# EUROPEAN PSYCHOMOTRICITY JOURNAL

http://www.psychomotor.gr/epj.htm

ISSN 1791-3837
*European Psychomotricity Journal* 2008; 1; 1, 40-46
**Special Issue: 1st Symposium of SPA-Hellas**
Published by: Athlotypo Sports Publishing
http://www.athlotypo.gr/

On behalf of:
Scientific Psychomotor Association Hellas
Additional services and information for *the European Psychomotricity Journal* can be found at:
**Email Alerts: http://www.psychomotor.gr/communication.htm**
**Subscriptions:** http://www.psychomotor.gr/subscription.htm

# The relationship between motor performance and accident proneness in preschool and primary school children

I. Ioannidou, N. Aggeloussis, G. Mavromatis

Democritus University of Thrace

## Abstract

Nowadays, children and adolescents are becoming less physically active and are adopting a sedentary life, in front of computers and television screens. However, at school, children get away from the above habits and become more active. Because of this increased physical activity, a lot of accidents are caused during school hours compared with the accidents that are caused during the rest of the day. The purpose of this study was to investigate the relationship between motor performance and accident proneness in preschool and primary school children. Specifically, the factors, which have been contributed to accident proneness, have been studied. Finally, the relationship between motor performance and severity of injury has been investigated. Possible factors that contribute to an accident are proved to be age, gender, psychological-behavioural factors, the activity engaged, the surface or equipment used and insufficient organization. Regarding the frequency of accidents and the age, most researchers come to the conclusion that as children grow up become more prone to accidents. According to the relationship between sex and frequency of accidents most researchers claim that boys have higher accident rates than girls. It is also mentioned a significant relationship between accident frequency and measures of high hazard exposure. Finally, children's motor development plays an important role in the avoidance of accidents. On the other hand, there is no research that studies the relationship between the seriousness of an accident with the level of motor ability and the tendency of a child to have accidents.

**Key words:** *accident proneness, school environment, motor ability, motor performance*

## Introduction

Nowadays, children and adolescents are becoming less physically active and are adopting a sedentary life, in front of computers and television screens. However, physical activity and sport remain a preferred past – time recreation for school children.

Most researchers agree that physical activity during sport and recreational play, if it is adapted and conducted on the terms of the child, is beneficial physiologically, medically and psychologically. It increases the child's physical capacity and also improves his balance, coordination and motor skills, of which the latter is considered a lifelong investment. Through a confident and encouraging environment the child also learns social

skills, self – discipline and develops self - esteem (Sundblad, Saartok, Engstrom, Renstrom, 2004).

Because of this increased physical activity at school, a lot of accidents are caused during school hours compared with the accidents that are caused during the rest of the day.

As a consequence, injuries such as laceration, scratches or bruises are frequent and they happen in children's daily school life, while running, playing with others or using equipment. Not only these accidents and injuries cause pain and danger for future complication but they also cost a large amount of money for the government for hospitalization and therapy of the injured children. (Christoforidis, Kambas, 2007).

The purpose of this study was to investigate the relationship between motor performance and accident proneness in preschool and primary school children. Specifically, the factors, which have contributed to accident proneness, have been studied. Finally, the relationship between motor performance and severity of injury has been investigated.

*Background*

Possible factors that contribute to an accident are proved to be age, gender, socioeconomic status, psychological-behavioral factors, the activity engaged, the surface or equipment used and insufficient organization (Christoforidis et al., 2007).

*Relationship between age and frequency of accidents*

Comparing the frequency of accidents and age, it seems that the frequency of injuring is different. Children and adolescents are at greater risk to sustain sport injuries than adults because of their not fully developed coordination, longer reaction time and less maturity at assessment. Furthermore, there are anatomical as well as biomechanical differences that are attributed to the growing skeleton and tissue, making children and adolescents susceptible to accidents. During growth, adolescents usually loose some of their flexibility, coordination and endurance, which can increase the risk of accidents (Sundblad et al. 2004).

According to several researchers, children become more prone to accidents as they grow up (Belechri, Petridou, Kedikoglou, Trichopoulos, Sports Injuries European Union group, 2001; Kingma, Ten Duis, 2000; Vorko-Jovic, Rimac, Jovic, Strnad, Solaja, 2001; Jia, Zhao, Bo, Zhang, Liu, 2005; Miller, Spicer, 1998; Maitra, 1997). However, some types of accidents such as accidents on a climbing frame and accidental falls decrease statistically at older ages. In contrast ball sport accidents increase (Kingma et al., 2000).

