

Supplemental materials

Materials A: Search strategies

Materials B: Hand-searched journals

Materials C: List of articles excluded during full-text review

Materials D: Table describing articles uncovered during the review

Supplemental material A: Search Strategies

1. Search strategy for databases hosted on EBSCOhost and ScienceDirect

The following terms were entered into the search:

(sport)

AND

(youth OR child OR children OR adolescent OR adolescents OR teen OR boy OR girl)

AND

(‘Social development’ OR Wellbeing OR Well-being OR Psychosocial OR Psychol*
OR Connectedness OR Belongingness OR Anxiety OR ‘Youth development’ OR
Cooperation OR ‘Social skills’ OR Sportsmanship OR Sportspersonship OR
Teamwork OR Motivation OR Confidence OR Friends OR Friendship OR Happiness
OR Quality of life OR Satisfaction OR Adherence OR Burnout OR Dropout OR Drop-
out OR ‘Perceived competence’ OR Self-perception OR Self-worth OR Self-esteem
OR Self-concept OR Life skills OR Moral OR Morality OR Morals OR Assertive OR
Assertiveness OR Character OR Competence OR Confidence OR Caring OR Self-
efficacy OR ‘Positive affect’ OR Resilience)

AND

(Practice OR Play OR Competitive OR Recreational OR Structured OR unstructured
OR adult-led OR child-led OR team sport OR individual sport OR formal OR informal
OR elite OR competition OR games)

**Additional delimiters on EBSCOhost databases
(search conducted across all three databases simultaneously)**

**Additional
delimiters on
ScienceDirect
database**

SPORTDiscus

- Date: After 1980
- Language: English

ERIC

- Date: After 1980
- Language: English

CINAHL

- Date: After 1980
- Language: English
- Age groups:
Childhood and
adolescent groups

PsychINFO

- Date: After 1980
 - Language: English
 - Age groups:
Adolescence (13-17
Yrs), Childhood
(birth-12 Yrs)
-

2. Search strategy for PubMed, hosted by MEDLINE

((("sports"[All Fields]
AND
(("child"[MeSH Terms] OR "child"[All Fields]) OR ("adolescent"[MeSH Terms] OR
"adolescent"[All Fields]) OR ("adolescent"[MeSH Terms] OR "adolescent"[All Fields]
OR "youth"[All Fields]) OR boy[All Fields] OR girl[All Fields]))
AND
(("social change"[MeSH Terms] OR ("social"[All Fields] AND "change"[All Fields])
OR "social change"[All Fields] OR ("social"[All Fields] AND "development"[All
Fields]) OR "social development"[All Fields]) OR ("health"[MeSH Terms] OR
"health"[All Fields] OR "well"[All Fields] OR "well being"[All Fields]) OR
"Psychosocial"[All Fields] OR Connectedness[All Fields] OR Belongingness[All
Fields] OR ("anxiety"[MeSH Terms] OR "anxiety"[All Fields]) OR ("growth and
development"[Subheading] OR ("growth"[All Fields] AND "development"[All
Fields]) OR "growth and development"[All Fields] OR "growth and
development"[MeSH Terms] OR ("growth"[All Fields] AND "development"[All
Fields])) OR (Moral[All Fields] OR Morals[All Fields] OR Morality[All Fields]) OR
Cooperation[All Fields] OR ("social skills"[MeSH Terms] OR ("social"[All Fields]
AND "skills"[All Fields]) OR "social skills"[All Fields]) OR Sportsmanship[All
Fields] OR Sportpersonship[All Fields] OR Teamwork[All Fields] OR
"motivation/psychology"[Mesh Terms] OR Confidence[All Fields] OR
("friends"[MeSH Terms] OR "friends"[All Fields]) OR ("happiness"[MeSH Terms]
OR "happiness"[All Fields]) OR "Quality of Life/psychology"[All Fields] OR
"personal satisfaction"[All Fields] OR Adherence[All Fields] OR Burnout[All Fields]
OR Dropout[All Fields] OR "self concept"[All Fields] OR Self-worth[All Fields] OR
"life skills"[All Fields] OR "assertive"[All Fields] OR "assertiveness"[All Fields] OR
"character"[All Fields] OR Confidence[All Fields] OR "Positive affect"[All Fields] OR
Resilience[All Fields]))
AND
(("Practice (Birm)"[Journal] OR "practice"[All Fields]) OR ("play and
playthings"[MeSH Terms] OR ("play"[All Fields] AND "playthings"[All Fields]) OR
"play and playthings"[All Fields] OR "play"[All Fields]) OR competitive[All Fields]
OR recreational[All Fields] OR structured[All Fields] OR unstructured[All Fields] OR
adult-led[All Fields] OR child-led[All Fields] OR "team sport"[All Fields] OR
"individual sport"[All Fields] OR formal[All Fields] OR informal[All Fields] OR
elite[All Fields] OR games[All Fields])
AND
(("1980/01/01"[PDAT] : "3000/12/31"[PDAT]) AND "humans"[MeSH Terms] AND
English[lang] AND medline[sb] AND ("adolescent"[MeSH Terms] OR "child"[MeSH
Terms:noexp] OR ("infant"[MeSH Terms] OR "child"[MeSH Terms] OR
"adolescent"[MeSH Terms]))))

Note: The final group of search terms represents the delimiters:

Date: After 1980

Language: English

Age groups: Adolescent and child age groups

Supplemental Material B: List of Journals Manually Searched (i.e., 1990 to December 2014)

