*ADAPTED PHYSICAL ACTIVITY QUARTERLY*, 2007, **24**, 178-196


# Effects of Sport Participation on the Basketball Skills and Physical Self of Adolescents With Conduct Disorders

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The purpose of this study was to examine the long-term effects of sport participation on the basketball skills and physical self-concept of adolescents with conduct disorders (CD). Participants were 24 adolescent males with CD, divided equally into three groups: (a) interestablishment basketball (IEBB), (b) integrated scholastic basketball (ISBB), and (c) control—adapted physical activity (APA). The basketball skills tests and physical self-concept were both administrated 4 times over an 18-month period. Results indicated (a) an improvement in basketball skills in both competitive groups (i.e., ISBB, IEBB), (b) a significant curvilinear trend of physical self-worth scale in the three groups, and (c) no significant changes in physical self-concept in the three groups (i.e., ISBB, IEBB, and APA). In conclusion, the integrated and segregated competitive programs did not represent an effective means for improving the physical self-concept of adolescents with CD.

Conduct disorders (CD) are defined in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; American Psychiatric Association, 1994) as follows.

> A repetitive and persistent pattern of behavior in which the basic rights of others or major age-appropriate societal norms or rules are violated, as manifested by the presence of three (or more) of the following criteria in the past twelve months, with at least one criterion present in the past six months: (a) aggression toward people or animals, (b) destruction of property, (c) deceitfulness or theft, and (d) serious rule violations. (pp. 90-91)

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Clinically, adolescents with CD are impulsive and aggressive and can be characterized by antisocial and/or delinquent behaviors (Frick, 1998). Their relationships with peers and nonpeers are mostly unstable and marked by conflict. They generally lack interest in social activities, and their few centers of interest tend to be quite limited (Frick, 1998). Therefore, their investment in leisure or extracurricular activities is inclined to remain superficial and temporary, and these activities must represent constant sources of immediate satisfaction to be maintained (Hill, 2002). The assessment of their intellectual abilities usually reveals an intellectual quotient (IQ) over 85, with higher performance IQ than verbal IQ (Teichner & Golden, 2000). Yet, despite their "average" intellectual abilities, these adolescents often have learning disabilities in reading, spelling, writing, and math, as well as cognitive and executive dysfunctions (Hill, 2002).

In adolescents with CD, these concomitant learning and behavioral problems represent persistent and significant barriers to satisfactory psychosocial functioning and further increase the likelihood of failure in many areas (i.e., academic, social, physical; Rock, Fessler, & Church, 1997). In adolescents with CD, their multiple limitations and failure experiences often result in the development of a low self-concept (Grande, 1988). Given their low self-concept, these adolescents tend to approach new tasks with a pessimistic and discouraged attitude, which again increases the probability of failure or makes them attribute success to luck rather than competence (Grande, 1988). In the physical domain, this self-perpetuating cycle of failure leads to a perception of low physical self-concept, which in turn contributes to lowered expectations for future physical success. Since the mid-1990s, the physical self-concept of adolescents with CD has been a major concern for teachers, sport psychologists, and adapted physical activity (APA) instructors.

## Physical Self-Concept

Self-concept has been conceived by theorists as a multidimensional construct encompassing many characteristics, competencies, attributes, and roles possessed or played by individuals (Shavelson, Hubner, & Stanton, 1976). It includes many sub-selves or domains, such as the academic self, the family self, the emotional self, the social self, and the physical self (Shavelson et al., 1976). According to Shavelson and colleagues, these various dimensions of the self are organized hierarchically: the self-concept system being like a pyramid, with global self-concept at the apex, and general constructs at the next-lower level. Within such a model, global self-esteem is the result of a personal assessment of how one is doing with respect to the constructs that are highly valued and considered important within specific cultures (Shavelson et al., 1976).

With the recognition of a multidimensionality of the self-concept has come a more detailed study of its various components (Hattie, 1992). The physical self occupies a unique position in the self-system because the body, through its appearance, attributes, and abilities, provides a substantive interface between the individual and the world (Fox, 1998). Appearance is an expression of status and sexuality and provides the major vehicle for social communication (Fox, 1998).

Physical self-concept investigators (Fox & Corbin, 1989; Marsh, Richards, Johnson, Roche, & Tremayne, 1994) developed a multidimensional and hierarchical model of the physical self-concept following the structure proposed by Shavelson

et al. (1976). They depicted this construct as a pyramid, with (a) global self-esteem at the apex; (b) global physical self-perceptions at the next-lower level; and (c) specific physical self-perceptions, such as perceived sport competence, physical attractiveness, physical strength, physical condition, coordination, and flexibility . . . at the bottom.

## Physical Self-Concept and Adolescents With CD

Several studies conducted in the general education system (i.e., regular education classes and resource rooms) have demonstrated that adolescents with CD frequently present a low level of global self-esteem (Al-Talib & Griffin, 1994; Barry, Frick, & Killian, 2003; Bynum & Weiner, 2002; Donnelan, Trzesniewski, Robins, Moffitt, & Capi, 2005; Harter, Whitesell, & Junkin, 1998; Hay, 2000; Levy 1997, 2001; Sprott & Doob, 2000) and a similar level of global physical self-perceptions (Al-Talib & Griffin, 1994; Hay, 2000; Levy, 1997, 2001) in comparison with normally achieving (NA) students. However, other studies explain that when adolescents with CD are schooled in a segregated education system (i.e., segregated classes in a specialized establishment) they tended to present lower levels of global self-esteem (Al-Talib & Griffin, 1994; Evans, Levy, Sullenberger, & Vyas, 1991; Levy 1997, 2001; Maïano, Ninot, Bilard, & Albernhe, 2002; Sweitzer, 2005), global physical self-perceptions (Al-Talib & Griffin, 1994; Levy 1997, 2001; Maïano et al., 2002; Sweitzer, 2005), and perceived physical condition and sport competence (Maïano et al., 2002) than NA students. Moreover, some of these studies also showed that when these adolescents were compared with other adolescents with CD schooled in the general education system they presented lower levels of global self-esteem (Al-Talib & Griffin, 1994; Levy 1997, 2001; Maïano et al., 2002), global physical self-perceptions (Al-Talib & Griffin, 1994; Levy 1997, 2001; Maïano et al., 2002), and perceived physical condition and sport competence (Maïano et al., 2002).

## Physical Self-Depreciation in Adolescents With CD Schooled in a SE: Consequences and Solutions

Scholars (see Hay, 2000, for a review) suggest that if this form of overall physical self-depreciation lasts for several years it may reinforce the already severe aggressive and delinquent behaviors, as well as the learning difficulties and generalized lack of interest of these adolescents. This reinforcement of their primary disorders may very well severely compromise their integration into the professional and social spheres of ordinary adulthood.

Although finding solutions to the physical self-depreciation problem of adolescents with CD may appear quite complex, APA instructors often rely on sport participation to prevent further deterioration in physical self-concept of adolescents with CD (see Bilard, 2001, for a review). According to these professionals, through the provision of success experiences and skill development, sport participation could represent an effective way of developing greater physical self-concept in adolescents with CD schooled in a specialized establishment (SE).

