspersen, C. J. (2001). Assessment of physical activity and sedentary behaviour in preschool-age children: Priorities for research. *Pediatric Exercise Science*, 13, 113-126.
- Garcia, A.W., Broda, M.A., Frenn, M., Coviak, C., Pender, N.J., & Ronis, D.L.
 (1995). Gender and developmental differences in exercise among youth and prediction of their exercise behaviour. *Journal of School Health*, 65, 213-219.
- Garcia, C., Garcia, L., Floyd, J. & Lawson, J. (2002). Improving public health through early childhood movement programs. *Journal of Physical Education*, *Recreation and Dance*, *73*(1), 27-31.
- Gesell, A. (1939). Reciprocal interweaving in neuromotor development. *Journal of Comparative Neurology*, 70, 161-180.

Gesell, A. (1945). The embryology of behaviour. New York: Harper.

- Gibson, J.J. (1979). *The ecological approach to visual perception*. Boston: Hougton-Mifflin.
- Goodway, J. & Rudisill, M. (1997). Perceived physical competence and actual motor skill competence of African American pre school children. Adapted Physical Activity Quarterly, 14, 314-326.
- Gretebeck, R. J., & Montoye, H. J., (1992). Variability of some objective measures of physical activity. *Medicine & Science in Sports & Exercise*, 24(10), 1167-1172.

- Halverson, L., Roberton, M.A., & Langendorfer, S. (1982). Development of the overarm throw: Movement and ball velocity changes by seventh grade. *Research Quarterly for Exercise and Sport, 50*, 256-264.
- Hands, B., & Larkin, D. (1998). Australian tests of motor proficiency: What do we have and what do we need? *The ACHPER Healthy Lifestyles Journal*, 45(4), 10-16.
- Hands, B., & Larkin, D. (2001). Using the Rasch measurement model to investigate the construct of motor ability in young children. *Journal of Applied Measurement*, 2(2), 101-120.
- Hands, B., & Parker, H. (2008). Pedometer-determined physical activity, BMI, and waist girth in 7- to 16-year-old children and adolescents. *Journal of Physical Activity & Health*, 5(S1), S154-S165.
- Hands, B., Parker, H., & Larkin, D. (2001). Building an Active Future Summit: Background Paper. Perth, WA: University of Notre Dame.
- Hands, B., Parker, H., & Larkin, D. (2006). Measuring physical activity in young children: A comparative study. *Measurement in Physical Education and Exercise Science*, 10(3), 203-214.
- Hands, B., Parker, H., Glasson, C., Brinkman, S. & Read, H. (2004). Physical Activity and Nutrition Levels in Western Australian Children and Adolescents: Report. Perth, Western Australia: Western Australian Government.
- Harten, N., Olds, T. & Dollman, J. (2008). The effects of gender, motor skills and play area on the free play activities of 8-11 year old school children. *Health* & *Place*, 14(3), 386-393.
- Harter, S. (1978). Effectance motivation considered: Toward a developmental model. *Human Development*, 1, 34-64.

- Harter, S. (1982). The perceived competence scale for children. *Child Development*, *53*, 87-89.
- Harter, S. (1990). Issues in the assessment of the self concept of children and adolescents. In A.M. La Greca (ed.), *Through the eyes of the child: Obtaining self reports from children and adolescents* (pp. 293-325). Newton, MA: Allyn and Bacon.
- Harter, S., & Pike, R. (1984). The pictorial scale or perceived competence and social acceptance of young children. *Child Development*, 55, 1969-1982.
- Harter, S. & Connell, J. P. (1984). A model of children's achievement and related self perceptions of competence, control, and motivational orientation. In J. G. Nicholls (ed). *The development of achievement motivation* (pp. 219-250) Greenwhich, CT: JAI Press.
- Haubenstricker, J. & Seefeldt, V. (1986). Acquisition of movement skills during childhood. In V. Seefeldt (ed). *Physical activity and wellbeing* (pp. 41-102).Rest, VA: American Alliance for Health, Physical Education, Recreation and Dance.
- Haubenstricker, J., Branta, C.F., & Seefeldt, V.D. (1999). History of the motor performance program study and related programs. In J.L. Haubenstricker & D.L Feltz (Eds.), *100 years of kinesiology: History, research and reflections*. East Lansing, MI: Department of Kinesiology, Michigan State University, pp. 103-125.
- Henderson, S. E., & Sugden, D. A. (1992). Movement assessment battery for children. Kent: The Psychological Association.
- Horn, T.S., & Hasbrook, C.A. (1987). Psychological characteristics and the criteria children use for self-evaluation. *Journal of Sport Psychology*, *9*, 208-221.

