

Can daily physical activity improve school performances?

A project study.

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The children's daily physical activity improves their health and prevents obesity (WHO, 2004).

Researches shows that physical activity improves learning and also causes a positive attitude toward schoolwork. It also improves student behaviour. (Keays & Allison, 1995; Dexter, 1999; Tomporowski et al., 2008).

An increase in the daily time devoted to physical education helps students to maintain and improve their educational performance, despite the reduction of teaching time devoted to other subjects in the curriculum (Shephard, 1997, Shephard & Trudeau, 2008).

Our pilot project explores the relationship between movement and executive functions in children fifth grade.

Hypothesis

Subjecting to the students to an everyday, specially designed, physical program, will have an impact on global and fine motor skills, instrumental aspects, the executive functions and, consequently, on the learning of the students.

Methodology

During 6 months the students of Class 1 of the fifth grade school in Monte Carasso have been subjected to a specific physical training, which included 20 minutes of daily exercises from moderate to strong intensity.

The training consisted of exercises aimed at developing postural control, motor skills and praxis. It was conducted in classrooms, corridors and the gym.

Participants were assessed before and after the procedure and the data obtained was compared with that of the control class, which followed the regular educational program. The data collected was analysed using the SPSS statistical program.

Population

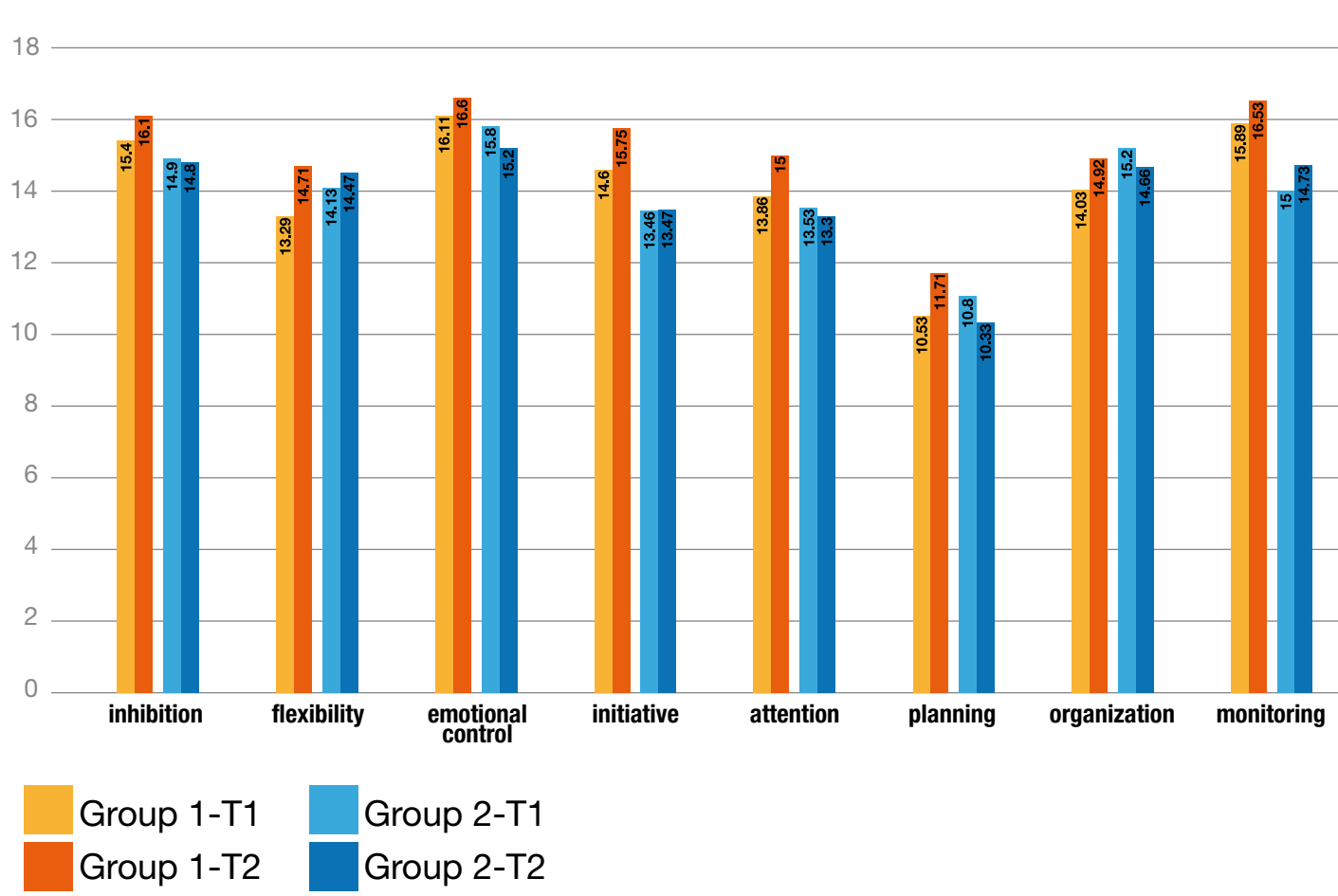
- Group 1: 15 students, following a daily physical program of 20 minutes during school lessons.
- Control group: 14 students, following the regular school program.
- Exclusion criteria: children who repeated the school year, are followed in occupational therapy or by other specialists.