## Sport Participation and Adolescents With CD Schooled in a SE

From a rehabilitation perspective, two types of sport competition programs for adolescents with CD are proposed by the SEs' APA instructors (Maïano, Ninot, Giry, & Bonino, 2000). In the first type (e.g., interestablishment), sport competition is limited to SE students so that students with CD compete against peers with CD schooled in other SEs. During these segregated competitions, the rules are adapted to take into account the overall skill level of the players. The atmosphere permeating these competitions is mostly festive and most games finish with the distribution of rewards to participants and/or by a postgame buffet. In such a festive atmosphere, the game outcome (i.e., winning or losing) is often relegated to the second rank (Maïano et al., 2000).

Conversely, integrated scholastic competitions pit adolescents with CD from SEs against adolescents without CD from normal schools. During these integrated competitions, the rules are not adapted and the prevailing conditions mimic those of an ordinary school championship: a fixed number of participants, standardized time for play, score sheets, and official referees. The prevailing atmosphere in such games is mostly competitive and game outcomes occupy a preeminent position in a player's mind (Maïano et al., 2000).

## Effect of Sport Participation on Physical Self-Concept of Adolescents With CD

According to literature reviews on sport participation and physical self-concept of individuals from various age groups and presenting diverse disabilities (e.g., cerebral palsy, mental retardation, visual impairment) or special needs (e.g., obese, offenders, problem drinkers, learning disabled, depressed), no study has ever examined sport participation effects on the physical self-perceptions of adolescents with CD (Block, Griebenauw, & Brodeur, 2003; Dykens, Rosner, & Butterbaugh, 1998; Fox, 2000; Porretta & Moore, 1997; Wind, Schwend, & Larson, 2004). However, despite this lack of literature about sport participation, physical self-concept, and adolescents with CD, there is growing evidence that successful participation in a wide variety of sports may represent an efficient means for developing greater physical self-concept in special populations (Block et al., 2003; Dykens et al., 1998; Fox, 2000; Hutzler & Bar-Eli, 1993; Porretta & Moore, 1997; Wind et al., 2004). Nevertheless, the positive effect of sport participation on physical self-concept appears related to motor skills development and the type of social environment (Block et al., 2003; Dykens et al., 1998; Porretta & Moore, 1997; Wind et al., 2004).

First, some authors show that motor skill development tends to result in a significant increase in the physical self-concept of individuals with intellectual or physical disabilities and that the successful application of these newly acquired skills may represent the active ingredient of this relation (Blinde & McClung, 1997; Dykens et al., 1998; Gibbons & Bushakra, 1989). For these authors, the motor skill development path appears to represent one of the best approaches to increase adolescents' physical self-perceptions and enjoyment in sport participation.

Second, additional results show that the positive outcomes of sport participation for individuals with intellectual disabilities did vary according to the social

environment of sport settings (i.e., integrated, segregated, alternated, and unified) (Castagno, 2001; Gibbons & Bushakra, 1989; Maïano, Ninot, & Erraïs, 2001; Ninot, Bilard, Delignières, & Sokolowski, 2000; Riggen & Ulrich, 1993; Wright & Cowden, 1986). For instance, some studies show that significant improvements in the physical self-concept of individuals with intellectual disabilities paths could be obtained in segregated and unified sport settings (Castagno, 2001; Gibbons & Bushakra, 1989; Wright & Cowden, 1986), as opposed to integrated and alternated sport settings (Maïano et al., 2001; Ninot, Bilard, et al., 2000).

## Purposes of the Study

Although APA instructors often rely on sport participation as a mean of developing greater physical self-concept in adolescents with CD schooled in SEs, no controlled study has examined the effects of both types of programs (i.e., interestablishment, integrated scholastic). Given the use of these program forms, this lack of knowledge is surprising. The present study was designed to address physical self-concept in adolescents with CD using the game of basketball. Basketball was chosen because it represents one of the most regularly used in research on sport participation and physical self-concept in adolescents with disabilities (Castagno, 2001; Dykens et al., 1998; Maïano et al., 2001; Ninot, Bilard, et al., 2000). Basketball involves direct interaction of players from different teams that could potentially accelerate the process of improvement of social relations and behavioral control. Additionally, basketball allows adolescents to practice a range of developmentally appropriate social and motor skills in ecologically relevant peer contexts.

The purpose of this study was threefold. First, it sought to examine whether adolescents with CD schooled in SEs really do present a low level of global self-esteem, global physical self-perceptions (i.e., physical self-worth), perceived physical condition, and sport competence. Thus, the first hypothesis, based on the findings from previous studies (Al-Talib & Griffin, 1994; Levy 1997, 2001; Maïano et al., 2002; Sweitzer, 2005), proposes that adolescents with CD schooled in SEs present lower level of global self-esteem, physical self-worth, perceived physical condition, and sport competence than adolescents without CD.

Second, this study sought to examine whether regular sport participation would improve motor skills. Thus, the second hypothesis, based on the findings of Blinde and McClung (1997), Dykens et al. (1998), and Gibbons and Bushakra (1989), assumes that adolescents with CD involved in basketball competitions would improve their skills in free throw, dribbling, and ball passing more than their peers involved in sessions of a multipurpose APA.

Third, this study examined the impact of both types of sport competition programs (i.e., interestablishment, integrated scholastic) on the physical self-concept of adolescents with CD. Indeed, it is well recognized that sport participation represents an efficient means of developing physical self-concept in disabled individuals, but these effects vary according to the settings in which these activities take place (Blinde & McClung, 1997; Dykens et al., 1998; Gibbons & Bushakra, 1989; Wright & Cowden, 1986). Thus, modifications in physical self-concept should vary according to the type of sport programs. Therefore, the third hypothesis, based on the findings of Gibbons and Bushakra (1989), Ninot,

Bilard, et al. (2000), Wright and Cowden (1986) proposes that interestablishment basketball competition would significantly enhance the level of global self-esteem, physical self-worth, and perceived physical condition and sport competence of adolescents with CD schooled in SEs, whereas integrated scholastic basketball competitions would maintain the low level of physical self-concept in this same population.

# Method

## Participants

Following project approval by the faculty ethical board, 130 adolescents with CD receiving special education in two French SEs were invited to participate in the study. When SEs' permission to perform the study was allowed, informational letters were sent to parents. These letters briefly explained the purpose of the study. Adolescents with CD who agreed to participate and who returned the informed consent forms from their parents were included in the study. From this pool of adolescents with CD, 24 participants were recruited. These participants had to meet the following ten inclusion criteria representative of the target population: (a) males; (b) between 11 and 13 years of age; (c) conduct disordered; (d) placed in SEs; (e) placed for at least 1 year; (f) full-scale IQ between 85 and 120 on the Weschler Intelligence Scale for Children–Revised (WISC–R; Weschler, 1974); (g) little experience in basketball (i.e., being exposed to a maximum of 12 basketball sessions; (h) no previous experience of sport competition; (i) low to middle economic status; and (j) no medication intake during the study period. Both of the targeted SE belonged to the same association. They both accommodated, on a 24-hour-per-day basis during the week, 65 adolescents (50 boys and 15 girls), aged between 10 to 16 years. These SEs provided similar educational, social, medical, and paramedical support to the students with CD.

