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Harnessing the power of 'us': A randomized wait-list controlled trial of the 5R shared leadership development program (5R^S) in basketball teams

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ABSTRACT

High-quality leadership has been established as a key factor driving a team's competitive advantage. Besides the role of the coach, recent research has emphasized the importance of leadership provided by athletes within a team (i.e., athlete leaders). To unlock the potential benefits of athlete leadership, the development of leaders is therefore essential. The 5R Shared Leadership Program (5R^S) aims to identify promising leaders within a team, on different athlete leadership roles, both on and off the field. After the appointment of the leaders, their identity leadership skills to build and strengthen a sense of 'we' and 'us' are further developed. The design of the present research consisted of a randomized wait-list controlled trial to test the effectiveness of a train-the-trainer approach to develop shared leadership within teams (i.e., 5R^S). We tracked 16 competitive basketball teams throughout a competitive season. While eight teams (four female and four male teams) received 5R^S during the first half of the season (i.e., experimental condition), the other eight teams received 5R^S during the second half of the season (i.e., wait-list control condition). Our findings highlight 5R^S's capacity to develop athlete leaders' ability to create a shared sense of 'us', build a stronger team identification, enhance the available social support in the team, help players to remain motivated and confident in their team's abilities, and nurture players' health. Moreover, 5R^S appeared to achieve this impact by using a train-the-trainer approach, regardless of whether the intervention was delivered during the first or second half of the season, and with generally consistent findings amongst male and female teams. The present study both advances the current field on in-group leadership development, and provides practitioners with guidance on how and when to apply 5R^S with the aim of improving team functioning and athletes' health.

1. Introduction

As leadership is one of the most studied topics in the social sciences (Antonakis et al., 2004), it is no surprise that leadership has also been researched extensively in sports. Here, research has shown that high-quality leadership constitutes an important driver of a team's competitive advantage (e.g., De Backer et al., 2011; Hampson & Jowett, 2012; Van Puyenbroeck et al., 2018). While the majority of research on sports leadership has focused on the roles and impact of the coach on the team (Cotterill, 2012), during the last decade, researchers have also established the importance of leadership by athletes within a team (for a review, see Cotterill & Fransen, 2016).

1.1. Athlete leadership

Defined by Loughead et al. (2006, p. 144) as "athletes occupying a formal or informal leadership role influencing team members towards a common goal", athlete leaders can take many forms. While formal

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athlete leaders are those players who are officially appointed in a leadership role (e.g., as the team captain), informal athlete leaders are players emerging as leaders through interactions with their teammates, even though their leadership status is not formally recognized (Cotterill, 2012).

Besides this distinction based on formal (vs. informal) status, athlete leaders can also be categorized according to the different roles that they occupy. Fransen, Vanbeselaere, et al. (2014) identified four distinct athlete leadership roles; the *task leader* who provides tactical and technical advice; the *motivational leader* who encourages teammates; the *social leader* who promotes a positive team atmosphere; and the *external leader* who represents the team outside of the immediate sporting environment (e.g., club management, media, sponsors). Previous researchers have suggested that in teams in which these four leadership roles are fulfilled, team members identify more strongly with their team, are more motivated, and have more confidence in their team's abilities, in ways that ultimately lead to better performance (Cotterill & Fransen, 2016; Fransen, Vanbeselaere, et al., 2014, 2015c). Furthermore, previous researchers have demonstrated that teams with high-quality athlete leaders are characterized by the following aspects: a stronger task-involving climate (in which athletes cooperate to master the task at hand), a weaker ego-involving climate (in which athletes try to outperform other team members), a psychologically safe environment, improved team work and team resilience (Fransen, McEwan, & Sarkar, 2020), and ultimately a better team performance (Fletcher & Arnold, 2011; Fransen, Decroos, et al., 2016, 2017).

1.2. Identity leadership

What is it that enables leaders to provide high-quality leadership? The Social Identity Approach to Leadership (Haslam et al., 2011; Tajfel & Turner, 1979) posits that leaders are effective to the extent that they are able to create a social identity — a shared sense of 'us' — in their team. This social identity reflects an individual's sense of internalized group membership. Specifically, this is a sense of self based on an awareness of membership to a particular group, and the meaning that people attach to this membership (Tajfel, 1972). For example, in the context of team sports, athletes or fans may derive a social identity from their membership of a particular club or team (e.g., 'as us Toronto Raptors players' or 'us, Real Madrid supporters'). The principles of the social identity approach suggest that by perceiving oneself and others in terms of a shared social identity (i.e., as 'us, team members'), a person's cognitions, emotions, and behaviors will align with the values, norms, ideals, and goals of the group.

This social identity, conceptualized as a shared sense of 'us', is central to mutual influence processes that lie at the heart of effective leadership (Haslam et al., 2011). More specifically, leadership is seen to be predicated upon a relationship between leaders and followers as members of a social group. As a result, leaders and followers are bound together by a common "we" or, in other words, by a social identity. The application of the social identity approach to leadership therefore posits that, if leaders can create, embody, advance, and embed a shared sense of 'us' in their teams, their ability to motivate others to work towards our collective will improve substantially (Haslam et al., 2011; Steffens, Haslam, Kerschreiter, et al., 2014). This claim has been supported by a growing number of studies across a wide range of contexts, which emphasize how identity leadership makes a real difference to the functioning of teams and the athletes within them (e.g., performance, team work, team resilience, and health: Fransen, McEwan, & Sarkar, 2020; exercise group atendance: Steffens et al., 2019; sport participation: Stevens & Cruwys, 2020).

1.3. The 5R Shared Leadership Program

Based on the above research, it can be concluded that an effective athlete leadership development program should not only be able to identify the best leaders on different athlete leadership roles, but should also ensure a further development of their identity leadership skills. The recently developed 5R Shared Leadership Program ($5R^S$) aims to fulfill precisely those needs (Fransen, Haslam, et al., 2020). First, by using *Shared Leadership Mapping*, $5R^S$ identifies which players within a team are perceived by the team as best suited for each leadership role (i.e., task, social, motivational, external). This first step involves using social network analysis to identify those team members who are consensually seen as already providing the best leadership on a specific athlete leadership role. As a means to capture the entire leadership structure in a team, social network analyses in the form of a Shared Leadership Mapping procedure is then used to identify the best perceived athlete leaders within the team, regardless of whether they are formally recognized as the team captain (Fransen et al., 2015b). Shared Leadership Mapping achieves this by placing the group at the center of its analysis, resulting in a network in which team members who appear to be most central are consensually perceived as the 'best' leaders by their team members. An important aspect of this process is the fact that it is grounded in the perceptions of team members, rather than those of coaches (Fransen, Haslam, et al., 2020), thus reflecting a bottom-up, rather than a top-down process. In this way, Shared Leadership Mapping ensures that these newly appointed leaders have a legitimate support base to maximize their effectiveness.

Second, after using the information gained from the Shared Leadership Mapping procedure to identify and appoint the athlete leaders on each leadership role, $5R^S$ then seeks to develop those leaders' identity leadership skills by taking the whole team through five different phases; Readying, Reflecting, Realizing, Representing, and Reporting. We will describe the aim of each of these phases in our Methods section, and how the present study implemented these phases. Furthermore, each of these phases is described in detail by Fransen, Haslam, et al. (2020).

1.4. Previous tests of $5R^S$

An initial examination of leadership development that focusses on building identity leadership can be found in an intervention by Slater and Barker (2018). The researchers investigated a partial implementation of $5R^S$ in an elite disability soccer team, where they established a leadership team consisting of three staff members and four athletes. However, the leadership team in the intervention was not identified by Shared Leadership Mapping, but instead chosen by staff members. Furthermore, the researchers designed an intervention based on only the three middle stages of the program (i.e., Reflecting, Representing, and Realizing). Their results indicated that helping team leaders to build their skills to nurture a sense of 'us' positively impacted athletes' identification with their team and the number of practice hours they completed away from training camps. However, their sample consisted of only one team, and no control group, limiting the generalizability of their findings.

Building and improving upon this work by Slater and Barker (2018), Mertens et al. (2020) conducted the first experimental test of the effectiveness of $5R^S$ in basketball teams, demonstrating the program's ability to strengthen the capacity of athlete leaders to improve teammates' identification with their team, thereby helping them to remain motivated and committed to the team goals and improving their well-being. It should be noted, though, that this initial test had several limitations that limit the inferences that can be drawn. First, and most importantly, the participant recruitment might have been subject to self-selection bias as the researchers assigned the teams to either the experimental or control group based on coaches' willingness to participate in $5R^S$. As such, the intervention was conducted with coaches who were more open to the ideas of shared leadership and social identity principles (and perhaps already used them in practice). By contrast, coaches of the control condition had not expressed an interest in these concepts. A second limitation of this initial test was that the sample consisted only of male teams, providing no insight into whether female

teams would also benefit from $5R^S$. Third, data collection was limited to the second half of a competitive season, and so we do not know whether $5R^S$ would also be successful when conducted in the first half of the season. A final limitation was that, the intervention was provided by a research confederate with a strong theoretical background in areas fundamental to the program. Thus, this initial study does not answer the question of whether $5R^S$ can also be delivered by coaches and sport psychologists with less theoretical knowledge of the program's core concepts — a question that is important to determine the program's applicability and suitability for train-the-train approaches. Accordingly, in our present work, we sought to address these four limitations.

1.5. The present research

The main aim of our study was to test the effectiveness of the 5R Shared Leadership Program ($5R^S$). More specifically, our study aims to advance our understanding of the effectiveness of $5R^S$ by using an experimental randomized wait-list control trial that can resolve the issues discussed above. First, our study makes use of a wait-list control condition, which enables us to include a homogeneous sample across experimental and control condition consisting of only teams whose coaches explicitly agreed to participate in the complete $5R^S$ program. These teams were then randomly allocated to either the intervention group or the wait-list control group, with the latter group following the intervention in the second half of the season. Second, we included an equal number of female and male teams to allow comparison across gender. Third, we conducted the intervention both in the first half of the season (i.e., intervention group) and in the second half of the season (waitlist-control group). In addition to overcoming the limitations of the previous researchers, we investigated whether delivering $5R^S$ successfully is something which can be facilitated using a train-the-trainer approach.

1.5.1. Main aims

Testing the Effectiveness of the $5R^S$ program. Based on previous research (e.g., Fransen, Haslam, et al., 2020; Mertens et al., 2020; Slater & Barker, 2018), we expected participation in $5R^S$ to have a beneficial effect on a range of processes and outcomes during the first half of the season (T1 – T2). Specifically, we expected the identity leadership skills of athlete leaders to improve significantly as a result of participating in $5R^S$, compared to a wait-list control group (H1a). Furthermore, we expected $5R^S$ to positively affect players' team identification (H1b), social support (H1c), intrinsic motivation (H1d), goal commitment (H1e), confidence in their team's abilities (H1f), and their perception of their team's performance (H1g), compared to players in the wait-list control group. Finally, we expected players to report decreased feelings of burnout (H1h) and improved perceived health (H1i) after participating in $5R^S$, compared to a wait-list control group.