Assessment tools

- **Test of handwriting speed.** Measures the number of characters copied in 5 minutes.
- **Tower of London** (Shallice and McCarthy 1982). Assesses problem-solving and planning.
- **QFUE** (Marzocchi, in press). Executive Function Questionnaire, filled by teachers and parents; measures executive functions (flexibility, inhibition, planning, organization, attention, emotional control, initiative, and monitoring).



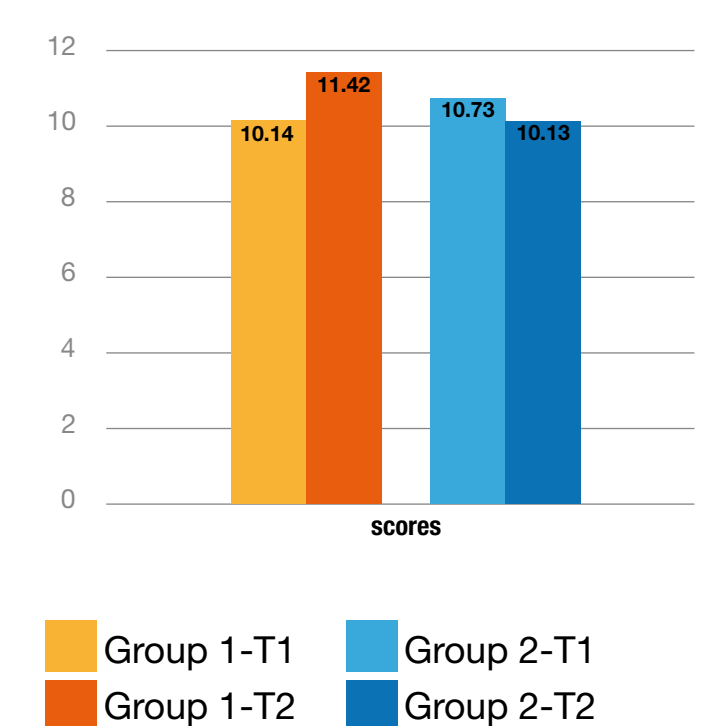
QFUE Teachers



At the beginning of the year, the 2 groups were similar in all the executive functions. At the end of the year, group 1 had a significant progress in inhibition, flexibility, initiative, attention, planning, and organization. The control group didn't have a significant progress in any categories. The progress of group 1 was statistically significant in initiative ($p < 0.05$), attention ($p < 0.05$), planning ($p < 0.01$), and organization ($p < 0.01$). There was also a tendency in emotional control ($p = 0.05$) and flexibility ($p = 0.05$).

