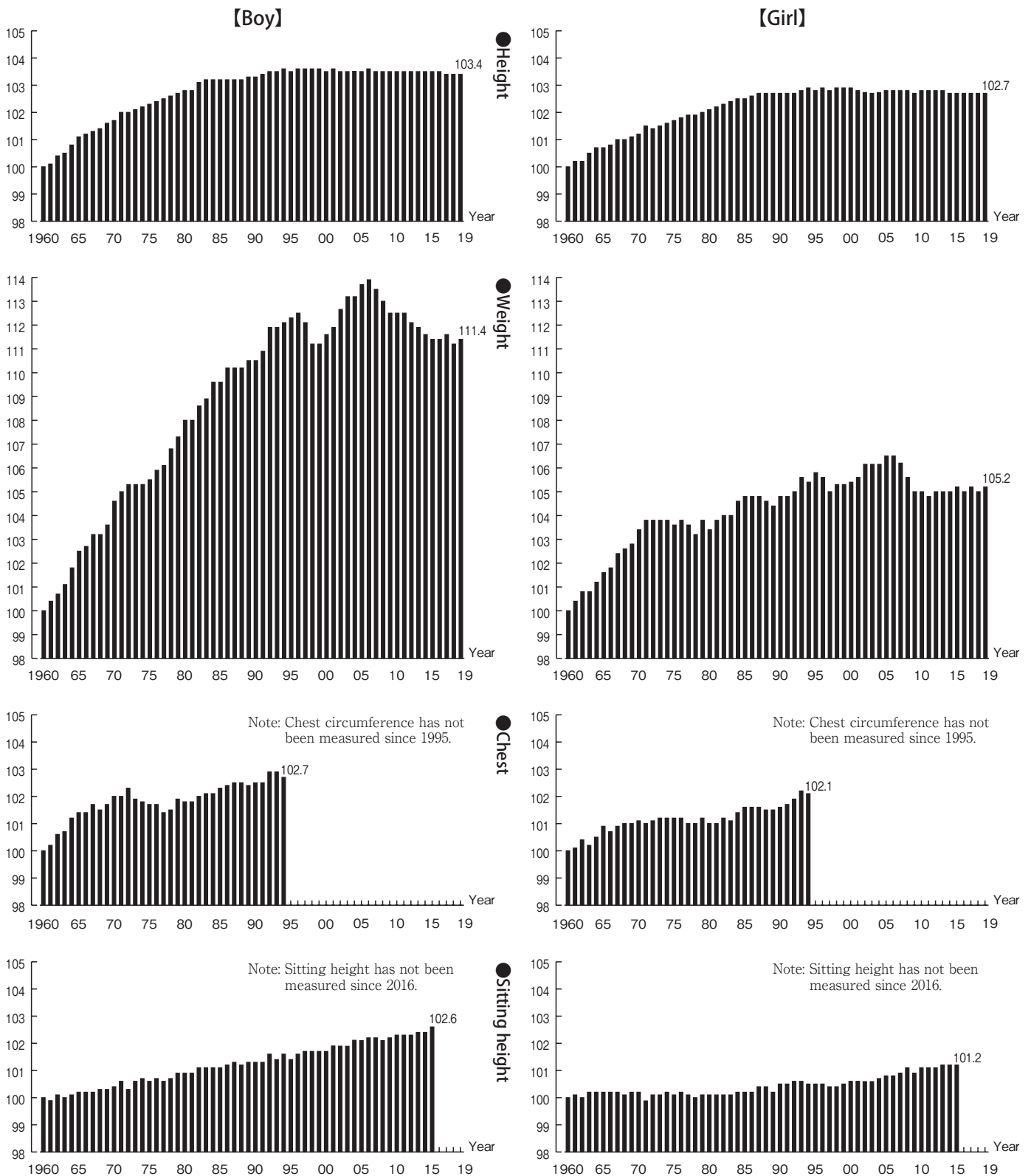


## 1 Physique



Note: All figures show the trend when the value in 1960 was set to 100 percent.

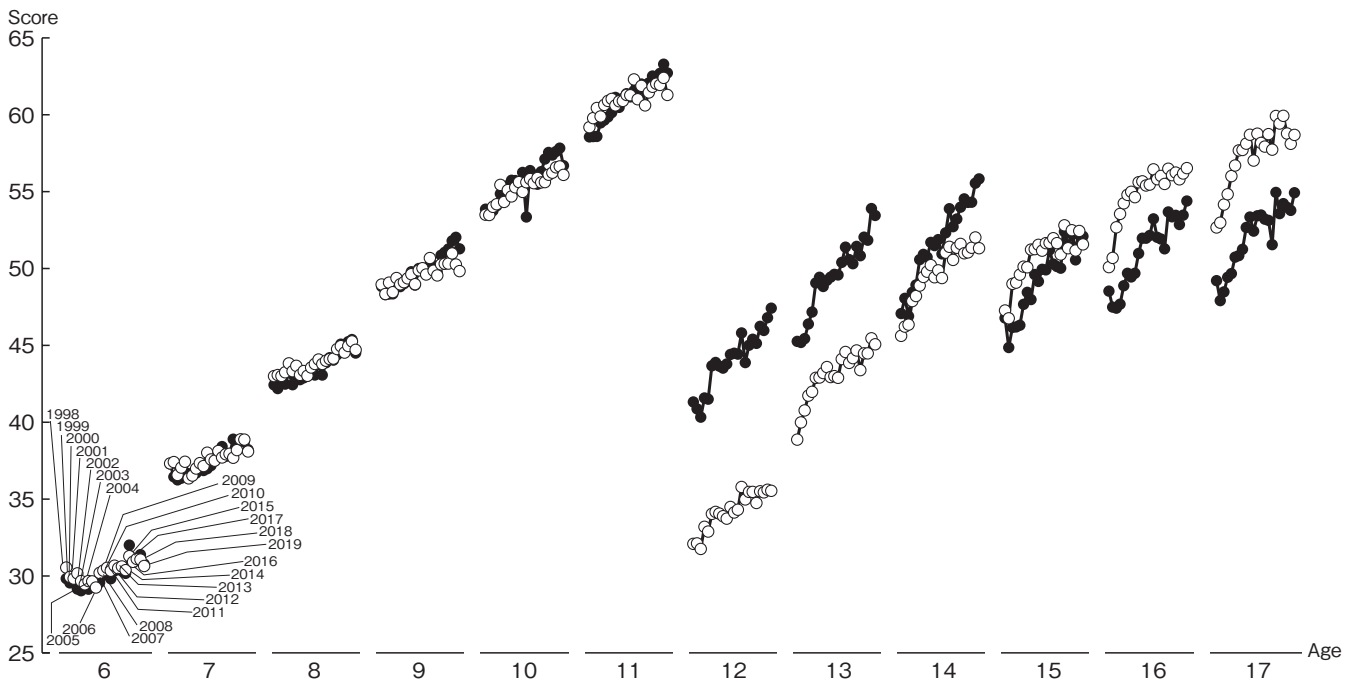
### ▲1-1 : Trends in height, weight, and chest circumference in 17 year-olds

(from the "Annual Report of School Health Statistics Research" by the Ministry of Education, Culture, Sports, Science, and Technology)