The selected participants were divided equally into three groups of eight adolescents by cross-checking from case to case in terms of the inclusion criteria (Table 1). Because of the difficulty inherent in gathering a single group of adolescents from different institutions located far away, participants could not be randomly assigned to each group.

A one-way analysis of variance (ANOVA) showed no difference between groups for age, $F(2, 21) = 0.90$, $p = .42$; duration of placement, $F(2, 21) = 0.19$, $p = .83$; full-scale IQ, $F(2, 21) = 0.15$, $p = .86$; verbal IQ, $F(2, 21) = 0.16$, $p = .85$; performance IQ, $F(2, 21) = 0.55$, $p = .59$; socioeconomic status, $F(2, 21) = 0.42$, $p = .66$; aggressive behavior scale, $F(2, 21) = 0.60$, $p = .56$; or delinquent behavior scale, $F(2, 21) = 0.14$, $p = .87$. Thus, the three groups could be considered as equated from the start of the experiment (Table 1).

Finally, in order to assess our first hypothesis, 134 adolescent males were also recruited from one middle high school. For all these participants, the following five inclusion criteria were used: (a) between 11 and 13 years old, (b) no CD, (c) schooled full time in general education classroom, (d) participated in physical education classes (these classes were not elective), and (e) never had repeated a school year.

**Table 1 Description of the Three Groups of Adolescents With Conduct Disorders**

| | ISBB (*n* = 8) | | IEBB (*n* = 8) | | APA (*n* = 8) | |
|---|---|---|---|---|---|---|
| Sport: | Basketball | | Basketball | | Several | |
| Modality: | Integrated scholastic | | Interestablishment | | None | |
| **Item** | ***M*** | ***SD*** | ***M*** | ***SD*** | ***M*** | ***SD*** |
| Age | 11.88 | 0.83 | 12.38 | 0.74 | 12.13 | 0.64 |
| Duration of placement, months | 33.00 | 13.98 | 37.50 | 16.27 | 36.00 | 14.34 |
| Full-Scale IQ | 100.25 | 5.50 | 98.63 | 4.81 | 99.50 | 7.43 |
| Verbal IQ | 99.38 | 4.78 | 98.00 | 5.21 | 98.75 | 4.37 |
| Performance IQ | 102.75 | 6.09 | 100.50 | 5.86 | 104.00 | 8.18 |
| Aggressive behavior | 84.25 | 3.24 | 83.13 | 4.70 | 82.00 | 4.24 |
| Delinquent behavior | 80.25 | 6.58 | 82.13 | 8.25 | 81.25 | 6.07 |
| SES | 1.75 | 0.45 | 1.88 | 0.54 | 1.63 | 0.50 |

*Note*. ISBB: integrated scholastic basketball; IEBB: interestablishment basketball; APA: adapted physical activity; SES: socioeconomic status.

## Measures

***Demographic and General Information.*** The social workers assigned to each student were asked to estimate the socioeconomic status (SES) of each student's family on a 3-point rating scale: 1 (*low*, <1,070€), 2 (*middle*, 1,070€ ≤ SES ≥ 1,830€) to 3 (*high*, >1,830€), based on the net income earned by both parents during the last 3 years. Students' placement duration was assessed from their registered date of entrance into the SEs.

***Conduct Disorders.*** Conduct disorders were assessed using the externalizing subscale (combining the aggressive and delinquent behavior subscales) of Achenbach's (1991) youth self-report (YSR). The French version of the YSR (Vermeersh & Fombonne, 1997) was completed by all the adolescents. The 38 items used in this scale are scored on Likert rating scales with three increasing degrees: 0—*not true*, 1—*somewhat or sometimes true*, 2—*very or often true*. T-Scores were calculated using the Achenbach's (1991) norms. All the adolescents retained for this study had T-scores greater than 70 on both the aggressive and delinquent behavior subscales of the YSR. The internal consistency and test–retest reliability of this instrument and of both the aggressive and delinquent behavior subscales where repeatedly found to be highly satisfactory (see Vermeersh & Fombonne, 1997).

***Intelligence (IQ).*** Students' IQ was assessed with the French version (Dague, 1982) of the WISC–R (Weschler, 1974). This instrument is composed of 12 subscales (6 for verbal IQ and 6 for performance IQ). The French adaptation of the WISC–R presents satisfactory internal consistency coefficients ($\alpha$ = .59 to .86 for

the 12 subscales and $\alpha = .90$ to .94 for the 3 forms of IQ) and satisfactory intraclass correlations coefficients over a 1-month period ($R = .57$ to .91 for the 12 subscales and $R = .88$ to .93 for the 3 forms of IQ; Dague, 1982).

***Physical Self-Concept.*** The Physical Self-Inventory (PSI) of Ninot, Delignières, and Fortes (2000) was used to measure students' physical self-concept. This instrument has been validated in previous research on adolescents with CD (Maïano et al., 2002). The questionnaire is composed of six scales, the first of which represents global self-esteem (GSE). The next five scales of the PSI measure students' perceptions of their global physical self-worth (PSW), physical condition (PC), sport competence (SC), physical attractiveness (PA), and physical strength (PS). For our sample, the internal consistency of the six PSI scales ranged from .77 to .88 and all the intraclass correlations coefficients were statistically significant and ranged from $R = .50$ to .80 over a 1-month period. Questions are presented as Likert scales with six increasing degrees (1, *not at all;* 2, *very little;* 3, *some;* 4, *enough;* 5, *a lot; and* 6, *entirely*). A multiple ANOVA revealed no between-group differences before the first competition for GSE, $F(2, 21) = 0.96$, $p = .40$; PSW, $F(2, 21) = 0.91$, $p = .42$; PC, $F(2, 21) = 0.06$, $p = .95$; SC, $F(2, 21) = 1.70$, $p = .21$; PA, $F(2, 21) = 0.19$, $p = .83$; and PS scales, $F(2, 21) = 1.72$, $p = .20$.