According to Menckel and Laflamme research (2000), which recorded accidents of children in primary school and in lycées, there is a decrease of accidents from primary school to high school and lycée, Moreover, Kelm, Ahlhelm, Pape, Pitsch, Engel, (2001) studied children between the age of 11-15 and found that children at the age of 13 are more prone to accidents.

Furthermore, Brudvik (2000) mentions that girls are more prone to accidents at the age of 10-12 comparing to girls at the age of 4-6.

However Schwebel, Binder, McDermott, Plumert (2003) didn't find differences in the frequency of accidents between children of the age of 6-8, while Macgregor, Hiscox (1998) mention that 66% of injured students are between the ages of 5-11 and 33% are between 12-13 years old.

Lastly, according to Sun et al. (2006) primary school children have the biggest frequency of accidents in relation to high school children, something that Brook, Boaz (2006) and Alkon et al. (1999) agree with.

*Relationship between sex and frequency of accidents*

According to the relationship between sex and frequency of accidents most researchers claim that boys have higher injury rates than girls, especially when comparing the moderate to severe injury rates (Belechri et al., 2001; Brook, Heim 1997; Vorko-Jovic et al., 2001; Kelm, et al., 2001; Nordin, 2002; Schwebel et al., 2003; Brudvik, 2000; Jia et al., 2005; Sun et al., 2006; Alkon et al., 1999; Currie, Williams, Wright, Beattie, Harel, 1996). It is also stated that boys tend to have twice as many accidents compared with girls (Gofin, Donchin, Schulrof, 2004; Macgregor et al., 1998). The reasons are several. Generally, boys are involved more in contact sports and ball sports such as football and basketball (Kelm et al., 2001). It is also a fact that boys do a lot of extremities during games in order to show

their skills in activities with bicycles, skates and snowboards (Brudvik, 2000). There are also studies which show that boys are more prone to accidents during their free time (Menckel, et al., 2000).

Many studies mention that both boys and girls who are good at the subject of physical education are more prone to accidents (Schwebel et al., 2003).

However, there are reports in which there is no difference in the frequency of accidents between boys and girls (Kingma et al., 2000; Schwebel et al., 2003). It is also mentioned that girls between the age 10-11 are injured more frequently (Maitra, 1997) and usually during the subject of physical education (Menckel et al., 2000).

*Relationship between motor performance and accident proneness*

By the term accident proneness we regard the tendency of an individual to experience more accidents than other dividuals (in terms of basic personal characteristics like age, gender and place of residence), due to stable personality characteristics (Visser, Pijl, Stolk, Neeleman, Rosmalen, 2006). The same researchers mention that people who are more prone to accidents are those who are exposed in more dangers.

Wazana (1997) suggests that certain children are "injury prone," is, that they have physical, developmental, emotional, or behavioral characteristics that increase the possibility of being injured. He mentions specifically that aggressive children in comparison with the nonaggressive onescounterparts are involved more in accidents and as a result they are injured more frequently and seriously. Statistically significant risk factors have been also found to be the antisocial behaviour and hyperactivity. Finally according to the same researcher there is a group of studies that found a significant relationship between accident frequency and measures of high hazard exposure (extroversion, exploring, daring, athletic) and poor ability to cope with hazards (discipline problems, disobedient, competitive, tenacious, impulsive, low frustration tolerance, careless, and unreliable). However, there are studies which do not prove this relationship.

Gofin et al. (2004), recorded accidents in primary school children and proved a positive relation between balance and the occurrence of accidents - children who managed to balance on tiptoe for longer seemed to have suffered injuries more than children with medium balance or children with poor balance. This may be a consequence of exposure to

risk situations: if children whose motor abilities are less developed tend to take less risks than children whose motor abilities are more developed, this may override the protective advantage of the latter group in terms of motor ability.

*Contribution of student's motor development to the avoidance of accidents*

Children's motor development plays an important role in the avoidance of accidents. According to Kingma et al.(2000), the duration of the lesson in the subject of physical education in school increases as the children grow up and as a result high school children and lycée children exercise more than kindergarden children. Children at the age of nine present different rates of development and this can affect their performance on the subject of physical education (Kingma et al., 2000). Gofin et al. (2004) found no significant difference in incidence between children who are usually active during recess and children who are not, or between children who do not exercise at least once a week during extra-curricural activities, and children who exercise once or twice a week.

Although it is common knowledge that clumsy children are more prone to accidents, few researchers have taken into consideration that motor ability may cause more accidents to children. There are studies which mention that children, who were more prone to accidents, during the school year, have been assessed by the physical education teacher as having less motor abilities compared with children who had no or little accidents (Schwebel et al., 2003).

