Sport Specialization and Sport Motivation in Middle School–Aged Athletes

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Context: Sport specialization has been assumed to have psychosocial ramifications for athletes, especially autonomous motivation, which has been associated with continued sport participation. Sport dropout is common in youth athletes, yet it is unknown how sport specialization may affect this population psychosocially.

Objective: To determine the association of sport specialization with autonomous and controlled motivation and amotivation in middle school–aged athletes.

Design: Cross-sectional study.

Setting: An anonymous online questionnaire was distributed to athletes via schools, club sports, and social media.

Patients or Other Participants: A total of 178 athletes (male = 59%; private school = 51%; grade: sixth = 20%, seventh = 32%, eighth = 48%) completed the questionnaire.

Main Outcome Measure(s): The questionnaire assessed demographics, sport participation, and motivation using the Youth Behavioral Regulation in Sport Questionnaire. Sport specialization was defined using a modified 3-point scale (*low, moderate,* or *high*) and multisport versus single-sport athletes. Nonparametric tests were used to analyze the differences among the types of

motivation and specialization levels and between multisport and single-sport athletes.

Youth Athletes

Results: Sport specialization categories were not significantly associated with autonomous motivation, controlled motivation, or amotivation. No significant associations were present between multisport or single-sport athletes and any type of motivation. However, multisport athletes had higher scores for intrinsic motivation, a subscale of autonomous motivation, compared with single-sport athletes (single sport: median = 5.00, 25th–75th quartile = 4.50–5.00; multisport: median = 5.00, 25th–75th quartile = 5.00–5.00; P = .04).

Conclusions: Sport motivation did not differ between sport specialization groups in middle school athletes. Dropout from sport is common in this age group but is multifactorial in nature. A lack of sport motivation could be a factor for some athletes, but all specialization groups appeared to have similar outcomes. Our exploratory analysis suggests that clinicians may consider having an open dialogue with single-sport athletes, their parents or guardians, and coaches to ensure that athletes are enjoying their sport.

Key Words: sport psychology, multisport athletes, youth athletes

Key Points

- · Sport motivational levels were not different among different categories of specialized athletes.
- · Sport motivation did not vary between single-sport and multisport athletes.
- Early changes in sport motivation may still be detectable in middle school athletes who play a single sport.

W outh sport participation has a broad scope of short- and long-term health benefits,^{1,2} including being an avenue for decreasing childhood obesity in the United States.³ However, a large proportion of US youth quit 1 or multiple sports during their middle school years (11–14 years old).⁴ Though the reasons are most likely multifaceted,⁵ recent statements from professional and health organizations have cited sport specialization as a possible cause for negative psychosocial outcomes in sport.^{6–8} However, few consensus statements have cited original studies to support this claim.⁹ The consensus definition for *sport specialization* is "intentional and focused participation in a single sport for a majority of the year that restricts opportunities for engagement in other sports and activities."¹⁰ The authors of a recent systematic review and meta-

analysis concluded that specialized athletes experienced greater levels of burnout than athletes who did not specialize.⁹ Unfortunately, few studies in the systematic review included athletes who were not specialized in sport.⁹ Furthermore, 2 of the 3 investigations conducted in North America did not find sport specialization to be related to burnout or dropout.⁹

Athlete burnout is commonly defined as emotional and physical exhaustion,¹¹ and athlete burnout may be a precursor to athlete dropout.^{5,12} Athletes who decide to drop out of their sport or sports have demonstrated a lack of fun and enjoyment that may have led to the decision to drop out.¹² Additionally, continuing sport participation and physical activity in general are best predicted by understanding an individual's level of enjoyment.¹² Enjoyment has been generally defined as a positive response such as fun or motivation to participation in



Figure. Scoring process for dependent variables from the Youth Behavioral Regulation in Sport Questionnaire.

an activity.¹² Thus, researchers assessing athlete enjoyment have centered on motivation-based theories. One such theory is the self-determination theory (SDT), which creates a framework for studying enjoyment.¹³