***Basketball Skills Tests.*** To assess basketball skills, three tasks to measure the free throw (FT), dribbling (DB), and precision in ball passing (PBP) were used. None of these basketball skills tests were used during the training sessions. For the FT task, the test validated by Grosgeorges and Wolff (1998) was used and adapted (i.e., equipment, preparation, directions, and scoring). In this test, students were asked to make as many baskets as possible out of 10 free throws and standardized testing conditions were defined: no crossing the line, normal foot position and shooting technique. In the original version, an interrater agreement computed from two judges' independent ratings was $r = .98$ and the test–retest reliability coefficient was $r = .92$. In this sample, the interrater agreement computed from two judges' independent ratings was $r = 1.00$ and the intraclass correlations coefficients, over 1-month periods, were $r = .88$. For the DB task, the Harrison dribble test (Harrison, 1969) was used and adapted (i.e., equipment, preparation, directions, and scoring). In this test, students were asked to accomplish as much as possible returns on a 4-m lane with a cones at each end, during one 20-s time trial and standardized conditions were defined: mandatory passing behind each cones, normal start position and choice of dribbling hand, no dribbling with two hands. In the original version, an interrater agreement computed from two judges' independent ratings was $r = .89$ and the test–retest reliability coefficient was $r = .91$. In this sample, the interrater agreement computed from two judges' independent ratings was $r = .95$ and the intraclass correlations coefficients, over 1-month periods, were $r = .81$. For the PBP task, the American Alliance for Health, Physical Education, Recreation and Dance basketball passing test (AAHPERD, 1984) was used and adapted (i.e., equipment, preparation, directions, and scoring). In this test, students stood 2.5 m from the wall and had to throw as many balls as possible inside a round target (1 m in diameter, placed at a height of 1.20 m from the floor) out of 10 attempts. For this task, standardized conditions were also defined: normal foot position and method of holding the ball, no line crossing, invalid attempt if the ball touched the edge of the circle or if it passed outside the target). In the original version, an

interrater agreement computed from two judges' independent ratings was $r = .95$ and the test–retest approach reliability coefficient was $r = .97$. In this sample, the interrater agreement computed from two judges' independent ratings was $r = .96$ and the intraclass correlations coefficients, over 1-month periods, were $r = .84$. A one-way ANOVA on these measures showed no between-group differences before the first competition—FT, $F(2, 21) = 0.16$, $p = .85$; DB, $F(2, 21) = 4.13$, $p = .34$; PBP, $F(2, 21) = 0.59$, $p = .56$.

## Procedure

Two groups participated in basketball competition for an 18-month period: one of them did so in the context of an interestablishment program (IEBB) and the second one in the context of an integrated scholastic event program (ISBB). The third group (APA) was used as a control and included adolescents who were involved, during the same period, in a traditional SE program of adapted physical activity (combining numerous physical activities such as tennis, volleyball, wrestling, and basketball). The APA instructors from both these SEs participated in this study. All of them (a) have the same degree and school diploma in APA, (b) are working in their SE for 5 years, and with these types of adolescents for 10 years. One of them had the responsibility of both the APA and the IEBB groups, whereas the other coached only the ISBB group.

During the experimentation, both competitive groups participated in one basketball game per month and three training sessions per month during an 18-month period. Thus, they played 18 basketball games and they participated in 54 training sessions. None of the competitions or training sessions was canceled. The three groups were exposed to the same number of training sessions ($n = 54$). The APA group was only exposed to 16 (8 per year) training sessions of basketball. The two competitive groups were exposed to the same basketball program. It was taught by their respective coaches following directives suggested by the research team. The specific objective of these training sessions was to prepare the participants for the athletic competitions. All of these sessions consisted of the same format of practice: 15 min of warm-up, 60 min of exercise, 30 min of games, and 15 min of cool-down. During these training sessions, (a) the proposed exercises were repetitive and focused on the acquisition of basketball skills (e.g., pivoting, dribbling, lay-ups, jump and three throw shooting, rebounding, defense positioning) and (b) different games situations were proposed to the students (e.g., five-on-five and three-on-three games, game without dribbling, mandatory one-on-one defense, mandatory territorial defense).

For every participant, six additional standardized conditions of participation were defined: (a) agreement to participate; (b) freedom to stop the program at any time; (c) one 2-hr training per week for the two competitive groups, as well as for the APA group; (d) the same coach or APA instructor throughout the study period; (e) training with a rigorous program and calendar for the competitive groups.

The PSI was presented individually to adolescents with CD in standardized conditions (i.e., paper and pencil supplied, inventory filled out by the subjects, help with reading or comprehension when necessary) by the same researcher before the first basketball competition (T0) and then systematically after each of the six basketball competitions (i.e., 6 month) over an 18-month period. The

adolescents without CD completed the PSI once during their physical education classes, in the same standardized conditions than the adolescents with CD. The basketball skills tasks were performed by the adolescents with CD individually in standardized conditions (i.e., same gym, same equipment, etc.) in the presence of the same researcher before the first basketball competition (T0) and then systematically after each of the six basketball competitions (i.e., six month) over an 18-month period.

### Data Analyses

To evaluate the first hypothesis, Kolmogorov–Smirnov's test was first used to determine data normality from the three experimental groups and the adolescents without CD schooled full-time in an ordinary class. The results show that all the data were not normally distributed. Then, a Kruskal-Wallis (KW) ANOVA for ranked data was used. In order to identify pairs of interest, post hoc multiple comparisons of mean ranks (MCMR) were used for all pairs of groups.

To evaluate the second and third hypothesis, Kolmogorov–Smirnov's test was used to determine the normality of the data from the three experimental groups. The results show that all the data were normally distributed. Thus, basketball skills performances and PSI scales were analyzed using 3 (groups) × 4 (measurement points over an 18-month period) repeated measures ANOVA with Huynh-Feldt adjustments (Huynh & Feldt, 1970). The Student-Newman-Keuls (SNK) multiple post hoc comparisons test was used to interpret the significant main effects and interactions revealed by the ANOVAs. The statistical power and effect sizes were computed for all analyses following Cohen's (1988, 1992) suggestions.

## Results

### Physical Self-Depreciation in Adolescents With CD Schooled in SEs

Table 2 shows PSI scales' means and standard deviations for the four groups before the first competition. Concerning the first hypothesis, the KW ANOVA shows a significant difference between the three experimental groups and the adolescents without CD on the GSE, $H(3) = 27.78$, $p < .001$, $\eta^2 = .18$, power = .89; PSW, $H(3) = 10.55$, $p = .01$, $\eta^2 = .07$, power = .60; PC, $H(3) = 24.01$, $p < .001$, $\eta^2 = .15$, power = .83; SC, $H(3) = 14.12$, $p = .002$, $\eta^2 = .09$, power = .66; PA, $H(3) = 8.37$, $p = .04$, $\eta^2 = .05$, power = .55; and PS [$H(3) = 12.83$, $p < .001$, $\eta^2 = .08$, power = .63, scales of the PSI. The MCMR post hoc test showed that adolescents without CD presented consistently higher scores than the three experimental groups in all PSI scales (Table 2).

### Changes in Basketball Performances

Performances on the three basketball tasks for the three groups over an 18-month period are illustrated in Table 2. The results from the two-way repeated measures ANOVAs with Huynh-Feldt adjustments evaluating the effects of interaction, groups, and time on basketball skills tasks scales are reported in Table 3.

