

Research article

REGULAR EXTRA CURRICULAR SPORTS PRACTICE DOES NOT PREVENT MODERATE OR SEVERE VARIATIONS IN SELF-ESTEEM OR TRAIT ANXIETY IN EARLY ADOLESCENTS

Caroline Binsinger¹, Patrick Laure¹✉ and Marie-France Ambard²

¹ Direction régionale de la Jeunesse et des Sports de Lorraine, Saint-Max Cedex, France

² Service de Promotion de la Santé en faveur des élèves des Vosges, Epinal, France

Received: 22 November 2005 / Accepted: 03 February 2006 / Published (online): 01 March 2006

ABSTRACT

Physical activity is often presented as an effective tool to improve self-esteem and/or to reduce anxiety. The aim of this study was to measure the influence of a regular extra curricular sports practice on self-esteem and anxiety. We conducted a prospective cohort study, which has included all of the pupils entering the first year of secondary school (sixth grade) in the Vosges Department (east France) during the school year 2001-2002 and followed during three years. Data were collected every six months by self-reported questionnaires. 1791 pupils were present at each of the six data collection sessions and completed all the questionnaires, representing 10,746 documents: 835 boys (46.6 %) and 956 girls (53.4 %), in November 2001, the average age was 11.1 ± 0.5 years (mean \pm standard deviation). 722 pupils (40.3 %) reported that they had practiced an extra-school physical activity in a sporting association from November 2001 to May 2004 (ECS group), whereas, 195 (10.9 %) pupils had not practiced any extra-school physical activity at all (NECS group). The average global scores of self-esteem (Rosenberg's Scale) and trait anxiety (Spielberger's Scale) of the ECS pupils were, respectively, higher and lower than those of the NECS group. However, the incidence density (number of new cases during a given period / total person-time of observation) of moderate or severe decrease of self-esteem (less than "mean - one standard deviation" or less than "mean - two standard deviations") was not significantly different between the two groups, a finding that was also evident also in the case of trait anxiety. Finally, among ECS pupils, the incidence density of severe decrease of self-esteem was lower at the girls'. Practitioners and physical education teachers, as well as parents, should be encouraged to seek out ways to involve pupils in extra-school physical activities.

KEY WORDS: Adolescents, self-esteem, trait anxiety, extra-curricular sport practice.

INTRODUCTION

The practice of a regular physical activity induces benefits for health. These benefits are not only physiological but are also psychological. In particular, physical training results in increased self-esteem and perceived physical competence (Demarco et al., 1989; Sonstroem, 1984), especially when self-esteem is initially low (McAuley, 1994), and in reduced anxiety level (Landers and

Petruzzello, 1994; Carmack et al., 1999; Katula et al., 1999; Landers and Petruzzello, 1994).

Self-esteem can be defined as a positive or negative orientation toward oneself, an overall evaluation of one's worth or value (Rosenberg, 1979). Self-esteem is never definitive and may vary from a situation to another, from a meeting to another, according to problems to be solved or choices to be made (Tap et al, 2002). This factor is assumed to be responsive to enhancing interventions

(Robson, 1988). To define anxiety, a distinction between state and trait has become commonplace. State anxiety is defined by an unpleasant emotional arousal in face of threatening demands or dangers. On the other hand, trait anxiety is independent of specific situations and reflects the existence of individual differences in the tendency to respond with state anxiety in the anticipation of threatening situations (Spielberger, 1983). It is primarily through experiences that some individuals acquire low or high trait anxiety and persons who are high in trait anxiety tend to be anxious in many situations. This factor is considered to be relatively stable but it may increase, even if modestly, in some cases (Norris et al., 1988).

Self-esteem and trait anxiety vary during adolescence. There is a gradually but significant decrease of girls' (Basow and Rubin, 1999; Gilligan, 1990) and boys' (Eccles et al., 1989; Wigfield et al., 1991) self-esteem, as well as an increase of trait anxiety (Canals et al., 1992). These variations begin after the transition to secondary school as pupils adjust to the school change (Wigfield et al., 1991).