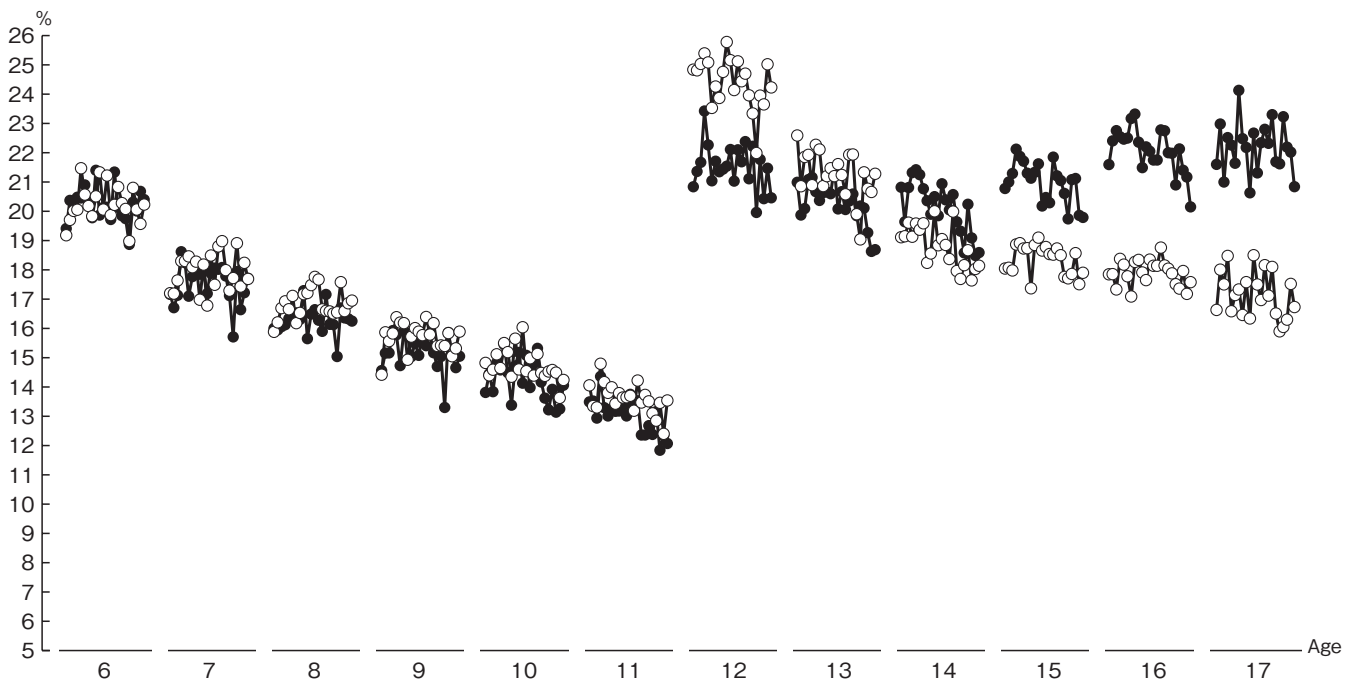
These figures show the annual changes in height, weight, chest circumference, and sitting height of 17 year-olds, whose bodies are believed to have almost completed their morphological development. However, since the units of measurement were different for height, chest circumference, sitting height, and weight, we observed the changes that occurred when the average value of each index by gender was set to 100% in the 1960s.

Both figures show an upward trend, and it can be observed that the size of children has grown in the last half-century. It can be also observed that, in boys, the increase in weight was extremely large compared to the increase in height. In girls, sitting height hardly increased compared to height.