**Table 2 Changes in Basketball Skills Tasks and PSI Scales for the Three Experimental Groups Over an 18-Month Period and PSI Scales Scores for Adolescents Without CD**

| | | AWCD | ISBB | | | | IEBB | | | | APA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Item | | T0 | T0 | T1 | T2 | T3 | T0 | T1 | T2 | T3 | T0 | T1 | T2 | T3 |
| **Basketball skills tasks** | | | | | | | | | | | | | | |
| FT | *M* | — | 1.13 | 1.88 | 2.50 | 3.00 | 1.25 | 2.13 | 2.75 | 3.88 | 1.00 | 1.25 | 1.00 | 1.13 |
| | *SD* | — | 0.83 | 0.64 | 1.07 | 0.76 | 1.04 | 0.83 | 1.04 | 0.99 | 0.76 | 1.58 | 1.60 | 1.36 |
| DB | *M* | — | 5.38 | 7.50 | 7.63 | 8.00 | 5.88 | 7.75 | 8.63 | 8.75 | 5.13 | 5.63 | 5.38 | 5.88 |
| | *SD* | — | 1.41 | 0.93 | 1.77 | 0.53 | 0.64 | 0.46 | 1.06 | 1.04 | 0.83 | 0.52 | 0.52 | 0.83 |
| PBP | *M* | — | 5.63 | 7.00 | 7.50 | 8.25 | 6.13 | 7.50 | 7.75 | 8.00 | 5.88 | 5.00 | 5.50 | 5.63 |
| | *SD* | — | 0.92 | 0.76 | 2.07 | 0.71 | 0.99 | 1.41 | 1.04 | 0.76 | 0.83 | 0.53 | 0.76 | 0.74 |
| **PSI scales** | | | | | | | | | | | | | | |
| GSE | *M* | 4.63 | 3.58 | 3.38 | 3.08 | 3.18 | 2.88 | 3.93 | 3.48 | 3.78 | 3.30 | 3.33 | 3.55 | 3.60 |
| | *SD* | 1.03 | 1.08 | 0.84 | 0.47 | 1.14 | 1.26 | 0.81 | 1.03 | 0.79 | 0.58 | 0.83 | 0.57 | 0.41 |
| PSW | *M* | 5.16 | 4.93 | 4.63 | 4.05 | 4.33 | 4.40 | 4.05 | 4.43 | 4.78 | 4.33 | 3.65 | 3.55 | 4.40 |
| | *SD* | 0.77 | 0.85 | 0.80 | 1.18 | 1.51 | 0.76 | 1.48 | 1.08 | 0.66 | 1.24 | 1.36 | 1.77 | 1.27 |
| PC | *M* | 4.92 | 3.63 | 4.08 | 4.53 | 3.68 | 3.60 | 4.68 | 4.18 | 4.65 | 3.75 | 3.50 | 3.13 | 3.68 |
| | *SD* | 1.13 | 0.99 | 0.96 | 0.81 | 1.33 | 1.01 | 1.19 | 0.97 | 0.97 | 0.87 | 0.78 | 1.47 | 1.15 |
| SC | *M* | 5.15 | 4.50 | 4.06 | 4.16 | 3.88 | 4.84 | 4.44 | 4.28 | 4.81 | 4.00 | 4.00 | 3.31 | 4.00 |
| | *SD* | 0.79 | 1.11 | 1.27 | 1.01 | 1.43 | 0.87 | 0.87 | 0.89 | 0.35 | 0.74 | 0.94 | 1.31 | 0.99 |
| PA | *M* | 4.47 | 3.83 | 4.08 | 4.00 | 4.42 | 3.75 | 4.21 | 4.46 | 4.67 | 3.50 | 3.25 | 3.50 | 3.67 |
| | *SD* | 1.10 | 1.02 | 0.90 | 1.40 | 0.87 | 0.61 | 1.40 | 1.15 | 0.94 | 1.54 | 1.16 | 1.52 | 1.33 |
| PS | *M* | 5.10 | 4.75 | 4.33 | 4.46 | 4.25 | 3.83 | 3.75 | 4.13 | 4.42 | 4.42 | 3.33 | 3.58 | 3.88 |
| | *SD* | 0.79 | 0.68 | 0.98 | 0.94 | 1.41 | 1.40 | 1.61 | 1.23 | 0.89 | 0.75 | 1.20 | 1.52 | 1.15 |

*Note*. FT: free throw; DB: dribbling; PBP: precision in ball passing; GSE: global self-esteem; PSW: physical self-worth; PC: physical condition; SC: sport competence; PA: Physical attractiveness; PS: physical strength; AWCD: adolescents without conduct disorders; IEBB: interestablishment basketball; ISBB: integrated scholastic basketball; APA: adapted physical activity; T0: precompetition; T1: at 6 months; T2: at 12 months; T3: at 18 months.

**Table 3 Results from the Two-Way Repeated Measures ANOVAs Evaluating the Effects of Interaction, Group, and Time on Basketball Skills Tasks and PSI Scales**

| Item | HF[a] ε | Effects | df | *F* | *p* | $\eta_p^2$ | Power |
|---|---|---|---|---|---|---|---|
| **Basketball skills tasks** | | | | | | | |
| Free throw performance | 1.00 | Interaction | 6, 63 | 2.63 | .02 | .25 | .78 |
| | | Group | 2, 21 | 9.64 | .001 | .55 | .96 |
| | | Time | 3, 63 | 10.13 | .001 | .48 | .99 |
| Dribbling performance | 1.00 | Interaction | 6, 63 | 4.32 | .001 | .29 | .95 |
| | | Group | 2, 21 | 26.28 | .001 | .71 | 1.00 |
| | | Time | 3, 63 | 30.14 | .001 | .59 | 1.00 |
| Precision in ball passing performance | 0.97 | Interaction | 5.86, 61.60 | 3.58 | .004 | .25 | .88 |
| | | Group | 2.21 | 9.64 | .001 | .73 | 1.00 |
| | | Time | 2.93, 61.60 | 8.31 | .001 | .28 | .97 |
| **PSI scales** | | | | | | | |
| Global self esteem | 1.00 | Interaction | 6, 63 | 1.51 | .19 | .13 | .55 |
| | | Group | 2, 21 | 0.34 | .72 | .03 | .10 |
| | | Time | 3, 63 | 0.73 | .54 | .03 | .20 |
| Physical self-worth | 1.00 | Interaction | 6, 63 | 1.38 | .24 | .12 | .50 |
| | | Group | 2, 21 | 0.58 | .57 | .05 | .13 |
| | | Time | 3, 63 | 3.05 | .04 | .13 | .69 |
| Physical condition | 0.89 | Interaction | 5.20, 54.66 | 2.26 | .06 | .18 | .70 |
| | | Group | 2, 21 | 2.03 | .16 | .16 | .38 |
| | | Time | 2.60, 54.66 | 1.14 | .34 | .05 | .27 |
| Sport competence | 1.00 | Interaction | 6, 63 | 0.78 | .58 | .07 | .29 |
| | | Group | 2, 21 | 2.06 | .15 | .16 | .38 |
| | | Time | 3, 63 | 1.84 | .15 | .08 | .46 |
| Physical attractiveness | 1.00 | Interaction | 6, 63 | 0.41 | .87 | .04 | .16 |
| | | Group | 2, 21 | 1.64 | .22 | .14 | .31 |
| | | Time | 3, 63 | 1.17 | .17 | .08 | .43 |
| Physical strength | 1.00 | Interaction | 6, 63 | 0.86 | .53 | .08 | .31 |
| | | Group | 2, 21 | 1.27 | .30 | .11 | .25 |
| | | Time | 3, 63 | 1.24 | .30 | .06 | .32 |

*Note.* HF[a]: Huynh-Feldt adjustments. df: Degrees of freedom.