These results confirm the results of the test of the Tower Of London on the problem solving.

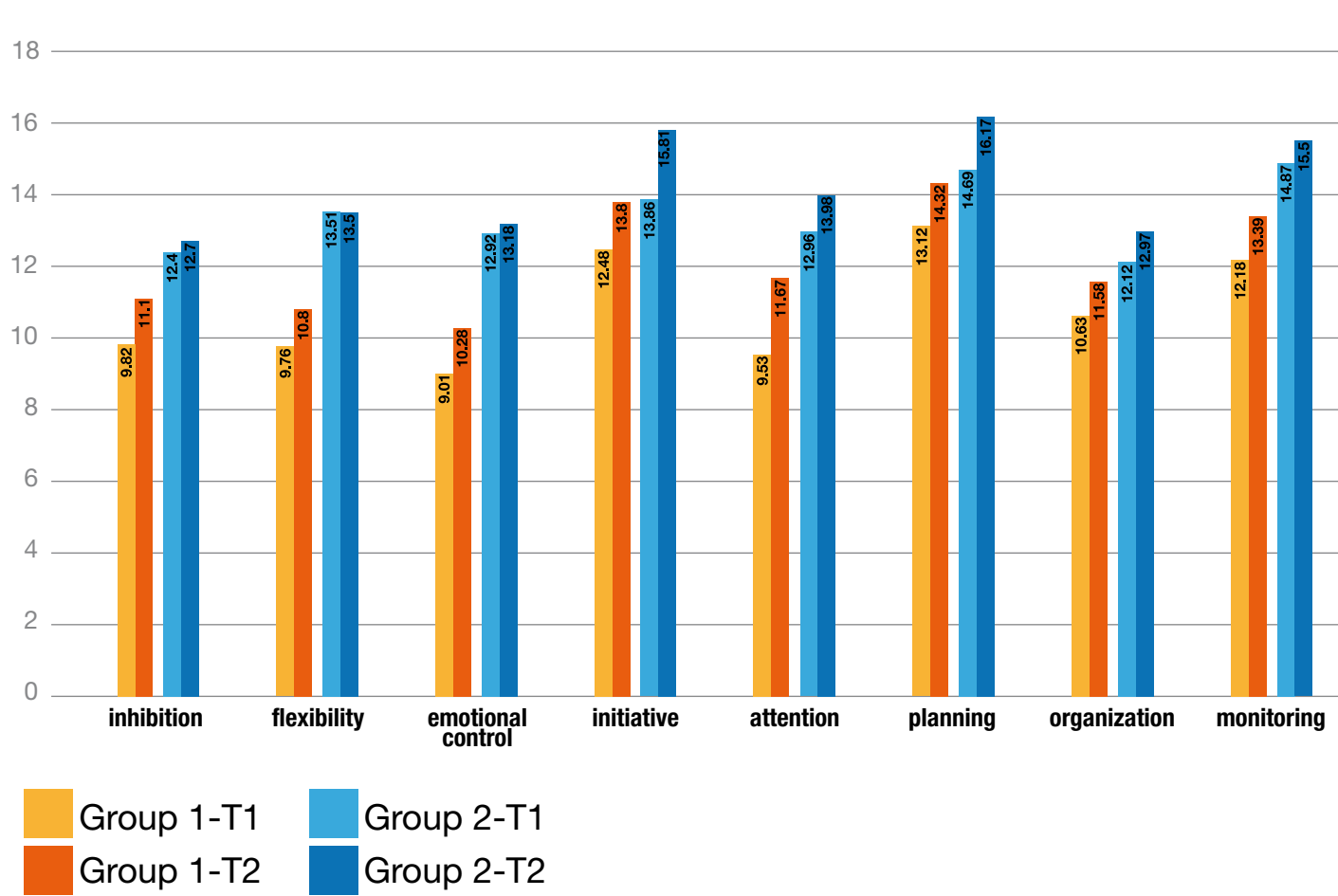
Tower Of London



At the beginning of the year, the 2 groups had similar results. After 6 months of physical activity, group 1 had a significant progress ($p < 0.01$) compared to group 2, which had a small decrease.