Gender Differences. Previous researchers have suggested that gender dynamics might influence the impact of leadership development programs in an organizational context (Ely et al., 2011). Moreover, gender has been shown to influence the perceived impact of athlete leaders on their team's emotional state (Cotterill et al., 2020). Therefore, our second aim was to explore whether (or not) the effects of participation in $5R^S$ are gender-specific.

1.5.2. Exploratory aims

Besides the core aims, our study explored two additional research questions, namely; the long-term effectiveness of the intervention Research Question 3); and the effect that timing (i.e., first vs. second half of the season) has on the examined outcomes (Research Question 4). Since the waitlist-control group received an intervention in the second half of the season, we conducted an exploratory analysis of these aims by using the T1 – T2 timeframe of the waitlist-control group as control group for these analyses.

More specifically, with respect to our third aim, we sought to explore the *long-term effectiveness of the $5R^S$ program* that was completed during the first half of the competitive season. We set out to explore this research question by comparing changes during the second half of the season among participants in the experimental group (who thus received $5R^S$ in the first half of the competitive season) in the aforementioned outcomes (H1) with changes among participants in the wait-list control group (T1 – T2). In practical terms, this exploration boils down to comparing the changes during the second half of the season in outcomes of a group who received $5R^S$ earlier in the season (i.e., the first half), with a group who did not yet receive any form of $5R^S$, thus allowing for an exploratory view of the long term-effects.

With respect to our fourth aim, we sought to explore *the effectiveness of the $5R^S$ program that was completed during the second half of the competitive season* (as opposed to the $5R^S$ program that was completed during the first half of the competitive season in H1). More specifically, we compared the changes in the aforementioned outcomes (H1) among participants completing $5R^S$ during the second half of the competitive season with changes among participants in the wait-list control group (T1 – T2). In practical terms, this second exploration results in a comparison of the changes in outcomes of a group who received $5R^S$ in the second season-half, with a group who did not yet receive any form of $5R^S$.

2. Methods

2.1. Procedure

An a-priori power analysis using Gpower 3 (Faul et al., 2007), based on the results of a previous study with a similar experimental design (Fransen et al., 2018), indicated that 84 participants would be sufficient to detect a significant (condition X time) interaction effect with a power of .96 and an alpha of .05. Given that we aimed to perform interaction analyses for male and female teams separately, and given that in previous work researchers were able to recruit an average of 12 participants per team, we decided to include 16 teams (i.e., eight male and eight female teams). To obtain this number of teams, we contacted 28 head coaches of both male and female competitive basketball teams (i.e., a response rate of 57%). The main reason for non-participation was a perceived lack of time to complete the data collection and the intervention.

The 16 teams whose coaches agreed to participate were randomly assigned to one of two groups (both consisting of eight teams, four male and four female): the experimental group (who completed the intervention at the start of the season) and a wait-list control group (who completed the intervention at the start of the second half of the season). The 170 players of the 16 teams whose coach agreed to participate were asked individually whether they agreed to participate. All players agreed to do so and completed a consent form. The research was approved by the ethical committee of the first author's university (G-2017 11 996).

2.2. Participants

The players ($N = 170$) were on average 24.98 years old ($SD = 6.93$) and had played for 8.42 years ($SD = 6.84$) for their current team. Fig. 1 contains an overview of the obtained full data sets and relevant response rate for each time point. Across the duration of the study, we were able to collect full data sets for 131 players in the first half of the season, 85 players in the second half of the season, and 81 players over the entire season. The main reasons for dropout were a mid-season coach replacement (i.e., one team changed their coach before T2, three teams changed their coach before T3) and players who were not present at the point of assessment (i.e., due to an injury, sickness, or personal reasons). Team sizes ranged from 9 to 18 players ($M = 12.19$, $SD = 2.74$). All teams were competitively active in the region of Flanders, Belgium, and are considered to be 'semi-elite' according to the categorization by

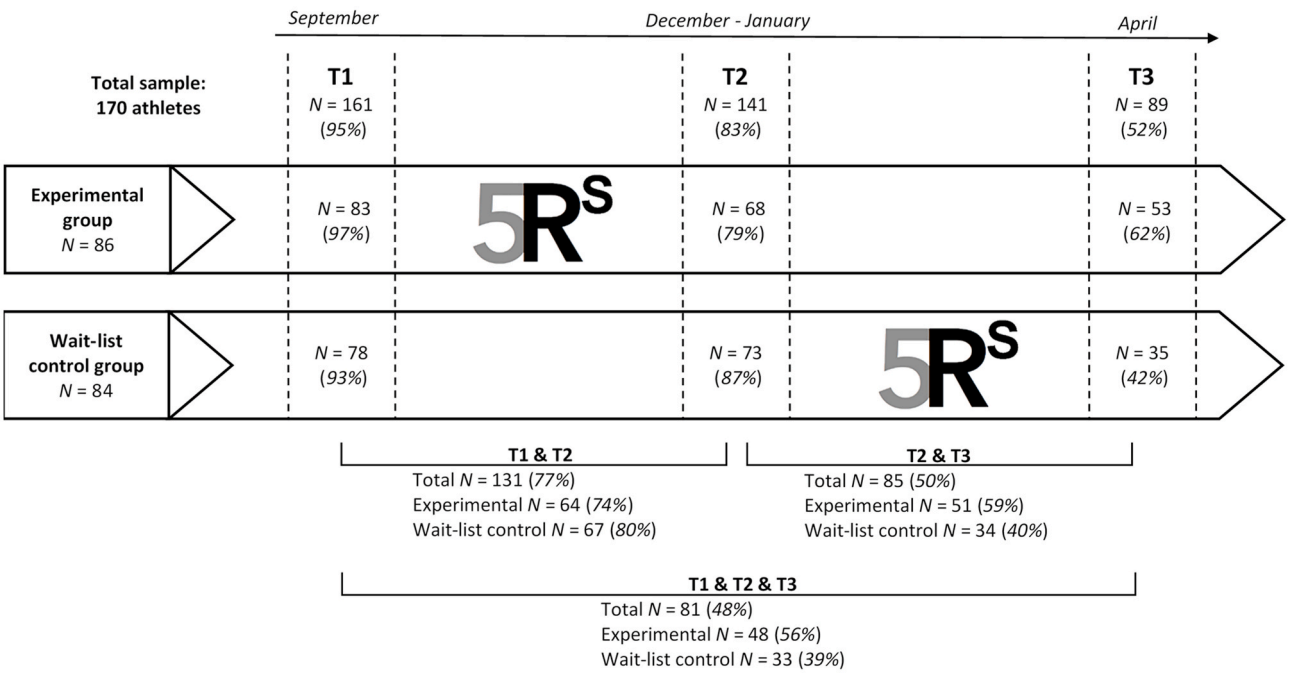

Fig. 1. Visual overview of the wait-list controlled trial. The number of observed participants is indicated for each timepoint and group. The relevant response rate is presented between parentheses in italics. The response rates are provided both for all athletes (i.e., compared at each timepoint or overlap of timepoints with the total sample) and for each separate group (i.e., compared at each timepoint or overlap of timepoints with the number of athletes in the relevant group).

Swann et al. (2015).

2.3. Design

We adopted a randomized wait-list control design and gathered data by administering questionnaires at three time points (see Fig. 1 for an overview). With respect to the content of $5R^S$, consistent with the program description provided by Fransen, Haslam, et al. (2020), we implemented three workshops which each took about 90 minutes: Readying and Reflecting (Workshop 1); Representing and Realizing (Workshop 2); and Reporting (Workshop 3).

Depending on the availability of the teams and their training schedule, we attempted to deliver the first two workshops within a two-week time frame. All workshops were provided by two research assistants (one male, one female) who are also licensed basketball coaches. For clarity, we will refer to these research assistants as 'trainers' throughout the manuscript. These two trainers were taught how to conduct the workshops by the first author of the study who had a strong theoretical background in the literature that informs the $5R^S$ program and previous practical experience in conducting $5R^S$. More specifically, both trainers first observed two $5R^S$ interventions delivered by the first author. Next, the first author taught the two trainers every step of the $5R^S$ intervention, explaining the theoretical background and ensuring that both understood the specific aim of every step. After both trainers were confident in their understanding of $5R^S$, they each delivered three practice sessions of $5R^S$ to the respective other trainer and first author, who gave feedback to both trainers in order to standardize and optimize how they delivered $5R^S$.

During the first workshop, the trainer guided the team through the first two phases of $5R^S$ (i.e., Readying and Reflecting). This workshop informed team members about the importance and benefits of a shared identity, and provided practical exercises to discover their own team's shared identity by creating their personal 'trademark'. This trademark is an idea or visualization that encompasses all the team's norms and values. As an example, one team created the trademark of an anthill. This visualization emerged from the combination of values they associated with ants (perseverance, teamwork, work ethic, etc.) with a play on words from basketball jargon ("and one"[1]). At the end of this first workshop, we then sought to implement a structure of shared leadership. This leadership structure was based on the results of the earlier conducted Shared Leadership Mapping, based on the data of the first questionnaire. More specifically, players were asked to assess every team member's leadership quality in four leadership roles (i.e., task, motivational, social, and external leader) on an 11-point Likert scale ranging between 0 (*very bad leader*) and 10 (*very good leader*). Using this approach, we constructed four leadership networks for each team, one for each leadership role. Using social network analyses according to the guidelines of Borgatti et al. (2013), we computed the indegree centrality of each team member. This procedure resulted in a measure that reflected the leadership quality of each individual team members as perceived by other team members. Based on this information, we formally appointed the two best perceived leaders in their respective role. This number of two leaders in each role was suggested by Leo et al. (2019) to be the optimal number of athlete leaders. These authors also revealed how teams without formal athlete leaders display poorer performance than teams in which leadership is shared, highlighting the importance of leadership appointment. When appointing athlete leaders, we allowed for an overlap between two leadership roles for each individual team member (e.g., a player could both be a task leader and a motivational leader). However, to ensure that leadership roles would be reasonably spread out across team members, we opted to appoint no more than two leadership roles for any given player, even if this team members was perceived as a good leader on a third additional role. This resulted in a 'leadership team' for each team that ranged between 4 and 6 leaders (4.88 on average), out of a maximum of eight 'leadership positions'. Overall, 64% of all appointed leaders took up two leadership roles, while 36% of all appointed leaders took up one leadership role.

During the second workshop (i.e., the Representing and Realizing phase), the team was challenged to set goals to embed their team

[1] An "and one" is a term used in basketball when an athlete makes a basket for two points while being fouled and is awarded a free throw for another possible point.

identity. The team was asked to identify task, motivational, social, and external goals and develop strategies to reach those goals (e.g., to improve on-field communication in defensive positions as a task goal, to organize an event for sponsors as external goal). During this second workshop, the team's athlete leaders were asked to take the lead in coordinating the process with respect to the goals related to their leadership roles (e.g., task leaders coordinating the process on task-related goals). In this way, the athlete leaders were taught hands-on how to practice identity leadership relevant to their role.