- Horn, T.S. (2004). Developmental perspectives of self perceptions in children and adolescents. In M.R. Weiss (ed). *Developmental sport and exercise psychology: A lifespan perspective* (pp. 101-143). Morgantown, WV: Fitness Information Technology.
- Horn, T.S. & Amorose, A.J. (1998). Sources of competence information. In J.L.
 Duda (ed.). Advances in sport and exercise psychology measurement (pp. 49-63). Morgantown, WV: Fitness Information Technology.
- Horn T.S. & Weiss, M.R. (1991). A developmental analysis of children's self-ability judgements. *Pediatric Exercise Psychology*, 3, 312-328.
- Hovell, M., Sallis, J.F., Kolody, B., & McKenzie, T. (1999). Children's physical activity choices: A developmental analysis of gender intensity, levels, and time. *Pediatric Exercise Science*, 11, 158-168.
- Jacobs, J.E., Lanza, S., Osgood, D.W., Eccles, J.S., & Wigfield, A. (2002). Changes in children's self-competence and values: Gender and domain differences across grades one through twelve. *Child Development*, 73(2), 509-527.
- Kelly, L.E., Reuschlein, P., & Haubenstricker, J.L. (1990). Qualitative analysis of overhand throwing and catching motor skills: Implications for assessing and teaching. *Journal of International Council for Health, Physical Education* and Recreation, 25(4), 14-18.
- Keogh, J.F., & Sugden, D.A. (1985). Movement skill development. New York: Macmillan
- Kilanowski, C. K., Consalvi, A. R., & Epstein, L. H. (1999). Validation of an electronic pedometer for measurement of physical activity in children. *Pediatric Exercise Science*, 11, 63-68.
- Kohl, H.W., & Hobbs, K.E. (1998). Development of physical activity behaviours in children and adolescents. *Pediatrics*, 101(3), 549-554.

- Kugler, P. N., Kelso, J. A. & Turvey, M. T. (1980). On the concept of coordinative structures as dissipative structures. I. Theoretical lines of convergence. In Steimach G.E. & Requin, J. (Eds). *Tutorials of motor behaviour* (pp 3-47) New York: North Holland.
- Larkin, D., & Parker, H. (1995). The McCarron assessment for neuromuscular development: An Australian Perspective. Paper presented at the Advances in Child Neuropsychology: Theory and Practice symposium, Melbourne, Australia.
- Li, X. J., & Dunham, P. (1993). Fitness load and exercise time in secondary physical education classes. *Journal of Teaching Physical Education*, *12*, 180-187.
- Lindquist, C. H., Reynolds, K. D. & Goran, M. J. (1999). Sociocultural determinants of physical activity among children. *Preventative Medicine*, *29*, 309-312.
- Mandich, A., & Polatajko, H. J. (2003). Editorial Developmental coordination disorder: Mechanisms, measurement and management *Human Movement Science*, 22, 407-411.
- Manios, Y., Kafatos, A., & Markaksis, G. (1998). Physical activity of 6-year-old children: Validation of two proxy reports. *Physical Exercise Science*, 10(2), 176-188.
- Marsh, H. W. (1988). Self Description Questionnaire: A theoretical and empirical basis for the measurement of multiple dimensions of preadolescent self concept. San Antonio, TX: Psychological Corporation.
- Marsh, H. W. (1989). Age and sex effects in multiple dimensions of self concept: Preadolescence to early adulthood. *Journal of Educational Psychology*, *81*, 417-430.