The results indicate that students who had a daily physical stimulation, improved planning and problem solving, compared to the control group. This result confirms the results of teacher's QFUE.

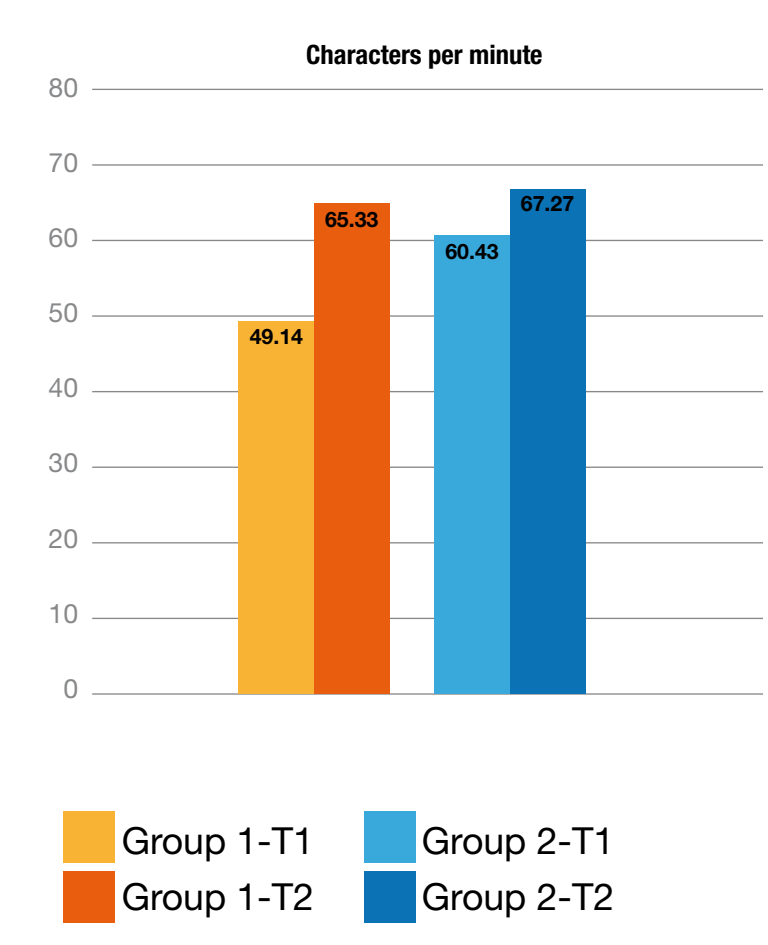
QFUE Parents



The analysis of the parents' questionnaires must be considered with precautions: it is based on 10 out of 15 questionnaires, and the results of both groups were not similar at the beginning of the project.

The two classes had a positive evolution, however class 1 had a greater increase of executive functions than the control group.