The third and final workshop of the $5R^S$ Program (i.e., Reporting) aimed to evaluate the progress towards the identified goals. Specifically, under the guidance of the respective appointed athlete leaders, the team discussed whether they achieved their task, motivational, social, and external goals, and to what extent the adopted strategies were effective. To provide teams with enough time to obtain their identified goals, we conducted this workshop three months after the previous phases and combined it with the post-intervention data collection. For more detailed information about the underlying theory and content of $5R^S$, we refer to the conceptual outline by Fransen, Haslam, et al. (2020).

2.4. Measures

For all constructs measured in this study (with exception of the health and performance measures), participants rated their agreement with the listed statements, unless indicated otherwise, on scales ranging from 1 (*completely disagree*) to 7 (*completely agree*). We treated all included measures as unidimensional scales, and the Cronbach's alphas (α) and McDonald's coefficient omega (ω) of each of the scales are reported in Table 1 on the diagonal.

2.4.1. Manipulation check

As an additional controlling measure to test for any differences in the quality of either trainer, we allowed players to anonymously provide feedback on their experience of $5R^S$ after the second workshop. This was done through a structured questionnaire, containing four identical items for the first and second workshop (e.g., "I think this first workshop was useful"; see Supplementary File A).

Furthermore, we included nine items specifically gauging whether participants experienced the processes which are essential to $5R^S$. More specifically, we created three subscales to gauge the most important underlying aspects of the program: "athlete voice", "value clarity", and "goal clarity". To investigate the extent to which players felt they had a say in the $5R^S$ processes, we included three items for *athlete voice* (e.g., "I had a say in creating my team's goals"). For *value clarity*, we included two items to examine whether players experienced the process of clarifying their teams' unique norms and values associated with building a trademark during $5R^S$ (e.g., "I know my team's norms and values"). To investigate each players' understanding of their team's goals and strategies on how to reach those goals, as created during the $5R^S$ process, we included three items for *goal clarity* (e.g., "I have a clear understanding of my team's goals"). The internal consistency for all these measures was shown to be very high, with both Cronbach's alphas and McDonald's coefficient omegas for all timepoints ranging from 0.80 to 0.94.

2.4.2. Identity leadership

We used the 15-item Identity Leadership Inventory (Steffens, Haslam, Reicher, et al., 2014) to assess the extent to which athlete leaders were perceived to nurture a sense of shared identity in their teams. An example item was "The athlete leaders of my team embody what the team stands for". Steffens, Haslam, Reicher, et al. (2014) also describes the development and provides evidence for the validity of this measurement. The scale had very high internal consistency at all data collection points ($\alpha_{T1} = 0.92$, $\alpha_{T2} = 0.94$, $\alpha_{T3} = 0.96$; $\omega_{T1} = 0.92$, $\omega_{T2} = 0.94$, $\omega_{T3} = 0.96$).

2.4.3. Team identification

We used the nine-item Social Identity Questionnaire for Sport developed by Bruner and Benson (2018). A sample item is "I feel strong ties to other members of this team." The validity of this measurement to assess social identity in sport as a global construct is evidenced by Bruner and Benson (2018). The internal consistency of the scale was high at all data collection points ($\alpha_{T1} = 0.88$, $\alpha_{T2} = 0.90$, $\alpha_{T3} = 0.93$; $\omega_{T1} = 0.89$, $\omega_{T2} = 0.91$, $\omega_{T3} = 0.94$).

2.4.4. Social support

To assess the social support received from team members, we used a 4-item measure proposed by Haslam et al. (2018), with an example item being "Do you receive the support you need from your team members?" This measurement is a short version of a ten-item measure validated by Haslam et al. (2005), shown by Steffens et al. (2016) to maintain reliability if shortened to four items. The scale had high internal consistency at all data collection points ($\alpha_{T1} = 0.89$, $\alpha_{T2} = 0.92$, $\alpha_{T3} = 0.95$; $\omega_{T1} = 0.90$, $\omega_{T2} = 0.92$, $\omega_{T3} = 0.95$).

2.4.5. Intrinsic motivation

The intrinsic motivation subscale of the Behavioral Regulation in Sport Questionnaire, developed and validated by Lonsdale et al. (2008), was included to asses players' intrinsic motivation. We chose to include only this subscale because intrinsic motivation represents the hallmark of volitional functioning (Ryan & Deci, 2000, 2017) and to ensure the questionnaire is kept at a manageable length allowing players to remain focused. This subscale consisted of two items: "I play basketball because it is fun" and "I play basketball because I like it". The internal consistency of the scale was acceptable ($\alpha_{T1} = 0.90$, $\alpha_{T2} = 0.72$, $\alpha_{T3} = 0.84$).

2.4.6. Team confidence

We included the five-item Observational Collective Efficacy Scale for Sports (Fransen, Kleinert, et al., 2014; "My team has the ability to demonstrate a strong work ethic"). The validity of this measurement was established by Fransen, Kleinert, et al. (2014) in sport teams. The scale had high internal consistency at all data collection points ($\alpha_{T1} = 0.82$, $\alpha_{T2} = 0.84$, $\alpha_{T3} = 0.89$; $\omega_{T1} = 0.83$, $\omega_{T2} = 0.85$, $\omega_{T3} = 0.89$).

2.4.7. Goal commitment

We included a five-item scale developed by Klein et al. (2001) to assess participants' commitment to the team's goals (e.g., "I am strongly committed to pursuing our team's goals"). Klein et al. (2001) also evidenced the validity of this measurement as a self-report measure of goal commitment. The scale had an acceptable internal consistency ($\alpha_{T1} = 0.79$, $\alpha_{T2} = 0.78$, $\alpha_{T3} = 0.83$; $\omega_{T1} = 0.80$, $\omega_{T2} = 0.78$, $\omega_{T3} = 0.82$).

2.4.8. Team performance

Players indicated their team's performance during the previous month on a single-item 11-point Likert scale ranging from 0 (*very poor*) to 10 (*very good*).

2.4.9. Burnout

We used the 15-item Athlete Burnout Scale to assess players' feelings of burnout (Raedeke & Smith, 2001). An example item is: "I feel physically exhausted from my sport participation". Raedeke and Smith (2001) also demonstrated this measurements validity in a sports setting. The internal consistency of the scale was acceptable ($\alpha_{T1} = 0.78$, $\alpha_{T2} = 0.82$, $\alpha_{T3} = 0.84$; $\omega_{T1} = 0.88$, $\omega_{T2} = 0.90$, $\omega_{T3} = 0.90$).

2.4.10. Health

Following the suggestion of Khan et al. (2014), we assessed participants' health using three items from the internationally-used core module of the Centers for Disease Control and Prevention Health Related Quality of Life Measure. After reading the stem "Since the start of the season, how would you describe your …", participants rated their physical health, their state of mind, and their energy levels on scales

Table 1
Means, standard deviations, and correlations between all variables included in the questionnaire (part 1). Cronbach's alphas and McDonald's coefficient omega are presented in italics on the diagonal (α/ω).

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. T1 Manipulation check: athlete voice	4.42	1.50	*(.91/.92)*																
2. T2 Manipulation check: athlete voice	4.81	1.49	.58***	*(.93/.94)*															
3. T3 Manipulation check: athlete voice	5.17	1.46	.58***	.74***	*(.94/.94)*														
4. T1 Manipulation check: value clarity	5.82	.88	.48***	.32***	.38***	*(.84/*[b])													
5. T2 Manipulation check: value clarity	5.74	1.00	.30***	.51***	.47***	.55***	*(.91/*[b])												
6. T3 Manipulation check: value clarity	5.96	.94	.43***	.52***	.68***	.55***	.59***	*(.90/*[b])											
7. T1 Manipulation check: goal clarity	5.69	.96	.48***	.35***	.37***	.60***	.54***	.53***	*(.81/.80)*										
8. T2 Manipulation check: goal clarity	5.57	1.14	.28***	.59***	.45***	.40***	.68***	.61***	.57***	*(.89/.89)*									
9. T3 Manipulation check: goal clarity	5.64	1.04	.39***	.48***	.73***	.51***	.60***	.82***	.58***	.65***	*(.87/.88)*								
10. T1 Identity leadership of athlete leaders	5.31	.77	.32***	.29***	.29***	.55***	.48***	.44***	.58***	.41***	.50***	*(.92/.92)*							
11 T2 Identity leadership of athlete leaders	5.28	.92	.28***	.47***	.47***	.36***	.57***	.54***	.30***	.51***	.51***	.57***	*(.94/.94)*						
12. T3 Identity leadership of athlete leaders	5.38	1.00	.31***	.49***	.62***	.40***	.44***	.63***	.39***	.47***	.71***	.53***	.61***	*(.96/.96)*					
13. T1 Team identification	5.32	.89	.37***	.26***	.24**	.43***	.34***	.36***	.38***	.33***	.30***	.49***	.38***	.35***	*(.88/.89)*				
14. T2 Team identification	5.14	.98	.27***	.41***	.38***	.31***	.49***	.47***	.25***	.45***	.40***	.41***	.62***	.54***	.61***	*(.90/.91)*			
15. T3 Team identification	5.35	1.08	.33***	.36***	.49***	.40***	.40***	.57***	.33***	.43***	.58***	.43***	.45***	.72***	.67***	.75***	*(.93/.94)*		
16. T1 Received social support	5.36	.94	.21***	.32***	.29***	.39***	.41***	.33***	.41***	.39***	.39***	.50***	.42***	.37***	.49***	.43***	.46***	*(.89/.90)*	
17. T2 Received social support	5.22	1.13	.25***	.50***	.40***	.27***	.53***	.43***	.26***	.55***	.45***	.44***	.59***	.51***	.41***	.70***	.55***	.52***	*(.92/.92)*
18. T3 Received social support	5.31	1.30	.23*	.34***	.41***	.32***	.46***	.44***	.29***	.48***	.53***	.45***	.48***	.63***	.49***	.64***	.77***	.53***	.68***
19. T1 Intrinsic motivation	6.62	.71	.16*	.09	.14	.13	.13	.22*	.29***	.15	.21*	.27***	.31***	.17	.33***	.16*	.19	.23**	.15
20. T2 Intrinsic motivation	6.30	.87	.17*	.26***	.23*	.16	.22***	.23*	.10	.24***	.27**	.30***	.42***	.23*	.31***	.31***	.25*	.29***	.34***
21. T3 Intrinsic motivation	6.55	.59	.09	.18	.28***	.24*	.17	.38***	.20*	.25*	.43***	.39***	.30**	.46***	.34**	.28**	.51***	.17	.29**
22. T1 Team confidence	5.32	.90	.24***	.24***	.18	.31***	.32***	.28**	.36***	.23***	.33***	.56***	.44***	.34**	.37***	.36***	.33**	.53***	.47***
23. T2 Team confidence	5.07	1.09	.19*	.40***	.37***	.26***	.51***	.46***	.28***	.48***	.48***	.43***	.66***	.49***	.24**	.56***	.40***	.42***	.68***
24. T3 Team confidence	5.16	1.11	.29***	.37***	.47***	.40***	.48***	.42***	.33***	.40***	.59***	.47***	.49***	.66***	.28**	.46***	.55***	.42***	.53***
25. T1 Goal commitment	5.75	.92	.24***	.22**	.12	.32***	.45***	.41***	.43***	.40***	.29***	.52***	.41***	.23*	.42***	.27**	.30**	.39***	.31***
26. T2 Goal commitment	5.53	1.00	.30***	.37***	.23*	.23**	.50***	.41***	.34***	.55***	.39***	.32***	.43***	.32***	.18*	.30***	.27**	.24**	.43***
27. T3 Goal commitment	5.43	1.03	.32***	.35***	.38***	.32***	.38***	.60***	.46***	.53***	.64***	.45***	.42***	.56***	.21*	.31**	.50***	.31**	.35**
28. T1 Perception of team performance	6.96	1.45	.27***	.01	.01	.15	.17	.13	.30***	.05	.18	.25**	.12	.04	.31***	.01	-.00	.31***	.08
29. T2 Perception of team performance	6.83	1.54	.03	.26***	.17	.08	.33***	.16	.17*	.37***	.25*	.12	.22*	.17	.11	.28**	.11	.21*	.30***
30. T3 Perception of team performance	7.15	1.42	.17	.11	.21*	.23*	.22*	.32***	.33***	.29**	.44***	.27*	.11	.21*	.06	-.01	.08	.33**	.15
31. T1 Burnout	2.72	.86	-.23***	-.22**	-.19	-.16*	-.21**	-.28**	-.32***	-.23***	-.28***	-.39***	-.35***	-.29**	-.43***	-.25**	-.31**	-.38***	-.21*
32. T2 Burnout	3.01	.97	-.28***	-.30***	-.20	-.15	-.30***	-.22*	-.21**	-.35***	-.30***	-.39***	-.41***	-.34**	-.33***	-.39***	-.35***	-.30***	-.34***
33. T3 Burnout	2.76	.91	-.08	-.13	-.17	-.06	-.21*	-.24*	-.19	-.29***	-.36***	-.28**	-.38***	-.36***	-.28**	-.25*	-.44***	-.28**	-.27**
34. T1 Self-assessed health	5.35	.94	.11	.14	.16	.15*	.17*	.22*	.23***	.28***	.27**	.28***	.34***	.31**	.25**	.26**	.32***	.27***	.16
35. T2 Self-assessed health	5.12	1.02	-.02	.25***	.16	.07	.22**	.27**	.11	.31***	.31***	.24**	.35***	.37***	.17*	.42***	.36***	.27**	.35***
36. T3 Self-assessed health	5.34	1.04	.03	.20*	.19	.05	.21*	.18	.23*	.32***	.31***	.35***	.310**	.38***	.22*	.32**	.37***	.31**	.23*

