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"Growth" of Mean Height by Age in the Same Year—Critical Views

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1. Abstract and Introduction

Stature is a net measure that captures the supply of inputs to health (Steckel, 1995, p.1903) [1].

Growth is a function of time. High school seniors in 2017(school year) were born in 2000, entered primary school as freshmen in 2006 or 2007 and entered middle school 6 years later and so on. Fresh men in primary school in 2006/2007 can never be 2017 high school seniors instantly in the same years. One grows in age one by one. It is conceptually inadequate to compare first graders in primary school, first graders in middle school and finally seniors in high school observed in the same year, 2017, to determine growth patterns of height of school students in 2017.

Seniors in 2017 were 6 years old in 2006. In a country, where the economy quits growing at all, thus depressing living standards for children unchanged, one could safely assume that differences between ages in mean height should nearly represent those of ages. Japan in three decades after 1990 might fall into this category. On the other hand, South Korea, China, Taiwan, and other economies in South East Asia have been increasing remarkably in per capita GDP (Figure 1).

Growth of Mean Height by Age in Contrast to Cross-sectional Observations in the Same Years, 1970 to 2017, Japan and South Korea [2,3]

Figure 2 shows that in the past half century school children in Japan were distinctly taller in height than those in South Korea before 1990 which kept growing vigorously in height until recent years. The Korean peers quit growing in height in the mid-2000. As mentioned earlier, high school seniors in 2017 were born in the year 2000 and one year old in 2001, entered primary school, 6 years old in 2006, and 17 years old in 2017. It has taken 17 years to grow to high school seniors, never instantly in 2000.

Figure 3 compares growth curve of Korean school boys from primary school first graders in 1975 to high school seniors in 1981 with simple listing of mean height of school children from 1st graders to high school seniors in 1986. Figure 4-5 compare growth curve of Korean school boys from primary school 1st graders in 1980 to high school seniors in 1991 with simple listing of mean height of from primary school 1st graders to high school seniors in 1991. Figure 6 repeats the similar comparison for the period of 1991 to 2002 for Japanese school boys. To save space, literal explanations of Figure 7-8 are saved. For the case of Korean school boys, genuine growth from primary school 1st graders in 2006 to high school seniors in 2017 is still greater than simple listing of mean height of from 1st graders to high school seniors in 2017 (Figure 8). One may need to realize that simple listing of mean height of from 1st graders to high school seniors in any year does not represent the actual growth of mean height by age.