## 2 Physical fitness and motor ability



(a) Annual change of average score

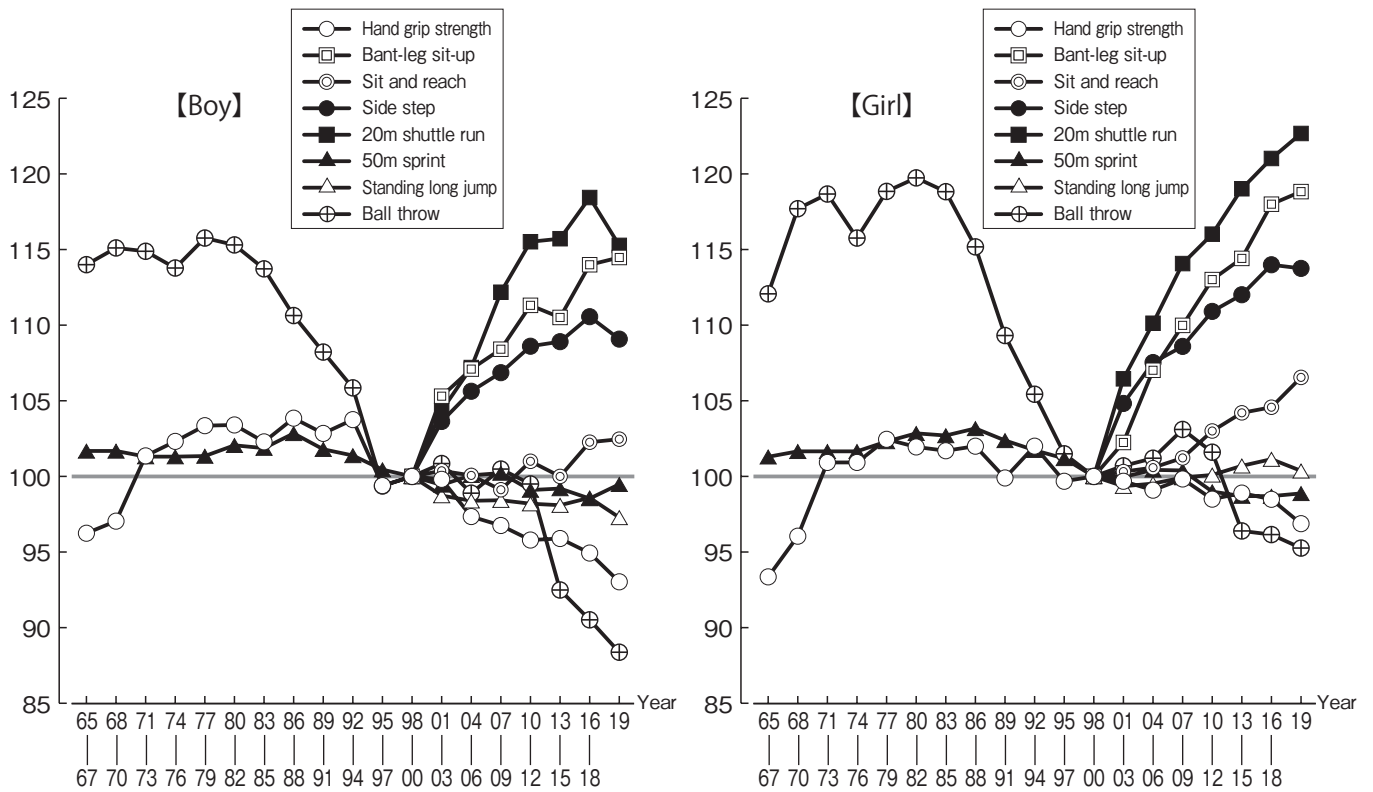


(b) Annual change in coefficient of variation

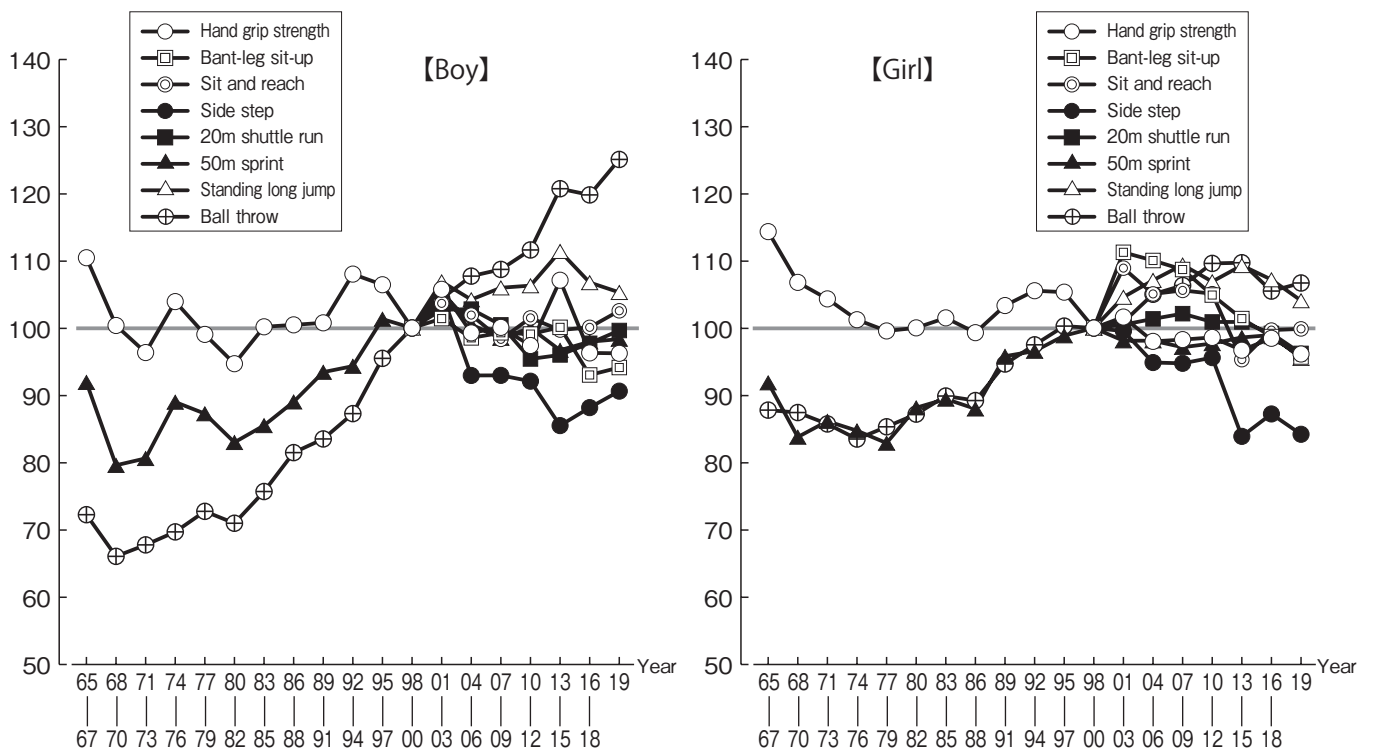


### ▲2-1 : Trends in the average and coefficient of variation of the “new physical fitness test” total scores (from the “Annual Report of Physical Fitness and Motor Ability Survey” by the Japan Sports Agency)

In Japan, the results of the annual “Physical Fitness and Motor Ability Survey” conducted in the previous fiscal year were announced by Ministry of Education, Culture, Sports, Science, and Technology until 2014 and thereafter by the Japan Sports Agency. The upper figure on this page shows the average of the total scores and the lower shows the coefficient of variation. As shown in the upper figure, there appears to have been a continuous upward trend among students in all grades over the last 22 years. This finding contradicts worries about the supposed “decline of physical fitness” among children, which has concerned some for many years. In this regard, there appears to have been a fortuitous misunderstanding.



(a) Annual change of average of the “new physical fitness test” by component



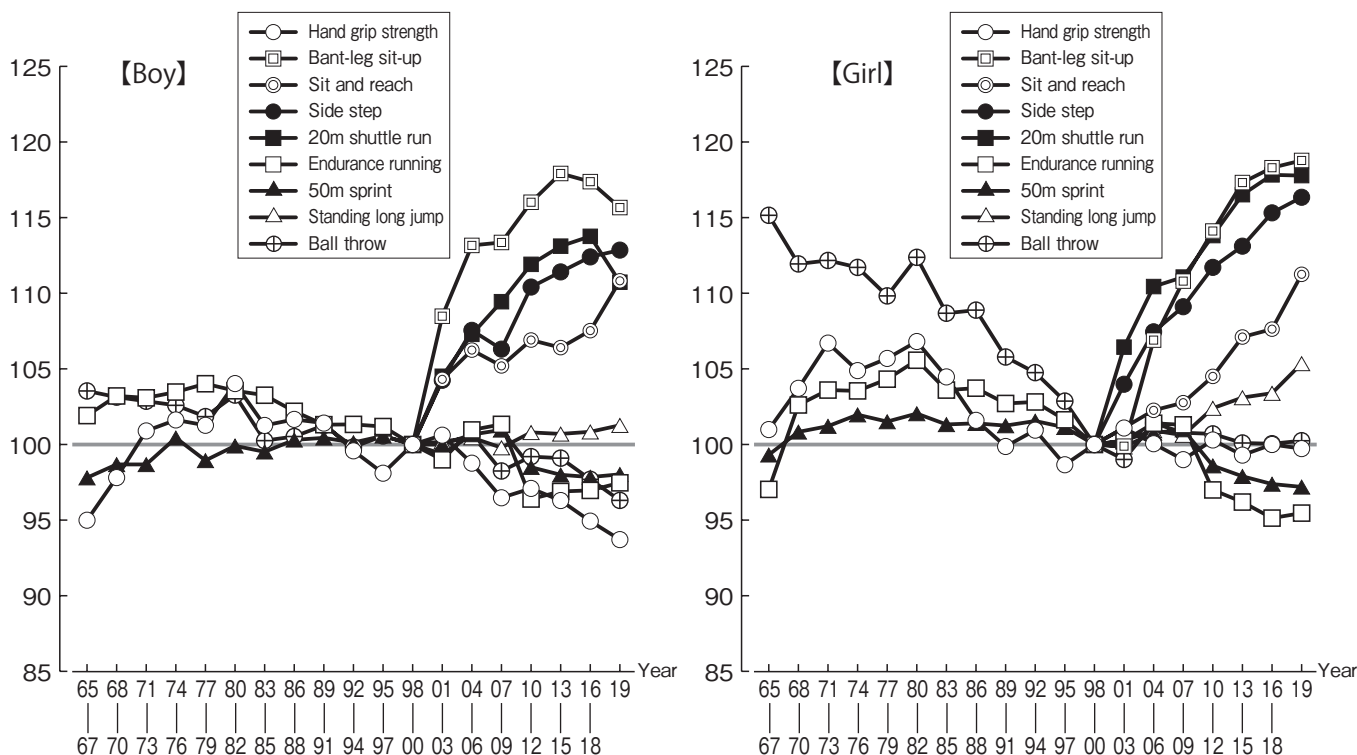
(b) Annual change of coefficient of variation of the “new physical fitness test” by component

Note: All figures show the trend when the values prior to 1998 to 2000 are set at 100 percent.

