

Reporting Summary

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Statistical parameters

When statistical analyses are reported, confirm that the following items are present in the relevant location (e.g. figure legend, table legend, main text, or Methods section).

n/a Confirmed

- The exact sample size (n) for each experimental group/condition, given as a discrete number and unit of measurement
- An indication of whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
- The statistical test(s) used AND whether they are one- or two-sided
Only common tests should be described solely by name; describe more complex techniques in the Methods section.
- A description of all covariates tested
- A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
- A full description of the statistics including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals)
- For null hypothesis testing, the test statistic (e.g. F , t , r) with confidence intervals, effect sizes, degrees of freedom and P value noted
Give P values as exact values whenever suitable.
- For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
- For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
- Estimates of effect sizes (e.g. Cohen's d , Pearson's r), indicating how they were calculated
- Clearly defined error bars
State explicitly what error bars represent (e.g. SD, SE, CI)

Our web collection on [statistics for biologists](#) may be useful.

Software and code

Policy information about [availability of computer code](#)

Data collection

Physical activity was measured by Actigraph accelerometers (either GT1M, GT3X or GT3X+; ActiGraph, Pensacola, FL.)

Data analysis

StataCorp. 2015. Stata Statistical Software: Release 14. College Station, TX: StataCorp LP and Microsoft Excel 2010 was used for the statistical analysis.
ActiLife (version 5.7.4, full edition), ActiGraph's (ActiGraph, Pensacola, FL.) data analysis software platform was used to extract and filter the data

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Data

Policy information about [availability of data](#)

All manuscripts must include a [data availability statement](#). This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A list of figures that have associated raw data
- A description of any restrictions on data availability

Provide your data availability statement here.

Field-specific reporting

Please select the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

Life sciences Behavioural & social sciences Ecological, evolutionary & environmental sciences

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Behavioural & social sciences study design

All studies must disclose on these points even when the disclosure is negative.

Study description	This is a Network Intervention study using (field-)experimental methods for the collection of quantitative experimental data. Network Intervention study: Using school classes' network data, we induce interactions between relatively good friends. We lock these interactions and the structure of the network for 5 weeks. Experimental methods: we run four different experimental conditions implemented to independent school classes and compared to a fifth control-condition. We follow the experimental procedures and protocols usually used in Behavioural Experimental Economics. Quantitative experimental data: Accelerometers were measuring acceleration (at 10-second epochs) which was then "translated" to daily Moderate to Vigorous Physical Activity Minutes (according to standard accelerometry).
Research sample	Data was collected from 19 fifth-grade elementary-school classes (9-11 year-old). Students (177 females and 172 males) were recruited from public schools in the same geographical region in Italy to minimize environmental effects and socioeconomic differences among participants. No further socioeconomic data was elicited for protecting participants' privacy. School classes was offering a very controlled environment with relatively closed sex-segregated networks where we could test our experimental conditions. Although our sample is not representative, we chose this sample as it is a public health priority to increase physical activity in children.
Sampling strategy	No prior sample size calculation was performed. The size of the sample was determined by the projects capacity and practical restrictions such as the number of available accelerometers (about 180 devises) and the number of recruited classes (19).The intervention was repeated two times (winter and spring experimental phases) for increasing the sample size. Table S2 in the supplementary materials show these sub-sample sizes by gender, classes and phases. The sample size (and the respective size of sub-groups by gender, classes, experimental conditions and phase) was sufficient for the researchers to perform non-parametric (Mann-Whitney, Wilcoxon and Kruskal-Wallis) and parametric (multilevel hierarchical model) analyses and testing, even when the data was collapsed at subjects level (one observation per individual). Results, with the corresponding p-values, z-statistics, chi-squares, degrees of freedom, standard errors are reported either in the manuscript or in the supplementary materials. For the multilevel hierarchical level model we also report results from Akaike and Bayesian information Criteria and also log-likelihood ratio tests which were performed for the selection of the most appropriate models. No test was rejected due to insufficient sample size.
Data collection	Network-data was elicited through a teacher-administered self-reported questionnaire in which participants rated individually each one of their classmates (fig. S6) from 1 "... is not my friend" to 5 "...is one of my best friends". Physical activity was measured by Actigraph accelerometers (either GT1M, GT3X or GT3X+; ActiGraph, Pensacola, FL.) and was communicated individually to classmates as minutes of intensive physical activity. Accelerometers were handed out at the beginning of each period (Wednesday, 12:00), and collected at the end of the period (Tuesday, 08:00) for data extraction, recharging and feedback preparation (see supplementary fig. S1). Teachers were collecting and delivering the accelerometers to the researchers. The latter were preparing the feedback which was given back to the teachers (in sealed envelopes so neither teachers nor anyone else could see the individual information) for distributing them to the children. Researchers had to know about the experimental condition conducted in each classroom in order to prepare the corresponding feedback.
Timing	The study was conducted in two experimental phases in 2014, with 10 classes (from 7 schools, classes from the same schools were participating in the same condition) participating in the winter phase (29 January 2014-18 March 2014) and 9 different classes (from 8 schools) in the spring phase (26 March 2014- 13 May 2014).
Data exclusions	Following standard processing practices in child-based accelerometry, data before 07:00 and after 23:00 were excluded and non-wear time was removed. An additional filter excluding days with less than 10 hours of valid wear time left 9776 valid days for our analysis. As a robustness check (in the supplementary materials) we repeat analysis with a less conservative filter including the accelerometer-delivery days (Wednesdays) with at least 5 hours of valid wear time (1359 additional observations). The exclusion criteria was pre-established.
Non-participation	Four parents declined to sign the informed consent on behalf of their children and did not participate in the study. One student also quit