- Marsh, H. W. (1990). A multidimensional, hierarchal model of self-concept: Theoretical and empirical justification. *Educational Psychology Review*, 2, 77-172.
- Marsh, H.W., Barnes, J., Cairns, L., & Tidman, M. (1984). Self-description questionnaire: Age and sex effects in the structure and level of self-concept in preadolescent children. *Journal of Educational Psychology*, 76, 940-956.
- Marsh, H. W., Craven, R., & Debus, R. (1991). Self concepts of young children 5 to 8 years of age: Measurement and multidimensional structure. *Journal of Educational Psychology*, 83(3), 377-392.
- Marsh, H. W., & MacDonald-Holmes, I. W. (1990). Multidimensional self concepts: Construct validation of responses by children. *American Journal of Educational Research Journal*, 27, 89-117.
- Marsh, H. W., & Shavelson, R. J. (1985). Self concept: Its multifaceted, hierarchical structure. *Educational Psychologist*, 20, 105-125.
- Marsh, H.W., Smith, I.D., & Barnes, I.D. (1983). Multitrait-multimethod analyses of the Self Description Questionnaire: Student-teacher agreement on multidimensional ratings of student self-concept. *American Educational Research Journal*, 20, 333-357.
- Martin, K., Giles-Corti, B., Rosenberg, M., Salmon, J., & Bremner, A. (2007). The active schools project: Schools socio-ecological correlates of children's physical activity while at school. Paper presented at the 25th ACHPER Biennial Conference.
- McCarron, L. (1982). *McCarron Assessment of Neuromuscular Development*. McCarron-Dial Systems: Dallas, Texas.
- McGraw, M.B. (1932). From reflex to muscular control in the assumption of an erect posture and ambulation in the human infant. *Child Development*, *3*, 291-297.

- McGraw, M.B. (1940). Neuromuscular development of the human infant as exemplified in the achievement of erect locomotion. *Journal of Pediatrics*, *17*, 747-771.
- McGraw, M.B. (1945). *The neuromuscular maturation of the human infant*. New York: Columbia University Press.
- McKenzie, T.L., Feldman, H., Woods, S.E., Romero, K.A., Dahlstrom, V., Stone,
 E.J. et al. (1995). Children's activity levels and context during third-grade
 physical education. *Research Quarterly for Exercise and Sport, 66*, 184-193.
- McKenzie, T.L. (1999). School-health related physical activity programs: What do the data say? *Journal of Physical Education, Recreation & Dance*, 70, 16-19.
- McKenzie, T.L., Sallis, J.F., Broyles S., Zive, M.M., Nader, P.R., Berry, C.C. et al. (2002) Childhood movement skills: Predictors of physical activity in Anglo American and Mexican American adolescents? *Research Quarterly for Exercise and Sport*, 73(3), 238-244.
- McKiddie, B., & Maynard, I.W. (1997). Perceived competence of schoolchildren in physical education. *Journal of Teaching in Physical Education*, 16, 324-339.
- McMurray, R. G., Bradley, C. B., Harrell, J. S., Bernthal, P. R., Frauman, A. C., & Bangdiwala, S. I. (1993). Parental influence on childhood fitness and activity patterns. *Research Quarterly for Exercise and Sport*, 64(3), 249-255.
- Missiuna, C. (1998). Development of "All About Me", a scale that measures children's perceived motor competence. *The Occupational Therapy Journal of Research*, *18*(2), 85-108.
- Morris, A.M., Williams, J.M., Atwater, A.E., & Wilmore, J.H. (1982). Age and sex differences in motor performance of 3 through 6 year old children. *Research Quarterly for Exercise and Sport*, 53(3), 214-221.