- 1) *Journal of Applied Sport Psychology*
- 2) *Journal of Sport and Exercise Psychology*
- 3) *Psychology of Sport and Exercise*
- 4) *The Sport Psychologist*
- 5) *Research Quarterly for Exercise and Sport*
- 6) *International Journal of Sport Psychology*
- 7) *International Journal of Sport and Exercise Psychology*

Supplemental materials C: Excluded articles during full-text review

Reason for Exclusion	Example(s)	Citations
Psychosocial constructs and activity types: Article lacked a psychosocial construct that aligned with inclusion criteria definition, or activity types were not compared.	Several articles considered drop-out as a behavioral outcome, but it was unclear how this linked to psychosocial constructs (e.g., 13, 14) or assessed outcomes such as expertise development (e.g., 7) Numerous articles included at the abstract review stage only tested relationships among psychosocial constructs (e.g., 31)	[1-59]
Methodology: Article was not an original source of quantitative research	Several articles were qualitative in nature (e.g., 60)	[60-64]
Age: Range of participants extended too high to be considered within the population of interest	Sample included older athletes (e.g., 65), or even though participation was considered during youth, the central psychosocial outcome was assessed during adulthood (e.g., 66)	[65-69]
Organized sport: Article features forms of sport that did not fit the criteria of organized sport, or compared a single organized sport activity type with other activities	Several articles compared organized sport with physical education, or against other organized youth activities (e.g., 70)	[70-76]
Activity type was considered as the dependent variable	Analyses were designed to predict sport involvement using psychological or psychosocial factors (e.g., 77)	[77, 78]

Note. Two additional articles reviewed at the level of full text are not included in this list, because they fell far outside the objectives of this review

1. Dunton GF, Kawabata K, Intille S, et al. Assessing the social and physical contexts of children's leisure-time physical activity: an ecological momentary assessment study. *American Journal of Health Promotion* 2012;26:135-42

2. Saunders RP, Motl RW, Dowda M, et al. Comparison of social variables for understanding physical activity in adolescent girls. *American Journal of Health Behavior* 2004;28:426-36
3. Motl RW, Dishman RK, Saunders R, et al. Measuring enjoyment of physical activity in adolescent girls. *American Journal of Preventive Medicine* 2016;21:110-17
4. Spink KS, Wilson KS, Ulvick J. Social influence and adolescent health-related physical activity in structured and unstructured settings: role of channel and type. *Annals of Behavioral Medicine*. 2012;44:94-103
5. Steptoe A, Butler N. Sports participation and emotional wellbeing in adolescents. *Lancet* 1996;347:1789-92
6. Huijgen BCH, Leemhuis S, Kok NM, et al. Cognitive functions in elite and sub-elite youth soccer players aged 13 to 17 years. *PLoS ONE* 2016;10(12).=
7. Coutinho P, Mesquita I, Davids K, et al. How structured and unstructured sport activities aid the development of expertise in volleyball players. *Psychology of Sport and Exercise* 2016;25:51-59
8. Arias-Estero JL, Cánovas M. Effect of training with a ball of smaller mass on psychological variables in child basketball. *Science & Sports*. 2014;29:S29-S29
9. Denham BE. Youth Sports Participation and Attitudes toward Societal Competition, Concern for Material Items, and the Consequences of Manipulative Advertising. *Youth & Society* 2009;41:124-47
10. Burton D, O'Connell K, Gillham A, et al. More cheers and fewer tears: examining the impact of competitive engineering on scoring and attrition in youth flag football. *International Journal Of Sports Science and Coaching*. 2011;6:219-28
11. Ferron C, Narring F, Cauderay M, Michaud PA. Sport activity in adolescence: associations with health perceptions and experimental behaviours. *Health Education Research*. 1999;14:225-33.
12. Soares J, Van Den Tillaar R. Relationship between involvement in school sport practice and the perception of the quality of school sport. *Journal of Physical Education & Sport* 2012;12:458-65
13. Wall M, Côte, J. Developmental activities that lead to dropout and investment in sport. *Physical Education & Sport Pedagogy*. 2007;12:77-87
14. Fraser-Thomas J, Côte J, Deakin J. Examining adolescent sport dropout and prolonged engagement from a developmental perspective. *Journal of Applied Sport Psychology*. 2008. 18;20:318-33.
15. Cetinkalp ZK. Achievement goals and physical self-perceptions of adolescent athletes. *Social Behavior and Personality*. 2015;40:473-780
16. Curran T, Hill AP, Hall HK, et al. Perceived coach behaviors and athletes' engagement and disaffection in youth sport: The mediating role of the psychological needs. *International Journal of Sport Psychology* 2014;45:559-80
17. Eys M, Loughhead T, Bray SR, et al. Development of a cohesion questionnaire for youth: The Youth Sport Environment Questionnaire. *Journal of Sport & Exercise Psychology* 2015;31:390-408
18. Kremer-Sadlik T, Kim JL. Lessons from sports: Children's socialization to values through family interaction during sports activities. *Discourse & Society* 2015;18:35-52
19. Mallinson SH, Hill AP, Hall HK, et al. The 2 × 2 model of perfectionism and school- and community-based sport participation. *Psychology in the Schools* 2015;51:972-85