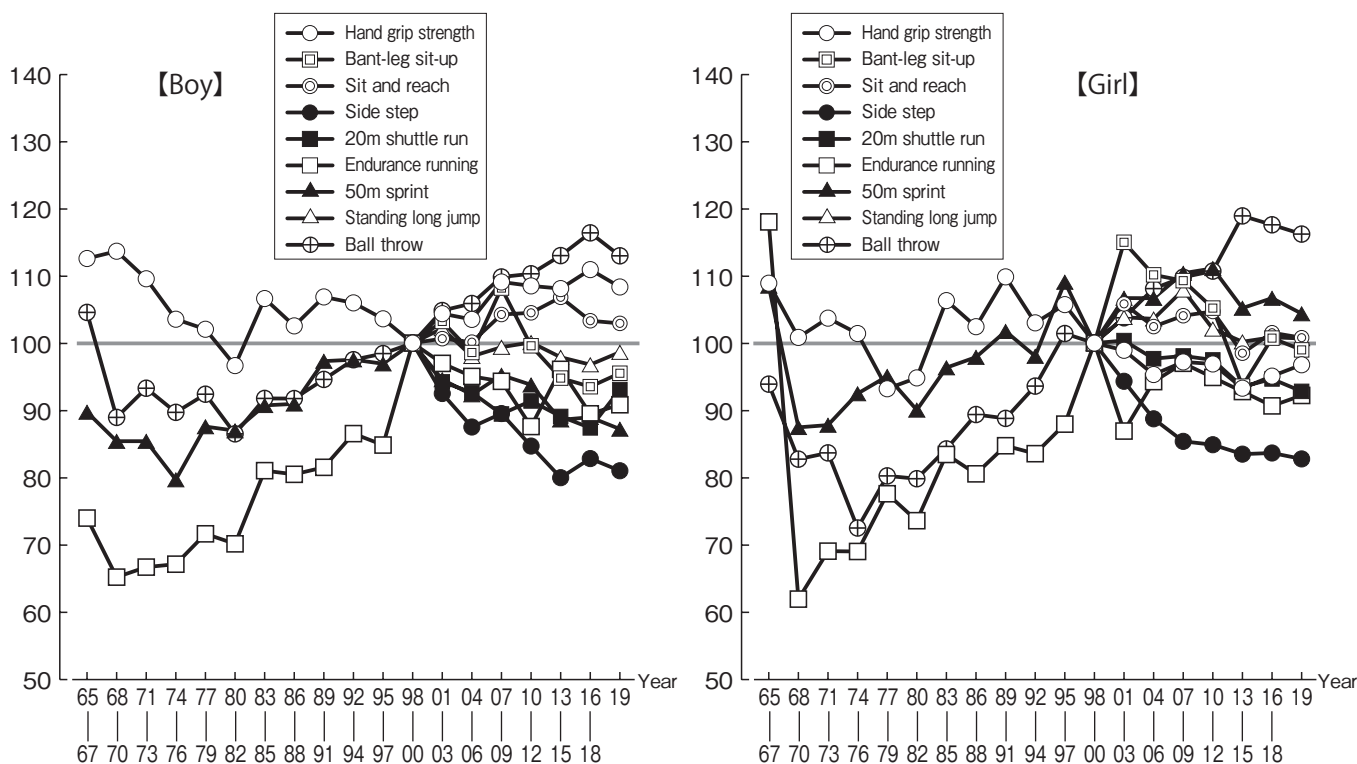
### ▲2-2 : Trends in the averages and coefficients of the variations in the “new physical fitness test” scores of 11 year-olds

(from the “Annual Report of Physical Fitness and Motor Ability Survey” by the Japan Sports Agency)

Looking at the yearly transitions in the average values for 11 year-olds, that of “ball throw” appeared to be on a downward trajectory in the 1980s and 1990s, when children’s time spent playing games like “catch the ball” decreased, and it flattened in the 2000s. The value for this item is now declining again. However, no significant downward trend was observed for other items, except for the “grip strength” of boys, which was somewhat reduced. It can be also confirmed that the values for the “20m shuttle run,” “repeated sit-up,” and “repeated side-step” have been on an upward trajectory since 1998.



(a) Annual change of average of the “new physical fitness test” by component



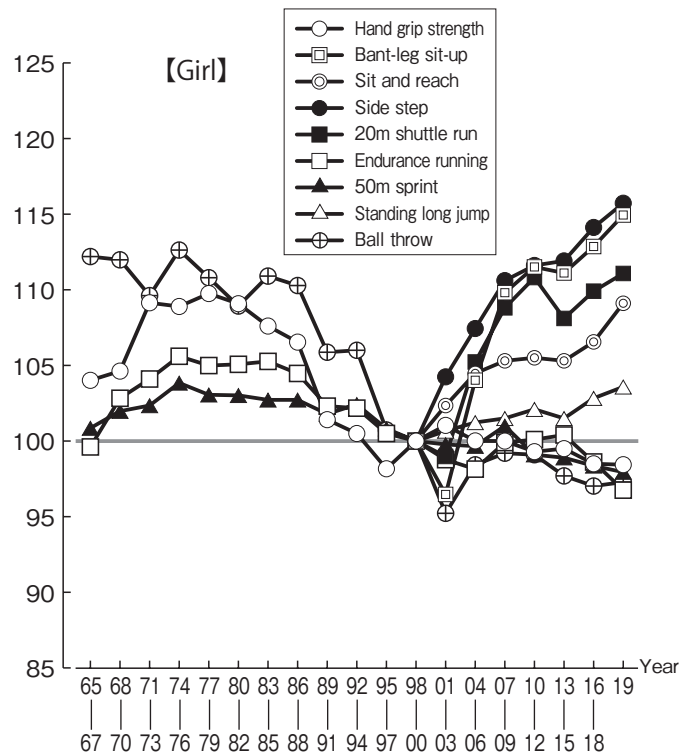
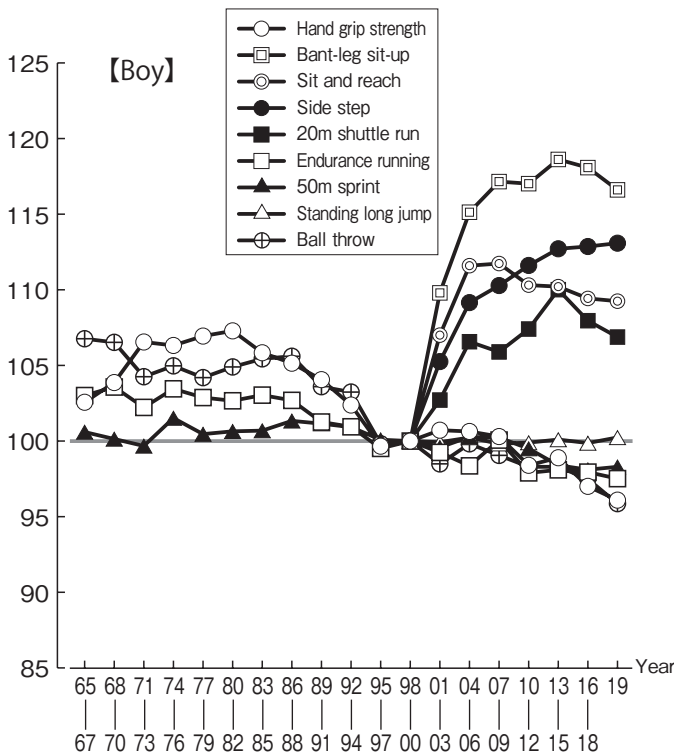
(b) Annual change of coefficient of variation of the “new physical fitness test” by component

Note: All figures show the trend when the values prior to 1998 to 2000 are set to 100 percent.

