

## Effects of a one-year coaching educational program on athlete perception of the coach–athlete working alliance

FRODE MOEN<sup>1</sup>, JAN ARVID HAUGAN<sup>2</sup>, MAJA OLSEN<sup>3</sup>, JOHN ANDERS BJØRKØY<sup>4</sup>

<sup>1,2</sup>Department of Education and Lifelong Learning, Norwegian University of Science and Technology, NORWAY

<sup>1,3</sup>Centre for Elite Sports Research, Department of Neuromedicine and Movement Science, Norwegian University of Science and Technology, NORWAY

<sup>4</sup>The Norwegian Centre for Elite Sports, NORWAY

Published online: May 31, 2021

(Accepted for publication May 15, 2021)

DOI:10.7752/jpes.2021.03178

### Abstract

The current study investigated the possible effects on athletes in a variety of sports of a one-year coaching educational program based on formal mentoring on their perceptions of the coach–athlete working alliance and their perceived performance development in their sports. The study also investigated if the athletes' perceptions of their coaches' communication skills and their performance development during the one year could predict their perceptions of their working alliances with their coaches. The current study did not find any significant results from the coaching educational program regarding their perceptions of their coach–athlete working alliance and the three dimensional bond, goals, or tasks nor their perceptions of their performance development. However, the results showed that attending and influencing skills in communication uniquely predict the variance in the coach–athlete working alliance and the bond, goal, and task dimensions. The results also showed that their performance development can uniquely predict all variables except for the bond dimension. The results are discussed in terms of applied implications and possible future research.

**Keywords:** coach education, working alliance, sport, coach–athlete relationship

### Introduction

Coach education in sport is supposed to provide the necessary knowledge and skills for coaches who attend coaching education programs (Bennie & O'Connor, 2011). The main purpose of providing knowledge and skills through coach education is to make coaches more effective in their roles (Côté & Gilbert, 2009). Importantly, in the coach–athlete relationship, the role of coaches is to assist their athletes as athletes seek and expect to receive assistance from their coaches to improve their learning (Langan, Blake, & Lonsdale, 2013). Therefore, the coach–athlete relationship in sport is defined as a helping relationship (Becker, 2009). The main task for coaches is to help their athletes to improve in their sports through teaching sport-specific strategies while also ensuring their well-being through education of general life skills (Gould, Collins, Lauer, & Chung, 2007). Thus, coaching in sport involves a practical element in which coaches need to apply the knowledge and skills they might gain from education to their coaching practices. Scientific studies that investigate the effects of coach educational programs on their athletes are therefore needed in sports science (Langan, et al., 2013).

#### *Coaches' responsibilities in sports*

Research within sports science claims that sport coaches have a special responsibility to establish effective relationships (Becker, 2009), to provide useful knowledge, to be a reflective practitioner, and to adjust their coaching indifferent contexts (Cote & Gilbert, 2009). The ability to create and maintain effective relationships with their athletes is a coaching skill that is defined as interpersonal competence that was highlighted by Cote & Gilbert (2009) in their integrative definition of coaching effectiveness. Useful knowledge for coaches includes knowledge of the sport sciences, sport-specific knowledge, pedagogical knowledge, and procedural knowledge (Abraham, Collins, & Martindale, 2006). Each domain is key among coaches to provide relevant knowledge to their athletes to develop their sport-specific skills and capacities. Intrapersonal knowledge refers to coaches' understanding of their self and their ability for introspection and reflection. This ability makes coaches able to be reflective practitioners in their partnerships with their athletes and their coaching staff (Knowles, Tyler, Gilbourne, & Eubank, 2006). Coaches' ability to adjust their behaviours to different contexts refers to effective integration of coaching and contexts, in general, by providing effective coaching approaches for different age and development levels. Thus, effective coach education should provide coaches with knowledge and skills that are necessary to build strong relationships with their athletes and to provide them with knowledge that is essential for positive athlete outcomes in different coaching contexts (Cote & Gilbert, 2009). The relational aspect of the coaching process in sport and the coaches' ability to influence athletes' learning of

sport-specific knowledge and skills, are therefore key to an effective coach–athlete relationship in sports (Gilbert & Côté, 2013; Jowett & Poczwadowski, 2007).

#### *Coaching influence on athletes' learning and development*

Because coaches in sport have ongoing interactions with their athletes, often on a daily basis over several years, they have the potential to significantly influence the development of their athletes (Conroy & Coatsworth, 2004). Not surprisingly, coaches are therefore key to explaining the well-being of their athletes and their athletic successes (Blom, Watson, & Spadaro, 2010; Jowett & Cockerill, 2003; Moen & Federici, 2017). Coaches are also key to explaining other athletic outcomes, such as improvements in learning, personal treatment, psychological effects, team cohesion, and motivation (Gearity & Murray, 2011; Jones, Armour, & Potrac, 2004; Jowett, 2003; Olympiou, Jowett, & Duda, 2008). Thus, the coach–athlete relationship in sports is considered one of the most crucial determinants of an athlete's motivation, satisfaction, and subsequent sport performance (Mageau & Vallerand, 2003). Importantly, a coaching educational program only fulfils its purpose if the athletes in the helping relationship find that their coaches are effective in their coaching practices.

#### *Coach–athlete working alliance inventory (CAWAI)*

Interestingly, a Coach–Athlete Working Alliance Inventory (CAWAI) has been developed and tested in a sport setting to measure the effectiveness of the coach–athlete relationship (Moen, Hrozanova, & Stenseng, 2019). The CAWAI is based on the well-documented Working Alliance Inventory (WAI) scale that measures the effectiveness of helping relationships between a therapist and a client in clinical psychology (Ivey, Ivey, & Zalaquett, 2014). The CAWAI defines the effectiveness of the coach–athlete relationship based on three dimensions: 1) bond, 2) goal, and 3) task (Moen, et al., 2019). The bond dimension defines the genuine interest athletes experience from their coaches when they are directly working with their coaches and the mutual trust that is established in the relationship (Gilbert, 2017). The bond dimension represents the relational dimension in the coach–athlete relationship and seems to be influenced by a coaches' ability to ask open-ended questions and their listening skills. The ability to ask open-ended questions and actively use listening skills is defined as attention skills in communication (Ivey, Andrea, & Ivey, 2012). This practice is essential to stimulate an athlete's feelings that they are being heard and understood by their coaches (Moen, Olsen & Bjørkøy, 2021). The second area of the inventory, the goal dimension, defines the mutual agreement between coaches and athletes relevant to the goals athletes aim to achieve in their sports (Raanes, Hrozanova, & Moen, 2019). The third area, task dimension, defines the mutual agreement between coaches and their athletes regarding the necessary tasks to accomplish goals and the degree in which the agreed upon tasks actually assists in goal achievement (Moen, Hrozanova & Myhre, 2017). Both the goal and task dimensions are related to an athlete's learning and development relevant to performance outcomes.