(*continued on next page*)

Table 1 (*continued*)

	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
18. T3 Received social support	*(.95/.95)*																		
19. T1 Intrinsic motivation	.16	*(.90/.[b])*																	
20. T2 Intrinsic motivation	.23*	.64***	*(.72/.[b])*																
21. T3 Intrinsic motivation	.37***	.48***	.55***	*(.84/.[b])*															
22. T1 Team confidence	.39***	.31***	.34***	.35**	*(.82/.83)*														
23. T2 Team confidence	.50***	.19*	.36***	.31**	.64***	*(.84/.85)*													
24. T3 Team confidence	.58***	.18	.24*	.39***	.61***	.70***	*(.89/.89)*												
25. T1 Goal commitment	.19	.29***	.34***	.37***	.29***	.25***	.14	*(.79/.80)*											
26. T2 Goal commitment	.34**	.13	.23**	.24*	.18*	.35***	.22*	.59***	*(.78/.78)*										
27. T3 Goal commitment	.48***	.18	.18	.47***	.27**	.33***	.35***	.49***	.69***	*(.83/.82)*									
28. T1 Perception of team performance	.09	.28***	.21*	-.08	.33***	.24**	.15	.18*	.04	.02	[a]/[b]								
29. T2 Perception of team performance	.16	-.05	.02	.03	.00	.32***	.21	-.01	.22*	-.01	.21*	[a]/[b]							
30. T3 Perception of team performance	.17	-.03	-.03	-.06	.09	.15	.16	.00	.15	.26*	.25*	.50***	[a]/[b]						
31. T1 Burnout	-.23*	-.44***	-.36***	-.50***	-.32***	-.16*	-.19	-.57***	-.36***	-.35***	-.28***	-.04	.09	*(.78/.88)*					
32. T2 Burnout	-.34**	-.26**	-.51***	-.50***	-.22**	-.32***	-.25*	-.47***	-.50***	-.40***	-.08	-.19*	-.01	.65***	*(.82/.90)*				
33. T3 Burnout	-.42***	-.32**	-.35***	-.55***	-.24*	-.22*	-.27**	-.48***	-.50***	-.55***	.04	-.12	-.10	.68***	.76***	*(.84/.90)*			
34. T1 Self-assessed health	.33**	.37***	.21*	.40***	.30***	.19*	.35**	.20**	.12	.29**	.11	.07	.03	-.41***	-.25**	-.42***	*(.68/.72)*		
35. T2 Self-assessed health	.31**	.14	.29***	.41***	.28**	.37***	.42***	.22**	.14	.22*	.08	.11	-.02	-.36***	-.42***	-.33**	.49***	*(.72/.73)*	
36. T3 Self-assessed health	.41***	.17	.17	.40***	.17	.21*	.29**	.17	.13	.29**	-.02	.34**	.16	-.42***	-.49***	-.51***	.57***	.57***	*(.80/.83)*

*$p < .05$; **$p < .01$; ***$p < .001$.
Means, standard deviations, and correlations between all variables included in the questionnaire (part 2).
[a] As 'Performance' was a single-item question, no Cronbach's alpha could be calculated.
[b] For one- or two-item variables, no McDonald's coefficient omega could be calculated.

from 1 *(very bad)* to 7 (*very good*). The scale had an acceptable internal consistency ($\alpha_{T1} = 0.68$, $\alpha_{T2} = 0.72$, $\alpha_{T3} = 0.80$; $\omega_{T1} = 0.72$, $\omega_{T2} = 0.73$, $\omega_{T3} = 0.83$).

2.5. Statistical analyses

To answer our research questions, we conducted multilevel regression modeling, thereby accounting for the clustered nature of our data (i.e., players belonging to teams), while investigating 2 (time) X 2 (group) within-between analyses to test all hypothesized interaction effects. More specifically, we included time as a Level 1-predictor, team as a Level 2-predictor, and a random intercept as a Level 3-predictor to control for variability between the teams due to nesting of the data.

3. Results

Means, standard deviations, correlations, and Cronbach alphas of all variables are presented in Table 1. A visualization of every outcome, displaying the total means of both groups at each time point can be found in Fig. 2.

3.1. Manipulation check

First, to test for any differences in the quality of either trainer, we calculated a compound score, gauging the quality of each workshop. After performing an independent samples *t*-test, no significant differences emerged between the quality of the workshops provided by both trainers (first workshop: $t_{(54)} = -0.39$; $p = .70$; second workshop: $t_{(54)} = 0.18$; $p = .86$; see Supplementary File A).

Second, to investigate whether our implementation of $5R^S$ was successful, we used the data of T1 and T2 (see Fig. 1). This allowed us to compare the experimental group (who participated in $5R^S$ between T1 and T2), with the wait-list control group (who had not participated in $5R^S$ at this time) through the investigation of 2 × 2 interaction effects. Results revealed significant interaction effects for all scales (athlete voice: $\beta = 0.56$, $p < .01$; value clarity: $\beta = 0.31$, $p < .05$; goal clarity: $\beta = 0.38$, $p < .01$; see Table 2). More specifically, participation in $5R^S$ enhanced players' perceptions that they had a say in team processes and helped to maintain players' understanding of team norms, values and goals, compared to a control group.

3.2. Main aims

3.2.1. Tests of aim 1: the effectiveness of the 5R Shared Leadership Program

We examined the data collected at T1 and T2 to assess the effectiveness of $5R^S$ (see Fig. 1). This allowed us to compare the experimental group (who received $5R^S$ between T1 and T2), with the wait-list control group (who had not yet received $5R^S$ at this time). The results are presented in Table 2, and key findings are discussed below.

Our analysis revealed a significant interaction effect for perceptions of leaders' identity leadership, supporting H1a. More specifically, the findings indicated that participation in $5R^S$ increased leaders' ability to create a shared sense of 'us' within their team, compared to athlete leaders in the wait-list control group ($\beta = 0.60$, $p < .001$, $R^2_\varepsilon = 0.14$). In line with H1b, participation in $5R^S$ maintained players' identification with their team while players' team identification decreased in the control group ($\beta = 0.55$, $p < .001$, $R^2_\varepsilon = 0.12$). Participation in $5R^S$ increased players' perceived social support, compared to the control group ($\beta = 0.63$, $p < .001$, $R^2_\varepsilon = 0.12$), thereby confirming H1c. H1d was supported, as participants who took part in $5R^S$ maintained their levels of intrinsic motivation in contrast to the decreasing motivation of participants in the control group ($\beta = 0.64$, $p < .001$, $R^2_\varepsilon = 0.38$). However, no support was found for H1e, as our analyses revealed no significant interaction effect for players' commitment to team goals. In line with

H1f, participation in $5R^S$. helped participants to maintain confidence in their team's abilities in contrast to players in the control condition who experienced a decrease in their team confidence over the course of the season ($\beta = 0.63$, $p < .001$, $R^2_\varepsilon = 0.23$). In contrast to H1g, there was no significant interaction effect for players' perception of the team's performance. Finally, in line with H1i, our analysis revealed that after $5R^S$, players reported that they had lower levels of burnout (H1h; $\beta = -0.47$, $p < .001$, $R^2_\varepsilon = 0.27$) and improved health (H1i; $\beta = 0.64$, $p < .001$, $R^2_\varepsilon = 0.15$), compared to players in the wait-list control group.

3.2.2. Tests of aim 2: gender differences

Additionally, we found that the results were generally consistent across male and female teams. Table 3 differentiates between the results for male and female participants. The results for both male and female teams are in line with the overall results for eight out of nine outcomes, with two noteworthy discrepancies (see Appendix A for detailed results). First, in female teams, we did not find a significant interaction effect for players' perceptions of the social support that they received. Second, in male teams, we did observe a significant interaction effect for players' perception of the team's performance ($\beta = -1.32$, $p < .01$, $R^2_\varepsilon = 0.09$), with players in the experimental group reporting a stronger decrease in the team's performance compared to players in the control group. Overall though, considering the patterns across all dependent variables, it can be concluded that $5R^S$ had a similar effect on both male and female teams.

3.3. Exploratory aims

3.3.1. Tests of aim 3: follow-up effects of $5R^S$

To explore the follow-up effects of $5R^S$, we focused on the data from T2 and T3 of the experimental group (who had received $5R^S$ between T1 and T2). More specifically, we investigated the 2 × 2 interaction effects comparing T2 and T3 from the experimental group with our control data (i.e., T1 and T2 from the wait-list control group, as indicated in the introduction).