Low self-esteem and/or high trait anxiety are potentially linked to risk behaviours, such as substance abuse (alcohol, cannabis, and other drugs), risky sexual behaviour, suicidal ideation and attempts, dieting and other extreme weight control methods (Laure et al., 2005; McGee and Williams, 2000; Wasson and Anderson, 1995; Wild et al., 2004a). This is proposed to be the reason why, for a long time, the aim of numerous prevention programs among adolescents is to improve their self-esteem and/or to enable them to cope with mental stress.

To achieve these objectives, physical activity is often presented as an effective tool (Ekeland et al., 2005; Gruber, 1986), notably because compared to sedentary peers, young athletes usually show a higher self-esteem and a lower trait anxiety (Calfas and Talor, 1994; Crews et al., 2004; Jaffee and Manzer, 1992; Koivula, 1999; Strauss et al., 2001; Taylor, 1995). In particular, participation in extracurricular sports has been linked to higher self-esteem (Duda, 1989; Holland and Andre, 1994; Jaffee and Ricker, 1993), even if the underlying mechanisms, which entail this fact, remain unclear.

The theoretical basis for the relationship between sports and self-esteem or anxiety is found in other areas than sport psychology. For instance, the theoretical models and measurement scales of these two variables were developed in psychology, education, and mental health. However, subsequently, their applicability to other fields, notably sports, has been widely tested (Boyd and Hrycaiko, 1997).

According to Ekeland et al. (2005), the beneficial effects of sports on self-esteem and anxiety were mainly revealed by small and low quality trials. Moreover, to our knowledge, little is known about the potentially "protective impact" of physical exercise. In other words, does a regular physical activity practice help to limit problematic variations of self-esteem levels (decrease) and trait anxiety (increase)?

The aims of this work, conducted among a large sample of 11 year old adolescents followed up during a three year period, are 1) to compare self-esteem and trait anxiety levels between adolescents who are engaged in a regular extra curricular sports (ECS) practice and those who are not, and 2) to measure whether, or not, a regular ECS practice may help to maintain levels of self-esteem and avoid increases in trait anxiety.

This study results from the "Cohorte Myrtilles", financed by the French ministry of Youth and Sports and by the regional health program "Fight against drug dependence in the Lorraine region (France)".

METHODS

Participants

Participants have taken part in a prospective cohort study, namely "Cohorte Myrtilles", which included all of the pupils entering the first year of secondary school (sixth grade) in the Vosges department (Lorraine region, east France) during the school year 2001-2002 and followed for four years. The data presented in this paper results from a three year follow up period (follow-up began on November 2001 and continued to May 2004). Only the voluntary pupils were included in the study (Nov 2001: $n = 3323$). From November 2001 to May 2004, more than 18,900 completed questionnaires were returned.

Overall, 1791 pupils were present at each of the six data collection sessions and completed all the questionnaires, representing 10 746 documents. 1532 pupils missed at least one session (illness, change of school, etc) and therefore, they were not included in the study.

The responding pupils were composed of 835 boys (46.6 %) and 956 girls (53.4 %). In November 2001, the average age was 11.1 ± 0.5 years (mean \pm standard deviation). There is no data available on the ethnicity status of the participants.

The distribution of the parents' social and occupational groups was similar to the one that is generally found in the Vosges department.

Table 1. Half-yearly variations of global scores in self-esteem (measured by Rosenberg's Scale) and trait anxiety (Spielberger's Scale). Comparison between extra curricular sports (ECS) practice and no extra curricular sports (NECS) practice (mean age 11 years in Nov 01). Data are means (\pm SD).

	Nov 01	May 02	Nov 02	May 03	Nov 03	May 04
Score of self-esteem						
ECS	31.5 (4.7)	32.5 (4.6)	31.1 (4.2)	32.8 (5.6)	32.8 (5.6)	32.3 (6.0)
NECS	29.5 (4.6)	30.8 (4.7)	29.4 (4.4)	30.8 (5.6)	31.0 (6.1)	30.8 (6.0)
F values	30.8 ***	26.0 ***	26.9 ***	23.2 ***	20.4 ***	10.7 ***
Score of trait anxiety						
ECS	38.9 (9.6)	35.7 (9.6)	36.1 (10.5)	36.3 (11.3)	36.9 (11.1)	37.3 (11.7)
NECS	42.1 (9.6)	38.4 (10.3)	39.3 (10.8)	39.9 (11.1)	38.8 (11.0)	39.9 (11.5)
F values	20.0 ***	17.4 ***	17.0 ***	15.4 ***	6.5 **	9.7 **

** $p < 0.01$, *** $p < 0.001$.

Data collection

Data were collected every six months by self-reported questionnaires, designed with an easy answer format. They were administered by school physicians, school nurses or school social workers and completed individually at school. Pupils indicated their number of anonymity, and placed the questionnaire in an envelope, which was sealed at once. Confidentiality and anonymity was assured for the respondents. They were solicited to give honest answers. In the present study, we included subjects who supplied complete questionnaire data and who participated at each of the six data collection sessions.