Coaches often need to influence the athletes' motivation and behaviours to help them to achieve changes. This motivation is defined as influencing skills in communication (Gyllensten & Palmer, 2007; Hargie, 2011). The goal of motivation and influence is to increase awareness regarding highly relevant tasks and actions that need to be improved to achieve goals. Powerful questions that reveal both conscious and unconscious information that is highly relevant for sport-specific improvements and that do not hamper the relationship bond is an advanced, important skill within communication (Moen, et al., 2019). Typical influencing skills include techniques, such as interpretation, confrontation, direct advice, recommendations, and instructions (Hargie, 2011). Thus, the CAWAI measures the relational aspect of the coaching process through the bond dimension and the coach's ability to influence athletes' learning and development of sport-specific knowledge and skills through the goal and the task dimension.

#### *Coaching educational programs and effects*

Not surprisingly, coach education is claimed to be key to increase the quality of coaches (Jones, Morgan, & Harris, 2012); thus, several countries have invested substantial resources into coaching educational programs (Araya, Bennie, & O'Connor, 2015; De Bosscher, et al., 2009). However, findings have claimed that formal coaching educational programs are rarely useful for coaches (Cushion, Armour, & Jones, 2003; Mallett, Trudel, Lyle, & Rynne, 2009; Piggott, 2012) and the impact from such programs have been found to be limited (Chesterfield, Potrac, & Jones, 2010; Lemyre, Trudel, & Durand-Bush, 2007; Wright, Trudel, & Culver, 2007). A recent review of the effectiveness of interpersonal coach education intervention on athlete outcomes also claimed that research cannot draw firm conclusions regarding the effectiveness of coach education intervention (Langan, et al., 2013). One plausible argument that is used to explain why limited conclusions can be drawn from research on coach education is that many coach education interventions lack a theoretical basis. Thus, future coach education interventions should be theory-driven, and effects should be explored and tested based on theoretical explanations of coach education.

Research claims that coach learning is driven mainly by non-formal or informal sources (Lemyre, et al., 2007; Côté, 2006). Non-formal sources of learning include those that are acquired outside of the formal academic system and are not strictly governed by quality demands from an official curriculum (Nelson, Cushion, & Potrac, 2006). Informal sources of learning are found in a variety of contexts, such as one's reflections upon

his or her own experiences, observation of other coaches, books, information found on the internet, and discussions with other coaches or professionals, all which can ultimately develop a coach's competencies (Nash & Sproule, 2011). Thus, coaches mainly acquire knowledge and skills in their coaching practices based on their own experience and by sharing experiences with other coaches.

Coach educational programs that are based on official academic quality demands offered by an institution are defined as formal sources of learning (Nelson, et al., 2006). Interestingly, research claims that the main argument for why coaching educational programs have limited effects on coaching practices is that they too often are based on formal sources of learning. However, mentoring has recently been suggested as a potential coaching developmental tool (McQuade, Davis, & Nash, 2015). Mentoring is the process of receiving guidance and support by a more experienced person who serves as a mentor (Jones, 2013). Mentoring programs can be executed both informally and formally. Thus, to succeed with coaching educational programs, they might be achieved through pedagogical approaches that actively involve coaches that involve sharing experiences with a more experienced person (McQuade, et al., 2015).

#### *Current study*

Based on the theoretical arguments of the current study, it is expected that an effective coaching educational program has a significant positive impact on athlete perception of the coach-athlete working alliance with their coaches through the dimensions of bond, goal, and task and their perception of their own performance development. It is also expected that athletes' perceptions of their coaches' communication with respect to attending and influencing skills predict perceptions of the coach-athlete working alliance. Additionally, because performance development is key in competitive environments, it is expected that athletes who have positive performance development evaluate their coaches more favourably than athletes who struggle. Research suggests that experimental designs and inclusion of athlete perspectives are needed for interventions that investigate the effects of coaching educational programs (Langan, et al., 2013; Moen, et al., 2021). The current study thus aimed to investigate the possible effects on athletes from a one-year coaching educational intervention based on a formal mentoring program. The research herein considered the following hypothesis:

- H1: The coaching educational program will improve athletes' perception of their coach-athlete working alliances through the dimensions bond, goal, and task.
- H2: The coaching educational program will improve athletes' perception of their performances as athletes.
- H3: Athletes' perceptions of their coaches attending and influencing skills will positively predict the coach-athlete working alliance dimensions of bond, goal, and task.
- H4: Athlete performance development will positively predict their perception of their coach-athlete working alliances through the dimensions of bond, goal, and task.

#### **Methods**

The Norwegian Social Science Data Services (NSD), which is the research ethics board for social sciences in Norway, approved this study. In the current study, talented coaches for elite athletes were invited to participate in a two-year coaching educational program arranged by the Norwegian Olympic Sports Center, which is a national organization that is part of the Norwegian Olympic and Paralympics Committee and Confederation of Sports. The Norwegian Olympic and Paralympics Committee and Confederation of Sports is the main responsible political governing body of all sports in Norway, and the Norwegian Olympic Sports Centre has the authority and responsibility to develop Norwegian elite sports.

#### *Participants*

Coaches in all parts of Norway were openly invited by the Norwegian Olympic Sports Centre to apply for the program. The coaches who applied for the program had to be prioritized by their sport federations and preferably be 30 years or younger to be selected to participate in the program. Based on the invitation, a total of 185 coaches applied for the coaching educational program from all over Norway. In all, 109 coaches were selected to participate, and all the coaches were invited to participate in the current study together with their athletes. Prior to the beginning of the study, the participating coaches and their athletes received information by email about the study. Of the 109 coaches, 107 accepted the invitation to participate, and a total number of 734 athletes were invited to participate in the study. Of the 734 athletes who were invited to participate, 443 athletes accepted. The current study is part of a larger data collection (Moen, et al., 2021) and focused only on the athletes whose coaches took part in the study. The athletes had a mean age of 20 years (ranging from 14 to 33 years). The athletes practiced a variety of sports ( $N > 30$ ) including both team and individual sports, although nearly half of them practiced either cross-country skiing (16.9%), handball (14.2%), biathlon (10.6%), soccer (8.1%) or swimming (7.9%). Seventy seven percent of the athletes had ambitions to become future elite athletes in their sports, whereas 22.6% had no such ambitions.

