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Inner Obstacles and Goal-Directed Behaviors of Elite and Youth-Level Cyclists

A Qualitative Analysis From the Perspective of Athletes and Coaches

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Abstract: As self-regulation is crucial in top-level performance, prior investigations aimed at studying the efficacy of the self-regulatory strategy of implementation intentions (i. e., if–then plans) in athletic performance. We investigated the inner obstacles (if) that athletes face in competitive situations and assessed the corresponding goal-directed behaviors (then) to design effective implementation intention theory-based interventions. We asked elite and youth-level cyclists (Study 1; N = 34; age: M = 23.7 ± 9.9 years) with a self-designed questionnaire and used a reworded version for assessing these research questions from a coach's perspective (Study 2; N = 42; age: M = 50.2 ± 9.8 years). Dealing with demanding situations, pressure, and concentration were the most frequently named inner obstacles, while goal-directed behaviors were preparation, self-encouragement, relaxation (athletes), and concentration (coaches). The results highlight the emotional–psychological challenges that elite and youth-level cycling athletes face and provide insights for sport psychological research with implementation intentions.

Keywords: obstacles and goal-directed behaviors in cycling, elite athletes, elite coaches, implementation intention theory, thematic analysis

Innere Hindernisse und zielgerichtetes Verhalten von Radsportler_innen der Elite- und Jugendklasse. Eine qualitative Analyse aus der Perspektive von Athlet_innen und Trainer_innen

Zusammenfassung: Da Selbstregulierung für Spitzenleistungen entscheidend ist, wurde in früheren Untersuchungen die Wirksamkeit der Selbstregulierungsstrategie Implementierungsintentionen (sog. Wenn-Dann Pläne) auf sportliche Leistung untersucht. Wir untersuchten innere Hindernisse (Wenn), mit denen Athlet_innen in Wettkampfsituationen konfrontiert sind, und erfassten die entsprechenden zielgerichteten Verhaltensweisen (Dann), um wirksame, auf der Theorie der Implementierungsintentionen basierende Interventionen zu entwickeln. Wir befragten Spitzen- und Nachwuchsradsportler_innen (Studie 1; N = 34; Alter: M = 23,7 ± 9,9 Jahre) mit einem selbst entworfenen Fragebogen und verwendeten eine umformulierte Version, um diese Forschungsfragen aus der Perspektive von Trainer_innen zu erfassen (Studie 2; N = 42; Alter: M = 50,2 ± 9,8 Jahre). Der Umgang mit herausfordernden Situationen, Druck und Konzentration wurden am häufigsten als innere Hindernisse genannt, zielgerichtete Verhaltensweisen waren hingegen Vorbereitung, Selbstermutigung und Entspannung (Sportler_innen) und Konzentration (Trainer_innen). Die Ergebnisse verdeutlichen die (emotions)psychologischen Herausforderungen, mit denen Spitzen- und Nachwuchsradsportler_innen konfrontiert sind, und liefern Erkenntnisse für die sportpsychologische Forschung mit Implementierungsintentionen.

Schlüsselwörter: Hindernisse und zielgerichtete Verhaltensweisen im Radsport, Spitzensportler_innen, Spitzentrainer_innen, Theorie der Implementierungsintentionen, thematische Analyse

Top-level cycling inspires millions of people. The Tour de France is the world's largest annual sporting event (sport1.de, 2016) and captures the attention of millions of spectators annually. To succeed in such an event, racing cyclists need not only outstanding physical fitness but also an extensive collection of excellent mental skills (Orlick & Partington, 1988). One broad mental faculty that is particularly relevant for optimal sports performance is self-regulatory control (e.g., Englert, 2016), which refers to "the set of mechanisms required to pursue a goal, especially when distraction and/or strong (e.g., habitual) competing responses must be overcome" (Shenhav et al.,

2013, p. 217). The relevance of these mechanisms for endurance performance is intuitively apparent: During an endurance competition, athletes frequently have to cope with intensifying sensations of pain, fatigue, and exertion that create and amplify the urge to quit rather than continue the race (Enoka & Duchateau, 2016; Marcora & Staiano, 2010; Mauger, 2019). Accordingly, endurance performance is critically dependent on how effectively athletes apply self-regulatory strategies to address such inner obstacles (Wolff et al., 2018). For example, an athlete might employ self-talk or imagery as goal-directed self-regulatory behaviors to cope with exercise-induced obstacles (McCormick et al., 2015). To shed light on the nature of these obstacles and the behaviors employed to overcome them, the present research takes a qualitative approach to analyze the inner obstacles elite and youth-level cyclists face during competitions and the goal-directed behaviors they use to overcome them.

Implementation intention theory (Gollwitzer, 1999, 2014) provides a conceptual framework for such an analysis: It explicates the role of obstacles and goal-directed behaviors in goal striving. Specifically, the theory proposes that attaining a goal (e.g., "I want to achieve X") is facilitated by making self-regulatory if–then plans. If–then planning involves thinking about two key elements: a critical situation that might jeopardize goal attainment (e.g., an inner obstacle standing in the way) and a goal-directed response that might be used to deal with this situation (e.g., a behavior to overcome the obstacle). These two elements are then linked to an if (situation)–then (response) plan. Take, for example, professional cycling. Here, the goal to win a sprint stage in the Tour de France could be threatened by the fear of being badly positioned in the closing kilometers of the stage, which often can be very hectic. To address this obstacle, an athlete might engage in self-talk to keep focused on the goal to stick with their lead-out rider in the closing kilometer. Making if–then plans is an important component of successful goal attainment across different domains (e.g., physical exercise, Bélanger-Gravel et al., 2013; health, Adriaanse et al., 2011; Bélanger-Gravel et al., 2013; Orbell & Sheeran, 2000; see Gollwitzer & Sheeran, 2006 for a meta-analysis, and Bieleke, Keller, et al., 2021 for a recent review). Accordingly, it has been suggested that if–then planning might also be a relevant self-regulatory strategy in sports in general and in endurance sports in particular (Bieleke, Wolff, et al., 2021). Indeed, the beneficial effects of if–then planning rest primarily on automating both the detection of critical situations and the initiation of goal-directed behaviors (Gollwitzer, 2014) – processes that are likely crucial for effective self-regulatory control in endurance sports (e.g., to deal efficiently with the urge to quit even under high levels of stress; Wolff et al., 2019).