For the FT task, the two-way repeated measures ANOVA with Huynh-Feldt adjustments showed significant effects for interaction, groups, and time (Table 3). For the significant interaction effect, the SNK test showed that the IEBB and ISBB groups presented significantly enhanced performances from T0 to T3 ($p < .05$), whereas no such effects were evident in the APA group. Concerning the group effect, the SNK test showed that the IEBB and ISBB groups presented higher scores than the APA group ($p < .05$). Finally, for the time effect, the SNK test revealed that the FT performances at T0 were lower than at T1, T2, and T3 ($p < .05$).

For the DB task, the two-way repeated measures ANOVA with Huynh-Feldt adjustments showed significant effects for interaction, groups, and time (Table 3). Concerning the interaction effect, the SNK test showed that the IEBB and ISBB groups presented a significantly enhanced DB performance between T0 and T3. Indeed, for these groups, the DB scores at T0 were lower than at T1, T2, and T3 ($p < .05$), whereas no such effects were evident in the APA group. Finally, the IEBB and ISBB groups showed higher scores than the APA group at T1, T2, and T3 ($p < .05$). For the group effect, the SNK test showed that both the IEBB and ISBB groups presented higher scores than those of the APA group ($p < .05$). Concerning the time effect, the SNK test showed that performances at T0 were lower than those at T1, T2, and T3 ($p < .05$).

For the PBP task, the two-way repeated measures ANOVA with Huynh-Feldt adjustments showed significant effects for interaction, groups, and time (Table 3). For the interaction effect, the SNK test showed that the IEBB and ISBB groups made significant progress between T0 and T3, as performances at T0 were lower than at T1, T2, T3, and T4 ($p < .05$), whereas no such effect was observed in the APA group. Finally, the IEBB and ISBB groups presented higher performances at T1, T2, and T3 than the APA group ($p < .05$). Concerning the group effect, the SNK test showed that the APA group presented lower performances than both the IEBB and ISBB groups ($p < .05$). Finally, concerning the time effect, the SNK test showed that PBP performances at T0 were lower than at T1, T2, and T3 ($p < .05$).

### Effects of Basketball Competition on PSI

The PSI means and standard deviations for the three groups over an 18-month period are illustrated in Table 2. The results from the two-way repeated measures ANOVAs evaluating the effects of interaction, groups, and time on PSI scales are reported in Table 3. These results only revealed a significant time effect on the PSW scale. The SNK test applied to the time effect revealed a decrease of the PSW of adolescents with CD between T0 and T2 and an increase of scores between T2 and T3 ($p < .05$).

## Discussion

The purpose of this study was to examine the effects of interestablishment and integrated scholastic basketball competition on basketball skills and physical self-concept of adolescents with CD schooled in SEs. The obtained results show that adolescents with CD schooled in SEs presented significantly lower physical self-concept than adolescents without CD schooled in regular schools. Thus, this study confirms the findings from previous studies (e.g., Al-Talib & Griffin, 1994;

Levy, 1997, 2001; Maïano et al., 2002; Sweitzer, 2005) in which such self-depreciation was identified in global self-esteem, global physical self-perceptions (i.e., physical self-worth), perceived physical condition, and sport competence. The first hypothesis was thus validated.

The results show enhanced performance of basketball skills for both experimental groups. However, adolescents from the APA group did not significantly improve their performances in basketball skills. Moreover, the type of sport competition programs, segregated or integrated, did not appear to play a fundamental role in this progress. Thus, these results confirmed the second hypothesis and replicate the findings of Blinde and McClung (1997), Dykens et al. (1998), and Gibbons and Bushakra (1989) in individuals with disabilities. This progress in basketball skills illustrates the involvement of adolescents with CD in their basketball training. In fact, both groups were involved in numerous training sessions ($n$ = 54) relative to the objective of preparing for the basketball games. Potentially, the fact that they had to focus on specific objectives (i.e., competitions) allowed them to better consolidate the various skills they had to learn during the training sessions. This may explain their enhanced basketball performances.

Unfortunately, in contrast to the findings of Blinde and McClung (1997), Dykens et al. (1998), and Gibbons and Bushakra (1989), in individuals with disabilities, these improved basketball skills did not appear to improve the physical self-concept of adolescents with CD. Indeed, after 18 months, (a) physical self-worth scores significantly decreased over 1 year and then significantly increased back to their initial level 6 months later in the three groups of adolescents with CD and (b) physical self-concept remained stable in the three groups (i.e., ISBB, IEBB, APA). Thus, this study does not confirm the findings of Gibbons and Bushakra (1989), Ninot, Bilard, et al. (2000), and Wright and Cowden (1986). The third hypothesis was thus not supported.

In the interestablishment basketball competition context, adolescents with CD came up against other adolescents schooled in SEs. Regular competition with other adolescents with CD over an 18-month period did little to change their low physical self-concept. The interestablishment competition maintained adolescents with CD in their usual social environment and maintained them in their habits and in their "downward spiral" of negative physical self-perceptions. The familiarity of this environment posed no challenge to their habits and thus may have confirmed their low physical self-concept as nonathletic "problem" adolescents. Part of this problem could come from the fact that this program provides adolescents with CD with a "mirror image" of their delinquent selves, which does not allow them to observe new and improved worldviews and prosocial behaviors.

In integrated scholastic basketball competition, adolescents with CD came up against nonpeers (i.e., adolescents without CD schooled in general schools). Regular engagement of adolescents with CD with adolescents without CD in general schools settings did not change the low levels of physical self-concept of adolescents with CD over an 18-month period. This result shows that adolescents from the ISBB group did not succeed in identifying themselves to adolescents without CD from regular school settings. The fact that their team remained labeled (Al-Talib & Griffin, 1994) as an "SE team" may have served to maintain in these adolescents a feeling of difference, rejection, and exclusion. Consequently, it is possible to hypothesize that adolescents from the ISBB group did not operate a

transformation of their identificatory references at a sporting level. Their social comparison system in this integrated sport context remains unchanged.

The lack of efficacy of both programs may be due to six additional potential explanations: (a) games outcomes, (b) the chosen sport, (c) the age category, (d) the frequency of competitions and training sessions, (e) the perceived sport relevance for adolescents with CD, and (f) the potential reliance on group-based comparisons rather than personal progress by the adolescents with CD to assess their physical self-perceptions.

First, during both sport competition programs, adolescents with CD encountered more defeats than victories. We believe these repetitive defeats, which occurred in the context of increasing basketball skills, may have confirmed low physical self-concept in adolescents with CD. Indeed, even though they were involved in numerous training sessions ($n = 54$) to prepare for the competitions and significantly improved their basketball skills, they still lost most games. We believe that the game outcome (i.e., win/lose) is a contributing factor in the maintenance of the low physical self-concept of adolescents with CD.