According to the SDT, participating in an activity for the enjoyment of that activity is considered intrinsic motivation.¹³ Motivation in SDT is placed on a continuum, moving from completely lacking self-determined behavior (ie, amotivation) to completely self-determined behavior (ie, intrinsic motivation), with 4 benchmarks in between: external regulation, introjected regulation, identified regulation, and integrated regulation.^{13,14} To characterize areas of this continuum, several tools have been created to identify amotivation, external regulation, introjected regulation, identified regulation, integrated regulation, and intrinsic motivation (Figure).¹⁴ These categories can be combined to give an overall view of controlled motivation (external) and autonomous motivation (intrinsic).¹⁴ The Youth Behavioral Regulation in Sport Questionnaire (YBRSQ) operationalizes this continuum in adolescent athletes.¹⁵ The YBRSQ has shown that increased autonomous motivation improved physical activity during sports in adolescents.16

Middle school athletes are generally between the ages of 11 and 14 years. This is a unique period in life when growth and maturation are prominent.^{17,18} This is also a time in development when adolescents search for autonomy in various areas of their life,¹⁸ with sport being no exception. Yet this population has rarely been evaluated in the sport specialization literature apart from clinical settings and large cohorts with participants spanning from 10 to 18-years old.9 Therefore, the purpose of our study was to determine the association of sport specialization with autonomous motivation, controlled motivation, and amotivation in middle school athletes. We hypothesized that highly specialized athletes would have less autonomous motivation and more amotivation and controlled motivation toward sport participation than low or moderately specialized athletes. The aim of a secondary (exploratory) analysis was to see if there was a difference in these motivation metrics between single-sport and multisport athletes, as this has been a common method for categorizing specialized and nonspecialized athletes.¹⁹

METHODS

A cross-sectional study design was used via an anonymous online and paper survey. A convenience sample of youth sport organizations and middle schools throughout the Midwest distributed the online or paper survey to potential participants. Additionally, the online survey was posted on social media (Facebook). Most surveys were completed online (n = 114) rather than on paper (n = 64). Because of the multiple methods of survey distribution, it was possible that an individual may have accidentally taken the survey twice. However, only 2 surveys were identified as having identical data. For this case, we analyzed only 1 of the surveys.

Participants

This study was approved by the institutional review board at the University of Wisconsin-Madison. For volunteers to be included in this study, they had to select in the survey that they were currently in sixth, seventh, or eighth grade and acknowledge that they had engaged in organized sport in the past 12 months. Participants and their parents were provided with a written description of the study design, and, because of the survey's anonymity, completing the survey was deemed as providing consent and assent.

Survey

The survey consisted of 4 blocks of questions: (1) study information and acknowledgment of being a participant, (2) demographic questions, (3) sport participation and specialization questions, and (4) the YBRSQ questions. Demographic questions addressed biological sex, grade in school (sixth to eighth grade), school setting (public or private), and if the child had been involved in organized sport during the past 12 months. Those who reported that they had engaged in organized sport in the past 12 months were then asked to select the sport(s). Participants were provided with 31 sports based on the list in the National Federation of State High School Associations annual participation statistics (www.nfhs. org/media/7212321/nfhs-2023-athletics-participation-surveyfor-press-release.pdf). Additionally, participants were provided 2 *other sport* options for writing in a sport that was not listed.

Sport Specialization Classification

Sport specialization was determined using the 3-point classification system first purposed by Jayanthi et al²⁰: (1) "Can you pick a main sport?" (2) "Have you quit other sports so that you could focus more on your main sport?" and (3) "Do you train more than 8 months a year in a single sport?" For question 1, "Can you pick a main sport?" participants were asked to select either their main sport or "I do not have a main sport." Those who selected a sport were given 1 point, and those who selected *I do not have a main sport*. This allowed us to identify each person's main sport. For questions 2 and 3, *yes* and *no* were scored as 1 or 0 points,

respectively. Based on findings from Miller et al,²¹ we added the question, "Have you only ever played 1 sport?" A respondent was asked this question if he or she had only been involved in 1 sport in the past 12 months and selected *no* for the question, "Have you quit other sports so that you could focus more on your main sport?" Participants who answered *no* to question 2 and *yes* to the additional question from Miller et al²¹ were given a score of 1 point for question 2, indicating lifelong single-sport athletes who had never had an opportunity to quit other sports. Scores for these 3 questions were summed to determine the specialization category in the 3-point scale as *low* (0–1), *moderate* (2), or *high* (3).