20. Soberlak P, Côté, J. The developmental activities of elite ice hockey players. *Journal of Applied Sport Psychology*. 2003;15:41-9.
21. Ommundsen Y, Pedersen BH. The role of achievement goal orientations and perceived ability upon somatic and cognitive indices of sport competition trait anxiety. A study of young athletes. *Scandinavian Journal of Medicine and Science in Sports*. 1999;9:333-43
22. Saotome H, Harada K, Nakamura Y. The relationship between change in perceived motivational climate and change in goal orientations among Japanese ice hockey players. *International Journal of Sports Science & Coaching*. 2016;7(1):81-88
23. Snyder EE, Spreitzer E. Social psychological concomitants of adolescents' role identities as scholars and athletes: A longitudinal analysis. *Youth & Society*. 2015;23:507-22
24. Vallerand RJ, Brière NM, Blanchard C, et al. Development and validation of the Multidimensional Sportspersonship Orientations Scale. *Journal of Sport & Exercise Psychology* 2015;19:197-206
25. Weiss MR, Smith AL. Quality of youth sport friendships: Measurement development and validation. *Journal of Sport & Exercise Psychology*. 2015;21:145-66
26. Cumming SP, Smoll FL, Smith RE, et al. Is Winning Everything? The Relative Contributions of Motivational Climate and Won-Lost Percentage in Youth Sports. *Journal of Applied Sport Psychology*. 2007;19:322-36
27. Salguero A, Gonzalez-Boto R, Tuero C, et al. Relationship between perceived physical ability and sport participation motives in young competitive swimmers. *Journal of Sports Medicine & Physical Fitness*. 2004;44:294-99
28. Weiss MR, Smith AL. Friendship Quality in Youth Sport: Relationship to Age, Gender, and Motivational Variables. *Journal of Sport & Exercise Psychology*. 2002;24:420-37
29. Vella SA, Cliff DP, Okely AD. Socio-ecological predictors of participation and dropout in organised sports during childhood. *International Journal of Behavioral Nutrition and Physical Activity*. 2015;11
30. Seabra AF, Mendonça DM, Thomis MA, et al. Associations between sport participation, demographic and socio-cultural factors in Portuguese children and adolescents. *European Journal of Public Health*. 2015;18:25-30
31. Paradis KF, Loughead TM. Examining the mediating role of cohesion between athlete leadership and athlete satisfaction in youth sport. *International Journal of Sport Psychology*. 2012;43:117-36
32. Weinberg R, Tenenbaum G, McKenzie A, et al. Motivation for youth participation in sport and physical activity: Relationships to culture, self-reported activity levels, and gender. *International Journal of Sport Psychology*. 2015;31:321-46
33. Davies MJ, Stellino MB, Nichols BA, et al. Other-initiated motivational climate and youth hockey players' good and poor sport behaviors. *Journal of Applied Sport Psychology*. 2016;28:78-96
34. Rodriguez D, Wigfield A, Eccles J. Changing competence perceptions, changing values: Implications for youth sport. *Journal of Applied Sport Psychology*. 2015;15:67-81
35. Saville PD, Bray SR. Athletes' perceptions of coaching behavior, relation-inferred self-efficacy (RISE), and self-efficacy in youth sport. *Journal of Applied Sport Psychology*. 2016;28:1-13
36. Smith RE, Cumming SP, Smoll FL. Development and Validation of the Motivational Climate Scale for Youth Sports. *Journal of Applied Sport Psychology*. 2008;20:116-36

37. Curran T, Hill AP, Ntoumanis N, et al. A Three-Wave Longitudinal Test of Self-Determination Theory's Mediation Model of Engagement and Disaffection in Youth Sport. *Journal of Sport & Exercise Psychology* 2016;38:15-29
38. Jeffery-Tosoni SM, Eys MA, Schinke RJ, et al. Youth Sport Status and Perceptions of Satisfaction and Cohesion. *Journal of Sport Behavior*. 2011;34:150-59
39. Rottensteiner C, Tolvanen A, Laakso L, et al. Youth Athletes' Motivation, Perceived Competence, and Persistence in Organized Team Sports. *Journal of Sport Behavior*. 2015;38:432-49
40. Sage LD, Kavussanu M. Goal orientations, motivational climate, and prosocial and antisocial behaviour in youth football: exploring their temporal stability and reciprocal relationships. *Journal of Sports Sciences*. 2008;26:717-32
41. Reinboth M, Duda JL, Ntoumanis N. Dimensions of coaching behavior, need satisfaction, and the psychological and physical welfare of young athletes. *Motivation and Emotion*. 2016;28:297-313
42. Smith RE, Smoll FL, Cumming SP. Motivational climate and changes in young athletes' achievement goal orientations. *Motivation and Emotion*. 2016;33:173-83
43. Proios M, Doganis G, Athanailidis I. Moral development and form of participation, type of sport, and sport experience. *Perceptual & Motor Skills*. 2004;99:633-42
44. Saar M, Jurimae T. Sports participation outside school in total physical activity of children. *Perceptual & Motor Skills*. 2007;105:559-62
45. Galán I, Boix R, Medrano MJ, et al. Individual factors and school-based policies related to adherence to physical activity recommendations in Spanish adolescents. *Prevention Science*. 2016;15:588-99
46. Cumming SP, Smith RE, Smoll FL, et al. Development and validation of the Achievement Goal Scale for Youth Sports. *Psychology of Sport & Exercise*. 2008;9:686-703
47. Graham TR, Kowalski KC, Crocker PRE. The contributions of goal characteristics and causal attributions to emotional experience in youth sport participants. *Psychology of Sport & Exercise*. 2002;3:273-91
48. Gaudreau P, Blondin JP. Differential Associations of Dispositional Optimism and Pessimism With Coping, Goal Attainment, and Emotional Adjustment During Sport Competition. *International Journal of Stress Management*. 2004;11(3):245-58.
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50. Appleton PR, Ntoumanis N, Quested E, et al. Initial validation of the coach-created Empowering and Disempowering Motivational Climate Questionnaire. *Psychology of Sport and Exercise*. 2016;22:53-65
51. Jowett GE, Hill AP, Hall HK, et al. Perfectionism, burnout and engagement in youth sport: The mediating role of basic psychological needs. *Psychology of Sport and Exercise*. 2016;24:18-26
52. Noordstar JJ, van der Net J, Jak S, et al. Global self-esteem, perceived athletic competence, and physical activity in children: A longitudinal cohort study. *Psychology of Sport and Exercise*. 2016;22:83-90
53. Ullrich-French S, Smith AL. Social and motivational predictors of continued youth sport participation. *Psychology of Sport and Exercise*. 2015;10:87-95

