Original Article

Achievement goals in youth sport and the influence of coaches, peers, and parents: A longitudinal study

JOAKIM INGRELL[1], URBAN JOHNSON[2], ANDREAS IVARSSON[2]

[1]*Department of Sport Sciences, Malmö University, Sweden*
[2]*Center of Research on Welfare, Health and Sport, Halmstad University, Sweden*

ABSTRACT

The first purpose of this study was to longitudinally examine achievement goals in youth sport. The second purpose was to examine the within-person effects of perceived motivational climates by coaches, peers, and parents on achievement goal orientation. Participants were 78 young student-athletes, representing a variety of sports. The student-athletes completed a multi-section questionnaire, six times over a three-year period, assessing the study variables. Multilevel modelling analysis revealed that both task orientation and ego orientation decreased for this age group over the three-year period. Furthermore, perceived task-involving peer climate was significantly and positively related to task orientation, and perceived ego-involving coach climate was significantly and positively related to ego orientation. The results from this study provides insights regarding developmental changes in achievement goals and the importance of certain social agents in that specific developmental stage.

Keywords: Achievement goals; Coaches; Longitudinal; Parents; Peers.

Cite this article as:
Ingrell, J., Johnson, U. & Ivarsson, A. (2020). Achievement goals in youth sport and the influence of coaches, peers, and parents: A longitudinal study. *Journal of Human Sport and Exercise*, *15*(3), 570-590. doi:https://doi.org/10.14198/jhse.2020.153.09

Corresponding author. *Department of Sport Sciences, Malmö University, 205 06 Malmö, Sweden.*
E-mail: joakim.ingrell@mau.se
Submitted for publication June 2019
Accepted for publication July 2019
Published September 2020 *(in press* October 2019)
JOURNAL OF HUMAN SPORT & EXERCISE ISSN 1988-5202

doi:10.14198/jhse.2020.153.09

INTRODUCTION

According to Nicholls (1989), the developmental process by which children become capable of adopting both task and ego orientation and fully differentiating between task- and ego-involving criteria for success starts around the age of twelve. However, because the physical and competitive nature of sport may make it easier for children to form judgments regarding effort and ability, suggestions have been made to extend achievement goal research downward to at least age nine (Fry & Duda, 1997; Keegan, Harwood, Spray, & Lavallee, 2009; Smith, Smoll, & Cumming, 2009). Fry and Duda (1997), and Smith et al. (2009) have suggested that competitions allow children to compare their ability relative to others because sport differences in ability are more salient through, for example, score keeping, league standings, or other performance statistics. Furthermore, in sports, effort is associated with physical and behavioural cues (e.g., sweating, loss of technical form, grimacing, or rate of breathing) that are readily observable, thereby making it easier to determine who is working hard and who is not. Following this line of reasoning, children and young adolescents might be capable of differentiating between effort- and ability-related conceptions of success, thus being able to develop achievement goal orientations at an earlier age.

Goal orientations have some stability over time (Roberts, Treasure, & Balague, 1998), but they should not be viewed as traits (Roberts, 2012). Earlier studies have revealed different emphasis on goal orientations based on age categories (see, for example, Steinberg, Grieve, & Glass, 2001). Moreover, longitudinal studies have provided insights regarding changes in achievement goals in both sport settings (e.g., Boyce, Gano-Overway, & Campbell, 2009; Smith et al., 2009) and in educational settings (e.g. Barkoukis, Ntoumanis, & Thøgersen-Ntoumanis, 2010; Gano-Overway & Ewing, 2004).

The sport environment is inherently a competence and achievement context (Støckel, Strandbu, Solenes, Jørgensen, & Fransson, 2010), and motivational factors play an important role. Although important aspects of individuals' motivations are determined by their own beliefs, cognitions, and values (Nicholls, 1989), significant influences can also be exerted by key social agents. Based on achievement goal theory, an individual's achievement goals will depend on the most prominent view of ability in that specific situation. These situational cues, also referred to as the motivational climate (Ames, 1992), are created and reinforced by significant others either in their home (e.g. parents) or in their sporting context (e.g. coaches and peers); they are then assumed to affect individuals' achievement behaviours, cognitions, and affective responses. Children and young adolescents, who have yet to firm up their personal theories of achievement, may be more susceptible to the influence of situational variables than older adolescents and adults (Roberts & Treasure, 1992). Roberts et al. (1997) have argued that when the situational cues are weak or vague an individual goal orientation should hold sway. Furthermore, if the situational criteria are particularly salient, perceptions of the motivational climate may override an individual's dispositional goal orientations and be a stronger predictor of behavioural, cognitive, and affective outcomes (Gano-Overway & Ewing, 2004). Similar findings have been reported with young student-athletes (M_{age} = 12.74, *SD* = 0.72) where those who had a high task orientation and a low perceived task-involving coach climate experienced a decrease in their task orientation across their competitive season, and those who had low task orientation and perceived a high task-involving coach climate demonstrated an increase in their task orientation (Boyce et al., 2009). Additionally, Boyce et al. (2009) found similar patterns regarding the ego-oriented variables. That is, a perceived high ego-involving coach climate and low ego orientation resulted in an increase in ego orientation, and vice versa across the three measured time periods.

From a developmental perspective, a significant other could have a different impact on athletes, depending on their athletic- and psychological level (Chan, Lonsdale, & Fung, 2012; Keegan, Spray, Harwood, and

Lavallee, 2014). Parents, peers, and coaches are argued to be the most important social agents for children and young adolescents (Vazou, Ntoumanis, & Duda, 2005; White, Kavussanu, & Guest, 1998; Wylleman, Rosier, & De Knop, 2016). Findings from Keegan et al.'s (2009) study on seven- to eleven-year-olds showed that coaches influenced most strongly through instructions and assessments, whereas parents influenced through supporting the child's participation and learning. Moreover, both parents and coaches influenced through their leadership styles, affective responses, and pre-performance behaviours, whereas peers influenced through competitive behaviours, collaborative behaviours, evaluative communications, and social relationships. Similar findings have been reported from Keegan, Spray, Harwood, and Lavalee's (2010) study on specializing sport participants between the ages of 9 and 18. Age has also appeared to moderate the impact of social influence from significant others on young athletes' sport experience. For example, in a study by Chan et al. (2012) on swimmers, the findings revealed that the social influences from mothers were more important for children than for adolescents, and vice versa regarding the social influence from peers. Further, the social influence from coaches appeared more important for athletes' enjoyment and effort in childhood, but more important for athletes' competence in adolescence.

According to Harwood, Keegan, Smith, and Raine (2015), parents, peers, and coaches are well represented in research based on an achievement goal theory standpoint. Previous studies have shown that goal orientations, different contexts (training or competition), and different affective and behavioural outcomes are differently related to the perceived motivational climate created by significant others (García-Calvo, Leo, Gonzalez-Ponce, Sánchez-Miguel, Mouratidis, & Ntoumanis, 2014; Ntoumanis, Taylor, & Thøgersen-Ntoumani, 2012; van de Pol, Kavussanu, & Ring, 2012; Vazou, Ntoumanis, & Duda, 2006). Furthermore, a common denominator in this line of research is a desire to include all major social agents into the analysis when examining motivational climate in youth sport in order to identify the social agent that is most important during that specific developmental stage.

