

Growth spurts lower teenage boys' coordination

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A sudden growth spurt during adolescence can lower teenage boys' coordination and affect their gait, according to research published in the open access journal *Biomedical Engineering OnLine*. This study investigates the cause behind the loss of coordination in growing adolescent boys, suggesting that as teenagers they may begin to walk clumsily because their brain requires some time to adjust to a rapid height increase.

The researchers analyzed different aspects of walking in 88 [teenage boys](#), such as the smoothness of gait, step regularity and balance. All these characteristics are guided by motor control. Boys who had growth spurts, defined as a height increase greater than 3cm in the three month period, showed a more irregular and less smooth gait than steadily growing [teenage boys](#).

Learning to walk is an important milestone in motor development, which is first achieved early in childhood and continues to develop until adult age. However, growth spurts are common during adolescence, and these accelerated changes in growth can alter an individual's control of their body and require some time to adapt.

Lead author, Dr Maria Cristina, from the University of Bologna, Italy, said, "A sudden increase in height affects the body's ability to control established motor skills, such as walking. Adolescents tend to show previous control of the body when growing up, but the motor control behaviour is organized on the body's dimensions. Following a growth

spurt, the body needs time to adjust to changes to the periphery, during which time a teenager may walk awkwardly, while teenagers who grow steadily are able to handle growth modifications better and so maintain smoothness and regularity when walking."

A total of 88 teenage boys from Liceo di Lugo school in Italy, all aged 15 years old, were measured and weighed. Height and weight were recorded again three months later. Nineteen teenagers showed [growth spurts](#). This represented the 'Grown' group. The 'Not Grown' group included boys with a similar body mass index, but only had a height increase of 1cm or less.

The boys wore wireless sensors, which were strapped to their lower back and on the lower legs, to quantify gait characteristics. The sensors could detect movement of the body's torso, indicating in which direction motor control was mostly affected.

The boys walked at a self-selected speed back and forth four times in a 10m long corridor. They then had to perform a mental arithmetic task while walking to test the relative cognitive demand of gait control, counting backwards aloud by intervals of eight from a random starting number. Only the 19 boys that had a growth spurt repeated the walking tests after three months.

All the boys showed changes in their walking ability when having to simultaneously complete a mental arithmetic task. However, the 'Not Grown' group walked more smoothly and their stride was more regular compared to the 'Grown' group, particularly when performing the cognitive task demonstrating an increased demand in gait control.

Basic understanding of motor control development during the life span, from infancy to old age, is fundamental for effective interventions and therapies. This study analyzes the different aspects of gait control

adjustment and furthers our understanding of [motor control](#) development, with a focus on sudden changes in height. However, there may be other factors involved. During adolescence, the body is going through a number of biological, cognitive and socio-emotional changes that could also affect motor development.

More information: Maria Cristina Bisi et al. Development of gait motor control: what happens after a sudden increase in height during adolescence?, *BioMedical Engineering OnLine* (2016). [DOI: 10.1186/s12938-016-0159-0](#)

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