#### *Pre-test/post-test control group design*

The coaching educational program of the current study was carried out through individual mentoring of the coaches in the experiment group (Moen, et al., 2021). Twenty-six coaches who had several years of

experiences with elite sports were recruited to serve as mentors for the coaches in the experiment group. The recruiting was based on an evaluation of relevant experience and competence within mentoring, which was carried out by the Norwegian Olympic Sports Centre. The recruited mentors had to complete an educational program that focused on mentoring, which was carried out by the Norwegian University of Science and Technology (Moen, et al., 2021). The program was based on theoretical, practical, and research-based knowledge about mentoring, and the approach was coach and athlete centred (Lefebvre, Bloom, & Loughead, 2020; Nelson, Cushion, Potrac, & Groom, 2014). The program especially focused on the importance of attending skills, such as the ability to ask open-ended questions and engage in active listening in which the coaches' own experiences, reflections, and self-determination were influenced. The educational program was carried out over four educational meetings with each lasting two full days, and individual lessons that the mentors had to complete at each meeting. The mentors also attended four team meetings lead by a superior mentor, where sharing of experiences and competence was the focused. The education program was completed with a final written exam.

The group of mentors were then divided into nine groups, each from nine different regions in Norway and with 2–5 mentors in each group, whereas each group had the responsibility for five to ten coaches in each region. The mentors were instructed to complete at least ten individual consultations with their coaches based on the principles from their own education and observe them in training and competition situations. Each mentor had the responsibility for one to four coaches in the program. Thus, the coaching educational program was based on athlete-centred values, where the social process of coaching was the focus, such as how to communicate to empower the athlete and use the athletes' own experiences in the development process. Thus, the coaching educational program in the current study was sanctioned, managed, and structured by an organization and was therefore defined as a formal mentoring program (McQuade, et al., 2015).

#### *Instruments*

To investigate if the one-year coaching educational intervention consisting of a formal mentoring program affected the athletes, the current study included variables that measured the athletes' perceptions of the coach–athlete working alliance, the athletes' perceptions of the coaches' communication skills and the athletes' perceptions of their own performances. The measurements were based on previously developed scales proven to hold satisfactory validity and reliability (Moen, et al, 2021; Moen, et al, 2019). The measurements were all in Norwegian and are described below in more detail.

*The Coach–Athlete Working Alliance Inventory (CAWAI).* The athletes' perceptions of their coach–athlete working alliances were measured using the Coach–Athlete Working Alliance Inventory (CAWAI). The CAWAI was recently validated for the sport context and measures the three different subscales of bond, goal, and task in coach–athlete working alliance (Moen, et al, 2019). Bond measures the personal bond and trust between the coach and the athlete, while the goal scale measures the agreement between the coach and the athlete concerning goals. The task scale measures the agreement between the coach and the athlete concerning the tasks that are chosen to achieve the defined goals. Each subscale has four corresponding items relating to the bond, e.g., “there is mutual trust between the coach and athlete”, to the goal, e.g., “the coach and athlete are working on mutually agreed upon goals”, and to the task, e.g., “there is agreement about the steps taken to help improve the athlete's performance”. The athletes were asked to respond on a 7-point scale ranging from (1) never to (7) always, indicating to what degree the statement applied to them concerning their perception of the relationship they have with their coaches. The Cronbach's alphas for each subscale were 0.88/0.88 (bond), 0.58/0.66 (goal), 0.88/0.86 (task), and for the complete measurement, 0.84/0.86, at the pre-test and post-test, respectively.

*The coach competence scale.* The coach competence scale was originally developed to measure coaches' communication skills (Moen & Federici, 2011, 2012). The scale measures athletes' perceptions of their coaches' communication skills. In the current study, two dimensions of the coach competence scale were used to measure the athletes' perceptions of their coaches' attending and influencing skills during communication (Moen & Federici, 2011, 2012). Each subscale has three corresponding items relating to attending skills, e.g., “My coach shows that he/she really understands me when we have conversations.”, and influencing skills, e.g., “My coach challenges me positively by his/her questions.”. The athletes responded to the question “Based on your knowledge and experience about your coach, consider to what degree the statements below match your opinion?”. The response was given on a 7-point scale ranging from 1 (not at all) to 7 (absolutely). Cronbach's alphas for each dimension were 0.85/0.85 (attention skills) and 0.83/0.86 (influencing skills) for the pre-test and post-test, respectively.

*The Perceived Athlete Performance (PAP).* An adjusted version of the individual performance from the Athlete Satisfaction Questionnaire was used to measure the athletes' perceived satisfactions with their own performance development in their sports (Riemer & Toon, 2001). This subscale seeks to measure the perceived satisfaction with progress in one's own task performance. Task performance includes a perception of absolute performance, improvements in performance, and goal achievement. An example of an item is: “I am satisfied with the degree to which I have reached my performance goals during the season.”. The athletes were asked to consider four items and how satisfied they were with their own progress as athletes in their sports during the last

year on a 7-point scale ranging from 1 (not at all satisfied) to 7 (extremely satisfied). The Cronbach's alphas for the scale were 0.94/0.92 for the pre-test and post-test, respectively.

*Performance group.* The PAP score on the post-test was used to subtract the PAP score on the pre-test to calculate if the athletes perceived that they had performance development during the year of the experiment or not. A group variable was calculated to document the group of athletes who had positive performance development and the group of athletes who had negative performance development.

*Data analysis procedures*

Composite scores for each of the included questionnaires and their respective subscales were calculated according to their relevant scoring manuals. Then, preliminary analyses were conducted to ensure no violation in the assumptions of normality, linearity, multi-co linearity, and homoscedasticity. In the current study, data were analysed for 443 athletes at the pre-test and 228 athletes at the post-test. Descriptive statistics for the CAWAI-bond, CAWAI-goal, CAWAI-task, CAWAI-sum, attention skills, influencing skills, and PAP, such as the statistical means, standard deviations, and maximum and minimum values, were analysed as well as a Pearson correlation analysis of these variables.