To date, there is scant longitudinal evidence on changes in achievement goals and perceptions of motivational climate in sport settings during late childhood and adolescence. In addition, previous longitudinal studies, although of great importance, have had few measurement points and have been of relative limited duration – covering, for example, between 9 and 12 weeks of athletic seasons (e.g., Boyce et al., 2009; Smith et al., 2009). We believe that it is important to adopt a developmental perspective and examine potential change in young people's achievement motivation for various reasons. Depending on both the adaptive and maladaptive outcomes related to perceptions of motivational climate and goal orientations (Biddle, Wang, Kavussanu, & Spray, 2003; Harwood et al., 2015), it is important to examine whether these change during a meaningful period of time. Furthermore, if changes in goal orientations are found, research should examine which social agent is the most important during that specific developmental stage. Depending on what stage in the athletic career an athlete is in, this could have implications for both adopting achievement goals and perceiving such goals in the social environment; it is therefore important theoretically as well as in the applied field, as it enhances the effectiveness of intervention work. Accordingly, in our study, focusing on the specializing stage of development, we sampled a cohort of Swedish student-athletes from the age of 12 for a period of three years when they attended a compulsory school with a sport profile. During six different measurement points, they filled out a battery of questionnaires regarding achievement goals in their main sports and their perceived motivational climates created by their coaches, peers, and parents. The specializing career stage is of interest because, according to Côté, Baker, and Abernethy (2003), this stage is characterized by changes including decreasing number of sports activities, a decrease in deliberate play, and gradual changes in the roles of coaches (from "helper" to "specialist"), parents (from direct to indirect involvement), and peers (from co-participation towards the fulfilment of emotional needs).

Based on above literature review, two purposes were developed. The first purpose was to examine student-athletes' developmental trajectories (i.e., levels and changes) in achievement goals. Because of the lack of research investigating developmental changes in achievement goals in sports, we, based on aforementioned findings in PE (e.g., Barkoukis et al., 2010), hypothesized that the student-athletes would report (*H*1) decrease in ego orientations and (*H*2) decrease in task orientation over the time period. Our second purpose was to examine within-person effects of perceived task-oriented motivational climates by coaches, peers, and parents on task-oriented achievement goals, as well as perceived ego-oriented motivational climates by coaches, peers, and parents on ego-oriented achievement goals. Children and young adolescents, who may not have clearly formulated their views on achievement (i.e., goal orientations), can be very susceptible to the influence of motivational climate (Roberts & Treasure, 1992). However, due to the lack of relevant findings in the literature, no hypotheses were made for a particular social agent-goal orientation relationship.

METHOD

Participants and procedure

This study is part of an interdisciplinary research project. Consequently, this sample has been used in other studies addressing different research questions (see Ingrell, Johnson, & Ivarsson, 2018; Ingrell, Larneby, Johnson, & Hedenborg, 2019). In short, a total of 78 Swedish student-athletes (female = 30, male = 48, M_{age} at *T*1 = 12.7, *SD* = 0.44) attending a community-based sport compulsory school participated in this study. Before conducting the study, we received approval from the Regional Ethical Review Board. After we obtained consent from the student-athletes' parents, data were collected six times from the beginning of seventh grade to the end of ninth grade. As Table 2 and Table 3 show, we collected between 370 (21% of missing cells) and 417 (11% of missing cells) out of a possible 468 observations.

Instruments

We used the Task and Ego Orientation in Sport Questionnaire (TEOSQ; Duda & Nicholls, 1992) to assess athletes' perceptions of success. The TEOSQ contains seven items examining task orientation and six items examining ego orientations. The possible responses were listed on a 5-point Likert scale. Previous work has supported the validity and reliability of the TEOSQ with children (Barkoukis et al., 2010).

We used the Peer Motivational Climate in Youth Sport Questionnaire (PeerMCYSQ; Ntoumanis & Vazou, 2005) to measure perceived peer-created motivational climate. The questionnaire contains 21 items capturing task-oriented features – improvement, relatedness support, and effort – and ego-oriented features – intra-team competition and ability and intra-team conflict. Response options fall on a 7-point Likert scale. All 12 perceived task-oriented question generated a peer task mean score. All 9 perceived ego-oriented questions generated a peer ego mean score. The validity of the PeerMCYSQ has been supported in previous work (Ntoumanis & Vazou, 2005; Vazou et al., 2006).

Moreover, we used the Motivational Climate Scale for Youth Sports (MCSYS; Smith, Cumming, & Smoll, 2008) to measure the athletes' perceived coaching climate. The 5-point Likert scale has 12 items and 2 factors (i.e., ego-involving and task-involving). Smith et al. (2008) reported acceptable levels of internal reliability and factorial validity for the MCSYS. In order to get satisfactory Cronbach alpha coefficients, item 2 (task-involving) and item 12 (ego-involving) were removed from further analysis. However, these variables only reached questionable reliability at T1, T2, and T3 (see Table 1).

Additionally, we used the Parent Initiated Motivational Climate Questionnaire (PIMCQ-2; White & Duda, 1993) to measure the athletes' perceived parent involvement. Factors studied include worry-conducive

climate, success without effort, and learning and enjoyment. This 5-point Likert scale includes 36 items (18 items repeated twice and focused on either mother or father). The learning and enjoyment subscale represent a task-oriented parental climate. We combined the two subscales worry-conducive climate and success without effort in order to create a single subscale representing an ego-oriented parental climate. The validity and reliability of the PIMC-2 have been supported in previous work (White, 1996; White et al., 1998).

Statistical analysis

Because of the many advantages (e.g., inclusion of time-varying covariates, handling missing data, and flexible handling of unequally spaced observation), we used multilevel modelling (MLM; Heck & Thomas, 2015; Singer & Willett, 2003), also known as hierarchical linear models (HLM; Raudenbush & Bryk, 2002), to examine changes in achievement goal orientations over the three years, as well as the within-person effects of perceived motivational climates (coach, parents, and peers) on achievement goals. Based on Maas and Hox's (2005) simulation study, we believe that our sample size fits well within their suggestions for this type of analysis.

We conducted Little's (1988) MCAR test because MLM requires that the missing data is missing completely at random (MCAR) or missing at random (Heck & Thomas, 2015; Singer & Willett, 2003). The non-significant *p*-value – $p = .060$ for the task-oriented variables and $p = .057$ for the ego-oriented variables – indicated that our missing observations could be assumed to be MCAR.

First, we estimated the growth or change from the perspective of random-coefficient MLMs with the growth rate included at Level 1. We conducted unconditional MLMs for the achievement goal variables (task and ego) across the six time points, where the intercepts represented student-athletes' overall level at the beginning of seventh grade (first measurement point) and the slopes represented the overall change trajectories across the six time points. The covariance between the intercepts and slopes represented the relationship between the scores at the first measurement point and the rate of change.

Second, we added motivational climates (coach, parents, and peers) as time-varying covariates at Level 1, thereby making the MLMs conditional to study the within-person effects. Each predictor variable was person-mean centred (i.e., centred around each participant's unique mean of each predictor variable averaged over time) and entered into Level 1 to represent within-person effects. By using person-mean centring, the invariant effects of each participant are removed, leaving only deviations from each participant's unique mean across time. The data were analysed using Mplus (version 7.4) with a robust maximum likelihood estimator (Muthén & Muthén, 1998–2015). We focused on the Bayesian information criterion (BIC) in comparing the models. Following Raftery's (1995) approach, we consider that a difference of BIC lower than 2 between two models is barely worth mentioning, a difference between 2 and 5 is positive, a difference between 5 and 10 is strong, and a difference larger than 10 is very strong. Statistical significance was set at $p < .05$.

RESULTS

Means, standard deviations, and Cronbach alpha coefficients for all study variables are displayed in Table 1 and a correlations matrix for all study variables in Table 2. The significance of the changes in the means of the goal orientation variables is examined below via the testing of the unconditional multilevel models for change. The reliability (measured in terms of internal consistency using Cronbach's alpha coefficient) was acceptable ($\alpha > .70$) for all measured variables except for ego orientation at *T*1, coach task involving climate at *T*3, and coach ego involving climate at *T*1, *T*2, and *T*3 – which only showed adequate reliability with alpha values of .62, .64, .59, .65, and .56, respectively.

Table 1. Means, Standard Deviations, and Cronbach Alpha Coefficients for all variables on each of the six measurement occasions (N = 78).