Single-sport and multisport participants were evaluated based on each individual's answer to the organized sports played in the past 12 months. Athletes who selected > 1 sport during this time frame were categorized as *multisport athletes*, and athletes who selected only 1 sport were categorized as *single-sport athletes*.

Youth Behavior Regulation in Sport Questionnaire

The YBRSQ is a valid and reliable tool for identifying amotivation, controlled motivation, and autonomous motivation in both adult and youth populations (the BRSQ for adults).^{14,15} The YBRSQ was developed by Viladrich et al,¹⁵ who used 20 of the original 24 questions in the BRSQ-6 questionnaire. For this survey, all questions were scored on a 5-point Likert scale ranging from strongly disagree to strongly agree. The 20 questions of the YBRSQ used for this survey consisted of 4 questions each on amotivation, external regulation, introjected regulation, identified regulation, and intrinsic regulation. The 4 questions for identified and intrinsic regulation were aggregated and averaged to measure autonomous motivation (possible score = 1-5).²² Similarly, the 4 questions each for external regulation and introjected regulation were aggregated and averaged to measure controlled motivation (possible score = 1-5), and the 4 questions for amotivation were aggregated and averaged to measure amotivation (possible score = 1-5).²² This process is outlined in the Figure.

Statistical Analysis

Before starting the study, we performed a sample size estimation via G*Power (version 3.1.9.4; Franz Faul, Kiel University) to establish the required sample size to detect a 30% difference between specialization levels, assuming a mean amotivation score of 1.22 \pm 0.71 in the moderate specialization group.²² Based on an omnibus analysis of variance test, assuming equal group sizes and $\alpha = .05$, we estimated we would need approximately 177 total participants to detect an overall difference in amotivation scores between specialization levels with 80% power. Data were summarized as frequencies and proportions, means and SDs, and median and interquartile ranges when appropriate. A χ^2 analysis was used to assess the association of sport specialization and being a multisport or single-sport athlete with sex, grade, and school setting. A Shapiro-Wilk test was calculated to test for normality for amotivation, controlled motivation, and autonomous motivation scores for the entire cohort. The motivation scores were not normally distributed; therefore, nonparametric tests were applied to determine if differences existed between sport specialization groups, sex, grade, and school type with regard to the scores for amotivation, controlled motivation, and autonomous motivation. For independent variables with 2 categories, a Mann-Whitney *U* test was conducted. For independent variables with 3 categories, a Kruskal-Wallis test was computed. Statistical significance was set a priori at $\alpha < .05$, and all analyses were performed using SPSS (version 27.0; IBM Corp).

RESULTS

A total of 178 individuals completed the sport specialization questions; of these, 34% were categorized as low specialization, 33% as moderate specialization, and 33% as high specialization. Further demographic information by sport specialization category is presented in Table 1. Sport specialization was not different between the sexes or between public and private school attendees. However, sport specialization was significantly associated with grade; eighth graders were more likely to be highly specialized compared with seventh and sixth graders. Participants' main sports were heterogeneous in this cohort, with basketball (25%) and soccer (16%) having the largest proportions. Sixteen percent of participants identified that they did not have a main sport.

The association of sport specialization, sex, grade, and school setting with autonomous motivation is outlined in Table 2. The association of sport specialization, sex, grade, and school setting with controlled motivation is shown in Table 3, and the association of sport specialization, sex, grade, and school setting with amotivation in Table 4. Sport specialization categories were not significantly associated with autonomous motivation, controlled motivation, or amotivation.