- Nader, P.R., Bradley, R.H., Houts, R.M., McRitchie, S.L & O'Brien, S.L. (2008) Moderate to vigorous physical activity from ages 9 to 15 years. *The Journal* of the American Medical Association, 300(3), 295-305.
- National Association for Sport & Physical Education (2004). *Physical activity for children: A statement of guidelines for children ages 5 – 12.* Reston, VA: Author.
- Nelson, J.K., Thomas, J.R., Nelson, K.R., & Abraham, P.C. (1986). Gender differences in children's throwing performance: Biological and environment. *Research Quarterly for Exercise and Sport*, 57, 280-287.
- Newell, K. M. (1984). *Motor Coordination: Constraints and Cognition*. Minneapolis: Burgess.
- Newell, K.M. (1986). Constraints on the development of coordination. In: Wade, M. G. & Whiting, H. T. (eds), *Motor Development in children: Aspects of coordination and control.* Boston, MA: Martinus, pp. 341-360.
- Nicholls, J.G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice and performance. *Psychological Review*, *91*, 328-346.
- Nicholson, J., Sanson, A., Rempel, L., Smart, D., & Patton, G. (2003). Longitudinal studies if children and youth. Implications for future studies. Located at, www.aifs.org.au/institute/pubs/resreport8/ch3.pdf, accessed 5 May 2004.
- Noland, M., Danner, F., Dewalt, K., McFadden, M., & Kotchen, J. M. (1990). The measurement of physical activity in young children. *Research Quarterly for Exercise and Sport*, 61(2), 146-153.
- NSW Department of Education and Training (2000). *Get Skilled: Get Active.* Ryde, NSW: Authors.

- O'Beirne, C., Larkin, D., & Cable, T. (1994). Coordination problems and anaerobic performance in children. *Adapted Physical Activity Quarterly*, *11*, 141-149.
- Okely, A.D., Booth, M.L., & Patterson, J.W. (2001a). Relationship of cardiorespiratory endurance to fundamental movement skill proficiency among adolescents. *Pediatric Exercise Science*, 13, 380-391.
- Okely, A.D., Booth, M.L., & Patterson, J.W. (2001b). Relationship of physical activity to fundamental movement skills among adolescents. *Medicine & Science in Sports & Exercise*, 33 (11), 1899-1904.
- Oliver, M., Schofield, G.M., Kolt, G.S., Schluter, P.J. (2007). Pedometer accuracy in physical activity assessment in preschool children. *Journal of Science and Medicine in Sport*, 10(5), 303-310.
- Ott, A.E., Pate, R.R., Trost, S.G., Ward, D.S., & Saunders, R. (2000). The use of uniaxial and triaxial accerelometers to measure childrens "free play" physical activity. *Pediatric Exercise Science*, *12*, 360-370.

Pallant, J. (2005). SPSS survival manual (2nd Ed). United Kingdom: McGraw-Hill.

- Pate, R.R., McIver, K., Dowda, M., Brown, W.H., & Addy, C. (2008). Directlyobserved physical activity in school children. *Journal of School Health*, 78(8), 438-444.
- Payne, V. G. & Isaacs, L. D. (2002) Human motor development: A lifespan approach. CA: Mayfield Publishing

Piaget, J. (1955). The language and thought of the child. New York: World.

Piers, E. V., & Harris, D. B. (1969). The Piers-Harris Children's Self-Concept Scale. Los Angeles, CA: Western Psychological Services.

- Plimpton, C.E., & Regimbal, C. (1992). Differences in motor proficiency according to gender and race. *Perceptual and Motor Skills*, 74, 399-402.
- Poest, C. A., Williams, J. R., Witt, D. D., & Atwood, M.E. (1989). Physical activity patterns of preschool children. *Early Childhood Research*, *4*, 367-376.
- President Council on Physical Fitness & Sport. (2002). *The Presidential active lifestyle award (PALA)*. Washington DC: PCPFS.
- Rappaport, L., Levine, M. D., Aufseeser, C., & Incerto, R. A. (1983). Children's descriptions of their developmental dysfunctions: Field testing of a self administered student profile. *American Journal of Disabilities in Childhood*, 137, 369-374.
- Raudsepp, L., Liblik, R., & Hannus, A. (2002). Children's and adolescent's physical self perceptions as related vigorous physical activity and physical fitness. *Pediatric Exercise Science*, 14, 97-106.
- Raudsepp, L. & Liblik, R. (2002). Relationship of Perceived and Actual Motor Competence in Children. *Perceptual and Motor Skills*, 94, 1059-1070.
- Raudsepp, L. & Paasuke, M. (1995). Gender differences in fundamental movement patterns, movement performances, and strength measurements of prepubertal children. *Pediatric Exercise Science*, 7, 294-304.
- Raudsepp, L., & Pall, P. (2006). The relationship between fundamental motor skills and outside-school physical activity of elementary school children. *Pediatric Exercise Science*, 18, 426-435.
- Riddoch, C., Savage, J.M., Murphy, N., Cran, G.W. & Boreham, C. (1991). Long term health implications of fitness and physical activity patterns. *Archives of Disease in Childhood*, 66(12), 1426-1433.