Variable list	Beginning of seventh grade *T*1 Aug				Middle of seventh grade *T*2 Dec				End of seventh grade *T*3 April				Middle of eight grade *T*4 Dec				Beginning of ninth grade *T*5 Aug				End of ninth grade *T*6 April			
	M	*SD*	*α*	*n*	*M*	*SD*	*α*	*n*	*M*	*SD*	*α*	*n*	*M*	*SD*	*α*	*n*	*M*	*SD*	*α*	*n*	*M*	*SD*	*α*	*n*
GO Task	4.28	0.62	.83	77	4.38	0.59	.82	77	4.20	0.58	.83	73	4.11	0.66	.85	71	4.01	0.74	.91	62	4.01	0.78	.91	57
GO Ego	3.80	0.66	.62	77	3.74	0.87	.85	77	3.46	0.76	.77	73	3.68	0.77	.81	71	3.33	0.90	.85	62	3.49	0.94	.87	57
Coach Task	3.91	0.83	.75	77	3.96	0.85	.80	74	3.86	0.71	.64	73	3.63	0.96	.84	72	3.55	1.04	.84	63	3.80	0.92	.88	57
Coach Ego	2.24	0.74	.59	77	2.16	0.83	.65	74	2.18	0.67	.56	73	2.75	0.98	.77	72	2.63	0.83	.71	63	2.43	0.97	.85	57
Mom Task	3.80	0.66	.82	77	3.75	0.65	.77	69	3.58	0.69	.80	71	3.52	0.66	.80	67	3.41	0.66	.77	53	3.30	0.80	.86	52
Mom Ego	1.60	0.54	.81	77	1.68	0.65	.84	69	1.71	0.64	.87	71	1.81	0.73	.87	67	1.97	0.74	.87	53	2.22	0.92	.92	52
Dad Task	4.10	0.61	.81	76	4.08	0.63	.76	66	3.87	0.66	.81	72	3.98	0.59	.77	68	3.68	0.63	.78	57	3.58	0.71	.85	52
Dad Ego	1.68	0.66	.84	76	1.78	0.82	.89	66	1.84	0.73	.86	72	1.87	0.79	.88	68	2.04	0.85	.89	57	2.28	0.90	.91	52
Peer Task	4.47	1.17	.89	78	4.60	1.41	.94	72	4.46	1.20	.91	73	4.36	1.21	.92	70	4.28	1.33	.94	62	4.37	1.29	.94	57
Peer Ego	3.63	0.97	.73	78	3.88	1.12	.80	72	3.99	1.03	.78	73	4.07	1.12	.81	70	3.99	1.15	.84	62	3.88	1.01	.78	57

Note. GO = Goal Orientation.

Table 2. Pearson Correlation Matrix for all variables on each of the six measurement occasions (N = 78) (Table 1 of 8).

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
1. Task T1	—														
2. Task T2	.491***	—													
3. Task T3	.660***	.436***	—												
4. Task T4	.481***	.591***	.473***	—											
5. Task T5	.333**	.351**	.360**	.548***	—										
6. Task T6	.275*	.354**	.303*	.370**	.314*	—									
7. Ego T1	.176	-.003	.132	.063	-.150	.423**	—								
8. Ego T2	-.059	.166	.000	.228	-.034	.099	.238*	—							
9. Ego T3	.206	.138	.380***	.423***	.169	.253	.179	.364**	—						
10. Ego T4	.100	.099	.118	.377**	.171	.263	.290*	.476***	.540***	—					
11. Ego T5	.020	.083	-.041	.351**	.180	.372**	.334**	.480***	.468***	.599***	—				
12. Ego T6	.180	.121	.119	.374**	.315*	.587***	.239	.285*	.377**	.423**	.732***	—			
13. Coach task T1	.330**	.229*	.237*	.049	.045	.043	.062	-.064	-.113	-.121	-.170	-.115	—		
14. Coach task T2	.238*	.222	.306*	.135	-.011	.182	.054	-.053	-.120	-.074	-.223	.064	.621***	—	
15. Coach task T3	.287*	.167	.386***	.184	.123	.238	.056	-.056	.115	-.214	-.168	.008	.541***	.601***	—
16. Coach task T4	.141	.119	.178	.067	-.148	-.012	-.002	-.119	-.031	-.204	-.254*	-.212	.343**	.414***	.436***
17. Coach task T5	.245	.304*	.293*	.091	.226	.258	-.053	-.166	-.074	-.144	-.349**	-.036	.366**	.352**	.386**
18. Coach task T6	.205	.265*	.207	.243	.127	.349**	.083	-.003	.138	-.065	.014	.122	.364**	.256	.421**
19. Coach ego T1	-.004	.117	-.037	.171	.231	-.048	-.009	-.034	.119	.179	.207	.049	-.232*	-.287*	-.181

20. Coach ego T2	.001	.029	-.150	.135	.129	.044	-.085	.042	.076	.198	.093	-.025	-.094	-.361**	-.130
21. Coach ego T3	.125	.097	.055	.189	.112	-.093	-.124	.098	.252*	.304*	.140	.068	-.236*	-.446***	-.282*
22. Coach ego T4	.310**	.173	.214	.117	.135	-.007	.118	.033	.207	.243*	.034	.015	-.121	-.071	-.116
23. Coach ego T5	.372**	.179	.184	.147	.282*	.041	.170	-.195	.055	.048	.057	.001	.235	.089	.179
24. Coach ego T6	.159	.094	.115	.139	.345*	-.080	.093	.055	-.121	.041	.139	.119	-.232	-.237	-.197
25. Peer task T1	.186	.006	.134	-.160	-.039	.071	.239*	-.191	-.151	-.324**	-.407**	-.210	.559***	.449***	.478***
26. Peer task T2	.143	.091	.236	.040	.101	.245	.106	-.075	.093	-.087	-.229	.060	.439***	.420***	.434***
27. Peer task T3	.116	-.004	.127	-.149	-.011	.261	.127	-.080	.019	-.176	-.203	-.080	.410***	.373**	.460***
28. Peer task T4	.063	.075	.133	.097	.044	.144	.023	-.066	.146	-.071	-.123	-.098	.349**	.331**	.456***
29. Peer task T5	.080	.118	.199	-.021	.222	.139	-.080	-.163	.016	-.160	-.266*	-.085	.352**	.275*	.338**
30. Peer task T6	.027	.192	.148	.062	.096	.320*	-.014	-.078	.033	-.234	-.152	-.030	.275*	.307*	.502***

*Note: * p < .05, ** p < .01, *** p < .001*

Table 2. (*Continued*) Table 2 of 8.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
31. Peer ego T1	.179	.095	.090	.288*	.228	.286*	-.015	-.008	.178	.232	.291*	.377**	-.027	.034	.089
32. Peer ego T2	.355**	.337**	.126	.454***	.251	.190	.021	-.029	.103	.245*	.234	.182	.148	.080	.091
33. Peer ego T3	.291*	.253*	.275*	.543***	.391**	.121	-.161	-.121	.209	.262*	.178	.237	-.001	.056	.067
34. Peer ego T4	.443***	.263*	.202	.415***	.392**	.053	-.000	-.020	.117	.307**	.204	.271*	.139	.073	-.065
35. Peer ego T5	.435***	.257*	.335**	.425***	.407**	.062	.073	.076	.254*	.105	.216	.263	.304*	.164	.312*
36. Peer ego T6	.262	.072	.094	.321*	.287*	.169	.135	.068	.108	.346**	.253	.279*	-.049	-.107	-.055
37. Mom task T1	.241*	.243*	.294*	.063	.010	.223	.091	.109	.019	-.154	.064	.075	.249*	.329**	.437***
38. Mom task T2	.190	.248*	.231	.171	-.132	.096	.056	.019	.122	.017	.150	.108	.211	.307*	.327**
39. Mom task T3	.270*	.349**	.297*	.176	-.147	.221	.026	.073	.186	-.003	.099	.067	.252*	.219	.399***
40. Mom task T4	.182	.279*	.265*	.203	-.006	-.014	.063	.004	.203	.115	.125	.012	.134	.228	.238
41. Mom task T5	.021	.147	-.035	.232	.045	-.052	.122	.131	.096	.056	.229	-.049	.223	.120	.259
42. Mom task T6	.112	.183	.174	.203	-.007	.370**	.091	.093	.093	.124	.086	.154	.190	.166	.433**
43. Mom ego T1	.168	.151	.269*	.143	.106	.273*	.099	.105	.221	.190	.171	.250	.088	.008	.311**
44. Mom ego T2	.291*	.100	.301*	.250*	.188	.143	.202	.079	.074	.193	.264*	.151	.110	.027	.154
45. Mom ego T3	.205	.155	.267*	.255*	.166	.147	.140	.080	.151	.226	.216	.065	-.020	-.069	.076
46. Mom ego T4	.162	.043	.169	.256*	.170	.014	.243*	.014	.193	.285*	.135	.044	-.036	-.025	.107
47. Mom ego T5	.044	-.107	.054	.150	-.040	-.261	.061	.095	.283*	.328*	.003	.001	.039	.174	.038
48. Mom ego T6	.301*	.157	.276*	.332*	.138	.046	.302*	.072	.193	.011	.178	.098	.033	-.008	.167
49. Dad task T1	.335**	.412***	.355**	.280*	.129	.387**	.046	.085	.190	.015	.124	.239	.287*	.333**	.372**
50. Dad task T2	.269*	.359**	.317*	.391**	.109	.324*	-.056	-.101	.146	.079	-.056	.146	.285*	.422***	.318*
51. Dad task T3	.348**	.390***	.381**	.401***	.101	.236	.110	.071	.217	.153	.060	.145	.309**	.382**	.432***