To test the hypothesis in the current study, a data analysis procedure with these variables was conducted. To test hypotheses 1 and 2 of whether or not the coaching educational program improved the athletes' perception of their coach-athlete working alliances with their coaches through the dimensions of bond, goal and task and their perception of their performances as athletes, descriptive statistics, including statistical means and standard deviations to measure the investigated variables, were carried out for the experimental and control groups, respectively, at each testing time-point. Additionally, paired samples t-tests were applied to test for improvements between the pre-test and post-test in each of the two groups. To investigate whether the athletes who had coaches in the experimental group had significantly improved in terms of the investigated variables, compared to the athletes who had coaches in the control group, a series of five separate hierarchical regression analyses were conducted for each of the dependent variables.

The variables at the post-test were included as dependent variables in the respective order of CAWAI-bond, CAWAI-goal, CAWAI-task, CAWAI-sum, and PAP. In the first step, sex and pre-test scores of the variables were entered simultaneously as covariates to rule out their potential confounding effects. In the second step, the group variable was entered as a dichotomized variable. Then, the coach competence variables were entered in a third step to investigate potential unique effects from the coaches' attending and influencing skills and to investigate hypothesis 3 in this study. Finally, the performance group variable was entered to investigate hypothesis 4 of whether or not changes in the athletes' perceived performance development from pre-test to post-test in their sports uniquely contributed to explain the variance in the dependent variables. The PAP variable was not relevant as a dependent variable for hypotheses 3 and 4; therefore, only the two first steps were conducted to investigate the possible effect from the experiment (hypothesis 2) in the final regression.

**Results**

*Descriptive statistics and bivariate correlations*

Descriptive statistics of the athletes' scores and correlations on the coach-athlete working alliance variables of CAWAI-bond, CAWAI-goal, CAWAI-task, CAWAI-sum, attention skills (AS), influencing skills (IS), and perceived athlete performance (PAP) from the pre-test and post-test are presented in Table 1.

**Table 1**  
Pearson correlation coefficients between the investigated variables and descriptive statistics based on the pre- and post-test for the athletes in the current study (n=443/ n=228)

Variables	1	2	3	4	5	6	7
1 CAWAI-bond	-						
2 CAWAI-goal	.56* / .64*	-					
3 CAWAI-task	.74* / .68*	.63* / .71*	-				
4 CAWAI-sum	.88* / .88*	.83* / .88*	.90* / .89*	-			
5 AS	.68* / .76*	.52* / .67*	.63* / .68*	.69* / .79*	-		
6 IS	.57* / .72*	.48* / .61*	.62* / .68*	.64* / .76*	.75* / .81*	-	
7 PAP	.31* / .25*	.22* / .21*	.36* / .46*	.34* / .38*	.20* / .25*	.21* / .27*	-
Mean	24.45/24.1	22.80/22.29	23.13/22.17	70.38/68.51	18.83/18.47	18.04/17.38	19.75/18.48
SD	3,9/4,1	3,8/3,97	3,83/3,77	10.1/10.5	2,45/2,64	2,68/3,09	4,81/4,73
Maximum	28/28	28/28	28/28	84/84	21/21	21/21	28/28
Minimum	4/5	11/7	4/8	24/23	3/6	4/6	4/4
Cronbach's alpha	.88 / .88	.58 / .66	.88 / .86	.84 / .86	.85 / .85	.83 / .86	.94 / .92

Note: Abbreviations: CAWAI = Coach-Athlete Working Alliance Inventory, PAP = Perceived Athlete Performance, \*p < 0.01

The results from the Pearson correlation analysis shown in Table 1 indicate that were from moderate to strong significant positive intercorrelations between the different dimensions of the coach-athlete working alliance and the total scale (CAWAI-bond, CAWAI-goal, CAWAI-task, CAWAI-sum), both on the pre-test and

post-test. The correlation analysis also shows that there were significant moderate correlations between all the CAWAI dimensions, AS, and IS, both at the pre-test and post-test.

The correlations between all CAWAI dimensions, AS, IS, and PAP were all weak both at the pre-test and post-test, except for the moderate significant correlations between the CAWAI-task and PAP at the post-test. The Cronbach's alpha values of the scales were acceptable and were good both on the pre-test and post-test, except for a poor/questionable Cronbach's alpha for the CAWAI-goal dimension both at pre-test and post-test. Thus, analyses that include the CAWAI-goal dimension should be treated with caution.

#### Paired sample t-test

To test our hypotheses (H1 and H2), a paired samples t-test was conducted on the experiment group (Table 2) and the control group (Table 3). Means, standard deviations, and p-values for the paired samples t-tests for the outcome variables of CAWAI-bond, CAWAI-goal, CAWAI-task, CAWAI-sum, and PAP at pre-test and post-test are provided in Tables 2 and 3.

**Table 2**

Paired sample t-test with mean, standard deviation and p-values for the experiment group at pre-test and post-test (n =57)  
Descriptive statistics (mean and SD) and p-values from the paired sample t-test for the experimental group at the pre-test and post-test (n=149)

Variable	Pre-test		Post-test		p
	Mean	SD	Mean	SD	
CAWAI-bond	24.70	4.23	24.24	3.71	.182
CAWAI-goal	23.03	3.64	22.53	3.69	.154
CAWAI-task	23.15	4.10	22.26	3.34	.014**
CAWAI-sum	70.89	10.45	69.02	9.21	.042**
PAP	19.95	4.84	18.31	4.63	.000*

Note: Abbreviations: CAWAI = Coach–Athlete Working Alliance Inventory, PAP = Perceived Athlete Performance, \*p <0.01, \*\* p <0.05

Overall, the paired sample t-test showed that there was a significant difference in scores for CAWAI-task under the pre-test (M = 23.15, SD = 4.10) and CAWAI-task under the post test (M = 22.26, SD = 3.34) conditions;  $t(148) = 2.50$ ,  $p = 0.014$ , CAWAI-sum under the pre-test (M = 70.89, SD = 10.45) and CAWAI-sum under the post test (M = 69.02, SD = 9.21) conditions;  $t(148) = 2.05$ ,  $p = 0.042$ , and PAP under the pre-test (M = 19.95, SD = 4.48) and PAP under the post test (M = 18.31, SD = 4.63) conditions;  $t(148) = 3.63$ ,  $p = 0.000$  (Table 2). All significant differences were negative.