Most participants were multisport athletes (83%) rather than single-sport athletes (17%). Demographic information by multisport and single-sport categorization is presented in Table 5. Neither sex nor grade was significantly associated with being a multisport or single-sport athlete. However, middle school students who attended a public school were more likely to be single-sport athletes compared with those who attended a private school. The associations of multisport and single-sport athlete categorization and autonomous motivation, controlled motivation, and amotivation are described in Table 6. No significant associations with multisport or single-sport athletes and any type of motivation were present. Yet the P value of .11 suggested that autonomous motivation may have been greater in the multisport athletes compared with the single-sport athletes (Table 6). On examining the raw data and considering this finding, we performed an exploratory, post hoc analysis to compare the average response to the 4 identified regulation questions and the 4 intrinsic regulation questions between single-sport and multisport athletes. The average identified regulation score did not differ between single-sport and multisport athletes (single sport n = 31, median = 4.25, 25th-75th quartile = 3.75-4.75; multisport n = 146, median = 4.50, 25th-75th quartile = 4.00-5.00; P = .24). However, the average intrinsic regulation score did differ between single-sport and multisport athletes; multisport athletes had higher intrinsic regulation scores than single-sport athletes (single sport n = 31, median = 5.00, 25th–75th quartile = 4.50-5.00; multisport n = 146, median = 5.00, 25th-75th quartile = 5.00-5.00; P = .04).

DISCUSSION

Our most important findings were that no differences in autonomous motivation, controlled motivation, or amotivation

	Spor	t Specialization Category, No			
Variable	Low (n = 61)	Moderate (n = 58)	High (n = 59)	Total (N = 178)	P Value
Sexª					.30
Male	37 (35)	37 (35)	31 (30)	105	
Female	22 (32)	19 (28)	28 (41)	69	
Grade					.001°
6	20 (57)	11 (31)	4 (11)	35	
7	12 (21)	25 (44)	20 (35)	57	
8	29 (34)	22 (26)	35 (41)	86	
School ^b					.26
Public	31 (36)	32 (37)	24 (28)	87	
Private	29 (32)	26 (29)	35 (39)	90	
Main sport					_
Archery	0 (0)	1 (100)	0 (0)	1	
Baseball	3 (43)	3 (43)	1 (14)	7	
Basketball	9 (20)	13 (30)	22 (50)	44	
Cross-country	4 (57)	1 (14)	2 (29)	7	
Dance	0 (0)	2 (67)	1 (33)	3	
Equestrian	0 (0)	0 (0)	1 (100)	1	
Football	2 (22)	6 (67)	1 (11)	9	
Golf	0 (0)	1 (50)	1 (50)	2	
Gymnastics	0 (0)	2 (100)	0 (0)	2	
Ice hockey	3 (43)	2 (29)	2 (29)	7	
Martial arts	0 (0)	1 (33)	2 (67)	3	
Skiing—cross-country	0 (0)	1 (50)	1 (50)	2	
Soccer	3 (11)	9 (32)	16 (57)	28	
Softball	2 (50)	1 (25)	1 (25)	4	
Swimming and diving	1 (17)	3 (50)	2 (33)	6	
Tennis	1 (100)	0 (0)	0 (0)	1	
Track and field	1 (100)	0 (0)	0 (0)	1	
Volleyball	9 (56)	2 (13)	5 (31)	16	
Wrestling	0 (0)	3 (75)	1 (25)	4	
Other	0 (0)	1 (100)	0 (0)	1	
No main sport	23 (79)	6 (21)	0 (0)	29	
		Median (25th–75th quartile)	d		
Total sports in the past year	3 (2–3)	3 (2–4)	3 (2–4)		.63

Table 1. Demographic Information and χ^2 and Kruskal-Wallis Analyses for Differences Among Low, Moderate, and High Sport Specialization Categories

^a Four participants did not answer the question.

^b One participant did not answer the question.

[°] Statistically significant *P* value (*P* < .05).

^d The Kruskal-Wallis test was used to determine whether the number of sports in the past year differed among specialization categories.

scores among sport specialization categories in middle schoolaged athletes were identified. Similarly, multisport and singlesport athletes did not differ in their scores for these same metrics. When autonomous motivation was broken down into the average scores for identified regulation and intrinsic regulation, multisport athletes scored higher on the former questions (eg, "The athlete plays this sport for fun and enjoyment") than single-sport athletes, though this was an exploratory analysis and should be interpreted with caution. Sport specialization categories were significantly associated with grade, as eighth graders displayed the largest proportion of highly specialized athletes. Additionally, single-sport athletes were more likely to attend a public than a private school.