Second, as mentioned earlier, basketball is a team sport that requires cooperation to defeat an adversary. It requires good execution skills and the respect of numerous rules. Moreover, this sport generates frequent body contact. Yet, adolescents with CD (a) are sensitive to body contact (which they generally interpret as aggression); (b) are impulsive and regularly seek out body contact; (c) are frequently in conflict with peers and nonpeers; (d) tend to be aggressive; (e) are easily influenced by external events; and (f) tend to find it hard to follow rules. Given this apparent misfit between basketball and adolescents with CD characteristics, it is highly probable that basketball may not have been the best choice of sport for these adolescents. This could have provoked numerous negative interactions between adolescents with CD from the same team, as well as with their adversaries and referees. In consequence, the physical self-concept of adolescents with CD may have been even more affected by the social events held occurring during the competitions (i.e., aggression, conflicts with partner and/or opponent, etc.) than by their own performances.

Third, there is growing evidence (Maïano, Ninot, & Bilard, 2004; Marsh, 1998; Raudsepp, Kais, & Hannus, 2004) that young adolescents typically exhibit a low physical self-concept between 11 to 15 years of age and that their self-perceptions are unstable and vulnerable during this period. Thus, we do not know whether low physical self-concept reflects a developmental process or a treatment effect. Consequently, we suppose that the age category and the experimentation period may have been too short to assess the changes in physical self-concept of adolescents with CD engage in basketball competition.

Fourth, during both sport competition programs, adolescents with CD were exposed to only one basketball competition and three training sessions per month during an 18-month period. It is possible that the frequency of competitions and training sessions were not sufficient to allow an improvement of the low physical self-concept of adolescents with CD.

Fifth, motor development theory (Gallahue & Ozmun, 2006) suggests that the age category (i.e., 11 to 13 years) of adolescents with CD is a socially defining period in which the adolescents begin the specialization phase with regard to sport participation. Because these adolescents with CD had limited experience in

basketball, it does not seem likely that this type of intervention could be effective. By this developmental age, it is not likely that basketball holds meaning or relevance for adolescents who do not currently engage in sport competition. Adolescents with CD involved in this study may have given low importance to being good in basketball and may have felt unconcerned about their progress and accomplishments in the game. Unfortunately, involvement in personally relevant activities may be a prerequisite to an improvement in physical self-concept (Fox, 2000).

Sixth, adolescents with CD may not have relied on personal basketball skills progress when assessing their physical self-concept. Indeed, they could have completed the physical self-concept measures while comparing themselves with other basketball players, with or without CD, with whom they competed and who might have been more skilled to begin with and or more skilled over time. Thus, if they referenced themselves against other athletes, they may not have perceived their progress in basketball skills. If the physical self-concept measures more explicitly relied on the use of personal references, greater changes could have been observed. Moreover, basketball skills constitute only one of the dimensions that the adolescents with CD might have considered when they evaluated various aspects of their physical self-concept.

In conclusion, this exploratory study revealed, in contrast to the literature in special populations (Block et al., 2003; Dykens et al., 1998; Fox, 2000; Porretta & Moore, 1997; Wind et al., 2004), that even though sport competitions programs may encourage significant basketball skills improvement, they may not be an effective medium for developing greater physical self-concept.

Some limitations must be taken into account when interpreting the present findings. Indeed, this study did not assess the perceived sport relevance, did not explicitly ask adolescents with CD to rely on personal references (i.e., progress) when evaluating their physical self-concept, and was based on (a) restricted age category (i.e., 11 to 13 years) and a short follow-up period (i.e., 18 months) within a period of developmental instability, (b) a small sample size, (c) adolescents with CD from only two SEs, (d) only one sport (i.e., basketball), (e) only two types of sport competition programs (i.e., interestablishment, integrated scholastic), and (f) only one game and three training sessions per month.

Future research should address these limitations by assessing (a) this question over a longer time period with a larger sample that comprises a larger age category and a greater number of basketball teams from multiple SEs, (b) the perceived sport relevance for adolescents with CD, (c) the more explicit use of personal references in the evaluation of the physical self-concept of adolescents with CD, (d) the effects of additional sport competition programs (e.g., unified and alternated) and individual and outdoor adventure sports (e.g., climbing, floor gymnastics, mountain biking, track and field events), and (e) the impact of more extended/intensive sport programs.

## References

Achenbach, T.M. (1991). *Child behavior checklist. Manual for the youth self-report form and profile*. Burlington, VT: University of Vermont, Department of Psychiatry.

Al-Talib, N.I., & Griffin, C. (1994). Labelling effect on adolescent's self-concept. *International Journal of Offender Therapy and Comparative Criminology, 38,* 47-57.

American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD) (1984). *AAHPERD skills test manual: Basketball for boys and girls*. Reston, VA: AAHPERD.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Barry, C.T., Frick, P.J., & Killian, A.L. (2003). The relation of narcissism and self-esteem to conduct problems in children: A preliminary investigation. *Journal of Clinical and Child Adolescent Psychology, 32,* 139-152.

Bilard, J. (2001). Problématiques actuelles des activités physiques adaptées. Approche psychologique des processus de réhabilitation par les APA. In A. Varray, J. Bilard, & G. Ninot (Eds.), *Enseigner et animer les* APA (pp. 175-180). Paris, Fr: EPS.

Blinde, E.M., & McClung, L.R. (1997). Enhancing the physical and social self through recreational activity: Accounts of individuals with physical disabilities. *Adapted Physical Activity Quarterly, 14,* 327-334.

Block, M.E., Griebenauw, L-M., & Brodeur, S. (2003). Psychosocial factors and disability: Effects of physical activity and sport. In M.R. Weiss (Ed.), *Developmental sport and exercise psychology* (pp. 425-451). Morgantown, WV: Fitness Information Technology.

Bynum, E., & Weiner, R. (2002). Self-concept and violent delinquency in urban African-American adolescent males. *Psychological Reports, 90,* 477-486.

Castagno, K.S. (2001). Special Olympics unified sports: Changes in male athletes during a basketball season. *Adapted Physical Activity Quarterly, 18,* 193-206.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112,* 155-159.

Dague, P. (1982). Les quotients intellectuels dans l'adaptation française du WISC-R. *Revue de Psychologie Appliquée*, *32*, 185-199.

Donnelan, M.B., Trzesniewski, K.H., Robins, R.W., Moffitt, T.E., & Capi, A. (2005). Low self-esteem is related to aggression, antisocial behavior, and delinquency. *Psychological Science, 16,* 328-335.

Dykens, E., Rosner, B.A., & Butterbaugh, G. (1998). Exercise and sports in children and adolescents with developmental disabilities. *Child Adolescent Psychiatric Clinics of North America, 7,* 751-771.

Evans, R., Levy, L., Sullenberger, T., & Vyas, A. (1991). Self concept and delinquency: The on-going debate. *Journal of Offender Rehabilitation, 16,* 59-74.