Considering the suitability of implementation intention theory as a conceptual framework and its well-established effectiveness as a self-regulatory strategy, interventions based on the theory have so far produced surprisingly inconsistent results in endurance sports and other sports domains (Bieleke, Wolff, et al., 2021). Concerning endurance, for example, if–then planning has been observed to enhance performance in some tasks (e.g., group weight-holding tasks, Thürmer et al., 2017; posture-holding tasks, Wang et al., 2019), but not in others (e.g., static muscular endurance tasks, Bieleke & Wolff, 2017; Hirsch et al., 2020; Wolff et al., 2018; cycling tasks, Hirsch et al., 2021; Latinjak et al., 2018). One possible explanation for these heterogeneous findings is that the bulk of studies investigated the effectiveness of if–then plans in inexperienced exercisers who might not have sufficient insight into the inner obstacles that limit their performance and the goal-directed behaviors that would be suitable to overcome them (Hirsch et al., 2021). Other studies used predetermined if–then plans that targeted obstacles (e.g., pain, effort) and behaviors (e.g., task continuation) that turned out to be unsuitable for improving endurance performance. For instance, it has been demonstrated that the obstacles specified in an if–then plan (e.g., physical pain vs. perceived effort) must correspond to exercisers' beliefs about whether these obstacles limit their performance (Hirsch et al., 2020). Thus, making an if–then plan to cope with exercised-induced pain during a static muscular endurance task was effective only when exercisers felt that such a physical obstacle limited their performance (in contrast to believing that performance was limited by mental factors). In another study using a static muscular endurance task, participants made if–then plans specifying that sensations of effort should be ignored; however, this plan inadvertently intensified rather than attenuated the perceived effort and thus failed to enhance performance (Bieleke & Wolff, 2017). Taken together, the heterogeneity of findings regarding the effects of if–then planning might be due to inexperienced samples with too little or no insight into relevant obstacles and goal-directed behaviors, reliance on obstacles that are at odds with athletes' beliefs about what limits their performance, and/or use of goal-directed behaviors that failed to improve performance. Thus, to facilitate the design of effective interventions based on implementation intention theory, it is important to take one step back and investigate which obstacles highly experienced athletes face in their sports, and what kind of goal-directed behaviors they employ to deal with those obstacles.

Accordingly, we turned to two independent samples of elite and youth-level cyclists and cycling coaches. In comparison to sub-elite and recreational athletes, elite and youth-level athletes excel in a variety of essential mental

skills (e.g., most importantly self-control, Englert et al., 2021; but also mental toughness, Beckford et al., 2016; imagery skills and use of associative strategies, Morgan & Pollock, 1977) and seem to possess higher neural efficiency (e.g., Li & Smith, 2021), which might allow them to deal more efficiently with the self-regulatory demands of sports (Wolff et al., 2021). Additionally, they are likely familiar with a broad range of challenging sensations that commonly arise in competitions (e.g., fear of failure, negative emotions, and dysfunctional thinking, Birrer et al., 2012) and with applying various skills that help them deal effectively with these challenges (e.g., imagery, emotion control, and automatic skill performance in Olympic medalists, Taylor et al., 2008). Meanwhile, coaches play an important role in the development and performance of their athletes, as their experience, including their competitive activity and skills, enables them to optimally adapt to athletes' needs (Jowett et al., 2005; Jowett & Poczwardowski, 2007). Feedback from coaches can give athletes important input about their abilities, willingness to exert effort, and an assessment of their expectation of success (Amorose & Smith, 2003). Through their position from the outside, their deep insights into processes, and their own competition and training experiences, coaches offer a valuable perspective on the specific obstacles and possible goal-directed behaviors of athletes. Obtaining their perspective to triangulate athletes' responses is therefore a logical step in gaining an overall picture of athletes' obstacles and goal-directed behaviors. Taken together, elite and youth-level athletes and coaches are ideally suited for studying the inner obstacles associated with endurance performance and behaviors that help to overcome these obstacles, which promises to provide a foundation for developing more effective interventions based on implementation intention theory.

Here, we report two studies that set out to identify the inner obstacles that athletes face in cycling competitions and the goal-directed behaviors they apply to overcome these obstacles. As the mere naming of goal-directed behaviors is minimally informative in gaining an impression of their usefulness, we asked athletes and coaches how helpful these behaviors were perceived. We recruited two samples: one sample of elite and youth-level athletes who actively competed in cycling events (Study 1) and a sample of elite cycling coaches (Study 2). To increase the sample size with a limited number of elite and youth-level athletes that could be surveyed, these two samples were recruited independently of each other (i.e., the athletes and coaches did not work with each other) and thus provided unique answers to our research question. Due to the explorative nature of our research, we capitalized on a qualitative, data-driven approach to identify relevant themes of obstacles and behaviors.

Method

Our research approach was shaped by an essentialist perspective. Essentialism postulates that "all objects and concepts can be defined by reference to certain core properties that make them what they are" (Rolfe, 2008, p. 269). This perspective had implications for our sampling strategy. Elite and youth-level athletes as well as their coaches are experts on the inner obstacles and goal-directed behaviors associated with endurance performance. Hence, they constitute an ideal sample for addressing our research question, and we sampled them for our study.

The surveys were carried out as part of a larger research project that focused on developing self-regulatory interventions for elite athletes (among other target groups). For this reason, athletes and coaches were asked to provide other information besides the reporting of inner obstacles, goal-directed behaviors, and estimated helpfulness (i.e., naming optimized handling of inner obstacles, strategies to mentally prepare for a step test, self-assessments on self-control, boredom proneness, and planning propensity). As only the first part of the questionnaires was relevant for answering our research question, we focused on the presentation of these results in this article. The questionnaires took about 25 min to complete and were developed together with an amateur and an elite cyclist to ensure comprehensibility and suitability for the target group. Furthermore, we based the structure and phrasing on established methods from research on if–then plans, for example, by explicitly asking for inner obstacles first and then focusing on possible goal-directed behaviors. Next to guiding our sampling strategy, the essentialist approach also shaped our approach to eliciting the relevant themes for the analysis. Specifically, to identify and extract fundamental aspects of inner obstacles and goal-directed behaviors, we captured the experiences and perspectives of the athletes and coaches by encouraging them to give answers as freely as possible (i.e., with open-ended questions). The athlete survey was conducted online (Qualtrics, 2021), while the coach survey was conducted in a paper-and-pencil format at the beginning of an in-person workshop. At the beginning of the questionnaire, athletes and coaches were informed about the purpose of the study and their participation rights. Data were collected anonymously. Neither the athletes nor the coaches received financial compensation for participating in the study. The surveys were conducted according to the 1975 Declaration of Helsinki and were approved by the Ethics Committee at the University of Konstanz. For all electronic supplementary material (study materials, Figures), please see ESM 1-4.

Questionnaires

Study 1: Athlete Sample

After they had given informed consent, the athletes provided demographic information (age, gender) and information about their cycling experience (e.g., years of cycling, competition experience). Athletes were then asked to name and describe inner obstacles they encounter in a typical competition ("Please describe your central inner obstacles in a typical competition in few words") that keep them from turning a race into a successful race. It was emphasized that athletes should focus on obstacles they could in principle overcome by themselves (as opposed to external obstacles, like a crash). Afterward, the athletes specified the behaviors they commonly apply to deal with these obstacles ("How do you typically deal with these inner obstacles?") and indicated the extent to which these goal-directed behaviors help them to overcome them (on a scale from 1 = *not at all* to 5 = *very much*).