52. Dad task T4	.285*	.126	.245*	.240	.174	.087	-.028	-.164	.145	.134	.001	.027	.069	.118	.106
53. Dad task T5	.076	.114	.042	.135	.221	.170	-.019	-.018	.124	-.031	.242	.159	.174	.052	.263
54. Dad task T6	.035	.181	.030	.160	.226	.404**	-.026	.055	.038	.272	.050	.225	.093	.104	.224
55. Dad ego T1	.047	.085	.070	.159	.205	.168	.101	.056	.107	.217	.276*	.260	.014	-.076	.229
56. Dad ego T2	.074	.005	.166	.133	.094	.086	.230	.095	.094	.300*	.266	.087	-.015	-.063	.145
57. Dad ego T3	.122	.002	.205	.217	.069	.058	.137	.117	.219	.310*	.164	-.009	-.001	-.005	.170
58. Dad ego T4	.065	.160	.103	.239	.144	-.085	.196	.043	.141	.267*	.082	-.113	.094	.017	.200
59. Dad ego T5	-.098	-.091	.033	.027	-.109	-.386**	.024	.004	.087	.163	-.148	-.240	-.062	-.016	-.007
60. Dad ego T6	.077	.120	.183	.142	-.058	-.160	.169	.068	.048	-.070	-.094	-.171	-.188	-.066	.069

*Note: * p < .05, ** p < .01, *** p < .001*

Table 2. (*Continued*) Table 3 of 8.

	16	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
1. Task T1															
2. Task T2															
3. Task T3															
4. Task T4															
5. Task T5															
6. Task T6															
7. Ego T1															
8. Ego T2															
9. Ego T3															
10. Ego T4															
11. Ego T5															
12. Ego T6															
13. Coach task T1															
14. Coach task T2															
15. Coach task T3															
16. Coach task T4	—														
17. Coach task T5	.461***	—													
18. Coach task T6	.459***	.319*	—												
19. Coach ego T1	-.159	-.079	-.021	—											
20. Coach ego T2	-.267*	-.041	-.102	.515***	—										
21. Coach ego T3	-.348**	-.116	-.226	.568***	.531***	—									
22. Coach ego T4	-.399***	-.054	-.182	.284*	.340**	.421***	—								
23. Coach ego T5	-.067	-.013	.055	.209	.100	.234	.233	—							

24. Coach ego T6	-.215	.113	-.335*	.450***	.269*	.459***	.347**	.224	—						
25. Peer task T1	.382***	.267*	.410**	-.272*	-.289*	-.388***	-.170	.153	-.362**	—					
26. Peer task T2	.326**	.330*	.470***	-.172	-.015	-.241*	-.023	.027	-.304*	.675***	—				
27. Peer task T3	.315**	.251	.417**	-.215	-.118	-.356**	-.077	-.067	-.347**	.661***	.726***	—			
28. Peer task T4	.657***	.453***	.422**	-.164	-.086	-.303*	-.195	-.095	-.209	.609***	.633***	.685***	—		
29. Peer task T5	.315*	.741***	.251	-.055	.073	-.111	-.111	-.045	.033	.363**	.468***	.422***	.576***	—	
30. Peer task T6	.402**	.312*	.585***	-.207	-.162	-.332*	-.149	.187	-.183	.458***	.499***	.565***	.599***	.477***	—

*Note: * p < .05, ** p < .01, *** p < .001*

Table 2. (*Continued*) Table 4 of 8.

	16	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
31. Peer ego T1	-.159	-.045	-.048	.436***	.267*	.291*	.200	.407***	.324*	-.345**	-.291*	-.204	-.138	-.083	.009
32. Peer ego T2	-.050	-.042	.060	.238*	.279*	.229	.244*	.519***	.293*	-.249*	-.230	-.202	-.092	-.036	.091
33. Peer ego T3	.012	.057	.132	.311**	.233	.334**	.139	.445***	.194	-.283*	-.113	-.272*	-.025	.108	.043
34. Peer ego T4	-.297*	-.001	.018	.144	.203	.337**	.461***	.454***	.259	-.182	-.034	-.196	-.237*	-.004	-.060
35. Peer ego T5	-.010	-.036	.256	.023	-.013	.130	.245	.493***	.145	.093	.174	-.040	.012	-.072	.125
36. Peer ego T6	-.018	.126	-.008	.252	.237	.274*	.255	.214	.417**	-.018	.058	.021	.153	.115	-.059
37. Mom task T1	.200	.106	.243	-.094	-.255*	-.215	-.073	.113	-.010	.262*	.211	.282*	.197	.034	.358**
38. Mom task T2	.126	-.076	.162	-.074	-.193	-.052	.012	.008	-.099	.140	.196	.236	.076	-.167	.144
39. Mom task T3	.203	.273*	.286*	-.098	-.102	-.105	-.039	-.008	-.027	.201	.257*	.249*	.260*	.122	.334*
40. Mom task T4	.165	.172	.040	-.055	.014	-.068	.248*	-.105	.148	.028	.307*	.255*	.269*	.188	.187
41. Mom task T5	.278*	.092	.027	-.007	.060	-.116	-.153	.072	.185	.071	.076	.126	.289*	.103	.017
42. Mom task T6	.223	.092	.422**	-.002	.004	.104	-.033	.201	.102	.162	.323*	.354*	.262	-.040	.497***
43. Mom ego T1	-.091	-.086	-.017	.226*	.235*	.227	.167	.156	.226	.122	.170	.243*	.230	.041	.161
44. Mom ego T2	-.124	-.059	-.112	.264*	.306*	.315*	.216	.447***	.502***	-.078	-.016	-.131	-.109	.029	-.023
45. Mom ego T3	-.181	-.240	-.130	.235*	.253*	.351**	.145	.342**	.389**	-.091	-.150	-.169	-.120	-.154	-.160
46. Mom ego T4	-.136	-.152	-.318*	.212	.337**	.279*	.383**	.197	.452***	-.114	-.057	-.185	-.074	-.068	-.270*
47. Mom ego T5	-.224	-.215	-.210	.165	.113	.178	.220	.357**	.155	-.016	-.117	-.234	-.182	-.087	-.105
48. Mom ego T6	.102	.029	.097	.254	.151	.183	.250	.345*	.502***	.132	.227	.089	.276	.101	.229
49. Dad task T1	.263*	.155	.441***	.040	-.198	-.093	-.019	.174	-.120	.272*	.389***	.341**	.352**	.070	.328*
50. Dad task T2	.405**	.247	.332	.056	-.020	.063	-.030	.040	-.156	.312*	.419***	.252*	.446***	.129	.199
51. Dad task T3	.293*	.381**	.404**	-.072	-.282*	-.060	-.010	.118	-.028	.276*	.341**	.324**	.337**	.154	.181
52. Dad task T4	.073	.261*	.138	-.138	-.167	-.058	.208	.027	-.063	.148	.116	.085	.205	.068	-.109
53. Dad task T5	.182	.239	.327*	.033	-.116	-.048	-.100	.169	-.037	.293*	.235	.155	.309*	.127	.073
54. Dad task T6	-.059	.295*	.257	.001	-.018	.161	-.029	.223	.042	.064	.096	.106	.022	-.066	.231
55. Dad ego T1	-.031	-.105	-.031	.200	.178	.148	.085	.227	.370**	-.011	-.028	.031	.151	-.022	.117