Questionnaire

The questionnaire, of semi-structured type, was tested beforehand on 120 pupils to ensure the questions were understood and the obtained responses were as accurate as possible (answers obtained by the questionnaire were compared with those collected by interview).

The final document contained the usual socio-demographic items and included an evaluation of:

- *The school and extra-school sports practice (nature and volume schedule);*
- *Self-esteem (SE), measured by Rosenberg's (1979) Self-esteem Scale;*
- *Trait anxiety (AT), measured by Spielberger's (1983) State-Trait Anxiety Inventory. State anxiety was not retained, because this variable is too dependent on the situation. Trait anxiety, more stable over the course of time, is the most commonly used indicator.*

Statistical analysis

The data were managed and analysed using the Modalisa® 4,6 (Kynos, Paris) survey processing software (data entry verified by two operators). According to the nature of the variable, comparisons were made by the chi-square test or by ANOVA, on

series paired by pupil. The significant threshold employed was $p < 0.05$.

Subjects' welfare

The study received the approval of the Inspection of Academy of Vosges (ethical approval is not required in France for anonymous self-completed questionnaire surveys, but we followed the French bioethics law, a text which is comparable to the APA Ethics Code). Each headmaster, duly informed by mail, had the choice to participate or not (three of them declined participation in the study). A letter of information was sent to the parents, who could refuse the participation of their child.

According to French law, our computerized files of data were authorized by the CNIL (National Committee of Data-Processing and Liberty).

RESULTS

Sports practice

On the whole, 722 pupils (40.3 %) stated that they had practiced an extra-school physical activity in a sporting association from November 2001 to May 2004 ("Extra curricular sports practice group, ECS"). On the contrary, 195 (10.9 %) told us that they had not practiced any extra-school physical activity at all during this period ("No extra curricular sports group, NECS"). The rest of the sample (48.8 %) had only an occasional extra-school physical activity (they were not approached in this work).

The ECS adolescents stated that they had done 3.5 hours per week of extra-curricular sport as they entered the secondary school (Nov. 2001) and 4.8 hours per week three years later (May 2004) ($F = 1.32$, $p < 0.05$).

According to the boys, their most practiced five sports were soccer, tennis, judo, basketball and table tennis. Besides dance, girls practiced especially horse riding, gymnastics, swimming, athletics and tennis.

Table 2. Incidence density of decrease in self-esteem and increase in trait anxiety between Nov 01 and May 04. Comparison between extra curricular sports (ECS) practice and no extra curricular sports (NECS) practice (mean age 11 years in Nov 01).

		ECS	NECS	Chi ² values
Incidence density of decrease in self-esteem	Moderate: < mean – 1 SD	129.0	124.1	.24
	Severe: < mean – 2 SD	25.1	16.2	1.60
Incidence density of increase in trait anxiety	Moderate: > mean + 1 SD	105.6	129.0	.25
	Severe: > mean + 2 SD	16.3	18.3	.15

SD = standard deviation.

Among the ECS participants, the average rate of withdrawal of a sport for the benefit of another one was 23 % (this ratio was calculated as follow: number of withdrawal / sum of ECS pupils). There were no differences according to gender (Chi² = 1.01).

Self-esteem, trait anxiety

The average global scores of self-esteem and trait anxiety of the ECS pupils were, respectively, higher and lower than those of the NECS group (Table 1).

To describe the evolution of these scores, we have used the incidence density (number of new cases during a given period/total person-time of observation), which is one of the most common variables in the field of public health. The incidence density of moderate or severe decrease of self-esteem (less than “mean – one standard deviation” or less than “mean – two standard deviation”) was not significantly different between the two groups (Table 2). The incidence density of moderate or severe increase of trait anxiety (more than “mean + one standard deviation” or more than “mean + two standard deviation”) was not different either.