No significant interaction emerged from these analyses for goal commitment or team performance (see Table 4), which was in-line with the analyses on the short-term effect of $5R^S$. Furthermore, we did not find a significant interaction for the identity leadership skills of athlete leaders, nor for the perceived social support in teams, indicating no further changes after the effect of $5R^S$ from earlier in the season occur. Moreover, the analyses revealed significant interactions for team identification ($\beta = 0.45$, $p < .001$, $R^2_\varepsilon = 0.18$), intrinsic motivation ($\beta = 0.62$, $p < .001$, $R^2_\varepsilon = 0.34$), team confidence ($\beta = 0.47$, $p < .001$, $R^2_\varepsilon = 0.25$), burnout ($\beta = -0.58$, $p < .001$, $R^2_\varepsilon = 0.30$), and health ($\beta = 0.52$, $p < .001$, $R^2_\varepsilon = 0.16$), in favor of the experimental group, pointing at continued

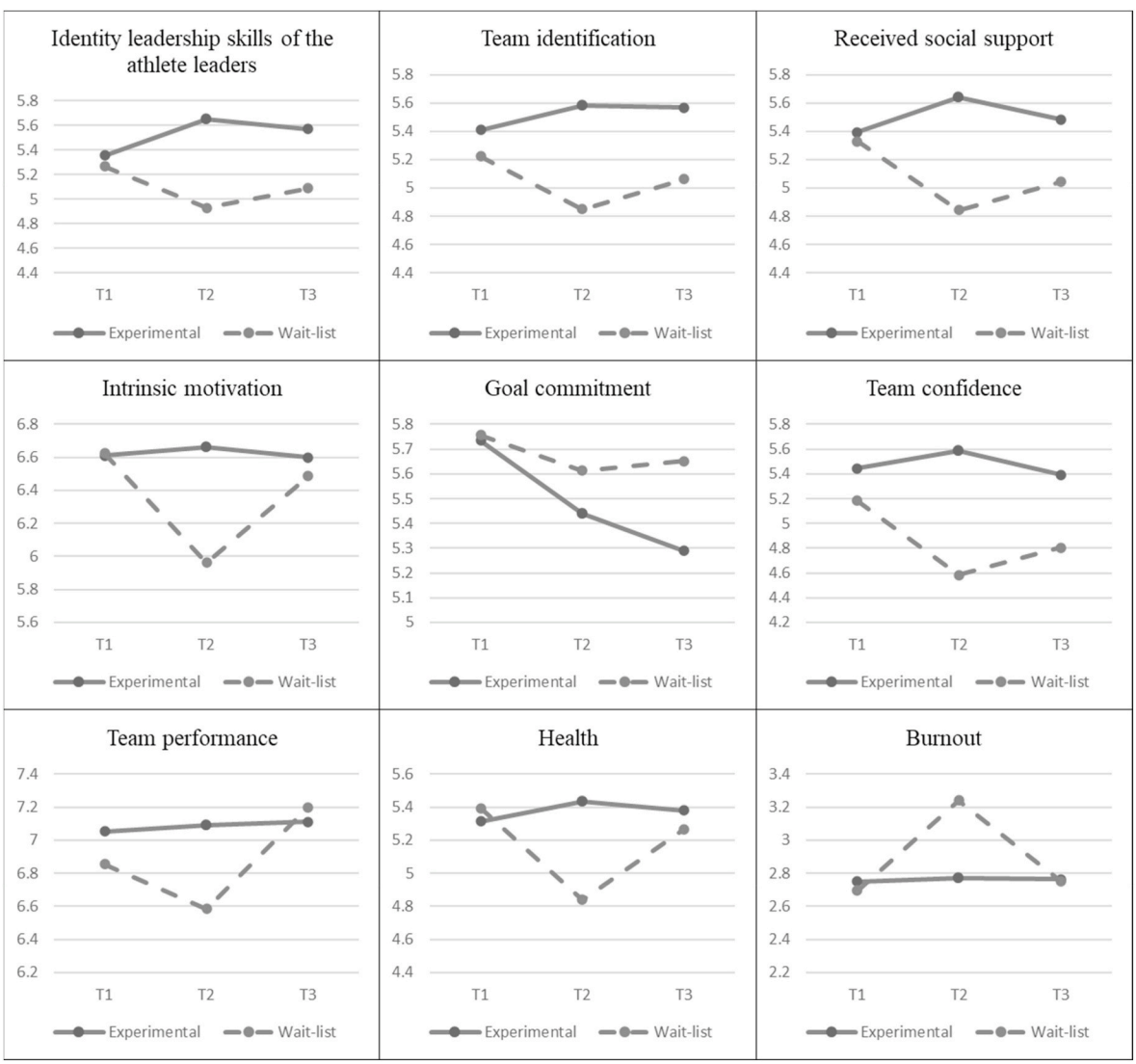

Fig. 2. Visualization of the total mean of all outcomes at each timepoint, for both the experimental group and wait-list control group.

Table 2
The results of the multilevel regression modeling, including time as a level 1-predictor, condition as a level 2-predictor, and a level 3 random intercept. The table displays interaction effects for the variables used for the manipulation check and all outcome variables between the two conditions at T1 and T2.

	Experimental group		Wait-list control group		β_{time}	SE_{time}	$\beta_{interaction}$	$SE_{interaction}$	Pseudo R^2_ε
	M (SD) (T1)	*M (SD)* (T2)	*M (SD)* (T1)	*M (SD)* (T2)					
Manipulation check: athlete voice	4.69 (1.51)	5.26 (1.37)	4.39 (1.29)	4.39 (1.52)	1.18**	.33	.56**	.21	.09
Manipulation check: value clarity	5.79 (.89)	5.85 (.86)	5.90 (.86)	5.66 (1.04)	.39	.23	.31*	.14	.04
Manipulation check: goal clarity	5.71 (.98)	5.68 (1.13)	5.80 (.77)	5.45 (1.16)	.39	.25	.38**	.16	.07
Identity leadership of athlete leaders	5.38 (.70)	5.66 (.74)	5.22 (.81)	4.91 (.95)	.88***	.19	.60***	.12	.14
Team identification	5.49 (.89)	5.54 (.88)	5.27 (.80)	4.76 (.90)	.52*	.21	.55***	.12	.12
Received social support	5.50 (.99)	5.62 (1.04)	5.35 (.75)	4.90 (1.11)	.79**	.25	.63***	.16	.12
Intrinsic motivation	6.72 (.57)	6.62 (.71)	6.68 (.54)	5.96 (.99)	.61***	.16	.64***	.10	.38
Team confidence	5.58 (.86)	5.59 (.88)	5.16 (.83)	4.57 (1.03)	.66**	.21	.63***	.13	.23
Goal commitment	5.81 (.84)	5.45 (.99)	5.79 (.96)	5.60 (1.03)	-.51*	.22	.18	.14	.09
Team performance	7.47 (1.30)	7.08 (1.58)	6.97 (1.10)	6.58 (1.42)	-.47	.46	.11	.29	.02
Burnout	2.60 (.86)	2.75 (.89)	2.65 (.84)	3.28 (.97)	-.34	.19	-.47***	.12	.27
Self-assessed health	5.37 (.97)	5.47 (.98)	5.41 (.90)	4.87 (.96)	.75**	.24	.64***	.15	.15

*$p < .05$; **$p < .01$; ***$p < .001$.

additional benefits from 5R^S, even in the long term. In conclusion, this exploration seems to indicate that, for most variables, the effect of 5R^S generated during the first half of the competitive season was maintained and even further increased through the rest of the season.[2]

3.3.2. Tests of aim 4: effect of timing of the 5R Shared Leadership Program

While the data evidenced the effectiveness of 5R^S in the first half of the season, we explored whether 5R^S was equally effective when delivered in the second half of the season. For this purpose, we investigated the 2 × 2 interaction effects for comparing T2 and T3 of the wait-list group (that completed the intervention in the second half) with the control data (i.e., T1 – T2 of the same wait-list control group). The results are presented in Table 5.

Our results revealed significant interaction effects for identity leadership skills ($\beta = 0.43$, $p < .01$, $R^2_\varepsilon = 0.08$), team identification ($\beta = 0.73$, $p < .001$, $R^2_\varepsilon = 0.18$), received social support ($\beta = 0.50$, $p < .01$, $R^2_\varepsilon = 0.11$), intrinsic motivation ($\beta = 1.10$, $p < .001$, $R^2_\varepsilon = 0.39$), team confidence ($\beta = 0.71$, $p < .001$, $R^2_\varepsilon = 0.21$), burnout ($\beta = -1.01$, $p < .001$, $R^2_\varepsilon = 0.34$), and health ($\beta = 1.08$, $p < .001$, $R^2_\varepsilon = 0.23$). These findings emphasize that participation in 5R^S also entails all these benefits when being conducting in the second half of the season. However, no significant differences for goal commitment emerged. The only notable difference with our findings on the effects of 5R^S in the first half of the competitive season was a significant improvement in perception of team performance ($\beta = 0.75$, $p < .01$, $R^2_\varepsilon = 0.05$) when 5R^S was conducted in the second half of the season.

Exploring the differences in timing of 5R^S, we wanted to take our analysis one step further by directly contrasting 5R^S delivered during either the first or the second half of the season. More specifically, we compared T1 to T2 from the experimental group with T2 to T3 from the wait-list control group. The results of these analyses can be found in Table 6. These analyses revealed no significant interaction effect for the identity leadership skills of athlete leaders, team identification, social support, team confidence, or goal commitment. However, a significant interaction effect was found for players' intrinsic motivation ($\beta = .48$, $p < .001$, $R^2_\varepsilon = 0.21$), perception of team performance ($\beta = 0.85$, $p < .001$, $R^2_\varepsilon = 0.06$), burnout ($\beta = 0.55$, $p < .001$, $R^2_\varepsilon = 0.16$), and health ($\beta = 0.40$, $p < .05$, $R^2_\varepsilon = 0.12$). More specifically, participants who completed 5R^S during the second half of the competitive season became more motivated, felt that their team's performance increased more, indicated reduced feelings of burnout, and reported a stronger improvement in health than participants who completed 5R^S during the first half of the competitive season. Overall, this pattern suggests that 5R^S has a similar, though potentially stronger, effect when delivered in the second half of the season than when it is delivered in the first half of the season.[3]

4. Discussion

Our present study offers a unique contribution to the literature by providing an experimental exploration into the effectiveness of the 5R Shared Leadership Program. More specifically, our experimental design improves upon earlier work investigating the effectiveness of 5R^S (Mertens et al., 2020) by using a randomized wait-list controlled trial and using both female and male teams.