Our outcomes were somewhat contradictory to the retrospective results of Waldron et al²³ on the differences in motivation measurements using the BRSQ (adult version of the YBRSQ) between specialization categories. Waldron et al²³ reported that high-specialization athletes had higher scores for integrated regulation and identified regulation than low-specialization athletes. Integrated regulation (ie, when

individuals start to fully assimilate extrinsic motivation into their own values and identity) is as internalized as an extrinsic motivation can become,¹³ and identified regulation (characterized by an individual's recognizing the importance of an external motivation in their own life) is the second most internalized an extrinsic motivation can become.¹³ Therefore, Waldron et al²³ found that high-specialization athletes had more internalized levels of extrinsic motivations than lowspecialization athletes. The differences between our results and those of Waldron et al 23 may be due to methodologic differences between the studies. First, Waldron et al²³ assessed college-aged students to retrospectively answer the BRSQ. This predisposes the study to retrospective bias, which may have affected its results. Similarly, the BRSQ is the adult version of the YBRSQ.^{14,15} One of the major differences between the instruments is that the YBRSQ does not include the integrated regulation subscale of the BRSQ.¹⁵ Integrated regulation is not included in the YBRSQ because it is a type of motivation that is not understood or present during adolescence¹⁵; thus, it is difficult to interpret the retrospective

 Table 2.
 Nonparametric Comparison Among Groups for Autonomous

 Motivation Score^a
 Provide Comparison Among Groups for Autonomous

Variable	No.	Median	25th–75th Quartile	P Value
Sport specialization				.31
Low	60	4.63	4.25-4.97	
Moderate	58	4.75	4.50-5.00	
High	59	4.75	4.38-4.88	
Sex				.89
Male	105	4.75	4.25-5.00	
Female	69	4.75	4.31-4.94	
Grade				.25
6	34	4.56	4.25-5.00	
7	57	4.75	4.38-4.88	
8	86	4.75	4.44-5.00	
School				.61
Public	87	4.75	4.25-4.88	
Private	90	4.75	4.38–5.00	

^a A higher score indicates a greater degree of autonomous motivation.

finding by Waldron et al²³ of differences in integrated regulation between specialization categories.

Our exploratory results revealed that multisport athletes had slightly higher levels of intrinsic regulation than single-sport athletes. Intrinsic regulation is understood as performing an activity for the inherent enjoyment the activity brings an individual.13 Intrinsic motivation has been positively associated with well-being, continued sport participation, and improved sport performance, whereas amotivation has been associated with a low level of performance, burnout, or dropout from sport.24,25 Because intrinsic motivation and continued sport participation are connected, our outcomes were consistent with the meta-analysis by Giusti et al9 on sport specialization and athlete burnout. Giusti et al⁹ determined that sport samplers had less exhaustion, a higher sense of accomplishment in sport, and less sport devaluation compared with individuals who specialized in a sport. These collected results suggest a possible association between being a single-sport athlete and a decrease in intrinsic motivation, though future examination is needed to continue to improve our understanding.

We must highlight that a causal relationship between multisport or single-sport participation cannot be drawn with intrinsic motivation from our work. Single-sport athletes may have had innately less intrinsic motivation in sport, which may explain why they reduced their activities to only 1 sport or

 Table 3.
 Nonparametric Comparison Among Groups for Controlled

 Motivation Score^a
 Provide Comparison Among Groups for Controlled

Variable	No	Madian	OEth ZEth Quartila	<i>D</i> .Voluo
Vallable	INO.	Weulan	25th=75th Quantile	F value
Sport specialization				.56
Low	60	1.63	1.16-2.50	
Moderate	58	1.81	1.25-2.88	
High	59	1.88	1.13-2.75	
Sex				.73
Male	104	1.81	1.25-2.75	
Female	69	1.63	1.19-2.56	
Grade				.61
6	35	1.50	1.13-2.50	
7	57	1.75	1.19-2.69	
8	85	1.88	1.25-2.81	
School				.76
Public	87	1.88	1.13-2.88	
Private	89	1.63	1.25–2.63	

^a A higher score indicates a greater degree of controlled motivation.