Finally, among ECS pupils, the incidence density of severe decrease of self-esteem was lower in the girls (Table 3). We did not notice any significant difference of the incidence density, neither of decrease of self-esteem, nor of increase of trait anxiety, between subjects who changed their sports and subjects who always practiced the same sport during the follow-up period.

DISCUSSION

This study has its limits. Firstly, data were collected

on a declarative mode. While this is common method, the investigators do not have the possibility to check the answers. On the other hand, this technique does not seem to disrupt excessively the validity of results even though it seems delicate to generalise them (Pate, 1993). Secondly, we have measured only global self-esteem and not its constituents: physical, social, and intellectual (Shavelson et al., 1986), or other more specific variables enrolled in the construction of teenagers' self-esteem, such as academic performance, physical appearance or athletic competence (Harter, 1993). This is due to the fact that « Cohorte Myrtilles » was a prospective study related to adolescents' drug use and abuse, and in this context, we felt more relevant to assess global self-esteem rather than a specific aspect of self-esteem (e.g. physical self-esteem).

Our study highlights an interesting finding: adolescents who engaged in a regular extra curricular sports practice had greater global self-esteem and lower trait anxiety than adolescents who did not engage in these activities. However, the link of causality between sports and self-esteem remains to be established: some studies show that physical exercise can improve self esteem in children and young people (Ekeland et al., 2005), whereas some others suggest that individuals with high self-esteem may be more likely to engage in exercise regularly (Fontane, 1996). There is probably a reciprocal influence of these two factors. In any case, these results are supported by a recent paper which emphasized that extra curricular activities are different than many other school activities because of the opportunities they provide to develop social and leadership skills, increase peer-awareness, and improve emotional fitness (Dworkin et al., 2003).

Table 3. Incidence density of variation in self-esteem and trait anxiety between Nov 01 and May 04 among extra curricular sports practice group. Comparison by gender.

		Girls	Boys	Chi ² values
Incidence density of decrease in self-esteem	Moderate: < mean – 1 SD	91.1	138.2	0.31
	Severe: < mean – 2 SD	10.1	24.5	7.20 ***
Incidence density of increase in trait anxiety	Moderate: > mean + 1 SD	130.0	184.7	0.62
	Severe: > mean + 2 SD	15.4	17.3	0.09

*** p < 0.001. SD = standard deviation.

Our second result is more disappointing, as we have found no “protective impact” of an extra-school physical activity over a period of 3 years: the ECS group showed as much moderate or severe variation of self-esteem or trait anxiety as the NECS group. Considering that self-esteem and trait anxiety certainly do not only depend on sports practice, but also on the adolescents’ social, school, and family life (Wild et al., 2004b), several hypothesis contribute to explain this result:

- 1) *The “protective impact” could be masked by the multiplicity and the heterogeneousness of practices in our population (more than 55 declared sports).*
- 2) *Three years of follow-up could be insufficient to show a “protective impact” of physical activity. Indeed, our pupils are young, positioned between childhood and adolescence. So the variations of self-esteem and trait anxiety could be more different to show and to connect with a particular behaviour such as sport practice (Lameiras Fernandez and Rodriguez Castro, 2003).*
- 3) *It is possible that the investigated “protective impact” does not exist.*

Nevertheless, we have found another interesting result: among young physically active pupils, girls have shown a less severe decrease in self-esteem than boys over 3 years. This result could be explained by the nature of the activities practiced by girls, maybe less centred on performance and competitive spirit, and more on “sensations”, such as those obtained from dance or horse riding, joyful and supportive camaraderie.

CONCLUSIONS

Our work shows that a regular extra-curricular sports practice is associated to better levels of self-esteem and trait anxiety among young adolescent and this activity seems to protect from severe variations of self-esteem in girls. Practitioners and physical education teachers as well as parents, should be encouraged to seek out ways to involve pupils in physical activities, in particular girls, who, traditionally, are not encouraged to pursue a physically active lifestyle.