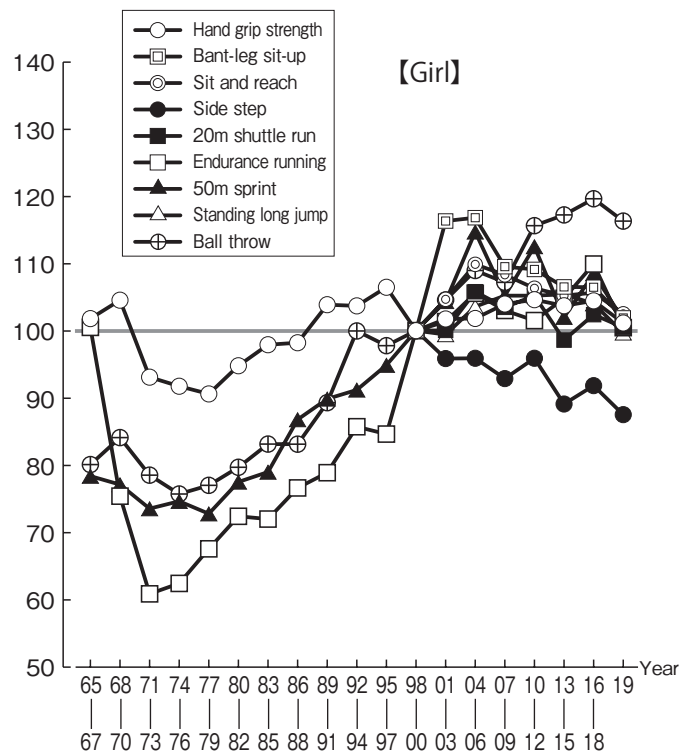
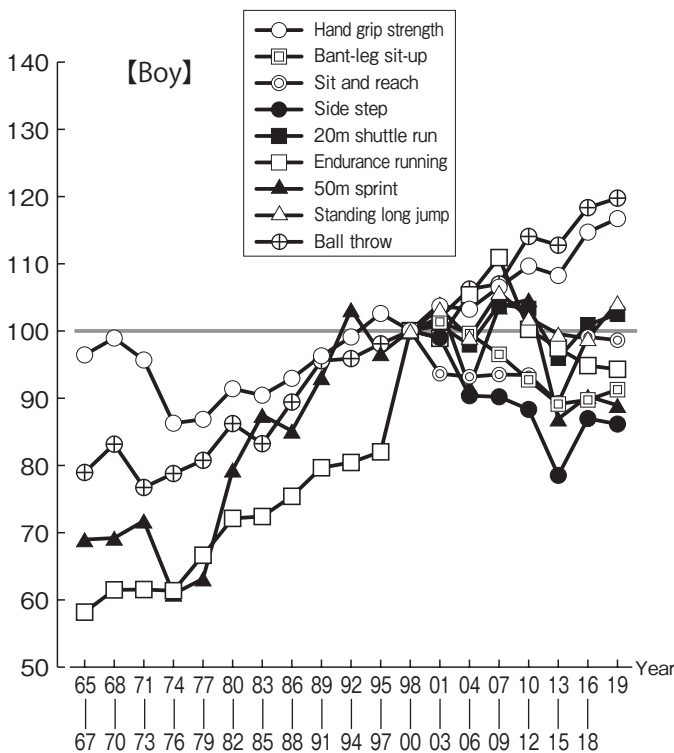
### ▲2-3 : Trends in the averages and coefficients of variation of the “new physical fitness test” scores of 14 year-olds

(from the “Annual Report of Physical Fitness and Motor Ability Survey” by the Japan Sports Agency)

Among 14 year-olds, it can be observed that girls’ “ball throw” scores declined from the beginning of the data-collection period to the late 1990s. In recent years, among both genders, the “long-distance run” and “50m run” scores have shown a gradual downward trend. However, for other items, in the case of 11 year-olds, no significant downward trend was shown; in addition, it can be observed that the scores for the “repeated sit-up,” “20m shuttle run,” “repeated side-step,” and “sitting flex” have been on an upward trajectory since 1998.



(a) Annual change of average of the “new physical fitness test” by component



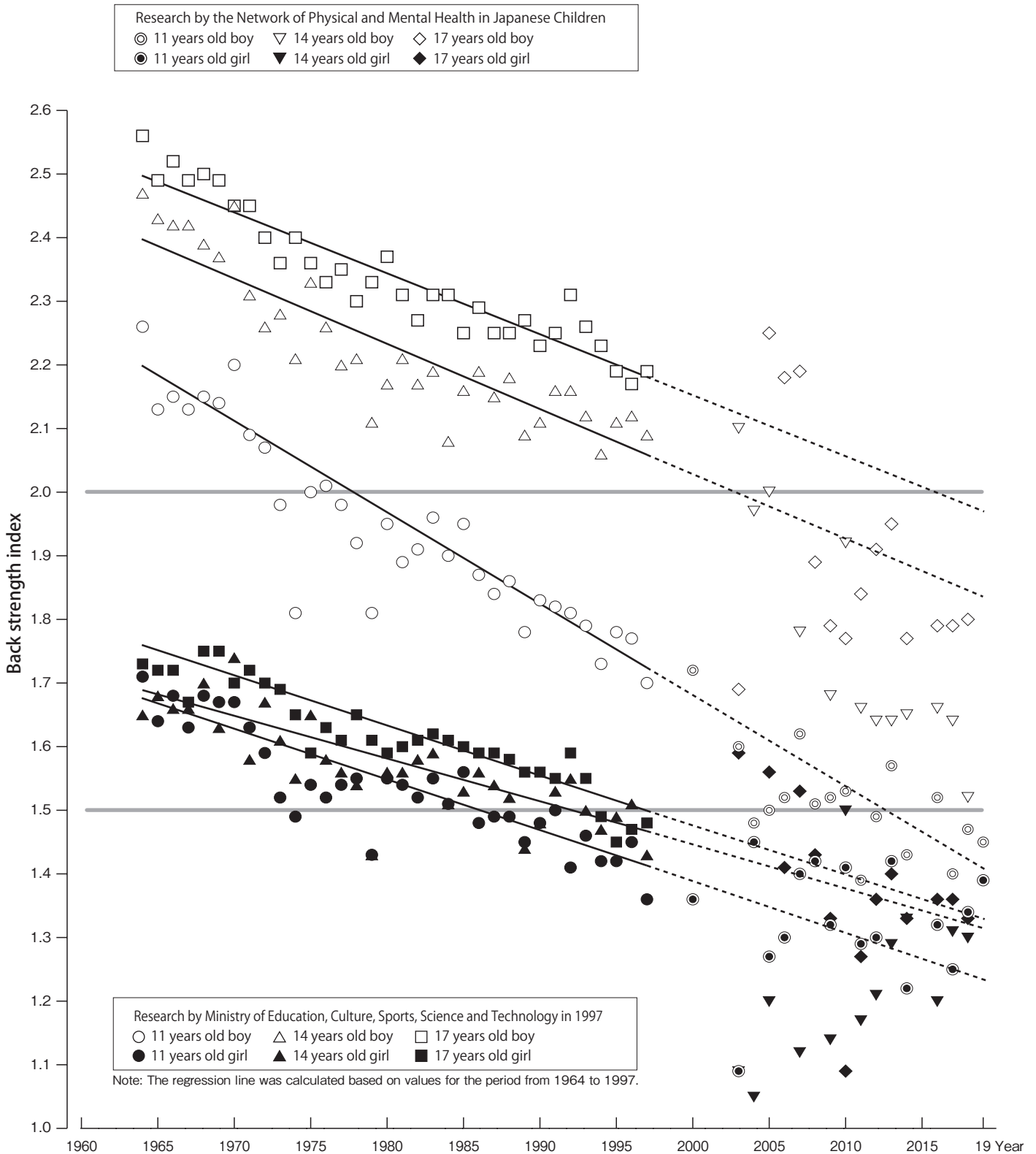
(b) Annual change of coefficient of variation of the “new physical fitness test” by component

Note: All figures show the trend when the values prior to 1998 to 2000 are set to 100 percent.