- Riddoch, C., Anderson, L-.B., Wedderkopp, N., Harro, M., Klasson-Heggebo, L., Sardinha, L.B. et al. (2004). Physical activity levels and patterns of 9- and 15year-old European children. *Medicine Science & Exercise & Sport*, 36(1), 86-92.
- Ridgers, N.D., Stratton, G., & Fairclough, S.J. (2006). Physical activity levels of children during school playtime. *Sports Medicine*, 36(4), 359-371.
- Roberton, M.A. (1984). Changing motor patterns during childhood. In J.R. Thomas (Ed.), *Motor development during childhood and adolescence*. Minneapolis: Burgess, pp. 48-90.
- Roberton, M.A., & Halverson, L.E. (1984). Developing children: Their changing movement. Philadelphia: Lea & Febiger.
- Roberts, G.C. (1984). Toward a new theory of motivation in sport: The role of perceived ability. In J.M Silva & R.S. Weinberg (ed). *Psychological foundations in sport* (pp. 214-228). Champaign, IL: Human Kinetics.
- Rose, B., Larkin, D., & Berger, B. (1997). Coordination and gender influences on the perceived motor competence of children. *Adapted Physical Activity Quarterly*, 14, 210-221.
- Rowlands, A. V., Eston, R. G., & Ingledew, D. K. (1997). Measurement of physical activity in children with particular reference to the use of heart rate and pedometry. *Sports Medicine*, 24(4), 258-272.
- Rowe, D.A., Mahar, M.T., Raedeke, T.D., & Lore, J. (2004). Measuring physical activity in children with pedometers: Reliability, reactivity, and replacement of missing data. *Pediatric Exercise Science*, 16, 343-354.
- Rudisill, M. E., Mahar, M. T., & Meaney, K. S. (1993). The Relationship between children's perceived and actual motor competence. *Perceptual & Motor Skills*, 76, 895-906.

- Saakslahati, A., Numminen, P., Niinikoski, H., Rask-Nissilia, L., Viikari, J., Tuominen, J., & Valimaki, I. (1999). Is physical activity related to body size, fundamental motor skills, and CHD risk factors in early childhood? *Pediatric Exercise Science*, 11, 327-340.
- Sallis, J. F. (1994). *Determinants of physical activity behaviour in children*. Champaign IL: Human Kinetics.
- Sallis, J. F., Berry, C. C., Broyles, S. L., McKenzie, T. L., & Nadar, P. R. (1995) Variability and tracking of physical activity over 2 years in young children. *Medicine & Science in Sports & Exercise*, 27(7), 1042-1049.
- Sallis, J.F., Conway, T.L., Prochaska, J.J., McKenzie, T.L., Marshall, S.J., & Brown, M. (2001). The association of school environments with youth physical activity. *American Journal of Public Health*, 91(4), 618-620.
- Sallis, J.F. & Owen, N. (1999). *Physical activity and behavioural medicine*. Thousand Oaks, CA: Sage.
- Sallis, J.F., Prochaska, J.J., & Taylor, W.C. (2000). A review of correlates of physical activity of children and adolescents. *Medicine & Science in Sports & Exercise*, 32, 963-975.
- Sallis, J. F., Simons-Morton, B. G., Stone, E. J., Corbin, C. B., Epstein, L. H.,
 Faucette, N., Iannotti, R. J., Killen, J. D., Klesges, R.C., Petray, C. K.,
 Rowland, T. W., & Taylor, W. C. (1992). Determinants of physical activity
 and interventions in youth. *Medicine & Science in Sports & Exercise*, 24(6),
 s248-s257.
- Sallo, M., & Silla, R. (1997). Physical activity with moderate to vigorous intensity in preschool and first grade children. *Pediatric Exercise Science*, 9, 44-54.