54. Xiang P, Lee A. Achievement goals, perceived motivational climate, and students' self-reported mastery behaviors. *Research Quarterly for Exercise and Sport*. 2002;73:58-65
55. Sukys S, Lisinskiene A, Tilindiene I. Adolescents' participation in sport activities and attachment to parents and peers. *Social Behavior and Personality* 2016;43:1507-18
56. Jonker L, Elferink-Gemser MT, Visscher C. The Role of Self-Regulatory Skills in Sport and Academic Performances of Elite Youth Athletes. *Talent Development & Excellence*. 2011;3:263-75
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58. Boone EM, Leadbeater BJ. Game on: Diminishing risks for depressive symptoms in early adolescence through positive involvement in team sports. *Journal of Research on Adolescence*. 2006;16:79-90.
59. Matheson H, Mathes S. Influence of performance setting, experience and difficulty of routine on precompetition anxiety and self-confidence of high school female gymnasts. *Perceptual and Motor Skills*. 1991;72:1099-105
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61. Burton D, Gillham A, Hammermeister J. Competitive engineering: Structural climate modifications to enhance youth athletes' competitive experience. *International Journal of Sports Science and Coaching*. 2011;6:201-18
62. MacDonald K. Competitive and recreational youth sport structures and gender: A study of goal orientation, intrinsic motivation and self-efficacy. National Library of Canada; 2002.
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64. Bowers MT, Green BC. Reconstructing the community-based youth sport experience: How children derive meaning from unstructured and organized settings. *Journal of Sport Management*. 2013;27:422-38.
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67. Russell W, Symonds M. A retrospective examination of youth athletes' sport motivation and motivational climate across specialization status. *Athletic Insight* 2015;7:33
68. White SA, Duda JL. The relationship of gender, level of sport involvement, and participation motivation to task and ego orientation. *International Journal of Sport Psychology* 1995;25: 4-18.
69. Crissey SR, Honea JC. The relationship between athletic participation and perceptions of body size and weight control in adolescent girls: The role of sport type. *Sociology of Sport Journal*. 2006;23:248-56.

70. Busseri MA, Rose-Krasnor L, Willoughby T, et al. A longitudinal examination of breadth and intensity of youth activity involvement and successful development. *Developmental Psychology*. 2006;42:1313-19
71. Maletse L. Perceived competence and physical activity involvement among youths: an examination of Harter's competence motivation theory in Botswana. *South African Journal for Research in Sport, Physical Education & Recreation*. 2004;26:91-103
72. Groff DG, Kleiber DA. Exploring the identity formation of youth involved in an adapted sports program. *Therapeutic Recreation Journal*. 2001;35:318-32
73. Kunstler R, Thompson A, Croke E. Inclusive recreation for transition-age youth: promoting self-sufficiency, community inclusion, and experiential learning. *Therapeutic Recreation Journal*. 2013;47:122-36
74. Bota E. Contribution of the game in the development of motor skills during the physical education class. *Timisoara Physical Education & Rehabilitation Journal*. 2013;6:59-63.
75. Kirshnit CE, Ham M, Richards MH. The sporting life: Athletic activities during early adolescence. *Journal of Youth and Adolescence*. 1989;18:601-15.
76. Chalip L, Csikszentmihalyi M, Kleiber D, Larson R. Variations of experience in formal and informal sport. *Research Quarterly for Exercise and Sport*. 1984;55:109-16
77. Anderson CB, Mâsse LC, Zhang H, et al. Contribution of athletic identity to child and adolescent physical activity. *American Journal of Preventive Medicine*. 2016;37:220-26
78. Whitehead J. Multiple achievement orientations and participation in youth sport: A cultural and developmental perspective. *International Journal of Sport Psychology*. 2015;26:431-52

Supplemental materials D. Table describing all included studies.

First author [citation]	Country	Sample with age, gender, sports	Study design and main analysis [risk of bias]	Activity operationalization	Guiding theories or frameworks	Psychosocial construct(s) & tool(s)	Core Findings
Adachi [49]	CAN	$n = 1492$ $M_{age} = 13.8y$ Numerous sports	Longitudinal (4yrs), school- based data collection Path analyses [11]	Amount of organized sport involvement using 5-point rating scale: (1 = never, to 5 = everyday)	Positive youth development through breadth and intensity of activities (Fredricks & Eccles, 2005)	Self-esteem (Rosenberg, 1965); Item created to assess sport enjoyment	Frequency of involvement did not predict higher self- esteem, after controlling for previous self-esteem. Self-esteem predicted higher frequency of involvement over time)
Agans [27]	U.S.	$n = 710$ 68.7% female, $M_{age} = 15.8y$ (.98) Numerous sports	Longitudinal (3yrs), school- based data collection ANOVA [11]	Individual vs team: Participants into four groups of involvement, based on the specific sports they identified involvement in, including: Individual sport, team sport, team+individual sport, or no participation.	Relational developmental systems theoretical framework (Lerner, 2006)	Positive youth development (Benson, Leffert, Scales, & Blyth, 1998); Depression scale (Radloff, 1977)	No significant differences in outcomes derived from activity types for either gender Among females, there were differences when comparing both sport types to no participation (e.g., Compared to the no participation group, the team+individual group had higher Contribution and PYD in numerous grades)
Bruner [28]	CAN	$n = 212$ 100% male $M_{age} = 15.27y$ (1.04) Basketball and cross country running	Cross-sectional, sport-based data collection ANOVA [11]	Individual vs. team: Participants recruited from a team sport (basketball) and an individual sport (cross country running)	Positive youth development (Larson, 2000)	Developmental experiences (Hanson & Larson, 2005); Social and task interdependence subscales developed for study	Basketball players reported higher perceptions of task interdependence but not outcome interdependence Basketball players reported higher levels of teamwork and social skills than middle- distance runners, along with more adult networks and social capital, and increased negative experiences