Variable	No.	Median	25th–75th Quartile	P Value
Sport specialization				.61
Low	60	1.00	1.00-1.50	
Moderate	58	1.00	1.00-1.50	
High	59	1.00	1.00-1.25	
Sex				.47
Male	103	1.00	1.00-1.25	
Female	69	1.00	1.00-1.50	
Grade				.61
6	35	1.00	1.00-1.25	
7	57	1.00	1.00-1.25	
8	84	1.00	1.00-1.75	
School				.58
Public	86	1.00	1.00-1.50	
Private	89	1.00	1.00-1.25	

^a A higher score indicates a greater degree of amotivation.

only ever played 1 sport in the first place. It is possible that their current sport is the only sport they enjoy. Furthermore, the median responses for the intrinsic regulation questions were the same between single-sport and multisport athletes. However, the differences in the interquartile range and the spread of answers in the single-sport group may be a significant sign for clinicians and other youth sport stakeholders to consider. Middle school athletics may be the point at which motivation to participate in sport starts to deviate between single-sport and multisport athletes. Thus, our findings and those from other studies^{9,23} demonstrated that psychosocial evaluations in adolescent athletes may help stakeholders identify individuals who are finding less enjoyment in their sporting endeavors. This is important clinically because a continued lack of enjoyment may lead to sport dropout in some or all sports. Specifically, these assessments may be most beneficial for middle schoolaged single-sport athletes. Identifying individuals in this age group allows for targeted interventions to maintain sport as fun and engaging for adolescent athletes as long as possible. Interventions such as creating an empowering environment¹⁶ or the FUN Integration Theory²⁶ may help preserve single-sport engagement throughout adolescence and beyond. Yet because of the exploratory nature of our exploration, future researchers should replicate this finding, possibly through longitudinal cohort studies that track the change in sport motivation over time. This would allow for more specific recommendations for multisport and single-sport youth athletes alike.

The increased proportion of highly specialized athletes in the eighth grade population compared with seventh and sixth grades is in line with previous investigations indicating that sport specialization rates increased throughout high school.^{27,28} The overall rate of highly specialized athletes was similar as well to rates reported in the middle school athlete cohort of Watson et al.²⁹ Our results and the literature demonstrated that interventions to reduce the rate of sport specialization must start in the middle school-aged population, as a proportion of athletes have already decided to specialize by this age. An unexpected result was that middle school-aged athletes who attended a public school were more likely to be single-sport athletes compared with middle school athletes who attended a private school. To the best of our knowledge, we are the first to establish this in a middle schoolaged population. Theoretically, this may be because larger schools, which are more likely to be public schools, are also more likely to facilitate higher rates of specialization.³⁰ This

Table 5.	Demographic Information and χ^2 Analysis for Differences
Between	Multisport and Single-Sport Athletes

	Athletes,		
Variable	Single Sport $(n = 31)$	Multisport $(n = 143)$	<i>P</i> Value
		· · · · ·	70
Male	18 (17)	87 (83)	.70
Female	13 (19)	56 (81)	
Grade	10 (10)	50 (01)	88
6	7 (20)	28 (80)	.00
7	9 (16)	48 (84)	
8	15 (17)	71 (83)	
School ^b		(00)	.002 ^d
Public	23 (26)	64 (74)	
Private	8 (9)	82 (91)	
Main sport ^c	- (-)	- (-)	_
Archery	0 (0)	1 (100)	
Baseball	0 (0)	7 (100)	
Basketball	3 (7)	41 (93)	
Cross-country	4 (57)	3 (43)	
Dance	3 (100)	0 (0)	
Equestrian	1 (100)	0 (0)	
Football	1 (11)	8 (89)	
Golf	0 (0)	2 (100)	
Gymnastics	0 (0)	2 (100)	
Ice hockey	2 (29)	5 (71)	
Martial arts	2 (67)	1 (33)	
Skiing—cross-country	0 (0)	2 (100)	
Soccer	5 (18)	23 (82)	
Softball	0 (0)	4 (100)	
Swimming and diving	1 (17)	5 (83)	
Tennis	0 (0)	1 (100)	
Track and field	0 (0)	1 (100)	
Volleyball	7 (44)	9 (56)	
Wrestling	2 (50)	2 (50)	
Other	0 (0)	1 (100)	
No main sport	0 (0)	29 (100)	

^a Four participants did not answer the question.