Study 2: Coach Sample

The coach questionnaire was analogous to the athlete questionnaire but differed in two ways: First, the coaches provided information about their coaching experience rather than their cycling experience (e.g., highest coaching qualification, main coaching discipline). Second, we asked the coaches about their views on the inner obstacles and goal-directed behaviors of the athletes they coached.

Data Analysis

Data resulting from the questionnaires were analyzed with thematic analysis on a semantic level (Braun & Clarke, 2006; Braun et al., 2016) individually for the athlete and the coach sample. Epistemologically, the analysis can best be allocated as essentialist-realist, being of an inductive nature, meaning that relevant themes were derived from participants' answers in a data-driven manner (Braun & Clarke, 2006). In the first step, the lead author of this paper conducted an initial review of the data to familiarize herself with the data, noted the first ideas to code the data, and then created codes for all data extracts. These codes were then grouped into possible themes. Data extracts that were related to more than one theme were assigned to multiple themes. These themes were then re-evaluated by the researcher regarding the homogeneity of context and content overlaps, and to ensure that they reflected the data accurately and parsimoniously. Finally, each theme was defined and labeled. In the second step, two independent raters assigned all data extracts to the previously defined themes for re-examination. The interrater reliability was between κ = .66 and κ = .75 in the athlete sample and κ = .54 and κ = .62 in the coach sample, which is adequate and suggests that the themes represented the data extracts in a meaningful way (Altman, 1999; Landis & Koch, 1977). Mutual agreement was achieved by discussion (see Sarkar & Fletcher, 2014) except for two data extracts in the athlete sample, which were accordingly assigned to the *other* theme.

Finally, the theme labels developed from the athlete and the coach data were compared in order to align theme names to establish coherent wording across both studies. Figure 2 provides an overview of the extracted themes and their frequencies. Tables 2 and 3 provide an overview of themes and their definitions. Illustrative data extracts in the results section were translated into English from the original language. Figure 3 shows how helpful the handling of mental obstacles was rated in Study 1 and Study 2. In addition to the data analysis presented here, further insights into the distribution of themes regarding inner obstacles and goal-directed behaviors by discipline and performance level are depicted in Figure S1 and Figure S2. Because of the unbalanced sampling due to limited access to elite samples, the interpretability of these additional aspects is limited. For the analyses and illustrations, the statistical software environment R (4.1.0; R Core Team, 2021) and the package ggplot2 (3.3.5; Wickham, 2016) were used.

Study 1: Athlete Sample

Participants

In total, 34 elite (world team, continental [pro] team, [elite] amateurs) and youth (under the age of 19)-level cyclists took part in the study (age: $M = 23.7 \pm 10.0$ years; gender: 7 female, 27 male). The recruitment took place through the coaches of the German Cycling Federation, who sent the questionnaire to their cyclists. As can be seen in Table 1 and Figure 1, our sample covered a wide range of experience levels concerning cycling and cycling competitions. Participants reported preparing themselves for licensed races such as the national league (N = 10), German (N = 7) or state championships (N = 3), or the sighting race of the German Cycling Federation (N = 5; only the most frequently mentioned listed here). Overall, 27 athletes completed the questionnaire in full, the remaining athletes dropped out before reaching the end of the questionnaire (athletes' level: N = 1 elite, N = 2 elite amateur, N = 1 elite woman, N = 1 junior, and N = 2 other). We used all the available answers in the analyses.

Table 1. Descriptive information regarding athletes' cycling experience and training status (Study 1) and coaches' training experience (Study 2)

Athletes (Study 1)		*M*	*SD*	95% CI
Cycling experience (years)[a]		10.2	5.1	[8.4, 12.0]
Competitive experience (years) [a]		6.9	4.5	[5.4, 8.5]
No. of competitions (in the last 6 months)		5.6	5.7	[3.7, 7.6]
Watts step test[b]	m	351.7	105.4	[304.3, 399.1]
	f	302.0	49.2	[258.9, 345.1]
Cycling training (h/week)		12.1	3.9	[10.8, 13.4]
Training overall (h/week)		14.4	4.0	[13.1, 15.7]
Coaches (Study 2)				
Coaching experience (years)		25.6	10.7	[22.2, 29.0]

Note. [a]Athletes that indicated more than 30 years (cycling experience $N = 1$; competition experience $N = 1$) or less than 1 year of experience (competition experience $N = 1$) were not included in the mean value calculation. [b]Watts of the last stage cycled through in athletes' most recent stage test of the Federation of German Cyclists.