**Table 3**

Paired sample t-test with mean, standard deviation and p-values for the experiment group at pre-test and post-test (n =57)  
Descriptive statistics (mean and SD) and p-values from the paired sample t-test for the control group at the pre-test and post-test (n=79)

Variable	Pre-test		Post-test		p
	Mean	SD	Mean	SD	
CAWAI-bond	24.36	3.41	23.57	4.86	.106
CAWAI-goal	23.12	3.45	21.80	4.45	.019**
CAWAI-task	23.12	3.60	21.88	4.56	.022**
CAWAI-sum	70.59	9.05	67.25	12.75	.014**
PAP	20.00	4.89	18.71	4.95	.072

Note: Abbreviations: CAWAI = Coach–Athlete Working Alliance Inventory, PAP = Perceived Athlete Performance, \*p <0.01, \*\* p <0.05

The paired sample t-test showed that there was a significant difference in scores for CAWAI-goal under the pre-test (M = 23.12, SD = 3.45) and CAWAI-goal under the post test (M = 21.80, SD = 4.45) conditions;  $t(78) = 2.41$ ,  $p = 0.019$ , CAWAI-task under the pre-test (M = 23.12, SD = 3.60) and CAWAI-task under the post test (M = 21.88, SD = 4.56) conditions;  $t(78) = 2.35$ ,  $p = 0.022$ , and CAWAI-sum under the pre-test (M = 70.59, SD = 9.05) and CAWAI-sum under the post-test (M = 67.25, SD = 12.7) conditions;  $t(78) = 2.54$ ,  $p = 0.014$ . All significant differences were negative. Of the 228 athletes who completed the data collection, 65% of them had negative performance development, while 35% of them had positive performance development.

#### Hierarchical multiple regression

To test the significant differences that were found in the experimental and control groups based on the paired samples t-test, and to determine if the significant effects were effects from the coaching educational program, multiple hierarchical regression analyses were conducted for each of the dependent variables (post-test scores for CAWAI-bond, CAWAI-goal, CAWAI-task, CAWAI-sum, and PAP). The group variable was entered as a dichotomized variable to test possible group effects. The post-test scores for the CAWAI-bond, CAWAI-goal, CAWAI-task, CAWAI-sum, and PAP variables were then entered as the dependent variables in five different regression analyses. Sex and the pre-scores of the dependent variables and the group variable were

entered as independent variables in the regression analyses. To test hypothesis 3, calculated scores of AS (AS-pre + AS-post/2) and IS (IS-pre + IS-post/2) were entered in the analysis. The performance group variable was entered to test hypothesis 4. The results are presented in Table 4.

**Table 4**  
Summary of linear regression analysis of the variables predicting the dependent variables (n = 228)

Dependent variable	Predictors	B	t	p	R <sup>2</sup>
CAWAI- bond- post	Sex	.083	1.657	.099	.50
	CAWAI- bond- pre	.060	.945	.346	
	Group	-.059	-1.181	.239	
	AS	.182	5.623	.000*	
	IS	.176	2.024	.044**	
	Performance group	.013	.269	.788	
CAWAI- goal- post	Sex	-.024	-.455	.649	.45
	CAWAI- goal- pre	.081	1.392	.165	
	Group	-.087	-1.664	.098	
	AS	.442	4.829	.000*	
	IS	.206	2.244	.026**	
	Performance group	.125	2.385	.018**	
CAWAI- task- post	Sex	.032	.617	.538	.46
	CAWAI- task- pre	.054	.875	.383	
	Group	-.044	-.855	.393	
	AS	.431	4.735	.000*	
	IS	.238	2.567	.011**	
	Performance group	.186	3.561	.000*	
CAWAI- sum- post	Sex	.031	.692	.490	.58
	CAWAI- sum- pre	-.037	-.650	.516	
	Group	-.071	-1.570	.118	
	AS	.561	6.883	.000*	
	IS	.260	3.227	.001**	
	Performance group	.110	2.413	.017**	
PAP- post	Sex	-.017	-.270	.787	.09
	PAP-pre	.287	4.470	.000*	
	Group	.037	.567	.571	

Note: Abbreviations: CAWAI = Coach–Athlete Working Alliance Inventory, AS = Attending Skills, IS = Influencing Skills, PAP = Perceived Athlete Performance, \*p < 0.001, \*\*p < 0.01

The results of the regression analyses indicated that the predictor variables explained 50% of the variance (R<sup>2</sup> = 0.50, F(6, 222) = 34.22, p < 0.001 in CAWAI-bond at the post-test, 45% of the variance (R<sup>2</sup> = 0.45, F(6, 222) = 27.79, p < 0.001) in CAWAI-goal at the post-test, 46% of the variance (R<sup>2</sup> = 0.46, F(6, 222) = 28.85, p < 0.001) in CAWAI-task at the post-test, 58% of the variance (R<sup>2</sup> = 0.58, F(6, 222) = 48.12, p < 0.001) in CAWAI-sum at the post-test, and 8% of the variance (R<sup>2</sup> = 0.08, F(6, 222) = 6.85, p < 0.001) in PAP at the post-test.

The group variable did not significantly predict any of the dependent variables that were entered in the five regressions that were conducted in this study. In the first regression analysis, AS (β = .18, p < 0.001) and IS (β = .176, p < 0.05) were the largest contributors of the explained variance in CAWAI-bond at the post-test. In the second regression analysis, AS (β = .44, p < 0.001), IS (β = .21, p < 0.05), and performance group (β = .13, p < 0.05) were the largest contributors of the explained variance in CAWAI-goal at the post-test. In the third regression analysis, AS (β = .43, p < 0.001), IS (β = .24, p < 0.05), and the performance group (β = .19, p < 0.001) were the largest contributors of the explained variance in CAWAI-task at the post-test.

In the fourth regression analysis, AS (β = .56, p < 0.001), IS (β = .26, p < 0.05), and the performance group (β = .11, p < 0.05) were the largest contributors of the explained variance in CAWAI-sum at the post-test. In the fifth regression analysis, PAP-pre-test (β = .29, p < 0.001) was the only contributor of the explained variance in PAP at the post-test. The pre-test scores did not uniquely predict the post-test scores (dependent variables), except for PAP, and sex did not have any significant association with the dependent variables that were entered in the regression analyses.