- Sarkin, J.A., McKenzie, T.L., & Sallis, J.F. (1997). Gender differences in physical activity during fifth-grade physical education and recess periods. *Journal of Teaching in Physical Education*, 17, 99-106.
- Savelsbergh, G., Davids, K., van der Kamp, J., & Bennett, S. (eds) (2003). Development of movement coordination in children's applications in the field of ergonomics, health sciences and sport. London and New York: Routledge Taylor & Francis.
- Schneider, P.L., Crouter, S.E., & Bassett Jr, D.R. (2004). Pedometer measures of free-living physical activity: Comparison of 13 models. *Medicine & Science in Sports & Exercise*, 36(2), 331-335.
- Schnoner, G., & Kelso, J.A.S. (1988). Dynamic pattern generation in behavioural and neural systems. *Science*, 239, 1513-1520.
- Seefeldt, V. (1980). Developmental motor patterns: Implications for elementary school physical education. In C. Nadeau, W. Holliwell, K, Newell & G, Roberts (Eds.), *Psychology of motor behaviour and sport* (pp. 314-323). Champaign IL: Human Kinetics.
- Seefeldt, V., & Haubenstricker, J. (1982). Patterns, phases, or stages: An analytical model for the study of developmental movement. In J.A.S. Kelso & J.E. Clark (Eds.), *The development of movement control and coordination* (pp. 309-318).Chichester, UK: John Wiley & Sons.
- Sherar, L.B., Eslinger, D.W., Baxter-Jones, A.D., & Tremblay, M.S. (2007). Age and gender differences in youth physical activity: Does physical maturity matter? *Medicine & Science in Sports & Exercise*, 39, 830-835.
- Shilton, T. & Naughton, G. (2001). Physical activity and children: A statement of importance and call to action from the Heart Foundation. The Heart Foundation.

- Shirley, M.M. (1931). The first two years: A study of twenty five babies. Vol. 1. Postural and locomotor development. Minneapolis: University of Minnesota Press.
- Sirard, J.R., & Pate, R.R. (2001). Physical activity assessment in children and adolescents. *Sports Medicine*, 31(6), 439-454.
- Sleep M., & Warburton, P. (1992). Physical activity levels of 5-11 year old children in England as determined by continuous observation. *Research Quarterly for Exercise and Sport*, 63(3), 238-245.
- Singer, J.D. & Willet, J.B. (2003). *Applied longitudinal data analysis. Modelling change and event occurance*. New York: Oxford University Press Inc.
- Smits-Engelsman, B.C.M., Henderson, S.E., & Michels, C.G.J. (1998). The assessment of children with developmental coordination disorders in the Netherlands: The relationships between the Movement Assessment Battery for children and Köperkoordinations Test für Kinder. *Human Movement Sciences, 17*, 699-709.
- Smyth, M. M., & Anderson, H. (2000). Coping with clumsiness in the school playground: Social and physical play in children with coordination impairments. *British Journal of Developmental Psychology*, 18, 389-413.
- Southall, J.E., Okely, A.D., & Steele, J.R. (2004). Actual and perceived competence in overweight and nonoverweight children. *Pediatric Exercise Science*, 16, 15-24.
- Stodden, D.F., Goodway, J.D., Langendorfer, S.J., Roberton, M.A., Rudisill, M.E., Garcia, C., & Garcia, L.E. (2008). A developmental perspective on the role of motor skill competence on physical activity: An emergent relationship. *Quest*, 60, 290-306.