REFERENCES

- Basow, S.A. and Rubin, L.R. (1999) Gender influences on adolescent development. In: *Beyond appearance: A new look at adolescent girls*. Eds: Johnson, N., Roberts M.C. and Worrell, J. Washington, American Psychological Association. 25-52.
- Boyd, K.R. and Hrycaiko, D.W. (1997) The effect of a physical activity intervention package on the self-esteem of pre-adolescent and adolescent females. *Adolescence* **127**, 693-708.
- Calfas, K.J. and Taylor, W.C. (1994) Effects of physical activity on psychological variables in adolescents. *Pediatric Exercise Science* **6**, 406-423.
- Canals, J., Marti-Henneberg, C., Fernandez-Ballart, J., Cliville, R. and Domenech E. (1992) Scores on the State-Trait Anxiety Inventory for children in a longitudinal study of pubertal Spanish youth. *Psychological Report* **71**, 503-512.
- Carmack, C.L., Boudreaux, E., Amaral-Melendez, M., Brantley, P.J. and de Moor, C. (1999) Aerobic fitness and leisure physical activity as moderators of the stress-illness relation. *Annals of Behavioral Medicine* **3**, 251-257.
- Crews, D.J., Lochbaum, M.R. and Landers, D.M. (2004) Aerobic physical activity effects on psychological well-being in low-income Hispanic children. *Perceptual and Motor Skills* **1**, 319-324.
- Da Costa, D., Rippen, N., Dritsa, M. and Ring, A. (2003) Self-reported leisure-time physical activity during pregnancy and relationship to psychological well-being. *Journal of Psychosomatic Obstetrics and Gynaecology* **2**, 111-119.
- DeMarco, T. and Sidney, K. (1989) Enhancing children's participation in physical activity. *Journal of School Health* **8**, 337-340.
- Duda, J. L. (1989) Relationship between task and ego orientation and the perceived purpose of sport among high school athletes. *Journal of Sport and Exercise Psychology* **3**, 318-335.
- Dworkin, J. B., Larson, R. and Hansen, D. (2003) Adolescents' accounts of growth experiences in youth activities. *Journal of Youth and Adolescence* **1**, 17-26.
- Eccles, J.S., Wigfield, A., Flanagan, C.A., Miller, C., Reuman, D.A. and Yee, D. (1989) Self-concepts, domain values, and self-esteem: Relations and changes at early adolescence. *Journal of Personality* **57**, 283-310.
- Ekeland, E., Heian, F. and Hagen, K.B. (2005) Can exercise improve self-esteem in children and young people? A systematic review of randomised controlled trials. *British Journal of Sports Medicine* **39**, 792-798.
- Fontane, P.E. (1996) Exercise, fitness, and feeling well. *American Behavioral Scientist* **39**, 288-305.
- Gilligan, C. (1990) *Making connections: The relational world of adolescent girls at the Emma Willard School*. Harvard University Press, Cambridge.
- Gruber, J. (1986) Physical activity and self-esteem development in children: a meta-analysis. In: *Effects of physical activity on children*. Eds: Stull, G. and Eckern, H. Champaign, Illinois: Human Kinetics. 330-348.
- Harter, S. (1982) The Perceived Competence Scale for children. *Child Development* **53**, 87-89.