## Discussion

The current study investigated the effects on athletes from a one-year coaching educational intervention with a formal mentoring program on the athletes' perceptions of the coach–athlete working alliance through the dimensions of bond, goal, and task (CAWAI-bond, CAWAI-goal, CAWAI-task, and CAWAI-sum), the athletes' perceptions of their performances as athletes (PAP). It also investigated whether the athletes' performance

development affects their perceptions of the working alliances with their coaches through the dimensions of bond, goal, and task (CAWAI-bond, CAWAI-goal, CAWAI-task, and CAWAI-sum). The current study also investigated if athletes' perceptions of their coaches attending and influencing skills positively predicted the coach-athlete working alliance dimensions. The hypotheses in this study predicted that the intervention would significantly affect the CAWAI-bond, CAWAI-goal, CAWAI-task, CAWAI-sum, and PAP variables positively, that the AS and IS would positively predict the CAWAI-bond, CAWAI-goal, CAWAI-task, and CAWAI-sum variables, and that the athletes' development predicts their perceptions of the coach-athlete working alliance variables. The main findings of the conducted analyses were: 1) no significant positive effects from the experiment were found on athletes' perceptions of the CAWAI dimensions and their PAP, 2) attending and influencing skills uniquely and significantly predicted the CAWAI dimensions, and 3) the athletes' perceptions of their performance development significantly predicted their perceptions of all the CAWAI dimensions, except for bond. Thus, the hypotheses in the current study were only partially confirmed.

1. *Were the athletes affected by the coaching educational program?*

The results of this study did not show any significant effects of the coaching educational program on the athletes' perceptions of their coach-athlete working alliances nor their perceptions of their own performance development. However, the paired sample t-tests showed that there were significant declines in CAWAI-task, CAWAI-sum, and PAP from pre-test to post-test in the experimental group, and in CAWAI-goal, CAWAI-task, and CAWAI-sum in the control group. The tendency was that the decline was larger in the control group compared to the experimental group. Thus, the investigated variables exhibited negative trends in both groups. One potential explanation of the negative tendency of the investigated variables is that the majority of the athletes in our study have high ambitions, and they needed to believe that their goals are achievable. The majority of the athletes in the current study have ambitions to become future elite athletes (77%). However, the decline in their perceived performances might indicate that their ambitions in reality are unattainable. It is easy for an athlete to set high goals, but it is difficult to be aware of and do the focused work that is necessary to achieve high goals (Ericsson, 2003). The athletes in this study had mean age on 20 years and they might not understand what they need to be aware of and do to progress towards their goals. When they do not progress to achieve their goals, their perceptions of their coach-athlete working alliances decline as a result. Other studies also underline the importance of athletes' outcomes as a critical aspect of considering coaching effectiveness (Cassidy, Potrac, & McKenzie, 2006; Côté & Gilbert, 2009). The key conclusion of these results is that the coaching educational program did not affect the athletes positively. The current result is a big paradox in coaching education because coaching educational programs are supposed to educate coaches and help them to develop their skills and competencies as coaches. Ultimately, the coach-athlete relationship is a helping relationship, where coaches are supposed to help their athletes to achieve their goals.

2. *Communication is the key to the coach-athlete relationship*

The results of the current study also show that athletes' perceptions of their coaches' attending and influencing skills are significant predictors of their perceptions of their coach-athlete working alliances. Attending skills are the largest predictors of all dimensions of the coach-athlete working alliance (CAWAI-bond, CAWAI-goal, CAWAI-task) and the sum variable (CAWAI-sum). Thus, our results indicate that communication is an essential and effective coaching strategy for developing quality coach-athlete relationships. Prior studies also support this claim (Gilbert, 2017, p.78; Moen & Federici, 2011; 2012). Based on this study, attending skills seem to be especially key. Attending skills are communication techniques that influence athletes' feelings of being treated with respect using open questioning and active listening skills. The result of an attending approach is that athletes' perspectives are fully heard and understood by the coach, and trust will be stimulated between athletes and their coaches (Gyllensten & Palmer, 2007). When athletes trust their coaches, they are more willing to share their thoughts and feelings openly and establish a relationship based on mutuality (Moen & Federici, 2013). The coach will then be in possession of more information about the athletes' thoughts and feelings and thus have the opportunity to make better decisions to influence their performance development. However, to influence athletes' motivation, focus, and actions, effective use of influencing skills is essential (Moen, et al., 2021). Our results show that influencing skills are a significant predictor of coach-athlete working alliances and the three dimensions. Thus, the results suggest that attending skills are essential for building a mutual and trustful relationship between athletes and their coaches, whereas influencing skills are essential for helping the athletes to discover new and necessary perspectives related to motivation, focus, and actions. Coaches need both skills to establish effective coach-athlete relationships.

3. *Performance development is key to a successful coach-athlete relationship*

As discussed, the core of the coach-athlete relationship is the role the coach needs to take as an active helper in the coach-athlete relationship. Coaches are expected to help their athletes and the athletes expect to receive help on their paths towards goal achievement. The results show that the performance group variable predicted all dimensions of the coach-athlete working alliance except for the CAWAI-bond dimension. Thus, the perceptions from the athletes who experienced performance enhancements through the experimental period positively predicted the coach-athlete working alliance dimensions of CAWAI-goal, CAWAI-task and CAWAI-sum. In



contrast, the perceptions of the athletes who experienced a decline in their performances through the experimental period negatively predicted the coach–athlete working alliance dimensions of CAWAI-goal, CAWAI-task and CAWAI-sum. These results underline the importance of establishing clear goals and strategies that help athletes towards goal achievements in the coach–athlete relationship. The results also indicate that the combination of attending and influencing skills is key to achieving this. Influencing skills have the highest predictive value amongst the CAWAI dimensions for CAWAI-task (Table 4), which indicate that influencing skills are important for influencing strategic decisions in the dyadic relationship between athletes and coaches. However, the results showed that attending skills are the foundation that the coach–athlete relationship is built upon because the largest predictor of the CAWAI and all three dimensions is attending skills. One possible explanation for why CAWAI-bond was not predicted by the performance group variable might be that it is possible to approach athletes in a respectful and trustful manner but that attending skills alone are not enough to influence athletes’ performance development. Thus, the results indicated that the CAWAI-goal and CAWAI-task dimensions are the key dimensions that are associated with performance development. The results also confirmed recent research, which claimed that performance development is the key purpose of sport coaching (Jowett, 2017a, b).

### **Conclusions**

First, our results showed that although coaches perceive that their coach–athlete working alliances benefit from coaching educational programs (Moen, et al., 2021), this does not necessarily mean that their athletes experience the same effect. Thus, we showed that there were no significant effects from the coaching educational program based on formal mentoring. Future studies should therefore include both coaches and athletes when effects from coaching educational programs are investigated, and ultimately, the athlete should benefit from coaching educational programs. Second, communication is the core of the coach–athlete working alliance, especially attending skills that are important for establishing strong bonds between athletes and their coaches but also influencing skills that enable coaches to influence the motivation, focus, and actions of their athletes. Third, athletes need to experience performance development to establish strong working alliances with their coaches.