- Stratton, G. (2000). Promoting children's physical activity in primary school: An intervention study using playground markings. *Ergonomics*, *43*, 1538-1546.
- Stratton, G. & Mullan, E. (2005). The effect of multicolour playground markings on children's physical activity during recess. *Preventive Medicine*, 41, 828-833.
- Strong, W.B., Malina, R.M., Blimkie, C.J.R., Danile, S.R., Dishman, R.K., & Gutin, B. (2005). Evidence based physical activity for school-age youth. *Journal of Pediatrics*, 146(6), 732-737.
- Tabachnick, B.G., & Fidell, L.S. (2007). *Using multivariate statistics* (5th Ed). Boston: Pearson Education Inc.
- Tasmanian Department of Education, Community and Cultural Development. (1997). *Fundamental motor skills*. Hobart, TAS: Authors.
- Telama, R. (1998). Psychological background of a physically active lifestyle among European youth. In R. Naul, K. Hardman, M. Pieron & B. Skirsted (Eds). *Physical activity and active lifestyles of children and youth* (pp. 63–74).
 Schorndorf: Karl Hofmann.
- Telford, A., Salmon, J., Timperio, A., & Crawford, D. (2005). Examining physical activity among 5-to 6 and 10-to 12-year-old children: The children's leisure activities study. *Pediatric Exercise Science*, 17, 266-280.
- Thelen, E., & Smith, L. B. (1994). A dynamic systems approach to the development of cognition and action. Cambridge, MA: MIT Press.
- Thomas, J.R. (1999). Children's control, learning, and performance of motor skills. *Research Quarterly for Exercise and Sport*, 71(1), 1-9.
- Thomas, J. R., & French, K.E. (1985). Gender differences across age in motor performance: A meta-analysis. *Psychological Bulletin*, 98, 260-282.

- Thomas, J. R. & Nelson, J. K. (1996) *Research Methods in Physical Activity* 3rd Ed. Human Kinetics, USA.
- Thompson, A., Baxter-Jones, A., Mirwald, R. & Bailey, D. (2003). Comparison of physical activity in male and female children: Does maturation matter? *Medicine and Science in Sports and Exercise*, 35(10) 1684-1690.
- Tinning, R. (2007) Aliens in the gym? Considering young people as learners in physical education. *ACHPER Healthy Lifestyles Journal*, *54*(2), 13-18.
- Trost, S. G. (2003). Discussion paper for the development of recommendations for children's and youth's participation in physical activity. Department of Health and Ageing: Commonwealth of Australia.
- Trost, S. G., & Brown, W. (2000). *Young people's participation on physical activity*. St Lucia: University of Queensland.
- Trost, S. G., Morgan, A. M., Saunders, R., Felton, G., Ward, D. S., & Pate, R. R. (2000). Children's understanding of the concept of physical activity. *Pediatric Exercise Science*, 12, 293-299.
- Trost, S.G., Pate, R. R., Sallis, J. F., Freedson, P.S., Taylor, W.C., Dowda, M. & Sirard, J. (2002). Age and gender differences in objectively measured physical activity in youth. *Medicine & Science in Sports & Exercise*, 34(2) 350-355.
- Tudor-Locke, C., Kasse, C., Williams, J.E., & Reis, J.P. (2002). Pedometer-assessed steps take in 30 minutes of self selected moderate intensity walking.
 Unpublished report. University of South Carolina, Columbia.
- Tudor-Locke, C., & Myers, A.M. (2001). Methodological considerations for researchers and practitioners using pedometers to measure physical (ambulatory) activity. *Research Quarterly for Exercise and Sport*, 72(1), 1-12.

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- Tudor-Locke, C., Pangrazi, R.P., Corbin C.P., Rutherford, W.J., Vincent, S.D., Raustorp, A., et al. (2004). BMI-referenced standards for pedometerdetermined steps/day for children. *Preventive Medicine*, 38(6), 857-864.
- Tudor-Locke, C., Williams, J.E., Reis, J.P., & Pluto, D. (2002). Utility of pedometers for assessing physical activity: Convergent Validity. *Sports Medicine*, 32(12), 795-808.
- Tudor-Locke, C., Williams, J.E., Reis, J.P., & Pluto, D. (2004). Utility of pedometers for assessing physical activity Construct Validity. *Sports Medicine*, 34(5), 281-291.
- Ulrich, B. D. (1987). Perception of physical competence, motor competence, and participation in organised sport: their interrelationships in young children. *Research Quarterly for Exercise and Sport*, 58, 57-67.
- Ulrich, B. D. (1997) Dynamic systems theory and skill development in infants and children. In: Connolly, K. J. & Forssberg, H. (eds) *Neurophysiology and Neuropsychology of Motor Development*. Cambridge: Mac Keith.