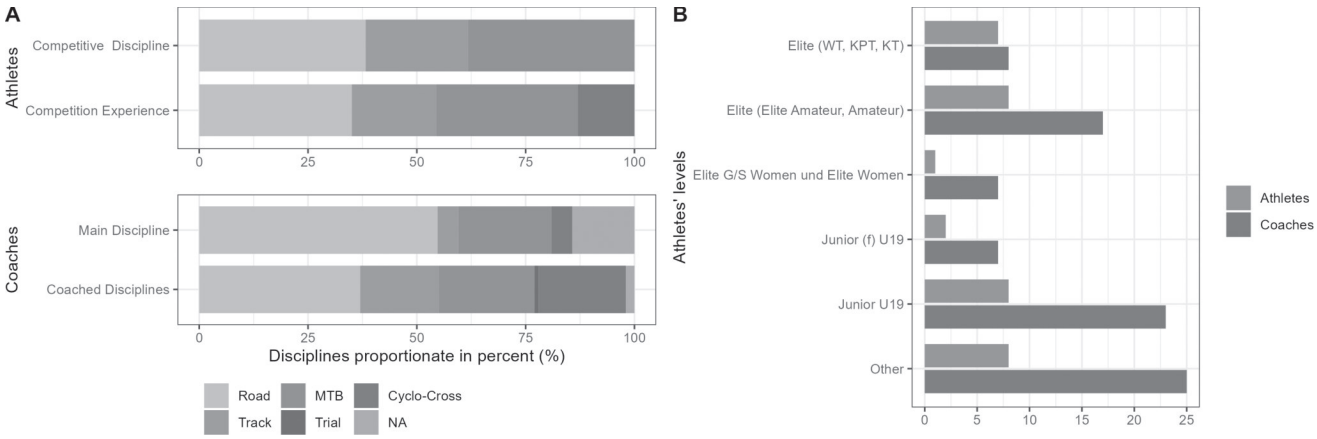
Results

Inner Obstacles

Athletes reported a variety of inner obstacles they experience during typical competitions. These were assigned to a total of 10 themes comprising between 1 and 10 data extracts per theme (see Table 2 for an overview of themes and their definitions and Figure 2 for a visualization of frequencies). The most frequent obstacle athletes stated was *pressure*, in terms of "pressure to succeed" or "pressure to perform" well. Athletes described to be pressured by "expectations," such as the "prior year placement" or their "competition." *Dealing with demanding situations* during the competition (e.g., unforeseen situations like "crashes," "hectic pace") challenged athletes, they listed examples such as a "bad starting position," "technical passages," or "getting poor nutritional intake." *Concentration* difficulties (e.g., when making decisions under stress) were also identified as a major obstacle that athletes encounter during competitions: Athletes emphasized the struggle to "keep a clear head," "focus on the race," or to "always stay alert in a 200-km race [...] and to go beyond the limit at the end." Being *demotivated* due to difficult competitive situations was perceived as an obstacle as well, for example, when it is demanding "not losing motivation especially when being overtaken" or "not to be dragged down by a probably unsatisfactory result." Also, athletes mentioned difficulties with sticking to their *cycling strategies*, such as "restraining oneself during long bike marathons, even though the legs seem to be able to give more." Related to this latter obstacle was *self-assessment* such as the adversity of "assessing your strength and attacking at the right moment." Upcoming *tension* (e.g., "excitement before the competition" or "playing down excitement") or *mental exhaustion* – for example, feeling mentally depleted due to increased mental demands, as one athlete put it more specifically "moving clever in the field costs mental energy, because of permanent concentration" – were further inner obstacles. *Pursuing the goal* when being mentally exhausted or lagging behind was also stated, as it is challenging to "believe from the beginning to the end that the goal can still be achieved."

Goal-Directed Behaviors

Goal-directed behaviors that were used to overcome the stated inner obstacles were assigned to 12 themes with 1 to 7 data extracts per theme (see Table 3 and Figure 2). *Preparation* (i.e., any way of preparing to face possible mental obstacles) was the most frequent goal-directed behavior, which was estimated between rather helpful and very much helpful. Athletes stated they prepared by "regarding food and drink: develop routine + logic regarding carbohydrate turnover and calorie consumption and maximum carbohydrate intake as well as fluid supply" or with "pacing strategies." *Self-encouragement* was the second most frequent goal-directed behavior in terms of verbalizing statements to cheering oneself up (e.g., "I tell myself that it is only a momentary state and will get better abruptly in the next rounds," "not to give up talking to myself"), which athletes perceived as partly helpful. Maintaining a *calm, relaxed inner attitude* in the face of mental obstacles or calming down (e.g., through breathing) was also stated by athletes, they described behaviors like, "regarding riding in the field, concentration, and tactics: Try to stay relaxed, don't tense up" or "try to stay calm and tell myself that I trained well. Have fun." *Imagination* in the sense of using motivating pictures or ideas and repression (i.e., "ignoring" the mental challenge) was also named. One athlete described his imagination in more detail: "About going to the limit: Thinking



Note. Abbreviations: MTB = Mountain biking, MTBO = Mountain bike orienteering, WT = World Tour, KPT = Continental Professional Team, KT = Continental Team. It was possible to select multiple disciplines when indicating competition experience (athletes), coached disciplines (coaches), and level of athletes (coaches).

Figure 1. Illustration A depicts athletes' main competitive discipline and their overall competition experience per discipline as well as coaches' primarily coached disciplines and coached disciplines in general. Illustration B displays athletes' performance levels.

about why you are doing it, playing music in your head or certain motivating phrases. Create feelings that release performance, for example, euphoria, anger." Athletes also described coping inadequately with inner obstacles due to *excessive demands* through mental obstacles. For example, they described feeling "overwhelmed" or simply answered dealing "bad[ly], I rise to the challenge." *Visualization* (e.g., "Visualization of the race situation, the attack, the victory in the head prior to the race") and *focusing* on themselves – as they reported "I do my own thing" or "I focus on myself" – was a possible goal-directed behavior, which was perceived as being between rather and very much helpful. *Social support*, in terms of "talk[ing] with parents or the coach" for support, and *concentration* (e.g., "Trying to think logically as much as possible, retrieve learned [sic] and also use more and more feeling and routine") were estimated as quite helpful. *Fun* with the athletic activity and *external aids* like "music" were also stated. Goal-directed behaviors were on average rated as being rather helpful (M = 3.7 ± 0.8), with *focusing* being estimated as most helpful (M = 4.5 ± 0.7). Figure 3 illustrates how helpful athletes rated each of the goal-directed behaviors.

Study 2: Coach Sample

Participants

A total of 42 coaches (age: M = 50.2 ± 9.8 years, gender: 38 male, 3 female, and 1 coach where no gender was specified) participated in the paper–pencil survey during an in-person workshop for level-A cycling coaches. They reported a coaching experience of M = 25.6 ± 10.7 years, most had a level-A license in competitive sports (i.e., the second-highest coaching license in Germany), and three coaches had the highest German coaching license. Table 1 maps the experience of cycling training in years, while Figure 1 shows which disciplines coaches stated they trained overall, their main trained cycling discipline, and on which levels their coached athletes compete.

Results

Inner Obstacles

Coaches' answers regarding central inner obstacles that are demanding during athletes' competitions were assigned to a total of 14 themes, which comprised between 1 and 8 data extracts per theme (see Table 2 for an overview of themes and their definitions and Figure 2 for a visualization of frequencies). The most frequently stated inner obstacle was *dealing with demanding situations,* such as "course conditions" or "surviving the mass start situation (riding as far ahead as possible)". Difficulties to *concentrate* were identified as a challenge by coaches, as trouble to "make thoughtful decisions under high physical stress" or to stay "100 % focused but not tense." From their point of view, athletes struggled with adhering to their *cycling strategies* such as "rolling along in the main field to save energy" or "completing difficult technical sections without crashing." *Self-assessment* – such as "not to become arrogant," "self-assessment of tactical–technical performance," or even "self-doubt" – was also mentioned. Coaches seemed to perceive their athletes as emotionally