### *Theoretical Implications*

These observations have important implications for both theory and practice. From a theoretical perspective, our results provide the first causal evidence regarding the “corrective” role of deliberation in media truth discernment. There has been a spirited debate regarding the role of deliberation and reasoning among those studying misinformation and political thought, but this debate has proceeded without causal evidence regarding the impact of manipulating deliberation on polarization versus correction. To our knowledge, our experiment is the first that enables this to be done and provides clear support for the classical account of reasoning.

### *Limitations and Future Directions*

Although the results are interesting and the strength of the current study is the experimental design that lasted for one year with a control group, it also has several limitations. First, the response rate among the athletes was rather low. The total sample size may have thus influenced the results, and larger response rates are needed for future research. Second, future studies should also include analysis where both indirect and direct relationships between independent variables are included to explain the effect on the dependent variable, such as structural equation modelling (SEM). Third, the collected data was based on self-reporting measures, and it is difficult to determine how these self-reports accurately reflect the variables under study.

### *Practical Implications*

This study indicates that coaches who attend coaching educational programs should include their athletes in their work to develop their coach–athlete working alliances. Coaching education should be a mutual endeavour between coaches and athletes because, ultimately, the athletes should benefit from such programs. Future coaching education should also include a primary focus on training of communication skills, both attending and influencing skills, and highlight the importance of facilitating mastery experiences for their athletes in terms of sport-specific tasks and capacities.

## References

- Abraham, A., Collins, D., & Martindale, R. (2006). The Coaching Schematic: Validation through Expert Coach Consensus. *Journal of Sports Sciences*, 24(6), 549-564.
- Araya, J., Bennie, A., & O'Connor, D. (2015). Understanding Performance Coach Development: Perceptions About a Postgraduate Coaching educational program. *International Sport Coaching Journal*, 2, 3-14.
- Bennie, A., & O'Connor, D. (2011). An effective coaching model: The perceptions and strategies of professional team sport coaches and players in Australia. *International Journal of Sport and Health Science*, 9, 98–104. doi:10.5432/ijshs.201108
- Becker, A. J. (2009). It's not what they do, it's how they do it: Athlete experiences of great coaching. *International Journal of Sports Science & Coaching*, 4(1), 93-119.
- Blom, L., Watson, J., & Spadaro, N. (2010). The impact of a coaching intervention on the coach-athlete dyad and athlete sport experience. *Athletic insight: online journal of sport psychology*, 12.
- Cassidy, T., Potrac, P., & Mckenzie, A. W. (2006). Evaluating and Reflecting upon a Coach Education Initiative: The CoDe of Rugby. *IEEE Transactions on Signal Processing*, 20, 145-161. doi:10.1123/TSP.20.2.145
- Chesterfield, G., Potrac, P., & Jones, R. (2010). “Studentship” and “impression management” in an advanced soccer coach education award. *Sport Education and Society Education and Society*, 15, 299–314. doi:10.1080/13573322.2010.493311
- Conroy, D. E., & Coatsworth, J. D. (2004). The effects of coach training on fear of failure in youth swimmers: a latent growth curve analysis from a randomized controlled trial. *Journal of Applied Developmental Psychology*, 25, 193-214. <https://doi.org/10.1016/j.appdev.2004.02.007>
- Cushion, C. J., Armour, K. M., & Jones, R. L. (2003). Coach education and continuing professional development: Experience and learning to coach. *Quest*, 55, 215–230. doi:10.1080/00336297.2003.10491800
- Côté, J. (2006). The development of coaching knowledge. *International Journal of Sports Science & Coaching*, 1(3), 217–222. doi:10.1260/174795406778604609
- Côté, J., & Gilbert, W. (2009). An integrative definition of coaching effectiveness and expertise. *International Journal of Sports Science & Coaching*, 4(3), 307–323. doi:10.1260/174795409789623892
- De Bosscher, V., De Knop, P., van Bottenburg, M., Shibli, S., & Bingham, J. (2009). Explaining international sporting success: An inter-national comparison of elite sport systems and policies in six countries. *Sport Management Review*, 12, 113–136. doi:10.1016/j.smr.2009.01.001
- Ericsson, K. A. (2003). How the expert performance approach differs from traditional approaches to expertise in sport: In search of a shared theoretical framework for studying expert performance. In K. A. E. J. L. Starkes (Ed.), *Expert performance in sports: Advances in research on sport expertise* (pp. 371–402). Champaign, IL: Human Kinetics.
- Gearity, B. T., & Murray, M. A. (2011). Athletes' experiences of the psychological effects of poor coaching. *Psychology of Sport and Exercise*, 12(3), 213-221. <https://doi.org/10.1016/j.psychsport.2010.11.004>
- Gilbert, W. (2017). *Coaching Better Every Season: A Year-Round Process for Athlete Development and Program Success*. Champaign, IL: Human Kinetics.
- Gilbert, W., & Côté, J. (2013). Defining coaching effectiveness: Focus on coaches' knowledge. In P. Potrac, W. Gilbert, & J. Denison (Eds.), *Routledge Handbook of Coaching* (pp.147–171). Oxon: Routledge.
- Gould, D., Collins, K., Lauer, L., & Chung, Y. (2007). Coaching life skills through football: A study of award-winning high school coaches. *Journal of Applied Sport Psychology*, 19(1), 16–37. <https://doi.org/10.1080/10413200601113786>
- Gyllenstein, K., & Palmer, S. (2007). The coaching relationship: An interpretative phenomenological analysis. *International Coaching Psychology Review*, 2(2), 168-177.
- Hargie, O. D. (2011). *Skilled International Communication* (5<sup>th</sup> ed). London: Routledge.
- Horvath, A. O., & Greenberg, L. S. (1989). Development and validation of the Working Alliance Inventory. *Journal of Counseling Psychology*, 36, 223-233. <http://dx.doi.org/10.1037/0022-0167.36.2.223>
- Ivey, A. E., Andrea, M. J., & Ivey, M. B. (2012). *Theories of counselling and psychotherapy* (7<sup>th</sup> ed). LA: Sage Publications, Inc.
- Jones, J. (2013). Factors influencing mentees' and mentors' learning throughout formal mentoring relationships. *Human Resource Development International*, 16(4), 390–408. doi:10.1080/13678868.2013.810478
- Jones, R. L., Armour, K. M., & Potrac, P. (2004). *Sports coaching cultures: From practice to theory*. Routledge: London, UK.
- Jones, R. L., Morgan, K., & Harris, K. (2012). Developing coaching pedagogy: Seeking a better integration of theory and practice. *Sport Education and Society*, 17(3), 313–329. doi:10.1080/13573322.2011.608936
- Jowett, S. (2003). When the “honeymoon” is over: A case study of a coach-athlete dyad in crisis. *The Sport Psychologist*, 17 (4), 444-460. doi:10.1123/tsp.17.4.444
- Jowett, S. (2017a). At the heart of effective sport leadership lies the dyadic coach-athlete relationship. *Sport and Exercise Psychology Review*, 13(1), 62-64. doi:10.13140/RG.2.1.2427.5449
- Jowett, S. (2017b). Coaching effectiveness: the coach–athlete relationship at its heart. *Current Opinion in Psychology*, 16, 154-158. doi:<https://doi.org/10.1016/j.copsyc.2017.05.006>