Calmeiro [29]	POR	$n = 238$ 63.4% female $M_{age} = 16.93y$ (1.34) Numerous sports	Cross-sectional, school-based data collection ANOVA (study goal was to develop psychosocial measure) [8]	Individual vs team: 77 athletes who participated in the study were classified as individual or team	Moral reasoning and achievement goal theory (e.g., Boardley & Kavussanu, 2010)	Moral reasoning (Calmeiro, Stoll, & Davis, 2015)	Team sport athletes scored significantly lower in moral reasoning than individual sport athletes and non-athletes
De Meester [43]	BELG	$n = 1049$ 46.4% female $M_{age} = 11.02y$ (.02) Numerous sports	Cross-sectional, school-based data collection Regression [9]	Student participation in extracurricular school-based sports and/or organized sport outside of school: Investigators grouped youth within four types, with combinations of whether or not youth were involved in either sport setting.	Self-determination theory (Deci & Ryan, 1985)	Behavioral regulation in physical education (Aelterman Vansteenkiste, Van Keer, Van den Berghe, De Meyer, & Haerens, 2012)	Autonomous motivation was highest among participants of community sport, regardless of participation in school sport Moderated by gender (e.g., for females, involvement in both settings increased autonomous motivation) No differences in controlled motivation or amotivation
Dimech [42]	SUI	$n = 145$ 51.0% female $M_{age} = 7.66y$ (.55) Numerous sports	Longitudinal (2yrs), school-based data collection RM ANOVA [10]	Individual vs. team: Classified youth as involved in team sport, individual sport, or no sport Amount of weekly hours involved in sport: Three groups (<1 hour; 1-2 hours; > 2 hours), reported by parents	Salutogenesis model (Antonovsky, 1997) and social learning theory (Bandura, 1977)	Social Phobia and Anxiety (Beidel, Turner, & Morris (1995); Parent assessment of youth social anxiety Symptoms (Weinbrenner, 2005)	Team sport participants had lower scores of self-report social anxiety, which also decreased to a greater extent over time No differences on parent-reported symptoms Weekly involvement was not linked to either dependent variable
** reported by parents							

Donkers [30]	CAN	<i>n</i> = 142 62% female <i>M</i> _{age} = 14.44y (1.63) Numerous individual sports	Longitudinal (2 time points, over one month period), sport-based data collection Regression (Moderation model) [11]	Requirements for task and outcome interdependence: Athlete-reported task interdependence (e.g., relays: interact with teammates during performance) and outcome interdependence (e.g., collective team goals) (Used as moderator)	Social interdependence theory (Johnson & Johnson, 2005)	Enjoyment of sport (Scanlan, Carpenter, Lobel, & Simons, 1993); Items assessing intentions to return	Perceptions of collectiveness more strongly predicted enjoyment and intentions to return to individual sport among athletes who were required to work directly with their teammates (i.e., moderation effect) Outcome interdependence did not act as a moderator.
Forsman [50]	FIN	<i>n</i> = 441 100% male <i>M</i> _{age} = 15.32y (.27) Soccer, ice hockey, basketball	Retrospective, Sport-based data collection. ANOVA [8]	Accumulated amount of practice (activities with adult to develop skills) throughout sport involvement: Athletes reported sport specific play and practice, and were grouped into Low Practice (0–3.75 h/week), Medium Practice (3.75–5.5 h/week) and High Practice groups (5.5–24.5 h/week)	Deliberate Practice (Ericsson, 1993) and Developmental model of sport participation (Côté, Baker, & Abernethy, 2007)	Psychological skills (Cabriel, & Perkins, 1987)	Athletes who practiced more reported stronger sport specific motivation, confidence, concentration, and mental preparation
Gore [51]	US	<i>n</i> = 1,036 57.7% female <i>M</i> _{age} = 15.48y (.97) Numerous sports	Longitudinal (2yrs), School-based data collection Regression [9]	Amount of organized sport involvement using 5-point rating scale: 1 (no time at all) to 5 (lots of time). <i>**termed 'team sport involvement' but unclear how this term was defined</i>	–	Depression (Roberts, Andrews, Lewinsohn, & Hops, 1990)	Weak correlations between sports involvement and each risk and protective factor for each gender Small but significant effect of team sport involvement on depression was no longer significant when the control variables (e.g., parental and peer support) were included