**▲2-4 : Trends in the average and coefficient of variation of the “new physical fitness test” scores of 17 year-olds**

(from the “Annual Report of Physical Fitness and Motor Ability Survey” by the Japan Sports Agency)

Seventeen year-olds demonstrate the same tendencies as 11 and 14 year-olds. There was no noticeable downward trajectory in any of the items; rather, the upward trajectory of “repeated sit-ups,” the “20m shuttle run,” the “repeated side-step,” and the “sitting flex” has become more marked since 1998.

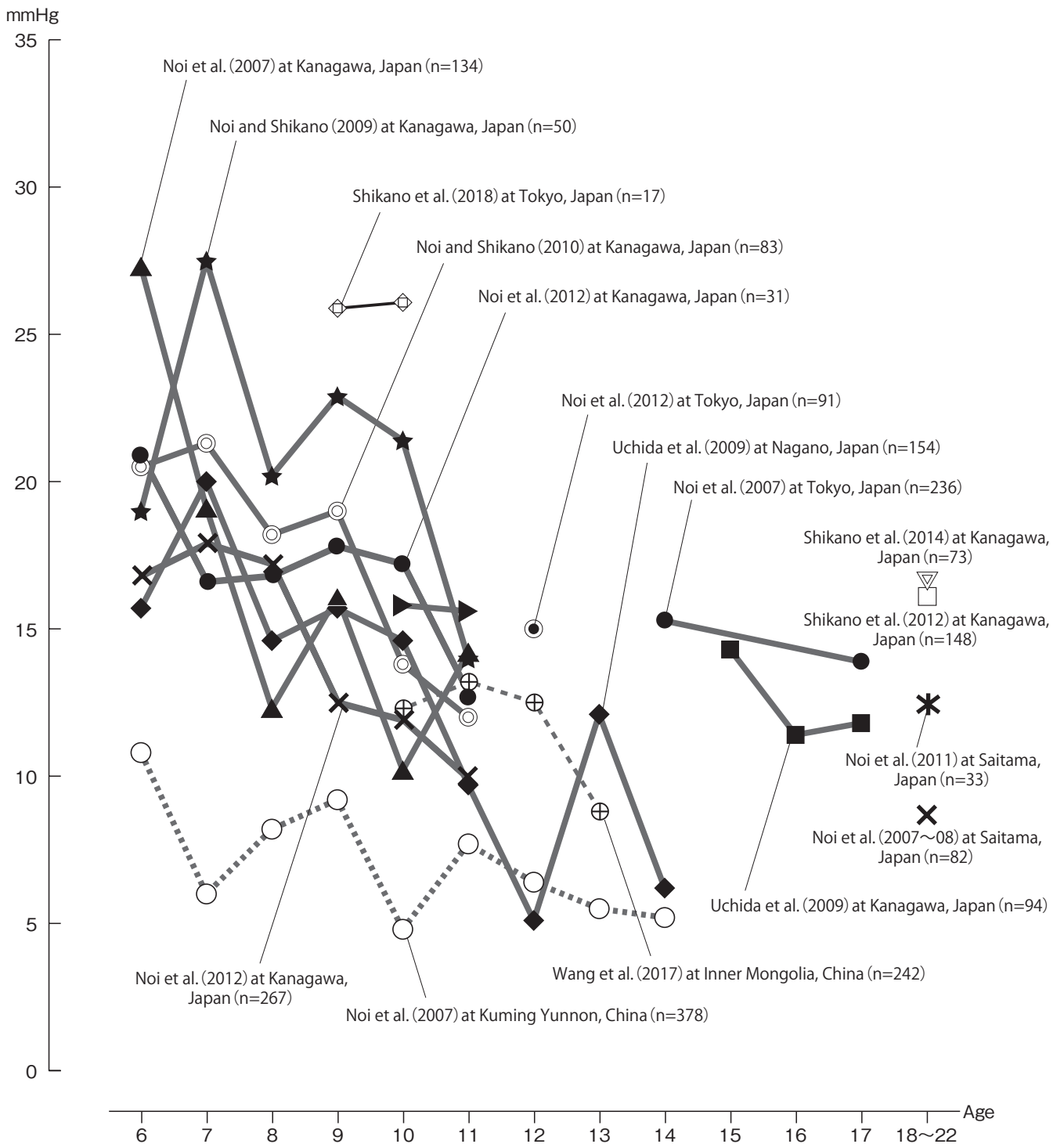


### ▲2-7 : Trends in the back strength index (value obtained by dividing the back strength by weight) of 11, 14, and 17 year-olds

(from the "Annual Report of Physical Fitness and Motor Ability Survey" up to 1997 by the Ministry of Education, Culture, Sports, Science, and Technology and from research by the National Network of Physical and Mental Health in Japanese Children)

From the national average of the physical fitness and motor ability surveys conducted from 1964 to 1997, the "back strength index" (BSI) for both genders and all ages, which was obtained by dividing the back strength by weight, appeared to have been on a consistent downward trajectory since the first survey. Our network has proposed a BSI of 2.0 for boys and 1.5 for girls as the goals to be achieved before graduating from high school; however, in the surveys conducted after 1998, when the items were reviewed, the "back strength" measurement appeared to have been deleted. Therefore, in this report, we have compiled the measurement results for each region and are creating the figure mentioned above with the intention of observing this trend until the downward trajectory stops. According to the data, it can be observed that the downward trajectory remains unchecked.

