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# The Effects of Growth and Somatic Maturation on Physical Health and Athletic Performance

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## ABSTRACT

*Physical performance is influenced by both the processes of growth and maturity, which are connected. In studies of growth and performance, chronologic age is frequently used as the standard. The growth, maturity, and performance status of people belonging to the same chronologic age, particularly during the pubertal years, however, vary significantly. This chapter focuses on how performance, growth, and maturation interact during childhood and adolescence.*

**Keywords:** Physical performance, Health, Athletes, Physical training, Adolescence.

## INTRODUCTION

Physical performance is influenced by both the processes of growth and maturity, which are connected. In studies of growth and performance, chronologic age is frequently used as the standard. The growth, maturity, and performance status of people belonging to the same chronologic age, particularly during the pubertal years, however, vary significantly. This chapter focuses on how performance, growth, and maturation interact during childhood and adolescence. It specifically takes into account:

1. The diversity in physical performance related with age, sex, and maturity
2. The features of young athletes' growth and maturation
3. The impact of training on growth and maturation
4. The matching of opponents for sport.

Somatic maturation is a factor that affects development and physical ability. In order to maintain health while reducing the danger of damage, appropriate training tactics should be used during the pubertal phase, which is a crucial time for young people's performance development and skill acquisition. It is possible for athletes of the same chronological age competing at the same level in the same category to exhibit differences in size, function, and body structure due to differences in maturity status. In a number of sports, athletes of the same selection year have been found to differ physically and psychologically according to their maturity level and birthdate. These variances may be related to youth practitioners' dropout rates and a shrinking talent pool. Regarding physical and athletic performance, it was discovered that chronological age had a determining influence on vertical jump, linear sprint, and direction change, showing that older soccer players perform better. On the other hand, age has no bearing on a player's position. Ivanovic and colleagues' study looked at various playing roles in young basketball players. The researchers found that (a) basketball guards are most valued for their change of direction speed; (b) forwards are most valued for their ability to jump; and (c) centers are most valued for their ability to control precise motions while dribbling the ball. Physical training on a regular basis enhances neuromuscular adaptation responses, which enhances performance in sports-specific skills. Somatotype, age, nutritional state, motor skills, perceived physical ability, training level, genetics, and injury risk based on prior injury are examples of physiologic, psychologic, and environmental factors that may affect athletic performance. The effectiveness of motor skills gradually improves during childhood and the early stages of puberty. Lower anaerobic and aerobic capacity in a young athlete may, from a physiologic perspective, impair performance potential. Although there is a weak link

between aerobic capacity, endurance, and performance throughout childhood and adolescence. Psychological elements like self-confidence, anger, and internal motivation also have an impact on athletic performance. The precise hazards of sports-related injuries depend on an adolescent's growth and development. Growth and development may also have an impact on the immediate and long-term effects of sports-related injuries.

***Performance variations related to maturity***

Growth status and performance are influenced by a person's level of maturity at a certain age and when their adolescent growth spurt occurs. Furthermore, compared to the general population, young athletes typically display different levels and rates of maturity. Reviewing performance variation related to maturity is crucial. Different levels of maturation have an impact on performance as well as physical size, composition, and proportions. Variations in body size and/or composition and a direct impact on performance are two ways that variations in mature status might have an impact. Skeletal age is one measure of maturity, and there are low to moderate correlations between skeletal age and a variety of motor performance measures, such as tests of speed, flexibility, explosive strength or power, and muscular endurance in kids and teenagers.

***Young athletes' development and maturation during training***

Training refers to unique short-term experimental programmes or to systematic, specialized practice for a given sport or athletic discipline over the majority of the year. Exercise is not the same as consistent training. More focus is required on measuring, quantifying, and defining training plans according to sport. Training regimens typically have a specific focus (such as endurance running, strength training, or sport skill training) and range in duration and intensity. While not all of the changes linked to regular training are in the same direction as those that go along with natural growth and maturity, the majority of them are. In the data that is currently available, it is challenging to distinguish between training effects and those caused by typical growth and maturity.