56. Dad ego T2	-.023	-.107	-.206	.214	.226	.258*	.145	.340*	.424**	-.130	-.061	-.139	-.019	-.036	-.074
57. Dad ego T3	-.058	-.251	-.180	.189	.129	.243*	.143	.206	.247	-.049	-.187	-.096	-.097	-.170	-.139
58. Dad ego T4	-.018	.013	-.294*	.121	.212	.117	.189	.243	.356**	-.003	-.051	-.134	-.009	-.013	-.147
59. Dad ego T5	-.159	-.141	-.379**	.223	.216	.224	.241	.253	.448**	-.097	-.293*	-.264	-.161	-.088	-.228
60. Dad ego T6	.023	-.011	-.174	.231	.001	.050	.192	.135	.535***	.022	-.112	-.078	.074	.096	.111

*Note: * p < .05, ** p < .01, *** p < .001*

Table 2. (*Continued*) Table 5 of 8.

	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
1. Task T1															
2. Task T2															
3. Task T3															
4. Task T4															
5. Task T5															
6. Task T6															
7. Ego T1															
8. Ego T2															
9. Ego T3															
10. Ego T4															
11. Ego T5															
12. Ego T6															
13. Coach task T1															
14. Coach task T2															
15. Coach task T3															
16. Coach task T4															
17. Coach task T5															
18. Coach task T6															
19. Coach ego T1															
20. Coach ego T2															
21. Coach ego T3															
22. Coach ego T4															
23. Coach ego T5															
24. Coach ego T6															
25. Peer task T1															
26. Peer task T2															
27. Peer task T3															

28. Peer task T4															
29. Peer task T5															
30. Peer task T6															

*Note: * p < .05, ** p < .01, *** p < .001*

Table 2. (*Continued*) Table 6 of 8.

	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
31. Peer ego T1	—														
32. Peer ego T2	.602***	—													
33. Peer ego T3	.514***	.692***	—												
34. Peer ego T4	.326**	.651***	.672***	—											
35. Peer ego T5	.262*	.495***	.552***	.657***	—										
36. Peer ego T6	.362**	.485***	.369**	.355**	.401**	—									
37. Mom task T1	.131	.263*	.004	.084	.259*	.036	—								
38. Mom task T2	.069	.219	.060	.168	.250	-.064	.702***	—							
39. Mom task T3	-.015	.224	.031	-.002	.196	.130	.720***	.668***	—						
40. Mom task T4	-.057	.123	-.015	.122	.052	.068	.460***	.561***	.542***	—					
41. Mom task T5	-.034	.177	.033	.140	.041	-.058	.233	.339*	.228	.378**	—				
42. Mom task T6	.088	.165	.148	.080	.176	.215	.210	.385**	.432**	.120	.252	—			
43. Mom ego T1	.343**	.204	.046	.036	.184	.326*	.290*	.170	.239*	.191	.057	.242	—		
44. Mom ego T2	.397***	.456***	.297*	.311*	.330*	.451***	.184	.076	.193	.092	.164	.192	.626***	—	
45. Mom ego T3	.318**	.449***	.356**	.260*	.287*	.444***	.226	.115	.235*	-.055	.051	.159	.592***	.729***	—
46. Mom ego T4	.183	.388**	.239	.276*	.329*	.413**	-.072	.064	.030	.128	.261	.128	.429***	.558***	.679***
47. Mom ego T5	.317*	.427**	.385**	.416**	.321*	.194	-.103	.039	-.069	-.035	.005	-.081	.380**	.455**	.405**
48. Mom ego T6	.273	.367*	.302*	.315*	.504***	.468***	.304*	.291*	.357*	.350*	.319*	.237	.373**	.431**	.375**
49. Dad task T1	.202	.222	.114	.163	.316*	-.016	.696***	.516***	.469***	.416***	.290*	.262	.253*	.059	.033
50. Dad task T2	.024	.156	.264*	.130	.203	.135	.257*	.485***	.265*	.327*	.228	.381*	.003	-.130	-.123
51. Dad task T3	.170	.221	.129	.157	.327*	.200	.468***	.539***	.575***	.399**	.359*	.375**	.129	.171	.042
52. Dad task T4	.002	.071	.049	.187	.085	.088	.097	.275*	.214	.379**	.392**	-.029	-.149	.001	-.058
53. Dad task T5	-.093	-.032	.061	.024	.195	.062	.286*	.286*	.293*	.228	.459***	.106	-.047	.114	-.027
54. Dad task T6	.173	.104	.152	.138	.216	.186	.010	.149	.207	-.166	-.033	.634***	-.033	-.018	-.004
55. Dad ego T1	.302**	.255*	.138	.028	.137	.270*	.145	-.033	.105	.111	.205	.305*	.749***	.590***	.577***
56. Dad ego T2	.230	.331**	.248	.110	.171	.367**	.051	-.047	.106	.082	.174	.275	.617***	.774***	.700***
57. Dad ego T3	.290*	.389**	.277*	.193	.190	.356**	.182	.108	.154	-.007	.191	.269	.491***	.553***	.801***
58. Dad ego T4	.037	.332**	.163	.208	.151	.193	.020	.127	.152	.236	.415**	.186	.330**	.411***	.496***
59. Dad ego T5	.186	.278*	.247	.187	-.064	.129	-.203	-.032	-.160	.035	.135	.028	.333*	.345*	.419**

60. Dad ego T6	.203	.236	.232	.138	.114	.254	.244	.238	.254	.227	.263	.041	.288*	.372*	.411**

*Note: * p < .05, ** p < .01, *** p < .001*

Table 2. (*Continued*) Table 7 of 8.

	46	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
1. Task T1															
2. Task T2															
3. Task T3															
4. Task T4															
5. Task T5															
6. Task T6															
7. Ego T1															
8. Ego T2															
9. Ego T3															
10. Ego T4															
11. Ego T5															
12. Ego T6															
13. Coach task T1															
14. Coach task T2															
15. Coach task T3															
16. Coach task T4															
17. Coach task T5															
18. Coach task T6															
19. Coach ego T1															
20. Coach ego T2															
21. Coach ego T3															
22. Coach ego T4															
23. Coach ego T5															
24. Coach ego T6															
25. Peer task T1															
26. Peer task T2															
27. Peer task T3															
28. Peer task T4															
29. Peer task T5															
30. Peer task T6															

Table 2. (*Continued*) Table 8 of 8.

	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
31. Peer ego T1															
32. Peer ego T2															
33. Peer ego T3															
34. Peer ego T4															
35. Peer ego T5															
36. Peer ego T6															
37. Mom task T1															
38. Mom task T2															
39. Mom task T3															
40. Mom task T4															
41. Mom task T5															
42. Mom task T6															
43. Mom ego T1															
44. Mom ego T2															
45. Mom ego T3															
46. Mom ego T4	—														
47. Mom ego T5	.418**	—													
48. Mom ego T6	.438**	.424**	—												
49. Dad task T1	-.125	-.084	.363**	—											
50. Dad task T2	-.009	-.050	.278	.592***	—										
51. Dad task T3	.017	-.012	.324*	.657***	.592***	—									
52. Dad task T4	.071	-.005	.107	.440***	.447***	.670***	—								
53. Dad task T5	-.110	-.115	.198	.506***	.391**	.562***	.695***	—							
54. Dad task T6	-.097	.055	-.090	.200	.377**	.467***	.226	.376*	—						
55. Dad ego T1	.464***	.211	.272	.150	-.175	.037	-.097	.058	.007	—					
56. Dad ego T2	.618***	.312*	.222	-.063	-.252*	-.017	-.113	-.007	-.051	.757***	—				
57. Dad ego T3	.675***	.333*	.288*	.048	-.085	.067	-.031	-.094	-.106	.565***	.714***	—			
58. Dad ego T4	.734***	.342*	.235	-.072	-.048	.075	.113	.052	.006	.475***	.638***	.658***	—		
59. Dad ego T5	.476***	.678***	.207	-.284*	-.107	-.208	-.044	-.192	-.132	.386**	.477***	.494***	.638***	—	
60. Dad ego T6	.394**	.426**	.797***	.132	-.002	.193	.070	.015	-.206	.277*	.319*	.488***	.350*	.499***	—

*Note: * p < .05, ** p < .01, *** p < .001*

Table 3. Unstandardized parameters estimate of the task orientation growth curve models (N = 78).