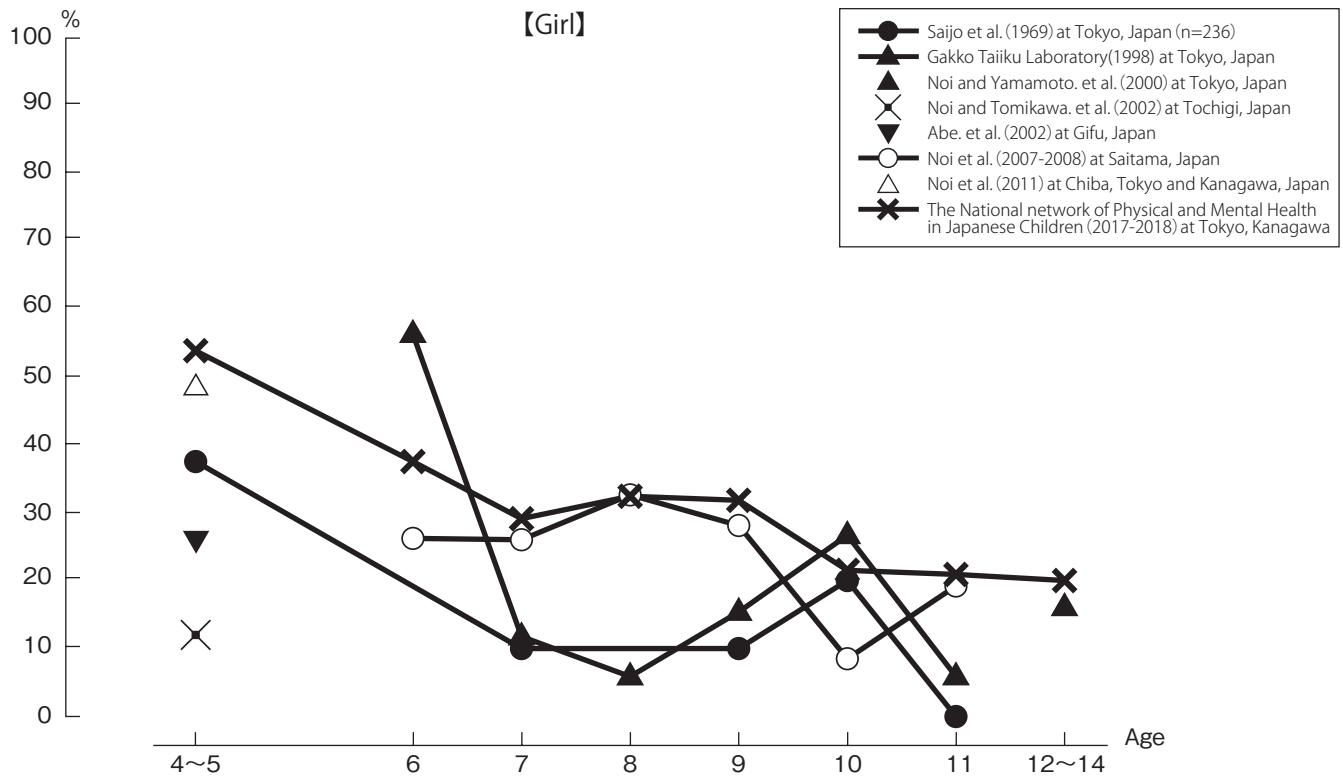
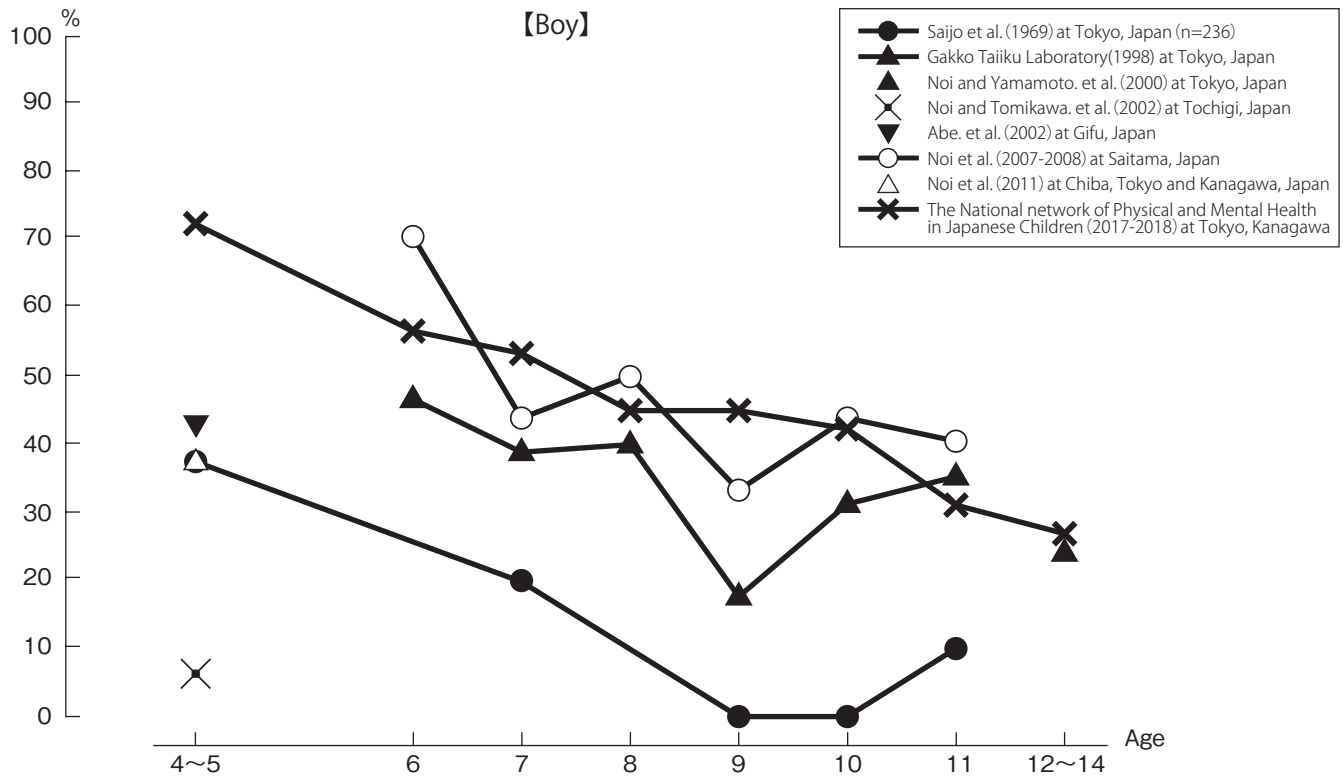
### 3 Autonomic nervous function



▲3-1 : Age-related trends in blood pressure responses to the “cold pressor test”

In Japan, some have been worried about the increase in conditions related to the autonomic nervous function of children. Therefore, to grasp the actual situation, in this report, we have continued to observe the results of a survey conducted using a measurement method called the “cold pressor test” (CPT). The CPT is used to determine the condition of one’s autonomic nervous function based on the blood pressure response when one hand is immersed in ice water at 4°C for 1 minute. The figure shows the increase in blood pressure (pressurized reaction: PR) due to cold water stimulation for each survey. As can be seen, the results of the survey conducted in Kunming, China (2007) show a smaller PR than any survey conducted in Japan, and some have become worried that the sympathetic nerves of Japanese children are too easily stimulated.