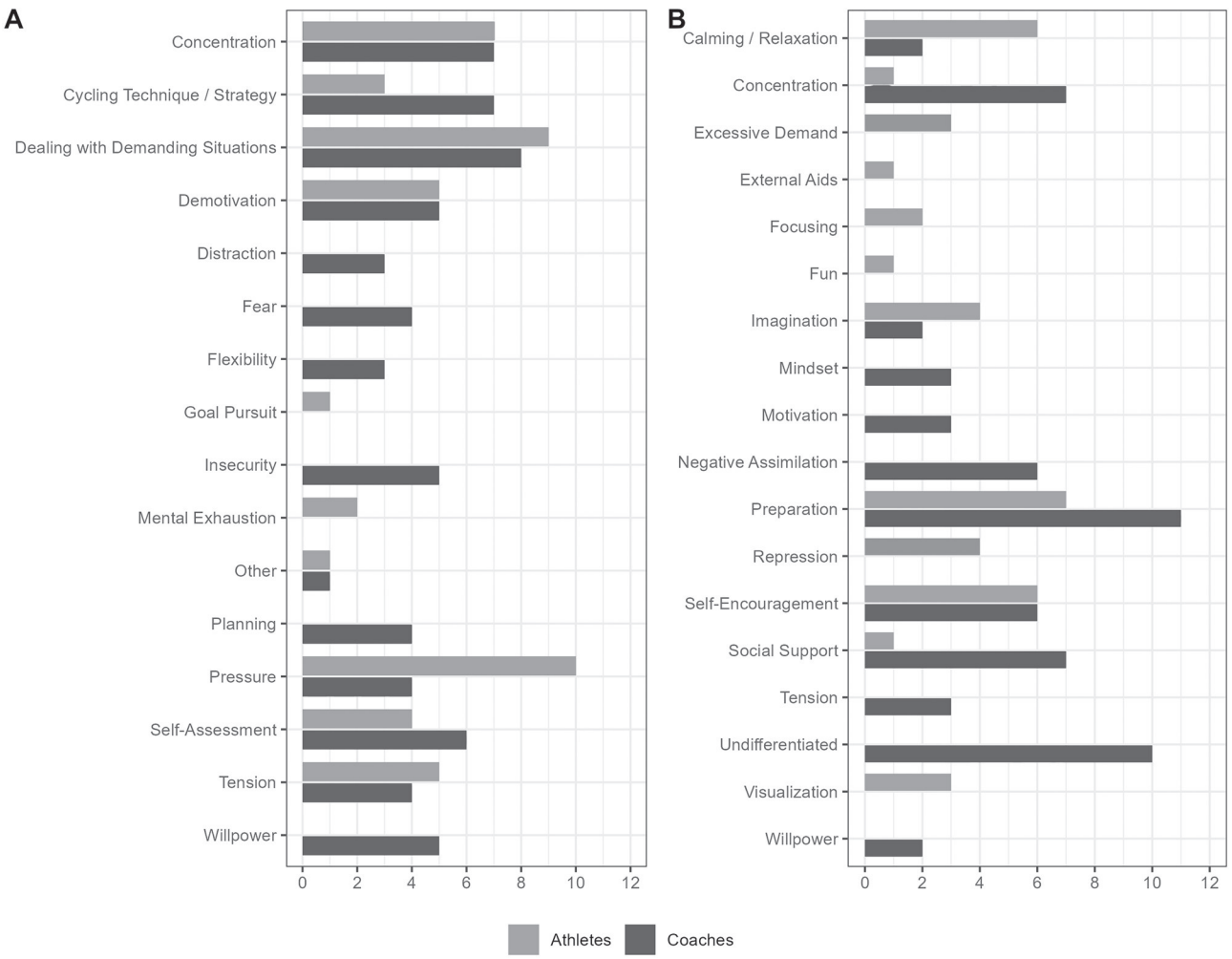


Figure 2. Visualization of the frequencies of (A) inner obstacles and (B) goal-directed behaviors from the perspective of athletes (Study 1) and coaches (Study 2).

challenged by *insecurity* (e.g., "there are so many strong/better athletes," "not knowing about [the] strength of competition") and *fear* (e.g., "fear of failure, of not performing up to expectations," "the higher the level, the more existential fears"). *Demotivation* due to difficult competitive situations, like "motivation problems when the pace of the field cannot be followed" or "to finish the race, not to give up even in a hopeless situation" and high *tension* (e.g., "nervousness at start [and prior]") and *pressure*, such as "pressure of expectations (internal + external)," were further performance-reducing obstacles. A lack of *willpower*, that is, the athlete cannot always maintain the will to push to the limit (e.g., "perseverance," "overcoming limitations"), was described as an inner obstacle as well. Athletes' difficulty in *planning* how to address certain obstacles (e.g., "1. Warm up; 2. Start of the race, pedaling; 3. Contact with escapees") was also addressed, while *flexibility* was mentioned in terms of the athletes' difficulty in responding safely, including their "reactions to [a] changed competition situation (keyword Plan B)". *Distraction* in the sense that athletes "focus too much on external factors (forgetting about eating)" was also observed as an inner obstacle.

Goal-Directed Behaviors

Goal-directed behaviors (i.e., how coaches perceive that athletes overcome inner obstacles) were assigned to 12 categories in total with 2 to 11 data extracts per theme (see Table 3 and Figure 2). *Preparation* (i.e., planning how to cope with difficult or critical information, e.g., regarding their competition, conditions) was cited most frequently but rated as partly useful. As one coach described it: "They require an extremely large amount of information on the competition requirement, competition, extra[ordinary] conditions, etc." It is emphasized to "talk through individual actions in your head (line choice, riding actions, self-motivation)". *Social support*, such as "cooperation with trainer (encouragement, strategy, cheering)" or the

Table 2. Themes of inner obstacles reported by athletes (Study 1) and coaches (Study 2) and their definitions

Theme	Definition
Dealing with demanding situations	Difficulties to deal with particularly demanding situations. This includes unforeseen events such as falls as well as difficult environmental conditions (unfavorable weather conditions, disadvantageous starting position, etc.), and personal situational difficulties such as experiencing pain.
Concentration	It is difficult for athletes to make a focused decision under high physical stress or to maintain concentration under distracting, irrelevant environmental factors, distractions that may arise internally or externally.
Pressure	Influenced from outside or by the person him/herself. Can be caused by different factors such as competition, one's own attitude of entitlement, or the individual situation as well as by the lack of competence to distance oneself internally and can be perceived as a threat.
Cycling technique / strategy	This includes everything that is related to the applied tactical strategy in a broader sense. Applying/maintaining the strategy even when the situation might lead one to do otherwise. Recognizing and assessing the right moment in a race situation for certain strategic moves, but also having difficulty using these moments to one's advantage.
Demotivation	Difficult to keep up motivation and not be able to motivate oneself despite/because of a negative situation occurring.
Self-assessment	A correct self-assessment as a challenge. This includes, for example, not overestimating oneself prematurely and then collapsing, but also not underestimating oneself and possibly risking too little. Overcoming a negative self-assessment or achieving a positive self-assessment also falls into this category.
Tension	High nervousness or an increased state of arousal (due to stress, hecticness, or excitement) hinders athletes from being able to deliver the best performance or prepare well for the competition.
Mental exhaustion[1]	A decrease in mental strength due to increased mental stress. This can show itself, for example, in increased distractibility / diminishing focus.
Goal pursuit[1]	The constant pursuit of the goal and the belief in the goal as a mental challenge. Continuing to pursue the goal even when (mentally) exhausted or lagging behind as a challenge.
Insecurity[2]	Athletes react with insecurity to demanding situations in competition.
Willpower[2]	Athletes cannot always maintain their will to go to the limit of performance.
Fear[2]	Athletes suffer from anxiety concerning their performance and competition, and/or are afraid to fail.
Planning[2]	Athletes still have difficulties to plan the correct way of dealing with certain challenges.
Distraction[2]	Athletes are too distracted before competition to prepare themselves well.
Flexibility[2]	It is difficult for athletes to react safely and quickly to changing conditions.
Other	Not classifiable

Note. [1]Refers to obstacles only stated in Study 1; [2]indicates obstacles reported only in Study 2.