Effects	**Model 1a**				**Model 1b**			
	Estimate	SE	*p* value	95 % CI	Estimate	SE	*p* value	95 % CI
Fixed Effects								
Intercept (I)	4.315	0.062	.000	4.194, 4.436	4.261	0.069	.000	4.125, 4.396
Linear slope (S)	-0.044	0.011	.000	-0.066, -0.022	-0.029	0.012	.017	-0.053, -0.005
Level 1 predictors								
Coach Task (TVC, PMC)					0.046	0.046	.317	-0.044, 0.136
Peer Task (TVC, PMC)					0.084	0.034	.014	0.017, 0.152
Mom Task (TVC, PMC)					0.090	0.072	.212	-0.051, 0.231
Dad Task (TVC, PMC)					0.104	0.061	.087	-0.015, 0.223
Random Effects								
Level 2: Athlete								
Intercept variances	0.195	0.039	.000	0.118, 0.272	0.242	0.059	.000	0.127, 0.356
Slope variances	0.004	0.002	.019	0.001, 0.007	0.004	0.002	.010	0.001, 0.008
Covariance	-0.008	0.006	.161	-0.019, 0.003	-0.013	0.006	.044	-0.025, 0.000
Level 1: Measure								
Residual variances	0.220	0.030	.000	0.160, 0.279	0.178	0.022	.000	0.136, 0.220
ICC	0.398				NA			
Goodness-of-fit								
AIC		731.788				616.596		
BIC		755.987				655.731		
-2 x log likelihood		736.947				624.005		
Parameters		6				10		
Observations		417/468				370/468		

Note. TVC = Time-varying covariate, PMC = Person mean centred, ICC = Intraclass correlation, AIC = Akaike Information Criteria, BIC = Bayesian Information Criteria.

Table 4. Unstandardized parameters estimate of the ego orientation growth curve models (N = 78).

Effects	**Model 2a**				**Model 2b**			
	Estimate	SE	*p* value	95 % CI	Estimate	SE	*p* value	95 % CI
Fixed Effects								
Intercept (I)	3.739	0.063	.000	3.615, 3.863	3.762	0.067	.000	3.630, 3.893
Linear slope (S)	-0.047	0.014	.001	-0.074, -0.020	-0.054	0.015	.000	-0.083, -0.024
Level 1 predictors								
Coach Ego (TVC, PMC)					0.128	0.053	.016	0.024, 0.233
Peer Ego (TVC, PMC)					-0.006	0.057	.923	-0.118, 0.107
Mom Ego (TVC, PMC)					-0.031	0.104	.762	-0.234, 0.172
Dad Ego (TVC, PMC)					0.007	0.094	.940	-0.177, 0.191
Random Effects								
Level 2: Athlete								
Intercept variances	0.146	0.052	.005	0.045, 0.247	0.168	0.060	.005	0.051, 0.285
Slope variances	0.004	0.002	.013	0.001, 0.008	0.006	0.002	.007	0.002, 0.011
Covariance	0.016	0.009	.064	-0.001, 0.033	0.008	0.010	.436	-0.012, 0.029
Level 1: Measure								
Residual variances	0.363	0.035	.000	0.294, 0.433	0.354	0.042	.000	0.272, 0.436
ICC	0.398				NA			
Goodness-of-fit								
AIC		913.999				825.982		
BIC		938.197				865.117		
-2 x log likelihood		919.158				833.391		
Parameters		6				10		
Observations		417/468				370/468		

Note. TVC = Time-varying covariate, PMC = Person mean centred, ICC = Intraclass correlation, AIC = Akaike Information Criteria, BIC = Bayesian Information Criteria.

We first tested an unconditional model (see Table 3, Model 1a) regarding the student-athletes' task orientation. The result showed that the student-athletes' initial level of task orientation (start of seventh grade) was high on average (γ = 4.315, $p < .001$). As indicated by the statistically significant negative slope coefficient (γ = −.044, $p < .001$), the student-athletes' task-orientation decreased marginally over the six time points. Adding perceived task-oriented motivational climate created by coaches, parents, and peers as time-varying covariates at Level 1 (Model 1b) improved the model fit. The model test statistics showed better support for Model 1b compared with Model 1a (for model fit indices, see Table 2). The fixed Level 1 effect for perceived task-orientated peer climate (γ = .084) was significant: SE = .034, $p = .014$. This result suggests that on each respective measurement time over the three years, one unit increase in perceived task-orientated peer climate resulted in .084 more task orientation when holding the other task-oriented climates constant. No other significant relationships were found at Level 1. More specifically, the fixed Level 1 effect for percieved task-oriented climates by coaches and parents were positive, though not statistically significant.

We then examined the student-athletes' ego orientation. The result from the unconditional model (see Table 4, Model 2a) showed that the student-athletes' initial level of ego-orientation (start of seventh grade) was relatively high on average (γ = 3.739, $p < .001$). A significant negative slope coefficient (γ = −.047, $p = .002$) indicates that the growth curve of ego-orientation decreased marginally over the six time points. Adding perceived ego-oriented motivational climate created by coaches, parents, and peers as time-varying covariates at Level 1 (Model 2b) improved the model fit. The model test statistics showed better support for Model 2b compared with Model 2a (for model fit indices, see Table 2). The fixed Level 1 effect for perceived ego-orientated coach climate (γ = .117) was significant: SE = .047, $p = .013$. This result suggests that on each respective measurement time over the three years one unit increase in perceived ego-oriented coach climate resulted in .117 more ego orientation when holding the other ego-oriented climates constant. The fixed Level 1 effects for percieved ego-oriented climates by peers and fathers were positive and negative for mothers. However, these relationships were not statistically significant.

DISCUSSION

The goal of the current study was to examine (a) student-athletes' developmental trajectories (i.e., levels and changes) in achievement goals, and (b) the within-person effects of perceived task-oriented motivational climates by coaches, peers, and parents on task-oriented achievement goals, as well as perceived ego-oriented motivational climates by coaches, peers, and parents on ego-oriented achievement goals. The result revealed that both task and ego orientation decreased for this cohort over the study's three-year period. Perceived task-involving peer climate was positively related to task orientation, and perceived ego-involving coach climate was positively related to ego orientation.

Our findings revealed decreases in both ego- and task-oriented goals, thereby supporting our first and second hypothesis. The decreases in these student athletes' task orientations could be due to more emphasis on competitions and normative comparisons, as opposed to learning new skills, and on selections for different teams or training groups (see Ingrell, Larneby et al., 2019). Ingrell, Larneby et al. (2019) also found a decrease in these student-athletes' incremental beliefs about athletic ability. If these student-athletes believe that their ability can no longer be changed through practice and effort, this might explain the decrease in task orientation.