# 4 Frontal lobe function

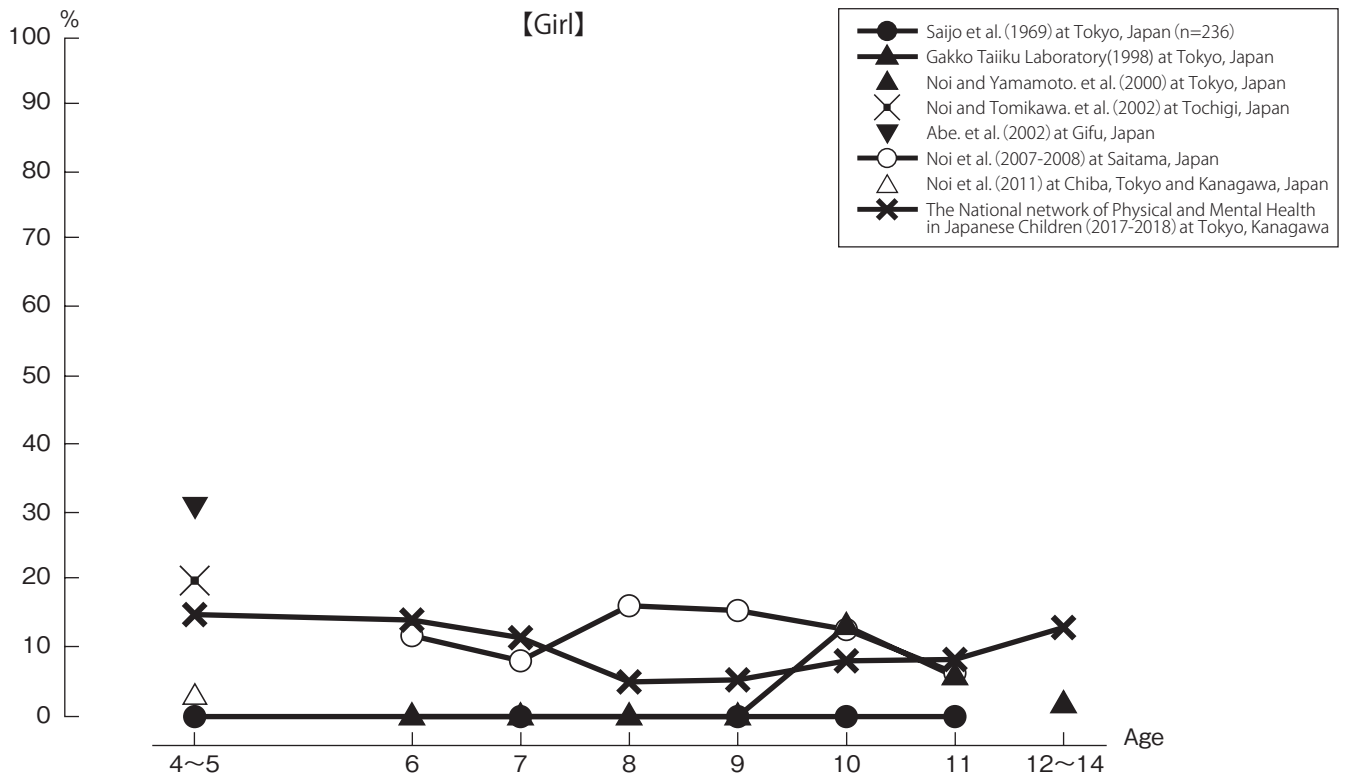
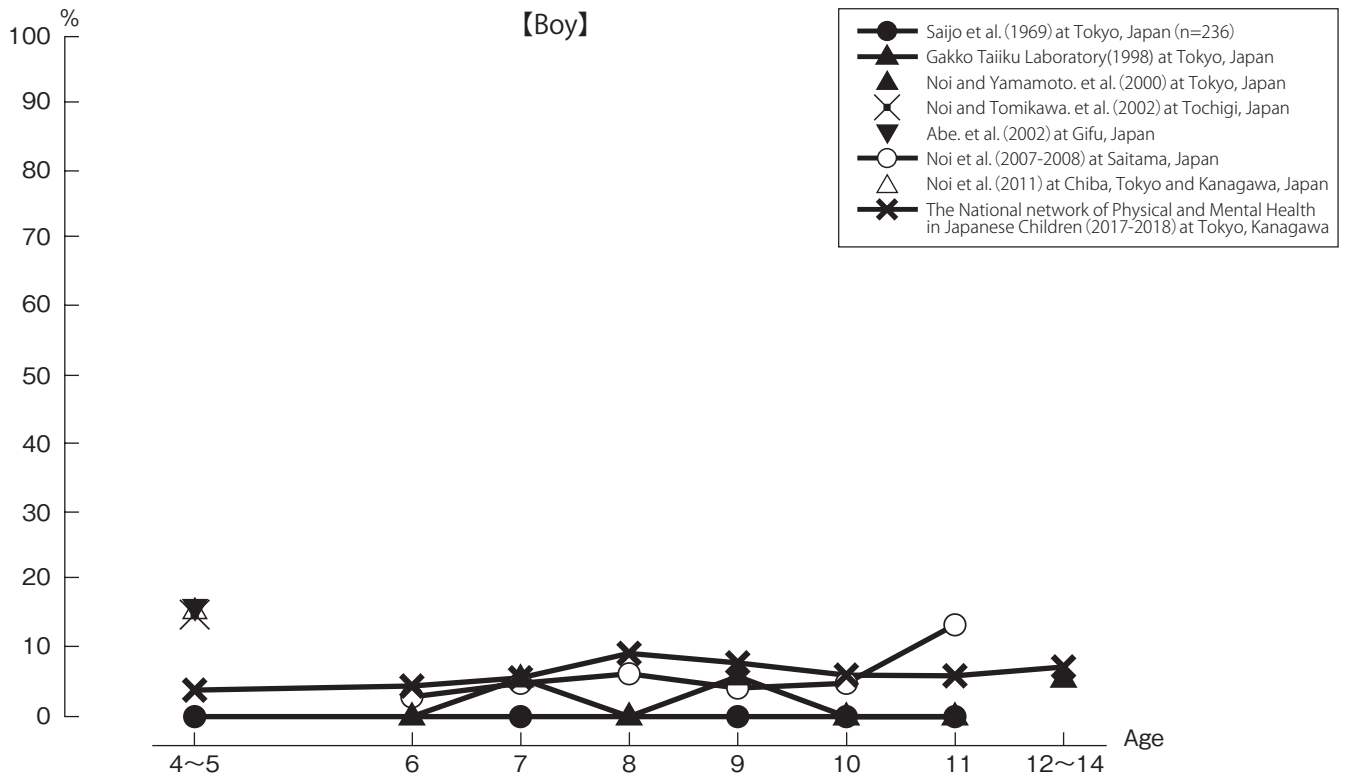


▲4-1 : Age-related trends in the incidence of the “melancholic type”

In Japan, the development of children’s minds is also a concern. On the other hand, part of the physical foundation of the mind lies in frontal lobe function. Therefore, in this report, we have been continuing to observe the results of the survey conducted using the go/no-go task. The go/no-go task is one of the items used for measuring the functions controlled by the frontal lobe, such as intention, motivation, judgement, and concentration. The characteristics (types) of frontal lobe function can also be observed.

The figure shows the incidence of the “melancholic type,” which is considered the most childish of the five types. The mental function of this type of child is characterized by the fact that neither the excitation nor the inhibition process is fully developed, so children of this type tend to be fidgety and unfocused. It can be confirmed that the incidence of this type has increased from the 1969 survey to the 1998 and 2007-08 ones, and there has been concern about childhood developmental delays among boys. In addition, based on the results of the 2017-18 survey, it appears that the incidence of this type among both genders was about the same as in the 2007-08 survey.





**▲4-2 : Age-related trends in the incidence of the “inhibitory type”**

The “inhibitory type” is a type of child in which the inhibition process is strong in relation to the excitation process. This type of child often has difficulty expressing their feelings appropriately. No one of this type was observed in the 1969 survey, but this type of child has increasingly been observed in subsequent surveys regardless of age. Looking at the results of the latest survey from 2017-18, it appears that about 10% of children in all age groups were classified as this type.