## Conclusions

Taking all the above into consideration, it seems that age, sex and the level of motor ability play an important role in the tendency of a child to have accidents. Most studies claim that boys are more prone to school accidents. In addition, regarding the frequency of accidents and the age, it seems that most researchers come to the conclusion that as children grow up, they become more prone to accidents. The level of motor ability plays an important role in the avoidance of an accident. There is no research that studies the relationship between the seriousness of an accident with the level of motor ability and the tendency of a child to have accidents.

## References

Alkon A., Genevro J.L., Tschann J.M., Kaiser P., Ragland D.R. & Boyce W.T., (1999). The epidemiology of injuries in 4 child care centers. *Arch Pediatr Adolesc Med*, 153: 1248-1254.

Belechri M., Petridou E., Kedikoglou S., Trichopoulos D. & Sports Injuries European Union group. (2001). Sports injuries among children in six European union countries. *European Journal of Epidemiology*, 17: 1005-1012.

Brook U. & Boaz M. (2003). Children hospitalized for accidental injuries: Israeli experiences. *Patient Education and Counseling*, 51: 177-182.

Brook U. & Heim M. (1997). Accidents among high school pupils in Israel: a recurrent disease? *Patient Education and Counseling*, 31: 237-242.

Christoforidis C. & Kambas A. (2007). Childhood injuries in Greek school environment. *International journal of injury control and safety promotion,* 14(4): 262-263.

Currie C.E., Williams J.M., Wright P., Beattie T. & Harel Y. (1996). Incidence and distribution of injury among schoolchildren aged 11-15. *Injury Prevention*, 2: 21-25.

Gofin R., Donchin M. & Schulrof B. (2004). Motor ability: protective or risk for school injuries? *Accident Analysis and Prevention*, 36: 43-48.

Jia C., Zhao Z., Bo Q., Zhang Y. & Liu Z. (2005). Incidence rates and risk factors for injury events in high school students in Lijin County, China. *Journal of Safety Research*, 36: 133-137.

Kelm J., Ahlhelm F., Pape D., Pitsch W. & Engel C. (2001). School sports accidents: analysis of causes, modes, and frequencies. *Journal of Pediatric Orthopaedics*, 21: 165-168.

Kelm J., Ahlhelm F., Pape D., Pitsch W. & Engel C. (2001). School sports accidents: analysis of causes, modes, and frequencies. *Journal of Pediatric Orthopaedics*, 21: 165-168.

Kingma J. & Ten Duis H-J (2000). Injuries due to school sports accidents in 4 to 13 yr.-old children. *Perceptual and Motor Skills*, 90: 319-325.

Macgregor D-M. & Hiscox J-A. (1998). School referral survey. *Scottish Medical Journal*, 43: 77-79.

Maitra A. (1997). School accidents to children: time to act. *J Accid Emerg Med*, 14: 240-242.

Menckel E. & Laflamme L. (2000). Injuries to boys and girls in Swedish schools: different activities, different results? *Scand J Public Health*, 28: 132-136.

Miller T-R. & Spicer S-R. (1998). How safe are our schools? *American Journal of Public Health*, 88(3): 413-418.

Nordin H. (2002). Accidents in playgrounds and school grounds in Sweden. From EHLASS, Swedish Consumer Agents Centre for Epidemiology, National Board of Health and Welfare.

Schwebel D., Binder S., McDermott J. & Plumert J. (2003). Is there a link between children's motor abilities and unintentional injuries? *Journal of Safety Research*, 34: 135-141.

Sun Y-H., Yu I.T-S., Wong T-W., Zhang Y., Fan Y-P. & Guo S-Q. (2006). Unintentional injuries at school in China – Patterns and risk factors. *Accident Analysis and Prevention*, 38: 208-214.

Sundblad G., Saartok T., Engstrom L-M. & Renstrom P. (2005). Injuries during physical activity in school children. *Scand J Med Sci Sports*, 15:313-323.

Visser E., Pijl Y.J., Stolk R.P. Neeleman J. & Rosmalen J.G.M. (2006). Accident proneness, does it exist? A review and meta-analysis. *Accident Analysis and Prevention*, *article in press*.

Vorco-Jovic A., Rimac M., Jovic F., Strnad M. & Solaja D. (2001). Epidemiological investigation of school-related injuries in Koprivnica Country Croatia. *Croatian Medical Journal*, 42(1): 58-63.

Ioanna Ioannidou
Dep Phys Educ Sp Sc
Democritos University of Thrace
69100 Komotini GR
iioannid@phyed.duth.gr