Gucciardi [52]	AUS	$n = 187$ 100% male $M_{age} = 16.15y$ (1.46) Cricket	Cross-sectional, sport-based data collection Path analysis [9]	Athletes' self-reported amount of weekly hours: Self-reported weekly involvement in cricket Sport involvement over several years: Number of years within cricket	–	Cricket Mental Toughness Inventory (Gucciardi & Gordon, 2009)	Athletes who had spent more years playing cricket reported a lower desire to achieve. Athletes with higher hours of weekly training reported higher global mental toughness, and higher ratings of desire to achieve and attention control
Hendry [53]	U.K.	$n = 144$ 100% male 11-16 years (no overall mean age available) Soccer	Retrospective, sport-based data collection ANOVA [9]	Accumulated amount of practice (activities with adult to develop skill) and sport play (unorganized, self-led) throughout sport involvement: Athletes provided with definitions of each type, and reported the number of hours each activity	Developmental model of sport participation (Côté, Baker, & Abernethy, 2007)	Behavioral regulation in sport	Correlations were generally low and non-significant Small, yet significant positive relationship between accumulated hours in practice and integrated regulation
Imtiaz [44]	CAN	$n = 27$ 100% male $M_{age} = 10.11y$ (.32) Soccer	Observational, sport-based data collection Paired t-tests [7]	Adult-structured sport practices compared to those where young participants design practice: Researchers attended sport practices with two unique structures: (a) Adult-led (i.e., athletes directed through drills and scrimmage by adult) and (b) Peer-led (i.e., participants led activities, with limited adult involvement)	Positive youth development (Larson, 2000)	Perceived enjoyment, effort, and concentration; Observed prosocial and antisocial behavior; Observed communication, engagement and disengagement <i>All tools developed for this study</i>	Greater effort and concentration in parent-led condition Participants displayed more prosocial behaviors and fewer antisocial behaviors in the peer led condition No difference in reported enjoyment or other outcomes

Karr [31]	U.S.	<i>n</i> = 627 100% female <i>M</i> _{age} = 15.85y (1.15)	Cross-sectional, School-based data collection Path Analyses [11]	Female athlete involvement in sports that require both leanness and aesthetic judgements (i.e., Gymnastics), only leanness (i.e., Cross country running), and neither (i.e., Softball)	Objectification theory (Fredrickson & Roberts, 1997)	Body Dissatisfaction (Garner, 2004); Athletic self-efficacy (Chen, Gully, & Eden, 2001)	No sport-based differences on body dissatisfaction Softball athletes' self-efficacy was higher in comparison to gymnastics and cross country
Koh [32]	SGP	<i>n</i> = 101 39.6% female <i>M</i> _{age} = 16.7y (.84)	Cross-sectional, sport-based data collection MANOVA [9]	Individual vs. team: Classified youth as involved in team sport (<i>n</i> = 76), or individual sport (<i>n</i> = 25)	Achievement goal theory (Nicholls, 1985)	Achievement goal orientation (Wang, Biddle, & Elliot, 2007)	Individual sport athletes had higher mastery approach and mastery avoidance motivation, along with lower performance avoidance motivation
Lee [33]	U.K.	<i>n</i> = 1391 52.3% female <i>M</i> _{age} = 13.35y (1.51)	Cross-sectional, sport-based data collection Independent samples t-tests (study goal was to develop psychosocial measure) [8]	Individual vs. team: Compared athletes recruited from team or individual sport Comparing athletes from interscholastic or local clubs compared to regional or national level competition	Moral development (Shields & Bredemeier, 1995)	Sport values (Lee, Whitehead, & Balchin, 2000)	No differences in values between team and individual sports Overall importance placed on sporting values increases from school/club level competition to those at the district level, and those at the regional level (or higher)
Lee [34]	U.K.	<i>n</i> = 1126, 49.7% female <i>M</i> _{age} = 13.48y (1.18) Numerous sports	Cross-sectional, school-based data collection, Regression (study goal was to develop psychosocial measure) [10]	Individual vs. team: Compared athletes recruited from team or individual sport Comparing athletes from interscholastic or local clubs compared to regional or national level competition	Moral development (Shields & Bredemeier, 1995)	Moral decision-making in youth sport (Lee, Whitehead, & Ntoumanis, 2007)	Team sport competitors scored higher on acceptance of cheating and acceptance of gamesmanship, but not on keeping winning in proportion Higher level competitors had higher scores in acceptance of gamesmanship, but not in acceptance of cheating or in keeping winning in proportion

Malete [45]	BOTS-WANA	<i>n</i> = 716 52.1% female <i>M</i> _{age} = 16.0y (1.10) Numerous sports	Cross-sectional, school-based data collection. MANOVA [9]	Comparing athletes in competitive settings with recreational sport: Competitive sport was defined as sport involvement at least 4 days a week and most weekends	Achievement goal theory (Nicholls, 1985)	Task and ego orientations in sport (Duda & Nicholls, 1992); Items developed to assess perceived sport ability and sport enjoyment	Although effect sizes were small, there were significant differences: Recreational athletes reported lower ego motivational orientation, increased task orientation, and lower perceptions of ability
Martin [35]	CAN	<i>n</i> = 290 54.8% female <i>M</i> _{age} = 10.73y (1.13) Numerous sports	Cross-sectional, school-based data collection Discriminant function analysis (study goal was to develop psychosocial measure) [9]	Individual vs. team: Compared athletes recruited from team or individual sport	–	Group cohesion (Martin, Carron, Eys, & Loughhead, 2013)	Cohesion did not successfully discriminate between sport type
Merglen [55]	SUI	<i>n</i> = 1245 49.6% female Age range from 16 to 20 years of age Numerous sports	Cross-sectional, community-based data collection Logistic regression [9]	Athletes' and students' self-reported amount of weekly hours involved in sport: Weekly sport practice was categorized into four groups, ranging from low (0–3.5 h), average (3.6–10.5 h), high (10.6–17.5 h) and very high (>17.5 h)	–	Well-being measured (WHO-5 well-being index)	Using the average involvement group as the reference category, very high and low groups showed a higher risk of poor well-being Those in the high group had a lower risk of reporting poor well-being than the normal group