Ulrich, D. A. (1999). Test of Gross Motor Development. Austin, TX: PRO-ED.

- van Beurden, E., Zask, A., Barnett, L.M., & Dietrich, U.C. (2002). Fundamental movement skills – How do primary school children perform? The "Move it Groove it" program in rural Australia. *Journal of Science & Medicine in Sport*, 5(3), 244-252.
- Victorian Education Department. (1996). *Fundamental motor skills A manual for classroom teachers*. Victoria: Department of Education.
- Weiss, M. R. & Amorose, A. J. (2005). Children's self perceptions in the physical domain: Between- and within-age variability in level, accuracy and sources of perceived competence. *Journal of Sport & Exercise Physiology*, 27, 226-244.

- Weiss, M.R., Ebbeck, V., & Horn, T.S. (1997). Children's self perceptions and sources of competence information: A cluster analysis. *Journal of Sport & Exercise Psychology*, 19, 52-70.
- Weiss, M.R., & Ferrer Caja, E. (2002). Motivational orientations and sport behavior. In T.S. Horn (Ed.), *Advances in sport psychology* (2nd ed., pp. 101-183). Champaign, IL: Human Kinetics.
- Welk, G.J. (1999). The youth physical activity promotion model: A conceptual bridge between theory and practice. *Quest*, *51*, 5-23.
- Welk, G.J., Corbin, C.B., & Dale, D. (2000). Measurement issues in the assessment of physical activity in children. *Research Quarterly for Exercise and Sport*, 71(2), 59-73.
- Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review*, 92, 548-573.
- Welsman, J. & Armstrong, N. (1998). Physical activity patterns of 5 to 7-year-old children and their mothers. *European Journal of Physical Education*, 3, 145-155.
- West, B.T., Welch, K.B. & Galecki, A.T. (2007) Linear mixed models. A practical guide using statistical software. U.S.A.: Taylor & Francis Group, LLC.
- White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychologist Review*, *66*, 271-333.
- Whitehead, M.E. (2001). The concept of physical literacy. *British Journal of Teaching Physical Education*, 32(1), 6-8.
- Wickstrom, R.L. (1983). *Fundamental motor patterns* (3rd ed.). Philadelphia: Lea and Febiger.

- Wigfield, A. (1994). Expectancy-value theory of achievement motivation: A developmental perspective. *Educational Psychology Review*, 6(1), 49-78.
- Wigfield, A., Eccles, J. S., Suk Yoon, K., Harold, R. D., Arbreton, A. J. A., Freedman-Doan, C. & Blumenfeld, P. C. (1997). Change in children's competence beliefs and subjective task values across the elementary school years: A 3-year study. *Journal of Educational Psychology*, 89, 451-469.
- Williams, H.G. (1983). *Perceptual and motor development*. Englewood Cliffs, NJ: Prentice Hall.
- Wright, J. (1997). Fundamental movement skills testing as problematic practice: A feminist analysis. ACHPER Healthy Lifestyles Journal, 44(4), 18-20.
- Wrotniak, B.H., Epstein, L.H., Dorn, J.M., Jones, K.E., & Kondilis, A. (2006). The relationship between motor proficiency and physical activity in children. *Pediatrics*, 118, 1758-1765.
- Zask, A., van Beurden, E., Barnett, L., Brooks, L.O., & Dietrich, U.C. (2001). Active school playgrounds – Myth or reality? Results of the 'Move it groove it' project. *Preventive Medicine*, 33, 402-408.
- Ziviani, J., MacDonald, D., Jenkins, D., Rodger, S., Batch, J. & Cerin, E. (2006). Physical activity of young children. *OTJR: Occupation, Participation & Health*, 26(1), 4-14.