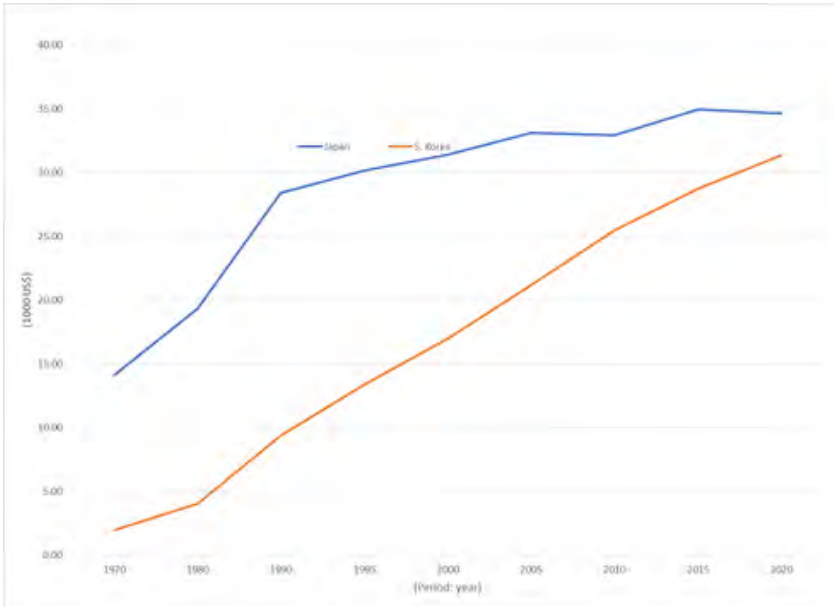

Figure 1: Per capita gdp in US$, 1970~2020, Japan and S. Korea

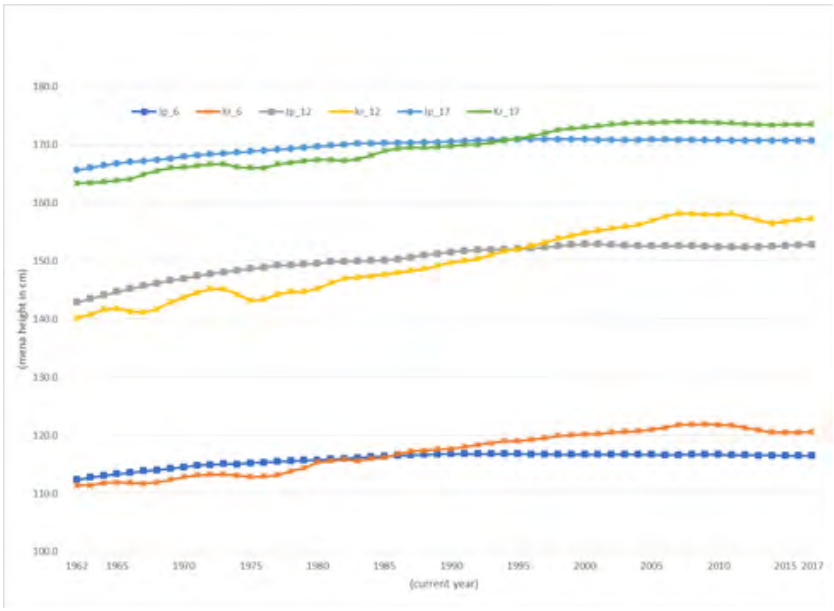

Figure 2: Secular changes in meaheight of Japanese and Korean male students, ages 6, 12 and 17

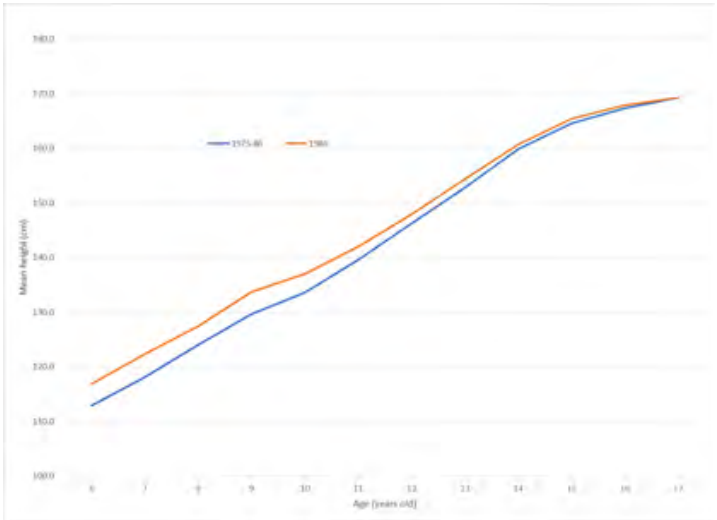

Figure 3: Lonjitudinal and Cross-sectional mean hight of school boys, 1975-86, Korean Case