"team meeting," and *concentration* were also mentioned frequently but estimated as being partly helpful. One coach stated the "focus on [one's] own pre-start process," and another the importance to "hide own weaknesses, concentrate on strengths." It was brought up that athletes *assimilated* inner obstacles *negatively* by showing "introverted, sometimes aggressive behavior," are "irritable, unresponsive," or "overact, distract," which was deemed as an important aspect. *Tension* as a reaction to mental obstacles was also stated as a (maladaptive) goal-directed behavior, which was rated as not very useful. Coaches reported their athletes were "nervous, talking [themselves] out of it" or that "nervousness is projected onto various trivialities" (e.g., supposedly "bad" food). They then get caught in a spiral of discomfort and are then unable to ride optimally activated." *Self-encouragement* in the form of motivational phrases (especially illustrative examples were "Only the good ones stay [–] The losers leave"; "If you can win [,] win [.] If you lose [,] then you lose [–] but never give up") as goal-directed behavior was estimated between partly and quite useful as well as *motivation* (one coach called it "high intrinsic motivation"). A positive *mindset* (e.g., a "positive basic attitude") and *willpower* – for example, labeled as "will to fight, will to win (winning rider)" – were also considered to be between partly and quite useful. Further goal-directed behaviors to handle mental obstacles were *relaxation* in the sense of "sufficient rest (active) before the competition, sufficient sleep," as well as *imagination.* One detailed imagination piece entailed, "You see yourself in the race, you've trained for it, the weather doesn't matter. You can do this, the road is one with you, and imagine how you ride the track. And ride ahead. You are one with yourself." One sixth of the coaches' statements could not be classified in a differentiated way because the statements were too general (e.g., "different, some very good, others rather bad"). Goal-directed behaviors on average were rated as partly helpful (M = 3.3 ± 0.9), with *motivation* being estimated as most helpful (M = 5.0, only one estimation provided; Figure 3 illustrates the helpfulness of each goal-directed behavior).

Table 3. Themes of goal-directed behaviors reported by athletes (Study 1) and coaches (Study 2) and their definitions

Theme	Definition
Preparation	Athletes prepare intensively for the competition and plan how to deal with difficult or critical situations.
Self-encouragement	Any form of speaking to oneself. Mental (for outsiders not audible) self-promotion like speaking aloud with oneself.
Calming / relaxation	Maintaining a calm, serene inner attitude when mentally challenged. Also, actions that promote relaxation or reduce hectic/stress.
Concentration	Athletes concentrate and blank out everything else.
Social support	Support from people in the social environment, such as family members, friends, coaches, etc.
Imagination	Athletes use motivational images or imagery.
Repression[1]	The mental challenge is ignored, blanked out, or repressed by athletes.
Visualization[1]	Something is pictured to deal with the mental challenge. This can be a past training as well as a future race. The visualization can happen before or in the situation.
Excessive Demand[1]	Athletes have inadequate strategies to deal with mental obstacles. Implies that athletes are impaired in their performance by their mental obstacles.
Focusing[1]	Focus (concentration) on the own person. The actions of other people and the situation recede into the background.
Fun[1]	Athletes try to meet the mental challenge by enjoying the activity (in this case, cycling) or using fun that does not come from the activity itself.
External aids[1]	These include technical aids that are external to the person, such as special apps, etc. These categories also include aids that the person uses before or during a stressful situation, such as certain drinks, food, or music.
Undifferentiated[2]	No specific handling can be derived from the answer.
Negative Assimilation[2]	Athletes process mental obstacles negatively and may react irritably or withdraw themselves.
Mindset[2]	Athletes deal with mental obstacles with a certain attitude.
Motivation[2]	Athletes are highly motivated for the competition.
Tension[2]	Athletes react nervously to mental challenges.
Willpower[2]	Athletes use their will (e. g., to win).

Note. [1]Refers to goal-directed behaviors only stated in Study 1; [2]indicates goal-directed behaviors reported only in Study 2.

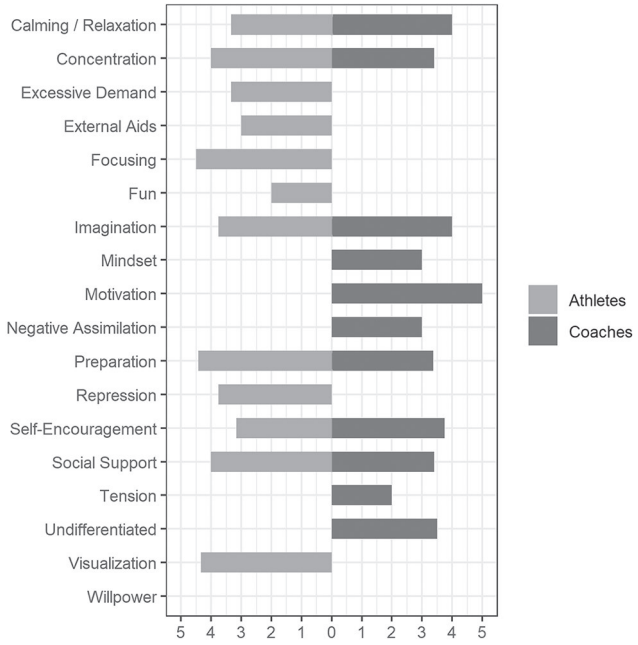


Figure 3. Perceived helpfulness of goal-directed behaviors to overcome inner obstacles rated by athletes (Study 1) and coaches (Study 2; scale from 1 = *not at all* to 5 = *very much*).

Discussion

We investigated the inner obstacles that athletes face in cycling competitions and assessed the goal-directed behaviors they use to deal with these obstacles. To this end, we recruited a sample of athletes (Study 1) and a sample of coaches (Study 2) to obtain two nonaligned perspectives on these questions. These analyses revealed substantial overlaps between the two perspectives (i. e., athletes and coaches) concerning obstacles and goal-directed behaviors. Pressure, dealing with demanding situations, and maintaining concentration were the most frequently experienced obstacles reported by athletes. Coaches reported dealing with demanding situations, concentration, and cycling technique as the most common challenges. However, some particularly interesting differences were observed too: for example, athletes frequently mentioned dealing with external circumstances as demanding (e. g., crashes, weather, course), while coaches were more likely to specify obstructive emotions such as fear and insecurity. To overcome these obstacles, athletes relied on preparation, self-encouragement, and relaxation. Preparation was also a goal-directed behavior mentioned by the

coaches, who additionally cited concentration and social support. All in all, athletes and coaches presented an extensive overview of the obstacles recurring in cycling competitions and the goal-directed behaviors they would apply to address them. In the following, we first outline how the findings of this qualitative assessment fit into existing sport psychology literature and then deduce how future research on implementation intention theory in sports might incorporate the present findings to develop better if–then plans for the sports domain to arrive at more effective interventions.