- Harter, S. (1993) Causes and consequences of low self-esteem in children and adolescents. In: *Self-esteem: the puzzle of low self-regard*. Ed: Baumeister, R.F. New-York, Plenum Press. 87-116.
- Holland, A. and Andre, T. (1994) The relationship of self-esteem to selected personal and environmental resources of adolescents. *Adolescence* **114**, 345-360.
- Jaffee, L. and Manzer, R. (1992) Girls' perspectives: Physical activity and self-esteem. *Melpomene Journal* **3**, 14-23.
- Jaffee, L., and Ricker, S. (1993) Physical activity and self-esteem in girls: The teen years. *Melpomene Journal* **3**, 19-26.
- Katula, J.A., Blissmer B.J. and McAuley, E. (1999) Exercise intensity and self-efficacy effects on anxiety reduction in healthy, older adults. *Behavioral Medicine* **3**, 233-247.
- Koivula, N. (1999) Sport participation, Differences in motivation and actual participation due to gender typing. *Journal of Sport Behavior* **22**, 360-381.
- Lameiras Fernandez, M. and Rodriguez Castro, Y. (2003) Age and sex differences in self-esteem among Spanish adolescents. *Psychological Reports* **93**, 876-878.
- Landers, D.M. and Petruzzello, S.J. (1994) Physical activity, fitness and anxiety. In: *Physical activity, fitness and health*. Eds: Bouchard, C., Shepard, R.J. and Stephens, T. Champaign: Human Kinetics. 868-882.
- Laure, P., Binsinger, C., Ambard, M.F., Girault, S. and Friser, A. (2005) Can self-esteem and trait anxiety predict drugs use among early adolescents? *Psychotropes* **1**, 73-90. (in French: English abstract).
- McAuley, E. (1994) Physical activity and psychosocial outcomes. In: *Physical activity, fitness and health*. Eds: Bouchard, C., Shepard, R.J. and Stephens, T. Champaign: Human Kinetics. 551-568.
- McGee, R. and Williams, S. (2000) Does low self-esteem predict health compromising behaviours among adolescents? *Journal of Adolescence* **5**, 569-582.
- Norris, F. and Murrell, S.A. (1988) Prior experience as a moderator of disaster impact on anxiety symptoms in older adults. *American Journal of Community Psychology* **16**, 665-683.
- Pate, R.R. (1993) Physical activity assessment in children and adolescents. *Critical Reviews in Food Science and Nutrition* **33**, 321-326.
- Robson, P.J. (1988) Self-esteem: a psychiatric view. *British Journal of Psychiatry* **153**, 6-15.
- Rosenberg, M. (1979) *Conceiving the Self*. Basic Books, New York.
- Shavelson, R., Hubner, J. and Stanton, G. (1986) Self-concept: Validation and construct interpretations. *Review of Educational Research* **46**, 407-441.
- Sonstroem, R.J. (1984) Exercise and self-esteem. *Exercise and Sport Sciences Reviews* **12**, 123-155.
- Spielberger, C.D. (1983) *Manual for the State-Trait Anxiety Inventory*. Consulting Psychologists Press, Palo Alto.
- Strauss, R.S., Rodzilsky, D., Burack, G. and Colin, M. (2001) Psychosocial correlates of physical activity in healthy children. *Archives of Pediatrics and Adolescent Medicine* **155**, 897-902.
- Tap, P., Tarquinio, C., Sordes-Ader, F. (2002) Health, disease and identity. In: *Traité de psychologie de la santé*. Ed: Fischer, G.N. Paris, Dunod. 135-161. (in French).
- Taylor, D. (1995) A comparison of college athletic participants and nonparticipants on self-esteem. *Journal of College Student Development* **36**, 444-451.
- Wasson, D. and Anderson, M.A. (1995) Chemical dependency and adolescent self-esteem. *Clinical Nursing Research* **4**, 274-289.
- Wigfield, A., Eccles, J.S., Mac Iver, D., Reunman, D.A. and Midgley, C. (1991) Transitions during early adolescence: Changes in children's domain-specific self perceptions and general self-esteem across the transition to junior high school. *Developmental Psychology* **27**, 552-556.
- Wild, L.G., Flisher, A.J., Bhana, A. and Lombard, C. (2004a) Associations among adolescent risk behaviours and self-esteem in six domains. *Journal of Child Psychology and Psychiatry* **8**, 1454-1467.
- Wild, L.G., Flisher, A.J., Bhana, A. and Lombard, C. (2004b) Substance abuse, suicidality, and self-esteem in South African adolescents. *Journal of Drug Education* **1**, 1-17.

AUTHORS BIOGRAPHY



Caroline BINSINGER

Employment

Associated researcher.

Degree

PhD candidate

Research interests

Drug abuse, prevention.



Patrick LAURE

Employment

Public Health Physician.

Degrees

MD, PhD

Research interests

Drug abuse, doping behaviour, Health and sports.

E-mail: patrick.laure@wanadoo.fr



Marie-France AMBARD

Employment

School doctor.

Degree

MD

Research interests

Drug abuse, health and nutrition.

KEY POINTS

- A regular extra-curricular sports practice is associated to better levels of self-esteem and trait anxiety among young adolescent.
- This activity seems to protect girls from severe variations of self-esteem.
- Boys do not seem to be protected from moderate or severe variations, neither of self-esteem, nor of trait anxiety, by a regular extracurricular sport practice.

✉ **Dr. Patrick Laure**

DRDJS, 13, rue Mainvaux, BP 69, 54139 Saint-Max
Cedex, France