McFadden [54]	CAN	<i>n</i> = 61 100% male <i>M</i> _{age} = 14.90y (1.41) Ice Hockey	Retrospective, Sport-based data collection ANCOVA [11]	Comparing athletes from differing specialization pathways: Parents described athletes' sport histories, which were used to place athletes into distinct sport pathways (i.e., Recreational; Late specialization; Early specialization)	Developmental model of sport participation (Côté, Baker, & Abernethy, 2007)	Mental health (Keyes, 2006); Depression (Faulstich, 1986); Psychological Needs Satisfaction (Sheldon & Gunz, 2009)	Needs dissatisfaction was highest among early specializers, compared to both late specializers and recreational players No differences across groups for psychological need satisfaction, mental health, or mental illness
Newcombe [36]	AUS	<i>n</i> = 312 41.1% female <i>M</i> _{age} = 16.98 (1.02) Numerous sports	Cross-sectional, sport-based data collection ANOVA [8]	Individual vs. team: Compared athletes recruited from team or individual sport Athletes participating in contact and non-contact team sport: Authors defined comparison as 'direct' and 'parallel' competition	–	State/trait anxiety; (Spielberger, 1971); Mood States (McNair, Lorr, & Droppleman, 1971)	No differences when comparing individual and team participants No differences when comparing contact and non-contact participants
Nixdorf [37]	GER	<i>n</i> = 199 (gender unclear) <i>M</i> _{age} = 14.96y (1.56) Most athletes (n = 113) from soccer	Cross-sectional, sport-based data collection Path analysis [7]	Individual vs. team: Compared athletes recruited from team (i.e., soccer, ice hockey) or individual sport (i.e., mountain biking, badminton, gymnastics, swimming, ice running)	–	Depression (Radloff, 1977)	Higher depressive symptoms and negative attributions after failure in individual sport Failure attributions mediated the relationship to depressive symptoms Cohesion did not differ between sport type, and perfectionism was higher in team sport

Perron [38]	CAN	<i>n</i> = 1250 52.6% female ≈7y at beginning of study	Longitudinal (3yrs), school-based data collection Regression (Mediation model) [11]	Amount of team/individual sport involvement: Mothers reported child involvement in individual (e.g., swimming) or team (e.g., soccer, baseball) sport, as well as frequency using a Likert scale (1 = almost never, to 7 = almost every day)	–	Teacher-reported depressive symptoms and externalizing problems at 7, 8, and 10 years (items developed for this study)	Youth involved in team sport had lower externalizing behaviors and depressive symptoms Individual sport involvement did not predict externalizing or depressive symptoms
Rasclé [46]	FRA	<i>n</i> = 240 100% male <i>M</i> _{age} = 12.84y (1.25) Cross country running, basketball, and other sports	Cross-sectional, sport-based data collection [8]	Comparing athletes from interscholastic sport with league competition: League sport was defined as voluntary clubs requiring training at least once a week, and that take part in competition	Achievement goal theory	Task and ego goal orientation (Roberts & Balague, 1991)	League participants were higher on ego-goal orientation than interscholastic and physical education participants
Sanders [56]	U.S.	<i>n</i> = 89 58.5% female <i>M</i> _{age} ≈ 17y Numerous sports	Cross-sectional, sport-based data collection MANOVA [8]	Athletes' self-reported their amount of weekly hours involved in sport, and were divided into three groups: Low < 2 hrs/week; Moderate = 3-6 hrs/week; High > 7 hrs/week	N/A	Depression (Radloff, 1977)	Low sports involvement group had higher depression score than the moderate sports involvement group, but not the high group

Seidel [47]	U.S.	<i>n</i> = 232 100% male Age range from 8.75 to 10.25 (no mean) Soccer or baseball	Cross-sectional, sport-based data collection. ANOVA [9]	Comparing athletes in competitive and recreational sport: Contrasted soccer and baseball players from leagues requiring try-outs and travel for competition (competitive) with house-league (recreational)	Harter's (1983) model of development	Self-concept (Harter, 1985)	No differences found between groupings
Shields [39]	U.S.	<i>n</i> = 676 43.6% females <i>M</i> _{age} = 12.1y (1.14)	Cross-sectional, school-based data collection ANOVA [10]	Athletes participating in contact and non-contact team sport: Grouped participants according to their most recent sport experience as participants of contact (hockey or football) or non-contact (e.g., basketball, soccer) sport	Sportspersonship and moral reasoning (Bredemeier & Shields, 1984)	Self-reported poor sportspersonship behavior and poor sport attitudes items (developed for this survey)	Unsportsmanlike behavior and attitudes were higher in contact sports
Slutzky [40]	U.S.	<i>n</i> = 987 50.8% female <i>M</i> _{age} ≈ 7y at beginning of study (which was the third wave, out of four, for a larger study)	Longitudinal (2yrs), school-based data collection Path analysis [11]	Amount of team/individual sport involvement, reported by parents using Likert scale (i.e., 1 = < 1hr/week, to 7 = > 20hr/week): Year-long weekly sport involvement calculated using parent report	Competence motivation (Harter, 1993) and Positive youth development (Larson, 2000)	Sport self-concept (Eccles & Harold, 1991); Self-esteem (Harter, 1982)	Time spent in team sports was positively associated with sport self-concept, which in turn mediated the relationship between time in team sports and self-esteem Time in individual sport not correlated with self-concept or self-esteem