4.1. Aim 1: the effectiveness the 5R Shared Leadership Program

The primary goal of the present research (H1) was the investigation of the effectiveness of 5R^S over the course of four months on team functioning and player health. In line with previous work (Cotterill & Fransen, 2016; Fletcher & Arnold, 2011; Fransen et al., 2017; Mertens et al., 2020), our findings demonstrate the beneficial effect that 5R^S has on sport teams by developing the ability of athlete leaders to create and advance a shared sense of 'us, thereby building players' team identification. Moreover, participation in the program also delivers benefits beyond identity leadership skills and team identification by enhancing the social support available in the team, and helping players to remain motivated and to believe in the abilities of their team. Perhaps even more importantly, and in line with recent theorizing on the Social Cure (Haslam et al., 2018; Jetten et al., 2012), our results provided initial evidence of the benefits of 5R^S on player's perceived health. More specifically, participation in 5R^S does not only improve players' assessment of their own health, but also seems to be able to reduce players' burnout,

[2] As an additional exploration, we also performed these analyses for male and female teams separately. Most of these results were similar to the overall results (Appendix B). More specifically, in female teams, eight out of nine outcomes were in line with the overall findings. For male teams, this was seven out of nine outcomes (see Table 3 for a full comparison between overall results and gender specific results).

[3] In order to further explore gender differences, we performed both of these analyses concerning the effect of timing for either gender separately. First, with respect to the interaction in the wait-list control group, comparing its T2 and T3 with T1 and T2, the gender specific findings were generally in line with the overall results (Appendix C). More specifically, for eight out of nine outcomes both male and female teams showed the same patterns consistent with the overall findings reported above. Second, the results of comparison of both 5R^S programs (i.e., in the experimental and the wait-list control group) for both female and male teams were also similar to the overall results (Appendix D). More specifically, seven out of nine outcomes were in line with the overall findings. Table 3 contains a comparison between overall results and gender specific results.

Table 3
An overview of all interaction effects ($\beta_{interaction}$) for all analyses performed in the present research, allowing for comparing gender differences with the overall results at a glance. Whenever a gender specific analyses resulted in an outcome differing from the overall analysis, we indicated it in **bold**.

Aim:	*Aim 1: Effectiveness of 5R^S (H1)*			*Aim 3: Retention of 5R^S*			*Aim 4a: Timing of 5R^S (analysis 1)*			*Aim 4b: Timing of 5R^S (analysis 2)*		
Comparison:	Experimental T1-T2	vs	Wait-list T1-T2	Experimental T2-T3	vs	Wait-list T1-T2	Experimental T1-T2	vs	Wait-list T2-T3	Experimental T1-T2	vs	Wait-list T2-T3
$\beta_{interaction}$	Overall	Female	Male	Overall	Female	Male	Overall	Female	Male	Overall	Female	Male
Identity leadership of athlete leaders	.60***	.65***	.51*	.23	.21	.37	**.43****	**.33**	**1.14*****	**.17**	**.33***	**.51**
Team identification	.55***	.51**	.47*	**.45*****	**.54****	**.35**	.73***	.84***	.73**	.20	.24	.08
Received social support	**.63*****	**.35**	**1.34*****	.33	.37	-.19	.50**	.44*	.65*	.11	.08	-.53
Intrinsic motivation	.64***	.65***	.68**	.62***	.68***	.57**	1.10***	1.12***	1.30**	.48***	.49***	.64*
Team confidence	.63***	.47**	.81***	**.47*****	**.24**	**.84****	.71***	.36**	1.59***	**.03**	**.11**	**-.72***
Goal commitment	.18	.18	.04	.03	.11	.03	.08	.05	.53	.27	.24	.44
Team performance	**.11**	**.53**	**−1.32****	.20	.21	.60	.75**	.79**	1.53**	**.85*****	.21	**2.75****
Burnout	-.47***	-.46**	-.47*	-.58***	-.53***	-.70**	−1.01***	-.94***	−1.35***	-.55***	-.49***	-.86***
Self-assessed health	.64***	.69***	.65*	**.52*****	**.65*****	**.22**	**1.08*****	**1.27*****	**.47**	**.40***	**.56****	**-.20**

*$p < .05$; **$p < .01$; ***$p < .001$.

and indeed these effects on health and burnout were at least as large as those for other outcomes.

In contrast to our expectations, our data showed no support for the idea that 5R^S has a positive effect on players' commitment to team goals. We therefore note, however, that a differential interpretation of the questions could explain these non-significant findings. More specifically, when filling out these questions at T1, participants in both conditions might have thought of some generic, unspecified team goal (e.g., winning the competition, playing "better defense", etc.). However after the completion of 5R^S — which aims to identify clear task, motivational, social, and external goals — participants in the experimental group might have adopted higher standards with respect to the quality and diversity of the team's goals. Consequently, these participants might have completed the same questions with a different understanding at T2.

Furthermore, we also did not find any effects on performance as a result of participation in 5R^S. This finding is in contrast to previous researchers investigating the relationship between high-quality leadership and team performance (Fransen et al., 2015a, 2016b; Mertens et al., 2018). However, most experiments investigating that relationship adopted a much shorter study design (e.g., over the course of a few hours) and used newly composed teams. In contrast, our present design tracked existing teams over the course of an entire competitive season, possibly allowing other factors to influence a team's performance (e.g., star players falling injured, the strength of opposing teams, etc.).

4.2. Aim 2: gender differences

The second aim of our study was to provide a deeper insight in potential differences in the impact of 5R^S on either male or female teams. While some differences emerged (i.e., one or two out of nine outcomes per gender, per aim, differed from the overall results), our overall conclusion is that 5R^S has a very similar effect on both male and female teams (see Appendix A, B, C, and D for detailed results on gender specific analyses; Table 5 for an overview comparing gender specific analyses with overall results). In contrast to previous researchers in an organizational context (Ely et al., 2011), the 5R^S approach in our study achieved a very similar effect on both men's and women's teams without requiring specific adaptations for gender.

4.3. Exploratory aims

4.3.1. Aim 3: follow-up effects of the 5R^S

Our data suggest that, for most variables, the effect 5R^S had during the first half of the season was retained for the whole season. More specifically, while continued improvement of identity leadership skills might need more sustained development than only three workshops over the course of two weeks, the effect achieved by 5R^S on team identification, intrinsic motivation, team confidence, burnout, and health lasts beyond the season-half during which it is provided. Indeed, our longitudinal design thereby addressed the need for such long-term investigations described earlier by Fletcher and Wagstaff (2009). To the authors' knowledge, Slater and Barker's (2018) investigation of an elite disability soccer team is the only other study to have investigated leadership development from a social identity perspective over the course of a whole competitive season. Building upon this previous work, our study serves as the first whole season investigation of an identity leadership development program tracking multiple teams in an experimental design, including a range of outcomes across both males and females.

4.3.2. Aim 4: timing of 5R^S

Our findings seem to indicate that 5R^S has a beneficial effect regardless of whether it is provided at the start of or half-way through the season. This finding is especially important for practitioners (e.g., sport psychology consultants, coaches), as it suggests that practitioners can fit this program in their unique team considerations and planning,

Table 4
The results of the multilevel regression modeling, including time as a level 1-predictor, condition as a level 2-predictor, and a level 3 random intercept, investigating the interaction effects between the experimental group at T2 and T3 and the wait-list control group at T1 and T2.

	Experimental group		Wait-list control group		β_{time}	SE_{time}	$\beta_{interaction}$	$SE_{interaction}$	Pseudo R^2_ε
	M (SD) (T2)	*M (SD)* (T3)	*M (SD)* (T1)	*M (SD)* (T2)					
Identity leadership of athlete leaders	5.67 (.79)	5.58 (.85)	5.23 (.81)	4.91 (.96)	.15	.22	.23	.14	.08
Team identification	5.59 (.92)	5.56 (1.09)	5.28 (.85)	4.85 (.96)	.43	.28	.45***	.13	.18
Received social support	5.59 (1.08)	5.46 (1.18)	5.35 (.75)	4.90 (1.05)	.19	.28	.33	.17	.12
Intrinsic motivation	6.64 (.57)	6.61 (.55)	6.62 (.71)	5.96 (.99)	.57**	.19	.62***	.12	.34
Team confidence	5.51 (.94)	5.41 (.93)	5.16 (.83)	4.57 (1.03)	.33	.22	.47***	.14	.25
Goal commitment	5.41 (1.03)	5.29 (1.00)	5.79 (.96)	5.60 (1.03)	-.10	.24	.03	.15	.03
Team performance	7.15 (1.61)	7.10 (1.62)	6.97 (1.10)	6.58 (1.42)	.13	.49	.20	.30	.02
Burnout	2.73 (.87)	2.74 (.96)	2.65 (.84)	3.28 (.97)	-.56	.20	-.58***	.12	.30
Self-assessed health	5.41 (.97)	5.42 (1.07)	5.41 (.90)	4.87 (.96)	.50*	.25	.52***	.16	.16

*$p < .05$; **$p < .01$; ***$p < .001$.

Table 5
The results of the multilevel regression modeling, including time as a level 1-predictor, condition as a level 2-predictor, and a level 3 random intercept, exploring the effectiveness of the intervention in the wait-list control group.

	Wait-list control group		Wait-list control group		β_{time}	SE_{time}	$\beta_{interaction}$	$SE_{interaction}$	Pseudo R^2_ε
	M (SD) (T2)	*M (SD)* (T3)	*M (SD)* (T1)	*M (SD)* (T2)					
Identity leadership of athlete leaders	4.99 (.81)	5.07 (.96)	5.23 (1.01)	4.91 (1.16)	.54**	.25	.43**	.15	.08
Team identification	4.83 (.97)	5.04 (1.22)	5.28 (.85)	4.85 (.96)	1.00***	.23	.73***	.14	.18
Received social support	5.00 (1.11)	4.99 (1.45)	5.35 (.75)	4.90 (1.05)	.55	.29	.50**	.18	.11
Intrinsic motivation	6.04 (.85)	6.47 (.65)	6.62 (.71)	5.96 (.99)	1.54***	.19	1.10***	.11	.39
Team confidence	4.71 (1.09)	4.75 (1.18)	5.16 (.83)	4.57 (1.03)	.83***	.26	.71***	.15	.21
Goal commitment	5.75 (1.14)	5.63 (1.07)	5.79 (.96)	5.60 (1.03)	.00	.23	.08	.14	.04
Team performance	6.83 (.92)	7.22 (1.13)	6.97 (1.10)	6.58 (1.42)	1.21**	.48	.75**	.28	.05
Burnout	3.14 (.94)	2.73 (.84)	2.65 (.84)	3.28 (.97)	−1.42***	.20	−1.01***	.12	.34
Self-assessed health	4.66 (1.00)	5.25 (1.00)	5.41 (.90)	4.87 (.96)	1.62***	.25	1.08***	.15	.23

*$p < .05$; **$p < .01$; ***$p < .001$.

Table 6
The results of the multilevel regression modeling, including time as a level 1-predictor, condition as a level 2-predictor, and a level 3 random intercept. The table displays interaction effects between the experimental (T1 to T2, coded as 0 to 1) and the wait-list control group (T2 to T3, coded as 0 to 1) in order to contrast the $5R^s$ program delivered during the first half of the competitive season (i.e., the experimental group) with the $5R^s$ program delivered during the second half of the competitive season (i.e., the wait-list control group).