There was also a decrease in ego orientation. Given that a complete differentiation between effort and ability, which is linked to the cognitive development of ego orientation, takes place around the age of 12 (Nicholls, 1989) or even at an earlier age (Fry & Duda, 1997; Smith et al.,2009), the decrease in ego orientation is not

surprising. With respect to young participants, they tend not to have fully differentiated the concepts of ability, luck, and effort, which can result in them reporting inflated ego goal orientation. One reason for this might be that they do not yet consistently distinguish between items such as "I feel most successful when I am the best" versus "I feel most successful when doing my best." Comparing the general mean levels in goal orientations over the six measurements (see Table 1) provides no findings for inflated ego orientations. In regard to that younger participants tend not to have fully differentiated the concepts of ability; this is also why they tend to have correlated goal orientations. Findings from the correlational analysis (see Table 2) show statistically significant relationships between task- and ego orientation at *T*3, *T*4, and *T*6. Thus, with no inflated ego orientations and correlated goal orientations on only 50 percent of the measurements, the change in ego goal orientation found in this study may be representing the cognitive development of differentiating the concepts of ability. Similar age-related decreases have been reported in American student-athletes' ego orientation towards their sport (Boyce et al., 2009; Smith et al., 2009), as well as in Greek junior high school students' ego orientation towards PE (Barkoukis et al., 2010). An explanation for the decrease in ego orientation could also be the incompatibility between goal orientation and perceived motivational climate. Similar results have been supported both in sport (Boyce et al., 2009) and in PE (Gano-Overway & Ewing, 2004), where student-athletes who had a high ego orientation and a perceived low ego-involving motivational climate experienced a decrease in their ego orientation. However, in our study, the mean scores for perceived ego-involving motivational climates regarding all social agents measured (see Table 1) increased over the three-year period.

The focus of achievement goal theory, as originally conceptualized by Nicholls (1984, 1989), was to ascertain what features influence the quantity and quality of achievement striving over time. An explanation to the decreases in both orientations could be that the student-athletes, over time, found less answers (both task-oriented and ego-oriented) to the question, what does it take to be successful here? In other words, they became less motivated.

Our findings revealed a positive within-person relationship between perceived task-involving peer climate and task orientation. However, no significant within-person relationship was found between perceived task-involving coach- and parental climate and task orientation. In line with previous research, the social influence from peers becomes more important for adolescents than for children (e.g., Chan et al., 2012; Keegan et al., 2009, 2010, 2014). Perhaps, peers deliver a higher frequency of task-related reinforcements and contribute more to the element of learning during a training day/week/period than coaches or parents do, and these situational task-related cues thereby affect their task orientation. Another explanation could be that peers offer substantial social support throughout the students' athletic career (see Keegan et al., 2014). Further possible influences on the student athletes' task orientation can be taken from the findings of Keegan et al. (2010, 2014) regarding the peer-specific theme "peer collaboration and altruistic behaviours" in the specialization stage and, more specifically, the emergent categories "emphasizing effort" (i.e., de-emphasize results or even performance failures and, instead, encourage effort and participation or remain patient while a peer attempts to master a skill) and "collaborative learning" (i.e., offering help and advice, practice together extra in their spare time).

Our findings revealed a positive within-person relationship between perceived ego-involving coach climate and ego orientation. However, no significant within-person relationship was found between perceived ego-involving peer- and parental climate and ego orientation. In previous research, coaches and parents have appeared to dominate the authority climate, but the influence of parents reduces significantly between the specialization and investment-mastery stages (Keegan et al., 2010, 2014). Our result is not surprising since coaches have the highest authority on the team or training group; therefore, their decisions and behaviours

could be the cause, for specializing athletes, to focus more on success via normative comparisons. Trying to determine whether ego orientation was best predicted by the coach, PE teacher, or by parents, White et al. (1998) found that the perception of an ego-involving coach climate emerged as the major positive predictor of ego orientation in youth sport athletes in the age range of 10 to 14 years, thus supporting our findings. Other explanations to why, in this study, the ego-involving motivational climate created by coaches had the only statistically significant relationship with ego orientation could be found in the coach-specific themes that emerged from Keegan et al. (2010), studying young specializing athletes. Along with tasks focusing on results and normative evaluation, any perceived favouritism or unfair treatment on the part of the coach – the highest authority figure – could be an important motivational cue influencing young athletes' ego orientation.

Our findings revealed not statistically significant within-person effects between parents and goal orientations. These findings are surprising since they contradict previous research in the same age range (e.g., White et al., 1998). However, findings from Keegan et al. (2014) suggest that the role of parents decreased markedly around the transition to investment-mastery, while the role of peers and coaches filled the gap left by parents and gradually increased across the athletic career. Even though the age of our participants should exclude them from being part of the investment-mastery stage (see Keegan et al., 2014; Wylleman et al., 2016), the specializing athletes in Keegan et al.'s (2010) study provided detailed descriptions regarding greater emphasis on skill acquisition, achievement, and competition. This could be consistent with advances into the investment-mastery stage. If applied to the participants in our study, it could explain why there were not statistically significant within-person effects between parents and goal orientations.

One methodological consideration that is important to address is the questions asked in the questionnaires. Since the measurements used to study the perceived motivational climate created by coaches, parents, and peers measured different items regarding the task- and ego-involving climates, this could explain why there were only statistically significant relationships between task-involving peer climate and task orientation and between ego-involving coach climate and ego orientation. In order to overcome such limitation, Chan et al. (2018) developed a psychological measure designed to capture the general types of social influence applicable equally to all important socializing agents.

Another limitation is that the sample consisted of student-athletes participating in different sports with different time aspects regarding their seasons (pre-season, competitive season, and post-season). A distinction between training and competition is recommended (e.g., van de Pol et al., 2012) because different achievement criteria may operate within these contexts. Furthermore, with a larger sample size, it would be of interest to predict the change between waves. Further examining of the similarities and differences between cohorts (e.g., by studying the moderating role of competence between achievement goals and perceived motivational climate) might further develop our knowledge about achievement motivation in youth sport.

CONCLUSION

Our findings revealed developmental trajectories regarding task- and ego-oriented goals that decreased during early adolescence. Furthermore, our findings showed that task-involving peer climate had a positive within-person effect on task-orientation and that ego-involving coach climate had a positive within-person effect on ego-orientation. Learning from our findings, we suggest increased awareness about the developmental, environmental, and individual aspects of achievement motivation. Developing an increased and deepened understanding of how youth athletes feel successful within sport and an understanding of how

feelings can change over time is valuable to enhance effectiveness of interventions regarding involvement in youth sport.

REFERENCES

Ames, C. (1992). Achievement goals, motivational climate, and motivational processes. In G. C. Roberts (Ed.), Motivation in Sport and Exercise (pp. 161–176). Champaign, IL: Human Kinetics.

Barkoukis, V., Ntoumanis, N., & Thøgersen-Ntoumani, C. (2010). Developmental changes in achievement motivation and affect in physical education: Growth trajectories and demographic differences. Psychology of Sport and Exercise, 11(2), 83–90. https://doi.org/10.1016/j.psychsport.2009.04.008

Biddle, S., Wang, C. J., Kavussanu, M., & Spray, C. (2003). Correlates of achievement goal orientations in physical activity: A systematic review of research. European Journal of Sport Science, 3(5), 1–20. https://doi.org/10.1080/17461390300073504

Boyce, B. A., Gano-Overway, L. A., & Campbell, A. L. (2009). Perceived motivational climate's influence on goal orientations, perceived competence, and practice strategies across the athletic season. Journal of Applied Sport Psychology, 21(4), 381–394. https://doi.org/10.1080/10413200903204887

Chan, D. K., Keegan, R. J., Lee, A. S. Y., Yang, S. X., Zhang, L., Rhodes, R. E., & Lonsdale, C. (2018). Towards a Better Assessment of Perceived Social Influence: The Relative Role of Significant Others on Young Athletes. Scandinavian Journal of Medicine & Science in Sports. https://doi.org/10.1111/sms.13320

Chan, D. K., Lonsdale, C., & Fung, H. H. (2012). Influences of coaches, parents, and peers on the motivational patterns of child and adolescent athletes. Scandinavian Journal of Medicine & Science in Sports, 22(4), 558–568. https://doi.org/10.1111/j.1600-0838.2010.01277.x

Côté, J., Baker, J., & Abernethy, B. (2003). From play to practice: A developmental frame- work for the acquisition of expertise in team sports. In J.L. Starkes & K.A. Ericsson (Eds.), Recent advances in research on sport expertise (pp. 89–110). Champaign, IL: Human Kinetics.