Inner Obstacles and Goal-Directed Behaviors

Regarding the inner obstacles, the central role of perceived pressure in both the athlete and the coach sample is consistent with existing literature (e.g., McKay et al., 2008; Thelwell et al., 2007). For instance, the importance of pressure and competitive stressors was also emphasized in a study focusing on young elite athletes across sports disciplines (Kristiansen & Roberts, 2010). Athletes in this study reported being challenged by pressure exerted by others and themselves, as well as by being intimidated by more experienced competitors in the field. These athletes also found it difficult to adhere to rituals before competitions, which was also mentioned by the coaches in Study 2 as a potential obstacle (e.g., athletes forget to eat because they are distracted by environmental factors). Especially negative emotions like insecurity and fear were mentioned by the coaches, which have been observed to interfere with focus and concentration similar to demotivation (Lazarus, 2000). The mention of mental exhaustion by athletes fits into the large research body of ego depletion (e.g., Englert, 2016) and mental fatigue (e.g., Marcora et al., 2009), and reflects the presumed impairment of athletic performance that is extensively studied in the theoretical framework (for an overview, see Giboin & Wolff, 2019).

Concerning goal-directed behaviors, athletes and coaches in our studies mentioned a broad range of behaviors that could be used as mental strategies to deal with inner obstacles, indicating their importance for optimum performance in elite competition (e.g., Orlick & Partington, 1988). For instance, self-encouragement that might occur in the form of self-talk was mentioned as a strategy by both athletes and coaches, in line with findings that athletes use self-talk routinely (Wang et al., 2003) and consider it as performance enhancing (Masciana et al., 2001). Similarly, research revealed that young elite athletes find it useful to engage in self-talk; moreover, they emphasized maintaining concentration and focus as well as controlling their nervousness as further helpful behaviors (Kristiansen & Roberts, 2010). The importance of emotion regulation is also evident in the coaches' statements that an accumulation of negative emotions (e.g., anxiety, self-doubt) occurred as a maladaptive reaction to dealing with inner obstacles. The necessity to keep up cognitive control, reflected by the categories concentration and focus in our data, is known to enhance performance (Brick et al., 2014) and facilitate performance improvement (Clingman & Hilliard, 1990). Indeed, the appropriate use of mental strategies has been linked to superior athletic performance in several studies. For example, ultramarathon runners use mental strategies like self-talk, attention strategies, imagery, and goal setting to master their race (Simpson et al., 2014). Finally, both the athletes and the coaches identified the relevance of social support to improve performance, which is assumed to aid in coping with stress in competitive contexts (Rees et al., 2007) and to protect from stress (Rees & Hardy, 2004). Coaches particularly emphasized the importance of their athletes' willpower and motivation in dealing with challenges, reflecting the complex discourse and interplay between these two factors (e.g., Ainslie, 2020) and also raising questions for further research, such as whether athletes have a higher overall motivation to overcome effort or fundamentally experience it as more justified.

Implications for If–Then Planning Research in Sports

We addressed our research question through the lens of implementation intention theory. Interventions based on the theory commonly take one of two forms (e.g., Keller et al., 2019): (1) Participants are either instructed to specify obstacles and goal-directed behaviors on their own or (2) they are given plans with predetermined obstacles and behaviors. In the first case, the assumption is that participants have sufficient insight into the obstacles that might jeopardize their goal attainment as well as sufficient knowledge about effective goal-directed behaviors. On the basis of our data, we addressed this assumption and established that athletes' and coaches' answers converge with findings in the sport psychology literature. The present research suggests that elite and youth-level athletes and coaches have substantial insights into the obstacles associated with cycling competitions and the goal-directed behaviors they could use to deal with them. This puts them in the ideal position to devise effective if–then plans to enhance their performance, which might not have been the case with the less experienced exercisers that have been investigated in previous research on

implementation intention theory in sports (Bieleke & Wolff, 2017; Hirsch et al., 2020; Hirsch et al., 2021; Latinjak et al., 2018; Wolff et al., 2018).

In the second case of interventions based on implementation intention theory, it is important to know the relevant obstacles and goal-directed behaviors. This is where our findings make an important contribution. One possibility to capitalize on the results of the present studies in future research is to combine the assessed obstacles and goal-directed behaviors into if–then plans to examine whether these if–then plans support athletes in optimizing performance (e.g., in analogy to previous studies on the effects of implementation intentions in sports where tennis players were provided with lists of negative inner states and coping responses to create effective if–then plans; Achtziger et al., 2008). For instance, future studies might focus more strongly on negative affective reactions as obstacles (e.g., tension, nervousness, pressure, anxiety) than previous if–then planning interventions in endurance tasks did, whose focus was mainly on muscle pain (e.g., Hirsch et al., 2020; Thürmer et al., 2017; Wang et al., 2019) and perceived effort (e.g., Bieleke & Wolff, 2017; Wolff et al., 2018). This seems particularly promising as, under some conditions, negative affective reactions have been associated with improved performance (Hanin, 2010; Lane et al., 2011); for instance, when exercisers associate nervousness with a good performance. Regarding the goal-directed behaviors specified in previous if–then planning research, a stronger focus could be on relaxation, concentration, preparation, or self-reassurance. Especially the focus on self-encouraging statements would reflect the importance of self-talk in sport psychology literature (e.g., McCormick & Hatzigeorgiadis, 2019). Indeed, while previous if–then planning research has often specified task continuation ("Keep going"; e.g., Hirsch et al., 2020) as a goal-directed behavior and failed to observe enhanced performance, one study found positive effects of if–then planning on endurance performance when using self-encouragement as a goal-directed behavior ("I can do it"; e.g., Thürmer et al., 2017). Although this latter study relied on a student sample, its findings lend credence to the promise of self-encouragement as a goal-directed behavior that is suitable for implementation intention theory-based interventions and that is deemed relevant by athletes and coaches alike. In addition, it might be promising to combine implementation intentions with mental contrasting (for a detailed description, see Oettingen, 2015) to design more effective implementation intention interventions in the sports context. Connecting mental contrasting with implementation intentions (MCII; Oettingen, 2014; Oettingen & Gollwitzer, 2010) successfully employs a similar formulation of wishes, optimal outcomes, possible obstructive obstacles, and plans, for example, in the area of health (Stadler et al., 2010) or physical activity (Marquardt et al., 2017).