	Experimental group		Wait-list control group		β_{time}	SE_{time}	$\beta_{interaction}$	$SE_{interaction}$	Pseudo R^2_ε
	M (SD) (T1)	*M (SD)* (T2)	*M (SD)* (T2)	*M (SD)* (T3)					
Identity leadership of athlete leaders	5.38 (.70)	5.66 (.74)	4.91 (1.02)	5.04 (1.07)	.45*	.22	.17	.15	.08
Team identification	5.49 (.89)	5.54 (.88)	4.79 (.99)	5.04 (1.13)	-.12	.20	.20	.13	.03
Received social support	5.50 (.99)	5.62 (1.04)	4.99 (1.18)	5.08 (1.40)	.26	.26	.11	.18	.01
Intrinsic motivation	6.72 (.57)	6.62 (.71)	6.04 (.87)	6.46 (.68)	-.51**	.15	.48***	.10	.21
Team confidence	5.58 (.86)	5.59 (.88)	4.65 (1.13)	4.74 (1.12)	-.01	.23	.03	.16	.00
Goal commitment	5.74 (.83)	5.44 (.98)	5.61 (1.02)	5.65 (1.06)	-.61	.23	.27	.16	.10
Team performance	7.47 (1.30)	7.08 (1.58)	6.83 (.92)	7.22 (1.13)	−1.23*	.45	.85***	.32	.06
Burnout	2.60 (.86)	2.75 (.89)	3.11 (.94)	2.72 (.83)	.68**	.18	-.55***	.13	.16
Self-assessed health	5.37 (.97)	5.47 (.98)	4.68 (1.04)	5.26 (1.04)	-.29	.26	.40*	.18	.12

*$p < .05$; **$p < .01$; ***$p < .001$.

starting off the season using $5R^S$ or using it halfway through the season.

An interesting remark with respect to the timing of implementing $5R^S$ is that our exploratory findings could be interpreted in such a way that $5R^S$ might have a potentially stronger effect during the second half of the season, as compared to the first half of the season (Table 6). Specifically, the changes experienced by players undergoing $5R^S$ during the second half of the season in intrinsic motivation, perception of team performance, burnout, and health, are stronger than the changes of players undergoing $5R^S$ during the first half of the season. However, Fig. 2 can help visualize a potential explanation for this phenomenon. Specifically, these variables appear to naturally experience a drop during the first half of the season, while $5R^S$ appears to prevent this drop in the first half. During the second half of the season, $5R^S$ appears to 'restore' these variables close to what participants who received $5R^S$ in the first half of the season experience near the end of the season. In other words, when solely considering the direct comparison, the findings suggest that when $5R^S$ is implemented in the second season half, this would lead to 'better' changes. However, the relevant variables in question appear to reach a similar value at the end of the season, regardless of the timing of $5R^S$. We therefore conclude that $5R^S$ is beneficial regardless of whether it is provided in the early or latter half of the season.

4.4. Strengths, limitations, and future research directions

Our current experimental design with a wait-list control group is characterized by a number of significant strengths. By including a wait-list control group, we were able to identify the unique effect of the $5R^S$ program among coaches open to the idea of shared leadership and team identification. Moreover, by adopting a train-the-trainer approach, we

provide evidence of the applicability of $5R^S$, opening the possibility of large-scale rollout of the program. Another benefit of our design is the fact that we investigated actual basketball teams (instead of creating teams out of random players, e.g., Fransen, Steffens, et al., 2016) during a whole competitive season (instead of an experimental setup with a one hour duration), enhancing the transferability to other real-world settings. In addition, due to the longitudinal nature of our study, implementing $5R^S$ at two different time points, our design also provides some preliminary insight multiple exploratory aims by investigating $5R^S$ follow-up effects, timing, gender differences, and the possibility of training people in providing $5R^S$.

Besides the strengths of our study, a number of limitations should be noted too. The most important limitation is the fact that we compared our intervention group to a no-treatment control group (instead of a control group who received a different kind of intervention). This was mainly due to the time restrictions when implementing $5R^S$ in eight teams simultaneously. Future researchers could validate the reliability of our findings by examining the intervention against a group also receiving reasonable alternative treatment (Shadish et al., 2002).

Another limitation is that we were not able to include data from beyond one competitive season. Future researchers could consider tracking teams over the course of multiple seasons. In doing so, we could obtain more detailed information on how $5R^S$ affects teams over time. Additionally, in the present wait-list control design, we did not include a control group that remained a control group across the entire season but only for the first half of the season. Future researchers could implement a control group and track this for the entire season.

Additionally, while the present study included a simple indicator of team performance, this was only represented by a (subjective) single-item question. This was done because measuring 'objective' performance indicators on a team level is often complex, as a given team's ranking does not always positively correlate to their performance (e.g., a team might be 'expected' to end in a top three position, while being in 'only' sixth place). Nevertheless, future research could try to implement more frequent and controllable measures (e.g., team effort). By doing so, future researchers could more accurately control for team performance, and consider investigating the influence of team quality on the effect of $5R^S$.

Finally, future researchers could investigate the effect of $5R^S$ in different settings. First, $5R^S$ should be tested in other team sports, to verify its generalizability across sports. Furthermore, $5R^S$ could potentially be beneficial to individual sports, as while those athletes might not compete together, they often do train together as one team. Additionally, given how in-group leadership and team identity principles are evidenced in both sports teams and organizational teams (e.g., Cotterill & Fransen, 2016; Pearce et al., 2007; Zhu et al., 2018), future research could conduct an experimental test of $5R^S$ in organizational teams, thereby further building on the initial case study conducted by Fransen, Haslam, et al. (2020).

4.5. Implications for practice

An important consideration is the fact that we were able to train people in delivering $5R^S$. As indicated before, the trainers who delivered the $5R^S$ in our study were not psychologists, but movement scientists enrolled in a master in training and coaching with a background in basketball coaching. Consequently, the $5R^S$ program as evaluated here can be considered as an application of the "train-the-trainer" approach. More specifically, both trainers in the present study had no previous experience with the program and were taught how to conduct these workshops over the course of a few weeks. Nevertheless, they both delivered $5R^S$ in a way that led to significant changes in their respective teams. This outcome is pertinent for both researchers and practitioners who would like to perform $5R^S$ on a larger scale, as they could train different people in providing a quality version of the program. The previous work by Carron et al. (1997) on indirect team-building interventions is especially relevant to our suggestion to provide $5R^S$ as a train-the-trainer program,. Specifically, the present research implemented an indirect manner of providing $5R^S$ to the teams, by first training the trainer, before the two trainers delivered $5R^S$ to the teams. Nevertheless, when comparing our method of 'train-the-trainer' with the indirect team-building processes as described by Carron and colleagues, we should also highlight that a notable difference exists between both methods. Most importantly, the present research provided $5R^S$ through an individual who previously had no connection to the team, as opposed to the work by Carron et al. (1997), which focuses on employing the coach of a sport team to provide team building.

Practitioners working with sport teams should consider the flexibility of $5R^S$. Our study only included three workshops to perform the program, of which two workshops provided in two weeks contained the bulk of the intervention. Besides the fact that this program does not require too much of a time investment, it is also applicable both at the start and half-way through the season, leaving many options for fitting this program in a team's specific planning. Besides the flexibility of timing, $5R^S$ also addresses multiple issues that team's might be struggling with. For example, $5R^S$ can not only help to set up a structure of shared leadership, it can also develop in-group leadership skills.

4.6. Conclusion

Overall, we can conclude that the 5R Shared leadership Program is beneficial not only for developing high-quality leadership in sport teams but also for improving team functioning, and nurturing players' health. More importantly, $5R^S$ can achieve these benefits using a train-the-trainer approach, opening the possibility of wider application by both researchers and practitioners. Results also showed that $5R^S$ seems to achieve these benefits, regardless of the intervention's timing during the season and the team's predominant gender. These findings both advance the current field on in-group leadership development, and provide practitioners with guidance on how and when to apply $5R^S$ with the aim of improving team functioning and players' health.

CRediT authorship contribution statement

Niels Mertens: Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing – original draft, Writing – review & editing, Supervision. **Filip Boen:** Conceptualization, Methodology, Writing – review & editing. **Niklas K. Steffens:** Conceptualization, Methodology, Writing – review & editing. **S. Alexander Haslam:** Conceptualization, Methodology, Writing – review & editing. **Jamie B. Barker:** Writing – review & editing. **Matthew J. Slater:** Writing – review & editing. **Katrien Fransen:** Conceptualization, Methodology, Writing – review & editing, Supervision, Funding acquisition: * no external funding was acquired.

Declaration of competing interest

There was no conflict of interest.

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Appendix A

The results of the multilevel regression modeling, including time as a level 1-predictor, condition as a level 2-predictor, and a level 3 random intercept, displayed separately for male teams and female teams. The table displays interaction effects between the experimental group and the wait-list control group at T1 and T2.

	gender	Experimental group		Wait-list control group		β_{time}	SE_{time}	$\beta_{interaction}$	$SE_{interaction}$	Pseudo R^2_e
		M (SD) (T1)	*M (SD)* (T2)	*M (SD)* (T1)	*M (SD)* (T2)					
Identity leadership of athlete leaders	female	5.32 (.71)	5.63 (.76)	5.25 (.91)	4.90 (1.07)	.96***	.24	.65***	.16	.16
	male	5.54 (.67)	5.73 (.71)	5.20 (.71)	4.92 (.83)	.73*	.34	.51*	.20	.11
Team identification	female	5.61 (.95)	5.59 (.95)	5.23 (.84)	4.66 (1.03)	.49*	.25	.51**	.17	.17
	male	5.39 (.87)	5.57 (.78)	5.35 (.86)	5.06 (.83)	.68	.37	.47*	.22	.09
Received social support	female	5.58 (1.03)	5.49 (1.09)	5.35 (.82)	4.91 (1.22)	.26	.28	.35	.18	.11
	male	5.30 (.88)	5.96 (.85)	5.35 (.69)	4.88 (.85)	2.18***	.47	1.34***	.28	.24
Intrinsic motivation	female	6.75 (.61)	6.68 (.56)	6.69 (.71)	5.96 (.89)	.57***	.17	.65***	.11	.45
	male	6.63 (.46)	6.68 (.49)	6.54 (.71)	5.96 (1.11)	.78*	.33	.68**	.20	.31
Team confidence	female	5.48 (.90)	5.50 (.91)	5.09 (.94)	4.67 (1.12)	.49*	.23	.47**	.15	.13
	male	5.83 (.73)	5.82 (.78)	5.24 (.69)	4.46 (.93)	.88*	.42	.81***	.24	.33
Goal commitment	female	5.74 (.88)	5.32 (.95)	6.04 (.96)	5.76 (1.11)	-.60*	.28	-.18	.18	.14
	male	5.98 (.69)	5.78 (1.04)	5.53 (.91)	5.42 (.92)	-.16	.39	-.04	.23	.02
Team performance	female	7.51 (1.24)	7.58 (1.29)	7.46 (.71)	6.86 (1.06)	.58	.41	.53	.27	.06
	male	7.36 (1.47)	5.83 (1.58)	6.47 (1.22)	6.28 (1.69)	−2.70**	.97	−1.32**	.56	.09
Burnout	female	2.51 (.90)	2.66 (.86)	2.55 (.84)	3.17 (1.06)	-.32	.21	-.46**	.14	.29
	male	2.80 (.72)	2.97 (.94)	2.76 (.83)	3.40 (.86)	-.34	.38	-.47*	.22	.26
Self-assessed health	female	5.33 (1.02)	5.41 (1.07)	5.37 (.91)	4.75 (1.00)	.77**	.27	.69***	.18	.18
	male	5.45 (.84)	5.63 (.71)	5.46 (.90)	5.00 (.92)	.84	.48	.65*	.28	.11

*$p < .05$; **$p < .01$; ***$p < .001$.