Fox, K.R. (1998). Advances in the measurement of the physical self. In J.L. Duda (Ed.), *Advances in sports and exercise psychology measurement* (pp. 295-310). Morgantown, WV: Fitness Information Technology.

Fox, K.R. (2000). The effects of exercise on self-perceptions and self-esteem. In S.J.H. Biddle, K.R. Fox, & S.H. Boutcher (Eds.), *Physical activity and psychological well-being* (pp. 88-117). London, UK: Routledge.

Fox, K.R., & Corbin, C.B. (1989). The physical self-perception profile: Development and preliminary validation. *Journal of Sport and Exercise Psychology, 11*, 408-430.

Frick, P.J. (1998). *Conduct disorders and severe antisocial behavior*. New York: Plenum.

Gallahue, D., & Ozmun, J. (2006). *Understanding motor development: Infants, children, adolescents, adults* (6th ed.). New York: McGraw Hill.

Gibbons, S.L., & Bushakra, F. (1989). Effects of Special Olympics participation on the perceived competence and social acceptance of mentally retarded children. *Adapted Physical Activity Quarterly, 6,* 40-51.

Grande, C.G. (1988). Delinquency: The learning disabled student's reaction to academic school failure? *Adolescence, 23,* 209-219.

Grosgeorges, B., & Wolff, M. (1998). *Détection et sélection en Sport Collectif*. Paris, Fr: Institut National des Sports et de l'Éducation Physique.

Harrison, E.R. (1969). *A test to measure basketball ability for boys*. Unpublished master's thesis, University of Florida, Gainesville.

Harter, S., Whitesell, N.R., & Junkin, L.J. (1998). Similarities and differences in domain-specific and global self-evaluations of learning-disabled, behaviorally disordered, and normally achieving adolescents. *American Educational Research Journal, 35,* 653-680.

Hattie, J. (1992). *Self-concept*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Hay, I. (2000). Gender self-concept profiles of adolescents suspended from high school. *Journal of Child Psychology and Psychiatry, 41,* 345-352.

Hill, J. (2002). Biological, psychological and social processes in the conduct disorders. *Journal of Child Psychology and Psychiatry, 43,* 133-164.

Hutzler, Y., & Bar-Eli, M. (1993). Psychological benefits of sports for disabled people: A review. *Scandinavian Journal of Medical Science and Sports, 3*, 217-228.

Huynh, H., & Feldt, L. S. (1970). Conditions under which mean square ratios in repeated measures designs have exact *F*-distributions. *Journal of the American Statistical Association*, *65*, 1582-1589.

Levy, K.S.C. (1997). The contribution of self-concept in the etiology of adolescent delinquency. *Adolescence, 32,* 671-686.

Levy, K.S.C. (2001). The Relationship between adolescent attitudes towards authority, self-concept, and delinquency. *Adolescence, 36,* 333-346.

Maïano, C., Ninot, G., Giry, B., & Bonino, J. (2000). Le projet des activités physiques adaptées en institut de rééducation psychothérapeutique. *Bulletin de l'Association des Professionnels des Activités Physiques et Sportives du Secteur Spécialisé, 18,* 17-25.

Maïano, C., Ninot, G., & Erraïs, B. (2001). Effect of alternated sport competition in perceived competence for adolescent males with mild to moderate mental retardation. *International Journal of Rehabilitation Research, 24,* 51-58.

Maïano, C., Ninot, G., Bilard, J., & Albernhe, T. (2002). Outcome of specialized schooling on self-esteem in adolescents with severe learning disabilities and behavior disorders. *European Review of Applied Psychology, 52,* 103-118.

Maïano, C., Ninot, G., & Bilard, J. (2004). Age and gender effects on global self-esteem and physical self-perception in adolescents. *European Physical Education Review, 10,* 53-69.

Marsh, H.W. (1998). Age and gender effects in physical self-concepts for adolescent elite athletes and nonathletes: A multicohort-multioccasion design. *Journal of Sport and Exercise Psychology, 20,* 237-259.

Marsh, H.W., Richards, G.E., Johnson, S., Roche, L., & Tremayne, P. (1994). Physical self-description questionnaire: Psychometric properties and a multitrait-multimethod analysis of relations to existing instruments. *Journal of Sport and Exercise Psychology*, *16*, 270-305.

Ninot, G., Bilard, J., Delignières, D., & Sokolowski, M. (2000). Effects of integrated sport participation on perceived competence for adolescents with mental retardation. *Adapted Physical Activity Quarterly, 17,* 208–221.

Ninot, G., Delignières, D., & Fortes, M. (2000). L'évaluation de l'estime de soi dans le domaine corporel. *STAPS*, *53*, 35-48.

Porretta, D.L., & Moore, W. (1997). A review of sport psychology research in individuals with disabilities: Implications for future inquiry. *Clinical Kinesiology, 50,* 83-93.

Raudsepp, L., Kais, K., & Hannus, A. (2004). Stability of physical self-perceptions during early adolescence. *Pediatric Exercise Science, 16,* 138-146.

Riggen, K., & Ulrich, D. (1993). The effects of sport participation on individuals with mental retardation. *Adapted Physical Activity Quarterly, 10,* 42-51.

Rock, E.E., Fessler, M.A., & Church, R.P. (1997). The concomitance of learning disabilities and emotional/behavioral disorders: A conceptual model. *Journal of Learning Disabilities, 30,* 245-263.

Shavelson, R.J., Hubner, J.J., & Stanton, G.C. (1976). Self-concept: Validation of construct interpretations. *Review of Educational Research*, *46*, 407-411.
Sprott, J.B., & Doob, A.N. (2000). Bad, sad, and rejected: The lives of aggressive children. *Canadian Journal of Criminology, 42,* 123-133.
Sweitzer, E. (2005). The relationship between social interest and self-concept in conduct disordered adolescents. *Journal of Individual Psychology, 61,* 55-79.
Teichner, G., & Golden, C.J. (2000). The relationship of neuropsychological impairment to conduct disorder in adolescence: A conceptual review. *Aggression and Violent Behavior*, *5,* 509-528.
Vermeersh, S., & Fombonne, E. (1997). Le Child behavior checklist: Résultats préliminaires de la standardisation française. *Neuropsychiatrie de l'Enfance et de l'Adolescence, 45,* 615-620.
Weschler, D. (1974). *Manual for the Weschler intelligence scale for children - revised*. New York: The Psychological Corporation.
Wind, W.M., Schwend, R.M., & Larson, J. (2004). Sports for the physically challenged child. *Journal of the American Academy of Orthopaedic Surgeons, 12,* 126-137.
Wright, J., & Cowden, J. (1986). Changes in self-concept and cardiovascular endurance of mentally retarded youths in a Special Olympics swim training program. *Adapted Physical Activity Quarterly, 3,* 177-183.

## Acknowledgment

We would like to thank the Specialized Union Center for Management of State Health Insurance Establishments (South-West Region) and the Collective Authority for Action-Research on Rehabilitation and Integration through Sport, both of which supported this study, and Jacques Bonino for his invaluable assistance in data collection.