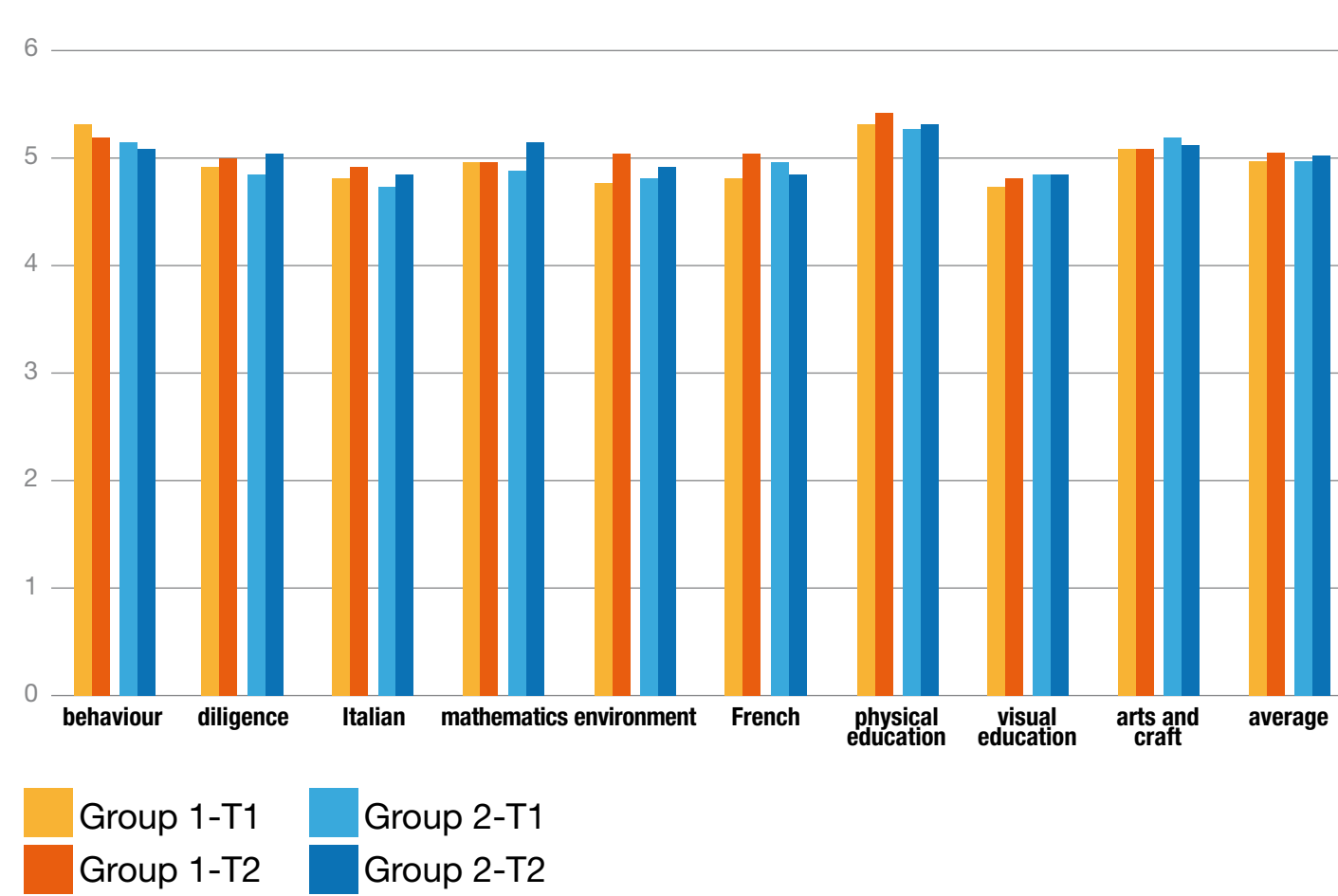
Handwriting speed



At the beginning, group 1 was slower by 11 letters/minute than the control group. After 6 month of physical activity, group 1 recuperated its delay and is now at the same level of the control group.

This result shows that physical activity contributes to the development of handwriting speed.

School report



At the beginning and at the end of the physical program, the groups are similar in school performance.

The two groups have got the same school program, but the group 1 has made 20 minutes of physical activity during the school day instead of mathematics and Italian. This results confirm that the physical activity can be integrated into the school day without decreasing the school performance.



Conclusions and limitations

After the first experience with this pilot project, we can say that the physical program helped to improve balance, motor skills and executive functions of the class that participated in the project, compared to the control class. All this without causing a decline in school performance, despite the time devoted to academic lectures have been lower. The results, with recognized limitations, confirm those of recent scientific evidence.

There should be further investigation into classroom behaviour, motivation and attention of students.

However this is an exploratory study, conducted on a specific population and on a small number of children. A more extended study, if possible on the basis of probability, is needed to confirm and generalize the results.



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