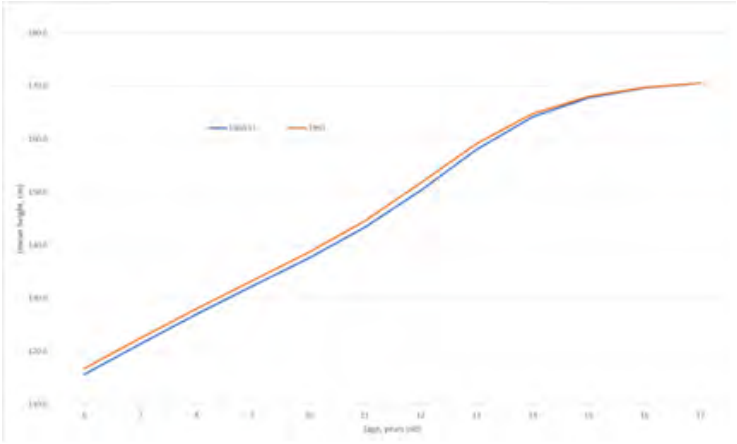

Figure 4: Growth by age, longitudina vs cross-sectionl, Japanese boys, 1980-1991

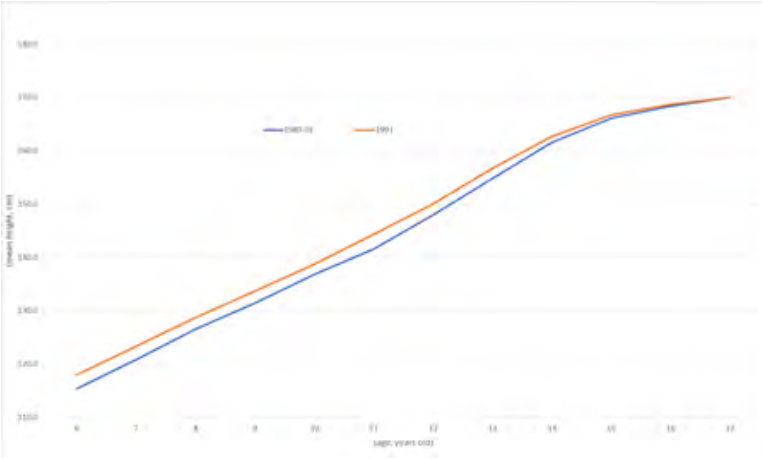

Figure 5: Growth by age, longitudinal vs cross-sectional, Korean boys, 1980-1991

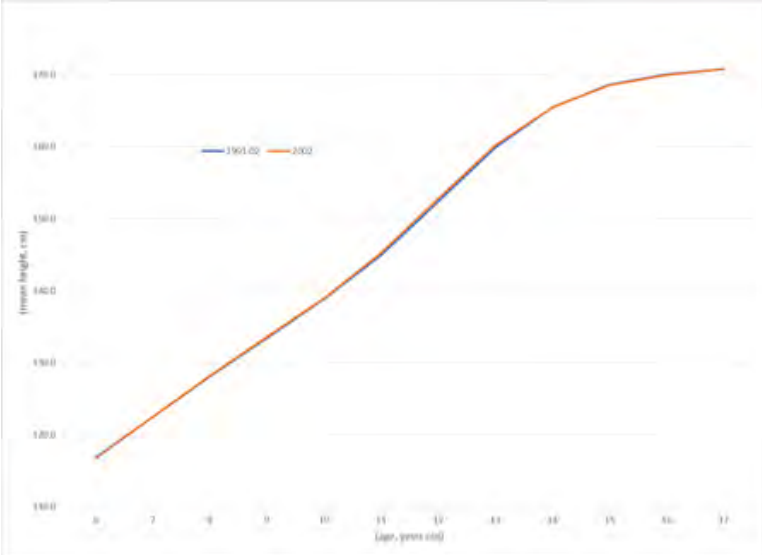

Figure 6: Growth of mean height by age, longitudinal vs cross-sectional, Japanese boys, 1991-2002

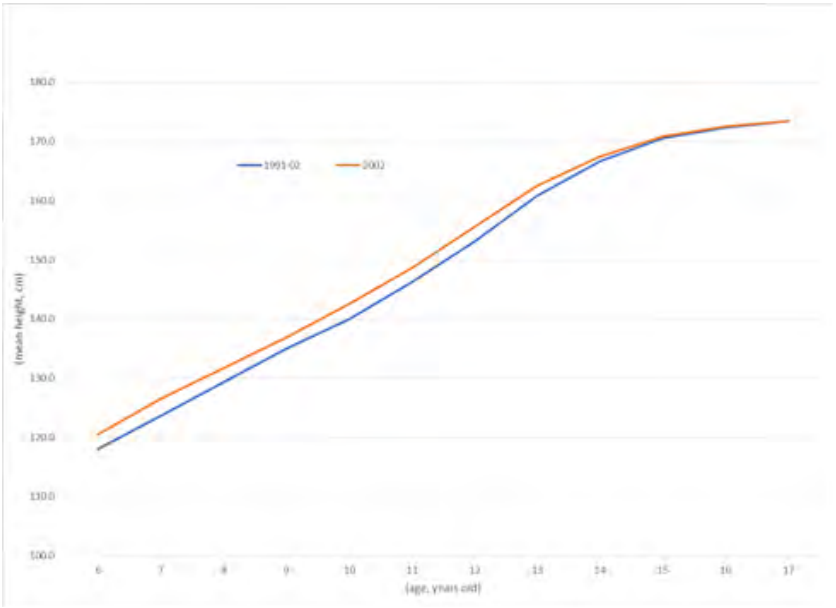

Figure 7: Growth of mean height by age, longitudinal vs cross-sectional, Korean boys, 1991-2002

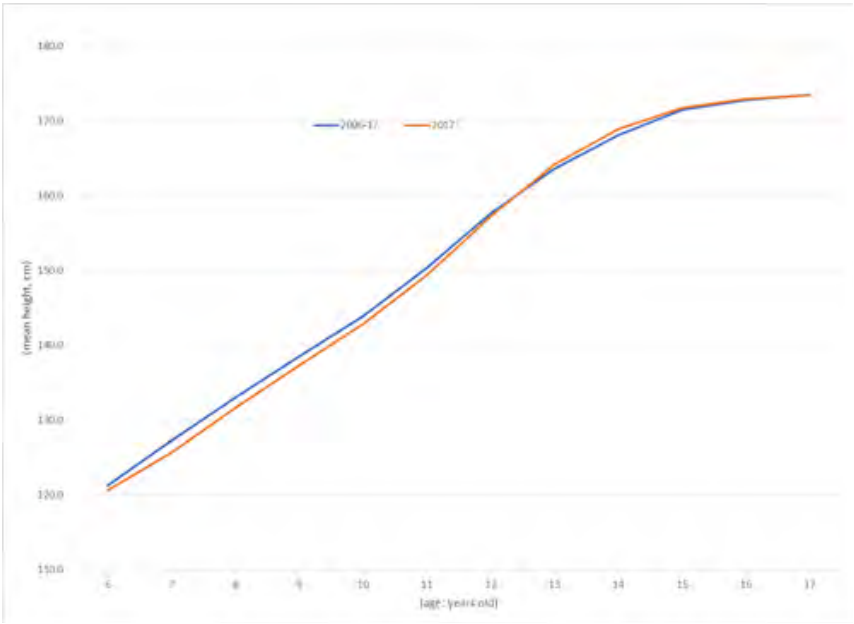

Figure 8: Growth of mean height by age, cross-setional vs loniditudinal, Korean boys

2. Conclusion

Children grow taller in mean height as they increase in age, until they quit growing in stature, 17 or 18 years of age in the case of male students.

Simple listing of mean height by ages by cross-sectional data does understate the real growth, particularly where the economy grows vigorously. It is recommendable to rely on longitudinal data [2,3].

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