Duda, J. L., & Nicholls, J. G. (1992). Dimensions of achievement motivation in schoolwork and sport. Journal of Educational Psychology, 84(3), 290-299. https://doi.org/10.1037//0022-0663.84.3.290

Fry, M. D., & Duda, J. L. (1997). A developmental examination of children's understanding of effort and ability in the physical and academic domains. Research Quarterly for Exercise and Sport, 68(4), 331–344. https://doi.org/10.1080/02701367.1997.10608014

Gano-Overway, L. A., & Ewing, M. E. (2004). A longitudinal perspective of the relationship between perceived motivational climate, goal orientations, and strategy use. Research Quarterly for Exercise and Sport, 75(3), 315–325. https://doi.org/10.1080/02701367.2004.10609163

García-Calvo, T., Leo, F. M., Gonzalez-Ponce, I., Sánchez-Miguel, P. A., Mouratidis, A., & Ntoumanis, N. (2014). Perceived coach-created and peer-created motivational climates and their associations with team cohesion and athlete satisfaction: evidence from a longitudinal study. Journal of Sports Sciences, 32(18), 1738–1750. https://doi.org/10.1080/02640414.2014.918641

Harwood, C. G., Keegan, R. J., Smith, J. M., & Raine, A. S. (2015). A systematic review of the intrapersonal correlates of motivational climate perceptions in sport and physical activity. Psychology of Sport and Exercise, 18, 9–25. https://doi.org/10.1016/j.psychsport.2014.11.005

Heck, R. H., & Thomas, S. L. (2015). An introduction to multilevel modeling techniques: MLM and SEM approaches using Mplus. Routledge. https://doi.org/10.4324/9781315746494

Ingrell, J., Johnson, U., & Ivarsson, A. (2018). Developmental changes in burnout perceptions among student-athletes: An achievement goal perspective. International Journal of Sport and Exercise Psychology. https://doi.org/10.1080/1612197x.2017.1421679

Ingrell, J., Larneby, M., Johnson, U., & Hedenborg, S. (2019). Student-athletes' belief about athletic ability: A longitudinal and mixed-method gender study. Scandinavian Sport Studies Forum, 10, 117-138.

Keegan, R. J., Harwood, C. G., Spray, C. M., & Lavallee, D. E. (2009). A qualitative investigation exploring the motivational climate in early career sports participants: Coach, parent and peer influences on sport motivation. Psychology of Sport and Exercise, 10(3), 361–372. https://doi.org/10.1016/j.psychsport.2008.12.003

Keegan, R. J., Spray, C. M., Harwood, C. G., & Lavallee, D. E. (2010). The motivational atmosphere in youth sport: Coach, parent, and peer influences on motivation in specializing sport participants. Journal of Applied Sport Psychology, 22(1), 87–105. https://doi.org/10.1080/10413200903421267

Keegan, R. J., Spray, C. M., Harwood, C. G., & Lavallee, D. E. (2014). A qualitative synthesis of research into social motivational influences across the athletic career span. Qualitative Research in Sport, Exercise and Health, 6(4), 537–567. https://doi.org/10.1080/2159676x.2013.857710

Little, R. J. (1988). A test of missing completely at random for multivariate data with missing values. Journal of the American Statistical Association, 83(404), 1198–1202. https://doi.org/10.1080/01621459.1988.10478722

Maas, C. J., & Hox, J. J. (2005). Sufficient sample sizes for multilevel modeling. Methodology: European Journal of Research Methods for the Behavioral and Social Sciences, 1(3), 86–92. https://doi.org/10.1027/1614-2241.1.3.86

Muthén, L. K., & Muthén, B. O. (1998–2015). Mplus User's guide (7th ed.). Los Angeles, CA: Muthén & Muthén.

Nicholls, J. G. (1989). The competitive ethos and democratic education. Cambridge, MA: Harvard University Press.

Ntoumanis, N., Taylor, I. M., & Thøgersen-Ntoumani, C. (2012). A longitudinal examination of coach and peer motivational climates in youth sport: Implications for moral attitudes, well-being, and behavioral investment. Developmental Psychology, 48(1), 213-223. https://doi.org/10.1037/a0024934

Ntoumanis, N., & Vazou, S. (2005). Peer motivational climate in youth sport: Measurement development and validation. Journal of Sport and Exercise Psychology, 27(4), 432–455. https://doi.org/10.1123/jsep.27.4.432

Raftery, A. E. (1995). Bayesian model selection in social research. Sociological Methodology, 25, 111–163. https://doi.org/10.2307/271063

Raudenbush, S. W., & Bryk, A. S. (2002). Hierarchical linear models: Applications and data analysis methods. Thousand Oaks, CA: Sage Publication.

Roberts, G. C. (2012). Motivation in sport and exercise from an achievement goal theory perspective: After 30 years, where are we? In G. C. Roberts & D. C. Treasure (Eds.) Advances in Motivation in Sport and Exercise (3rd ed., pp. 5–58). Champaign, IL: Human Kinetics.

Robert, G. C., & Treasure, D. C. (1992). Children in sport. Sport Science Review, 2, 46–64.

Roberts, G. C., Treasure, D. C., & Balague, G. (1998). Achievement goals in sport: The development and validation of the Perception of Success Questionnaire. Journal of Sports Sciences, 16(4), 337–347. https://doi.org/10.1080/02640419808559362

Singer, J. D., & Willett, J. B. (2003). Applied longitudinal data analysis: Modeling change and event occurrence. New York, NY: Oxford university press.

Smith, R. E., Cumming, S. P., & Smoll, F. L. (2008). Development and validation of the motivational climate scale for youth sports. Journal of Applied Sport Psychology, 20(1), 116–136. https://doi.org/10.1080/10413200701790558

Smith, R. E., Smoll, F. L., & Cumming, S. P. (2009). Motivational climate and changes in young athletes' achievement goal orientations. Motivation and Emotion, 33(2), 173–183. https://doi.org/10.1007/s11031-009-9126-4

Steinberg, G., Grieve, F. G., & Glass, B. (2001). Achievement goals across the lifespan. Journal of Sport Behavior, 24(3), 298–306.

Støckel, J. T., Strandbu, Å., Solenes, O., Jørgensen, P., & Fransson, K. (2010). Sport for children and youth in the Scandinavian countries. Sport in Society, 13(4), 625-642. https://doi.org/10.1080/17430431003616332

van de Pol, P. K., Kavussanu, M., & Ring, C. (2012). Goal orientations, perceived motivational climate, and motivational outcomes in football: A comparison between training and competition contexts. Psychology of Sport and Exercise, 13(4), 491–499. https://doi.org/10.1016/j.psychsport.2011.12.002

Vazou, S., Ntoumanis, N., & Duda, J. L. (2006). Predicting young athletes' motivational indices as a function of their perceptions of the coach-and peer-created climate. Psychology of Sport and Exercise, 7(2), 215–233. https://doi.org/10.1016/j.psychsport.2005.08.007

Vazou, S., Ntoumanis, N., & Duda, J. L. (2005). Peer motivational climate in youth sport: A qualitative inquiry. Psychology of Sport and Exercise, 6(5), 497–516. https://doi.org/10.1016/j.psychsport.2004.03.005

White, S.A. (1996). Goal orientation and perceptions of the motivational climate initiated by parents. Pediatric Exercise Science, 8: 22–129. https://doi.org/10.1123/pes.8.2.122

White, S. A., & Duda, J. L. (1993). The relationship between goal orientation and parent-initiated motivational climate among children learning a physical skill. In Paper presented at the 8th world meeting for the International Society for Sports, Psychology, Lisbon, Portugal.

White, S. A., Kavussanu, M., & Guest, S. M. (1998). Goal orientations and perceptions of the motivational climate created by significant others. European Journal of Physical Education, 3(2), 212–228. https://doi.org/10.1080/1740898980030209

Wylleman, P., Rosier, N., & De Knop, P. (2016). Holistic Perspective on the Development of Elite Athletes. Sport and Exercise Psychology Research: From Theory to Practice, 270–288. https://doi.org/10.1016/b978-0-12-803634-1.00013-3