Further Considerations and Practical Implications

Some limitations of the present research should be noted. First, we relied on data sets from athletes and coaches who were not matched to each other (even though we cannot rule out that some of them already worked together). While this provided us with more diverse perspectives than dyadically matched data, it also limits our ability to directly compare the answers and to triangulate the data appropriately. For instance, future research might investigate whether athletes differ in their views on obstacles and goal-directed behaviors from their coaches. Furthermore, recruiting matching samples would also enable a more precise evaluation of the usefulness of employed goal-directed behaviors, in accordance with both perspectives. Second, while the responses from coaches were collected via a paper–pencil questionnaire with a researcher on site, the athlete data were collected with an online survey, which might explain the higher dropout rate among athletes. This might limit the generalizability of our results (e.g., athletes who dropped out might have named other obstacles and behaviors) but the online format allowed us to recruit a larger number of athletes in general. In the future, generalization of the results for endurance sports could further be expanded by investigating comparative samples with amateur athletes to determine whether they perceive the same or different inner obstacles and goal-directed behaviors. Additionally, due to the accessibility of our samples, it was not possible to collect balanced samples in several aspects (e.g., age, performance level, cycling discipline). For example, our sample of athletes who completed the whole questionnaire consists of a disproportionately large number of young cyclists, which makes it not very informative about certain patterns in answers within specific age groups, for example. This analytical aspect could receive more attention in future research.

Also, with regard to the obstacles and goal-directed behaviors mentioned, further questions arise that are beyond the scope of this study. For example, athletes and coaches appeared to mention pressure differently: Pressure is perceived as the most common obstacle by athletes, while coaches often see pressure as an important factor in achieving the best performance. Considering that a very controlling, pressure-building training style can be associated with demotivation (e.g., Haerens et al., 2018), this might be a factor to consider when training

coaches in sport psychology interventions. One could speculate that the pressure that athletes listed is also captured by the negative affect that coaches mentioned. Linking this to the factor of willpower (which only coaches mentioned), it could be assumed that coaches tend to build up pressure when they suspect that their athletes have too little willpower, while on the other hand, the athletes might choke precisely because of this pressure. This assumption might be supported by the goal-directed behaviors mentioned by athletes and coaches: For example, athletes mentioned relaxation, possibly to reduce pressure, while coaches emphasized concentration, motivation, and social support to increase willpower and thus athletic performance. However, this could create even more pressure for athletes.

Moreover, future investigations might consider interviews with athletes and coaches to facilitate a more in-depth exploration (e.g., in terms of connections or context) of the findings compared to the questionnaires used. First, inner obstacles and goal-directed behaviors could be set in direct relation to each other. Given the data collection format used, no follow-up questions could be made to athletes or coaches about the extent to which the described inner obstacles or goal-directed behaviors directly relate to each other. For example, one goal-directed behavior was reported after naming three different inner obstacles. While it can be assumed that this goal-directed behavior could be used to overcome all three inner obstacles, this cannot be said with certainty and thus cannot be analyzed in relation to each other in our case. In future exploratory studies, it would be crucial to recognize and examine relevant connections between inner obstacles and goal-directed behaviors. In addition, hypothesized mechanisms for effective behavior could be extracted in further analytical approaches. Secondly, interviews would also make it possible to assess the extent to which athletes and coaches speak a different language for similar inner obstacles and goal-directed behaviors or where they might misunderstand each other. On a small scale, this would reduce the likelihood of unclear or overly general statements (as occurred in Study 2), and on a large scale could improve athlete–coach communication, thereby increasing athlete satisfaction. Finally, beyond bridging linguistic discrepancies in working together, guided interviews would have other benefits as well: To overcome inner obstacles using goal-directed behaviors, athletes must first recognize and identify them. To do so, they must have or must develop a deeper understanding of their thought patterns and emotional responses, as well as the external factors that may add to their struggles. This is necessary in order to choose the appropriate goal-directed behaviors but might be an ability that athletes are likely to have difficulties with. In interviews, one can react to any noticeable difficulties and assist athletes. This probably optimizes study results, which will facilitate even better theory–practice transfer in terms of acceptance and applicability of interventions. It is conceivable, aside from methodological considerations, that when experimenting with if–then plans in practice (as suggested by Bieleke, Wolff, et al., 2021), similar training effects could occur for this skill as for visualization skills (which are more highly developed in top athletes; Murphy & Martin, 2002; Weinberg, 2008). Potentially reinforcing effects are also found when implementation intentions are applied on a regular basis (Gollwitzer & Sheeran, 2006). In further research, an interplay of these two factors would certainly be worth considering, and in practice, athletes could benefit from visualizing and then formulating relevant inner obstacles and goal-directed behaviors.

Despite the difficulties associated with endurance performance, the implementation and training of self-reflective and self-regulatory strategies seems worthwhile for athletes and coaches. Our study provides insights into a multitude of potential inner obstacles and goal-directed behaviors. These insights can be used, for example, to facilitate and refine the application of if–then plans. While definitive conclusions and authoritative recommendations are beyond the scope of the present research, some tentative suggestions for the use of if–then planning can be derived from previous research. For instance, studies in endurance sports suggest that if–then plans should not be formulated too close to the planned behavior to allow sufficient time for the if–then plan to be consolidated (e.g., Hirsch et al., 2021). To facilitate memorizing and internalizing the content of the plans, it can be helpful to repeat them in one's mind's eye (e.g., Bieleke et al., 2018). Reinforcing effects occur when they are applied regularly (Gollwitzer & Sheeran, 2006). On the other hand, if–then plans should be reviewed on a regular basis as their impact varies depending on different factors, such as the type of behavior, motivation, and context (Gollwitzer & Sheeran, 2006). Finally, it is important to ensure the personal relevance of if–then plans to facilitate their effectiveness (Bieleke, Wolff, et al., 2021).

Conclusion

This study explored athletes' inner obstacles and goal-directed behaviors in a competitive context from the perspective of elite and youth-level athletes (Study 1) and elite coaches (Study 2). The qualitative analysis provided a comprehensive picture of inner obstacles (e.g., pressure, dealing with demanding situations, maintaining concentration, cycling technique) and goal-directed behaviors

(e.g., preparation, self-encouragement, relaxation, concentration, social support). The results of this study contribute to sport psychological research with implementation intentions by providing new approaches regarding the mixed literature in this area (e.g., through new plan content) and underline the variety of emotional–psychological obstacles that elite and youth-level cycling athletes face.

Electronic Supplementary Material

The electronic supplementary material is available with the online version of the article at https://doi.org/10.1026/2941-7597/a000002

ESM 1. Questionnaire Study 1: Athlete sample.

ESM 2. Questionnaire Study 2: Coach sample.

ESM 3. Figure S1. Illustration of the frequencies of (A) inner obstacles and (B) goal-directed behaviors per competitive discipline (coaches: primarily trained discipline) from the perspective of athletes (Study 1) and coaches (Study 2).

ESM 4. Figure S2. Illustration of the frequencies of (A) athletes' inner obstacles and (B) goal-directed behaviors per performance level.

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Publication Ethics
This article does not include studies on humans or animals conducted by the authors. Informed consent has been obtained from all participants in the survey. The research project has received ethical and legal advice from the relevant ethics committee.

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A.H., M.B., W.W., and J.S. contributed to the design of the survey. A.H. carried out the data collection. The first draft of the paper was written by A.H. Data analysis was performed by A.H.; M.B., W.W., and J.S. revised and edited the manuscript, which was then finalized by A.H. All authors approved of the submitted version of the manuscript.

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