Strachan [57]	CAN	<i>n</i> = 74 (Gender unspecified) <i>M</i> _{age} = 13.6y (1.5)	Cross-sectional, sport-based data collection Discriminant function analyses [8]	Comparing athletes from differing specialization pathways: Specializers (i.e., year-long involvement in single sport) compared with samplers (i.e., involved in at least three sports throughout the year) - all had invested at least 15hrs/week in sport	Developmental model of sport participation (Côté, Baker, & Abernethy, 2007) and Positive youth development (Larson, 2000)	Youth sport experiences (Hansen & Larson, 2005); Developmental Assets (Search Institute, 2004); Athlete Burnout (Raedeke & Smith, 2001); Sources of Enjoyment in Youth Sport (Wiersma, 2001)	No differences in sources of sport enjoyment or developmental assets Samplers were lower on psychosocial exhaustion, higher on integration with family subscales and linkages to community, and lower on diverse peer group relationships
Talliafero [61]	U.S.	<i>n</i> = 13,857 51.9% female <i>M</i> _{age} = 16.2y (1.2) Numerous sports	Longitudinal (2yrs), school-based data collection Logistic regression [9]	Number of sport teams: Youth reported the number of sport teams they participated in during the past year, and were grouped into Non athletes, Moderate involvement (1-2 teams); High involvement (3+ teams)	–	Students reported suicidal ideation and behavior across several items designed for this survey	Highly involved male athletes had reduced risk for hopelessness, considering suicide, or planning suicide Highly involved female athletes had reduced risk for hopelessness and considering suicide
Thomas [48]	U.K.	<i>n</i> = 272 100% male All participants under the age of nine	Cross-sectional, sport-based data collection Chi-square analysis [7]	Comparing rugby players competing under traditional rules with those in an adapted league, with changes to rules: Sport rules were changed to rules to reduce tackling and to include fewer players on field	Ericsson (1993)	Multiple choice answers to the 'most important experiences in rugby' (e.g., playing with friends, having fun, involved in the action, playing well, winning the game)	No significant differences between two sport settings

Vella [41]	AUS	<i>n</i> = 3249 60.1% female <i>M</i> _{age} = 8.3y (.4)	Longitudinal (2 time points, spread across two years), school-based data collection	Individual vs. team: Parents identified the extent that youth were involved in individual, team, or team and individual sport.		Parent-reported youth quality of life (Varni, Seid, Knight, Uzark, & Szer, 2002)	Children who maintained sports participation across all time points had higher quality of life than nonparticipants, dropouts, and commencers.
			ANOVA [12]	Sport involvement over two-year time period: Children classified into groups: (1) participated in sport at both time points; (2) Did not participate; (3) Dropped out of sport between time points; and, (4) Began participation between time points.	–		Of those who maintained their sports participation, quality of life was higher at follow-up for children who participated in only team sports, or in both team and individual sport (compared to individual sport)
Vink [58]	EST	<i>n</i> = 163 47% female <i>M</i> _{age} = 13.6y (.3) Basketball and volleyball	Longitudinal (2 time points during sport season, and one time point the following sport season.	Amount of individual deliberate practice: Individual deliberate practice was defined as self-directed practice involving a primary sport, to improve skills, and athletes recorded practice in daily journal	Deliberate practice (Ericsson, 1993)	Sport Motivation (Pelletier, Fortier, Vallerand, Tuson, Briere, & Blais, 1995)	Changes (e.g., increases/decreases) of intrinsic motivation were positively related to change in individual deliberate practice
			Latent growth modelling [11]				For athletes with higher initial individual deliberate practice, intrinsic motivation increased at a steeper rate
Wagnsson [59]	SWE	<i>n</i> = 920 41% female <i>M</i> _{age} = 13.78y (2.40)	Longitudinal (3yrs), school- based data collection	Amount of sport participation: Participants reported amount of time spent within organized sport in total	Exercise and self- esteem model (Sonstroem, Harlow & Josephs, 1994)	Self-esteem and sport competence (Harter, 1985)	Sport involvement at time point one predicted sport competence (T2/T3), which mediated the relationship with self-esteem (T2/T3)
			Multilevel mediation model [12]				

Zarrett [60]	U.S.	<i>n</i> = 1,357 57.9% female <i>M</i> _{age} = 11.00y (.43)	Longitudinal (3yrs), school-based data collection ANOVA [11]	Duration of sports participation: Student reports of whether he or she participated in sport at three time points. No involvement in sports across 3 years coded as 0; 1 year of participation coded as 1; sports participation in 2 or all 3 years coded as 2	Relational developmental systems theoretical framework (Lerner, 2006)	Positive youth development (Benson, Leffert, Scales, & Blyth, 1998); Depression (Radloff, 1977)	Higher levels of involvement related to greater perceptions of contribution No differences found regarding other youth developmental assets, nor for depression
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Notes.

1. Several studies identified more complex mediating or moderating relationships, behavioral or observational measures that did (or did not) relate to sport type, or differences when comparing sport types to other contexts, that are not demonstrated in this table.
2. Unless otherwise indicated, sport activities were IVs, whereas psychosocial outcomes were DVs. For longitudinal studies, mean age is provided from time point 1
3. Sport-based data collection: Typically, original data collection within sport clubs, teams, or at competitions; School-based data collection: Surveys collected within schools, typically as components of large mass surveys; Community data collection: Surveys collected at community recreation centers or other contexts not inherently school or sport-based.
4. Note that risk of bias was greatest among those with the lowest values, and that studies coded as '12' were those with the lowest risk of bias in this review