- Jowett, S., & Cockerill, I. M. (2003). Olympic medalists' perspective of the athlete-coach relationship. *Psychology of Sport and Exercise, 4*, 313–331. doi:10.1016/S1469-0292(02)00011-0
- Jowett, S., & Poczwadowski, A. (2007). Understanding the Coach-Athlete Relationship. In S. Jowett & D. Lavallee (Eds.), *Social Psychology in Sport* (pp. 3-14). Champaign, IL, US: Human Kinetics.
- Knowles, Z., Tyler G., Gilbourne, D., & Eubank, M. (2006). Reflecting on Reflection: Exploring the Practice of Sports Coaching Graduates. *Reflective Practice, 7*(2), 163-179.
- Langan, E., Blake, C., & Lonsdale, C. (2013). Systematic review of the effectiveness of interpersonal coach education interventions on athlete outcomes. *Psychology of Sport and Exercise, 14*(1), 37-49. <https://doi.org/10.1016/j.psychsport.2012.06.007>
- Lefebvre, J. S., Bloom, G. A., & Loughead, T. M. (2020). A citation network analysis of career mentoring across disciplines: A road map for mentoring research in sport. *Psychology of Sport & Exercise, 49*, 1-11. <https://doi.org/10.1016/j.psychsport.2020.101676>
- Lemyre, F., Trudel, P., & Durand-Bush, N. (2007). How youth-sport coaches learn to coach. *Sport Psychology, 21*, 191–209. doi:10.1123/tsp.21.2.191
- Mageau, G. A., & Vallerand, R. J. (2003). The coach–athlete relationship: a motivational model, *Journal of Sports Science, 21* (11), 883-904. doi:10.1080/0264041031000140374
- Mallett, C. J., Trudel, P., Lyle, J., & Rynne, S. B. (2009). Formal vs. informal coach education. *International Journal of Sports Science & Coaching, 4*, 325–364. doi:10.1260/174795409789623883
- McQuade, S., Davis, L., & Nash, C. (2015). Positioning mentoring as a coach development tool: Recommendations for future practice and research. *Quest, 67*, 317–329. doi:10.1080/00336297.2015.1048810
- Moen, F., & Federici, R. A. (2011). Perceptions of coach competence and perceived need satisfaction: Assessing a Norwegian Coach Competence Scale. *The International Journal of Coaching in Organizations, 8*, 124-138.
- Moen, F., & Federici, R. A. (2012). Perceived leadership self-efficacy and coach competence: Assessing a coaching-based leadership self-efficacy scale. *International Journal of Evidence Based Coaching and Mentoring, 10*(2), 1-16.
- Moen, F., & Federici, R. A. (2013). Coaches' Coaching Competence in Relation to Athletes' Perceived Progress in Elite Sport. *Journal of Education and Learning, 2*(1), 240-252. doi:10.5539/jel.v2n1p240
- Moen, F., & Federici, R. (2017). Can Athlete-Centered Coaching Stimulate Need Satisfaction and Prevent Athlete Burnout? *International Journal of Sport Management, 18*, 1-18.
- Moen, F., Hrozanova, M., & Myhre, K. (2017). The effects of coach-athlete working alliance on affect, worry and performance satisfaction among junior elite athletes. *International Journal of Applied Sport Sciences, 29*(2), 1-15. <https://doi.org/10.24985/ijass.2017.29.2.000>
- Moen, F., Hrozanova, M., & Stenseng, F. (2019). Validating the working alliance inventory as a tool for measuring the effectiveness of coach-athlete relationships in sport, *Cogent Psychology, 6*:1, 1695414. doi:10.1080/23311908.2019.1695414
- Moen, F., Olsen, M., & Bjørkøy, J. A. (2021). Investigating possible effects from a one-year coach-education program, *Sports, 9*(1), 3. <https://dx.doi.org/10.3390/sports9010003>
- Nash, C., & Sproule, J. (2011). Insights into experiences: Reflections of an expert and novice coach. *International Journal of Sports Science & Coaching, 6*, 149–161. doi:10.1260/1747-9541.6.1.149
- Nelson, L. J., Cushion, C. J., & Potrac, P. (2006). Formal, non-formal and informal coach learning: A holistic conceptualization. *International Journal of Sports Science & Coaching, 1*(3), 247–259. doi:10.1260/174795406778604627
- Nelson, L., Cushion, C. J., Potrac, P., & Groom, R. (2014). Carl Rogers, learning and educational practice: Critical considerations and applications in sports coaching. *Sport Education and Society, 19*, 513–531. doi:10.1080/13573322.2012.689256
- Olympiou, A., Jowett, S., & Duda, J. (2008). The psychological interface between the coach-created motivational climate and the coach-athlete relationship in team sports. *Sport Psychologist, 22*(4), 423-438. <https://doi.org/10.1123/tsp.22.4.423>
- Piggott, D. (2012). Coaches' experiences of formal coach education: A critical sociological investigation. *Sport Education and Society, 17*, 535–554. doi:10.1080/13573322.2011.608949
- Raanes, E. F. W., Hrozanova, M., & Moen, F. (2019). Identifying unique contributions of the coach-athlete working alliance, psychological resilience and perceived stress on athlete burnout among Norwegian junior athletes. *Sports, 7*(9), 212. doi:10.3390/sports7090212
- Riemer, H. A., & Toon, K. (2001). Leadership and satisfaction in tennis: Examination of congruence, gender, and ability. *Research Quarterly Exercise and Sport, 72*, 243–256. doi:10.1080/02701367.2001.10608957
- Wright, T., Trudel, P., & Culver, D. (2007). Learning how to coach: The different learning situations reported by youth ice hockey coaches. *Physical Education and Sport Pedagogy, 12*, 127–144. doi:10.1080/17408980701282019