^b Statistically significant *P* value (P < .05).

° One participant did not answer the question.

^d Chi-square analysis was not used because the test is not appropriate when too many cells have a count of <5.

may occur because of the competition for spots on a roster in a large-school setting versus a small-school setting.³⁰ However, anecdotally, many middle school athletic programs either refer athletes to community programs or do not cut athletes from their program. Therefore, other motivators not yet addressed may explain the differences between public and private school sport participation in a single sport. Furthermore, this theoretical hypothesis is based on the idea that most public schools are larger than private schools, which is not an absolute truth. Consequently, school size as well as school type should be explored to better understand this theoretical hypothesis.

Limitations

This study had a few limitations. Given the recruitment method through schools, youth sports programs, and social media, we were unable to determine the number of middle school athletes who were contacted or aware of this study. Thus, we cannot calculate a response rate. The methods used for recruitment also meant that an athlete might have

 Table 6.
 Mann-Whitney U Test Comparing Multisport and Single-Sport Athletes for Autonomous Motivation, Controlled Motivation, and Amotivation Scores^a

Score	No.	Median	25th–75th Quartile	P Value
Autonomous motivation				.11
Multisport	146	4.75	4.47-5.00	
Single sport	31	4.63	4.25-4.88	
Controlled motivation				.39
Multisport	146	1.75	1.25-2.75	
Single sport	31	1.63	1.00-2.50	
Amotivation				.15
Multisport	146	1.00	1.00-1.50	
Single sport	30	1.00	1.00-1.00	

^a A higher score indicates a greater degree of autonomous motivation, controlled motivation, or amotivation.

taken the survey twice. To safeguard against this possibility, only 1 survey was used for analysis if 2 surveys had identical answers. Furthermore, outside of social media, the schools and youth programs were a convenience sample from the midwest region of the United States. It is possible that these results would differ from those in other US regions or globally. We did not calculate a priori power for the exploratory analysis, and hence, the study may have been underpowered for this analysis. Similarly, our sample size of 178 was barely larger than the suggested sample size of 177 with our a priori power analysis. However, our sample size of 178 was still larger than that of several investigations that have been conducted in this research area.9 The cross-sectional nature did not allow us to claim any causal relationships or indicate how these measures may change over time. Also, the self-reporting nature of this study may introduce social desirability bias. This study was rather heterogeneous in considering the main sports and overall sports engaged in by middle school athletes. Though this is a strength in the sense that we believe these results are generalizable to most middle school athletes, it is important to acknowledge that sport specialization and its effect on athletes are different among different sport cultures.³¹ Therefore, a study using the same methods in different middle school sports may provide more specific results for that particular sport culture. Lastly, though the 3-point sport specialization scale has been used extensively in sport specialization research, the scale itself has never been validated.^{20,21,27-29} Future researchers should use the recent consensus definition of sport specialization¹⁰ to either validate the 3-point scale or create a validated scale.

CONCLUSIONS

As assessed with the YBRSQ, motivation was not different among sport specialization categories in middle school-aged athletes, but intrinsic regulation was slightly higher in multisport athletes compared with single-sport athletes. This suggests either that decreased intrinsic regulation to participate in sport preceded athletes deciding to participate in only 1 sport or that multisport participation decreased once intrinsic regulation decreased. Regardless, intrinsic regulation and motivation are important psychological components that have been associated with continued sport participation in adolescents. With the plethora of positive health benefits linked with adolescent sport participation, clinicians and youth sport stakeholders should strive for ways to increase multisport participation in middle school athletes or create environments for single-sport athletes that promote autonomy, competence, and relatedness¹³ to foster intrinsic regulation to the best of their ability.

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