Non-participation	from the study during the conduction of the study due to health issues (not related with the study).
Randomization	The study was conducted in two experimental phases in 2014, with 10 classes (from 7 schools) participating in the winter phase (N _w =176) and 9 different classes (from 8 schools) in the spring phase (N _s =173). In both phases, after one week preliminary period, an experimental condition (out of 5, including control) was randomly assigned to one of the schools (classes from the same school and experimental phase participated in the same experimental condition for avoiding data contamination). Within classroom, boys and girls were participating in the same condition but they were receiving gender specific feedback on their relevant performance (scores, points and ranking). Within the same class-gender-group and only for the social rewards schemes, students were randomly allocated to groups (or pairs) satisfying the following condition: their members were good or best friends (i.e. they had bilaterally scored equal or more than 3 (out of 5) in the self-reported "friendship" scale).

Reporting for specific materials, systems and methods

Materials & experimental systems

n/a	Involvement in the study
<input checked="" type="checkbox"/>	<input type="checkbox"/> Unique biological materials
<input checked="" type="checkbox"/>	<input type="checkbox"/> Antibodies
<input checked="" type="checkbox"/>	<input type="checkbox"/> Eukaryotic cell lines
<input checked="" type="checkbox"/>	<input type="checkbox"/> Palaeontology
<input checked="" type="checkbox"/>	<input type="checkbox"/> Animals and other organisms
<input type="checkbox"/>	<input checked="" type="checkbox"/> Human research participants

Methods

n/a	Involvement in the study
<input checked="" type="checkbox"/>	<input type="checkbox"/> ChIP-seq
<input checked="" type="checkbox"/>	<input type="checkbox"/> Flow cytometry
<input checked="" type="checkbox"/>	<input type="checkbox"/> MRI-based neuroimaging

Human research participants

Policy information about [studies involving human research participants](#)

Population characteristics	See above
Recruitment	Data was collected from 19 fifth-grade elementary-school classes. Students were recruited from schools in the same geographical region in Italy to minimize environmental effects and socioeconomic differences. Over 98% of children provided signed parental informed consent and participate in the study (N=349), leaving little space for self-selection. At least 3 school-classes were randomly assigned to each experimental condition with an average of 35.4 females and 34.4 males participating in each condition. In particular, 4 classes (40 females, 36 males) participated in control (random) condition, 4 classes (42 females, 45 males) in the Individual Scheme, 3 classes (23 females, 27 males) in Direct Reciprocity Scheme, 3 classes (31 females, 30 males) in Indirect Reciprocity Scheme and 5 classes (41 females, 34 males) in Team rewards scheme.