Appendix B

The results of the multilevel regression modeling, including time as a level 1-predictor, condition as a level 2-predictor, and a level 3 random intercept, displayed separately for male teams and female teams. The table displays interaction effects between the experimental group at T2 and T3 and the wait-list control group at T1 and T2.

	gender	Experimental group		Wait-list control group		β_{time}	SE_{time}	$\beta_{interaction}$	$SE_{interaction}$	Pseudo R^2_e
		M (SD) (T2)	*M (SD)* (T3)	*M (SD)* (T1)	*M (SD)* (T2)					
Identity leadership of athlete leaders	female	5.64 (.80)	5.50 (.86)	5.25 (.91)	4.90 (1.07)	.07	.28	.21	.18	.08
	male	5.78 (.78)	5.84 (.80)	5.20 (.71)	4.92 (.83)	.45	.40	.37	.22	.11
Team identification	female	5.62 (.94)	5.58 (1.12)	5.23 (.84)	4.66 (1.03)	.52	.26	.54**	.17	.19
	male	5.47 (.86)	5.47 (1.02)	5.35 (.86)	5.06 (.83)	.34	.41	.35	.23	.18
Received social support	female	5.48 (1.11)	5.40 (1.25)	5.35 (.82)	4.91 (1.22)	.29	.32	.37	.21	.09
	male	5.96 (.90)	5.65 (.96)	5.35 (.69)	4.88 (.85)	-.12	.61	-.19	.34	.17
Intrinsic motivation	female	6.62 (.59)	6.60 (.58)	6.69 (.71)	5.96 (.89)	.63**	.20	.68***	.13	.38
	male	6.69 (.52)	6.65 (.43)	6.54 (.71)	5.96 (1.11)	.56	.42	.57**	.23	.30
Team confidence	female	5.48 (.96)	5.29 (.97)	5.09 (.94)	4.67 (1.12)	.04	.24	.24	.16	.17
	male	5.62 (.90)	5.80 (.65)	5.24 (.69)	4.46 (.93)	.93	.49	.84**	.28	.37
Goal commitment	female	5.33 (1.00)	5.20 (1.03)	6.04 (.96)	5.76 (1.11)	-.01	.28	.11	.18	.06
	male	5.65 (1.12)	5.60 (.86)	5.53 (.91)	5.42 (.92)	-.14	.50	.03	.28	.01
Team performance	female	7.54 (1.36)	7.29 (1.59)	7.46 (.71)	6.86 (1.06)	-.06	.44	.21	.29	.09
	male	5.82 (1.78)	6.45 (1.64)	6.47 (1.22)	6.28 (1.69)	−1.16	1.20	.60	.67	.01
Burnout	female	2.62 (.83)	2.69 (.94)	2.55 (.84)	3.17 (1.06)	-.46*	.21	-.53***	.13	.32
	male	3.09 (.94)	2.92 (1.03)	2.76 (.83)	3.40 (.86)	-.81	.47	-.70**	.26	.28
Self-assessed health	female	5.39 (1.02)	5.45 (1.11)	5.37 (.91)	4.75 (1.00)	.70**	.27	.65***	.17	.21
	male	5.46 (.82)	5.31 (.97)	5.46 (.90)	5.00 (.92)	-.02	.58	.22	.33	.14

*$p < .05$; **$p < .01$; ***$p < .001$.

Appendix C

The results of the multilevel regression modeling, including time as a level 1-predictor, condition as a level 2-predictor, and a level 3 random intercept, displayed separately for male teams and female teams. The table displays interaction effects between the wait-list control group at T2 and T3 and at T1 and T2.

	gender	Wait-list control group		Wait-list control group		β_{time}	SE_{time}	$\beta_{interaction}$	$SE_{interaction}$	Pseudo R^2_ε
		M (SD) (T2)	*M (SD)* (T3)	*M (SD)* (T1)	*M (SD)* (T2)					
Identity leadership of athlete leaders	female	5.06 (1.06)	4.99 (1.22)	5.25 (.91)	4.90 (1.07)	.32	.32	.33	.20	.08
	male	4.62 (.57)	5.46 (.65)	5.20 (.71)	4.92 (.83)	2.00***	.45	1.14***	.24	.22
Team identification	female	4.82 (1.00)	5.02 (1.28)	5.23 (.84)	4.66 (1.03)	1.13***	.30	.84***	.19	.19
	male	4.87 (.82)	5.15 (.87)	5.35 (.86)	5.06 (.83)	1.09*	.45	.73**	.25	.18
Received social support	female	5.02 (1.16)	4.98 (1.54)	5.35 (.82)	4.91 (1.22)	.45	.37	.44*	.23	.09
	male	4.92 (.83)	5.08 (.85)	5.35 (.69)	4.88 (.85)	.82	.62	.65*	.34	.14
Intrinsic motivation	female	6.14 (.64)	6.50 (.61)	6.69 (.71)	5.96 (.89)	1.53***	.19	1.12***	.12	.49
	male	5.50 (1.58)	6.33 (.88)	6.54 (.71)	5.96 (1.11)	2.01***	.49	1.30**	.27	.32
Team confidence	female	4.74 (1.15)	4.54 (1.18)	5.09 (.94)	4.67 (1.12)	.30	.29	.36**	.18	.14
	male	4.57 (.67)	5.37 (1.04)	5.24 (.69)	4.46 (.93)	2.43***	.59	1.59***	.32	.36
Goal commitment	female	5.87 (1.14)	5.66 (1.12)	6.04 (.96)	5.76 (1.11)	-.12	.27	.05	.17	.09
	male	5.07 (.96)	5.47 (.79)	5.53 (.91)	5.42 (.92)	-.97	.51	.53	.27	.05
Team performance	female	6.87 (.98)	7.15 (1.20)	7.46 (.71)	6.86 (1.06)	1.09**	.43	.79**	.27	.10
	male	6.60 (.55)	7.60 (.55)	6.47 (1.22)	6.28 (1.69)	−2.95**	1.30	1.53**	.70	.06
Burnout	female	3.02 (.97)	2.68 (.89)	2.55 (.84)	3.17 (1.06)	−1.28***	.20	-.94***	.13	.39
	male	3.78 (.35)	3.01 (.37)	2.76 (.83)	3.40 (.86)	−2.11***	.51	−1.35***	.28	.33
Self-assessed health	female	4.62 (1.01)	5.30 (1.00)	5.37 (.91)	4.75 (1.00)	1.93***	.27	1.27***	.17	.35
	male	4.92 (.94)	4.94 (1.05)	5.46 (.90)	5.00 (.92)	.48	.60	.47	.33	.14

*$p < .05$; **$p < .01$; ***$p < .001$.

Appendix D

The results of the multilevel regression modeling, including time as a level 1-predictor, condition as a level 2-predictor, and a level 3 random intercept, for both male and female teams separately. The table displays interaction effects between the experimental (T1 to T2, coded as 0 to 1) and the wait-list control group (T2 to T3, coded as 0 to 1) in order to contrast the $5R^s$ program delivered during the first half of the competitive season (i.e., the experimental group) with the $5R^s$ program delivered during the second half of the competitive season (i.e., the wait-list control group).

	gender	Experimental group		Wait-list control group		β_{time}	SE_{time}	$\beta_{interaction}$	$SE_{interaction}$	Pseudo R^2_ε
		M (SD) (T1)	*M (SD)* (T2)	*M (SD)* (T2)	*M (SD)* (T3)					
Identity leadership of athlete leaders	female	5.32 (.71)	5.63 (.76)	5.06 (1.06)	4.99 (1.22)	.64*	.25	.33*	.17	.09
	male	5.54 (.67)	5.73 (.71)	4.62 (.57)	5.46 (.65)	-.28	.40	.51	.31	.28
Team identification	female	5.61 (.95)	5.59 (.95)	4.82 (1.00)	5.02 (1.28)	-.25	.25	.24	.17	.03
	male	5.39 (.87)	5.57 (.78)	4.87 (.82)	5.15 (.87)	.10	.24	.08	.19	.20
Received social support	female	5.58 (1.03)	5.49 (1.09)	5.02 (1.16)	4.98 (1.54)	-.18	.30	.08	.20	.01
	male	5.30 (.88)	5.96 (.85)	4.92 (.83)	5.08 (.85)	1.29**	.44	-.53	.33	.36
Intrinsic motivation	female	6.75 (.61)	6.68 (.56)	6.14 (.64)	6.50 (.61)	-.57**	.16	.49***	.11	.21
	male	6.63 (.46)	6.68 (.49)	5.50 (1.58)	6.33 (.88)	-.55	.36	.64*	.27	.32
Team confidence	female	5.48 (.90)	5.50 (.91)	4.74 (1.15)	4.64 (1.18)	.13	.26	-.11	.18	.01
	male	5.83 (.73)	5.82 (.78)	4.57 (.67)	5.37 (1.04)	-.68	46	-.72*	.35	.20
Goal commitment	female	5.74 (.88)	5.32 (.95)	5.87 (1.14)	5.66 (1.12)	-.65*	.28	.24	.19	.14
	male	5.98 (.69)	5.78 (1.04)	5.07 (.96)	5.47 (.79)	-.58	.38	.44	.29	.12
Team performance	female	7.51 (1.24)	7.58 (1.29)	6.87 (.98)	7.15 (1.19)	-.17	.42	.21	.29	.02
	male	7.36 (1.47)	5.83 (1.58)	6.60 (.55)	7.60 (.55)	−4.24***	1.06	2.75**	.80	.29
Burnout	female	2.51 (.90)	2.66 (.86)	3.02 (.97)	2.68 (.89)	.63**	.22	-.49***	.15	.12
	male	2.80 (.72)	2.97 (.94)	3.78 (.35)	3.01 (.37)	1.00**	.33	-.86***	.25	.34
Self-assessed health	female	5.33 (1.02)	5.41 (1.07)	4.62 (1.01)	5.30 (1.00)	-.48	.28	.56**	.19	.20
	male	5.45 (.84)	5.63 (.71)	4.92 (.94)	4.94 (1.04)	.41	.63	-.20	.46	.04

*$p < .05$; **$p < .01$; ***$p < .001$.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.psychsport.2021.101936.

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