

What can sports psychology learn from work and organizational psychology?

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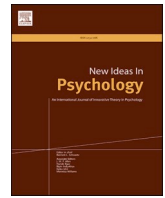
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What can sports psychology learn from work and organizational psychology? Benefits and pitfalls of applying theoretical models from one context to another

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ABSTRACT

In the last couple of decades, there has been an increasing trend of sports psychology research studies drawing on theoretical models from the realm of work and organizational psychology. These models have been either directly applied or adapted to fit the sports context. The purpose of this narrative review is to explore the advantages and potential drawbacks of using models rooted in work and organizational psychology in sports psychology. We will first examine the similarities between the two contexts, followed by an in-depth analysis of theoretical models that have been successfully or unsuccessfully transferred to sports psychology, such as the Goal Setting Theory, the Theory of Transformational Leadership, the Conservation of Resources Theory, and the Demand-Induced Strain Compensation-Recovery Model. Ultimately, this review will provide a comprehensive overview of the benefits and pitfalls associated with applying work and organizational psychology theoretical models to sports psychology.

In the last couple of decades, an increasing number of research studies in sports psychology have drawn on theoretical models rooted in work and organizational (W/O) psychology (Balk et al., 2017; Wendling et al., 2018). These researchers have taken theories and models developed in the W/O context and adapted them to the sports context, under the assumption that the two contexts share key characteristics and processes that make them comparable in certain respects.

The objective of this narrative review is to examine the advantages and disadvantages of using established theoretical models from W/O psychology in the field of sports psychology. This paper will address three primary questions: (a) What similarities exist between the sports context and the W/O context? (b) Which theoretical models from W/O psychology have been effectively applied to sports psychology? (c) What are the potential benefits and drawbacks of incorporating models from W/O psychology into sports psychology?

To answer these three questions, we first have listed the theoretical models developed specifically in the W/O context from prominent W/O

psychology handbooks (Anderson et al., 2001; Cooper et al., 2015; Linley et al., 2010; Quick & Tetrick, 2011). These handbooks have introduced a multitude of models, with the principal ones being the Job Demands-Resources Model (JD-R, Bakker & Demerouti, 2007), the Theory of Transformational Leadership (TFL, Bass, 1985), the Demand-Induced Strain Compensation-Recovery Model (DISC-R, De Jonge & Dormann, 2003), the Person-Environment Fit Theory (PEFT, Edwards et al., 1998), the Conservation Of Resources Theory (COR, Hobfoll, 1989), the Goal Setting Theory (GST, Locke & Latham, 1990), and the Effort-Reward Imbalance Model (ERI, Siegrist, 2016). These models were then searched in the following databases: Psychinfo, SportDiscus, Psychology and Behavioral Sciences Collection, and PsycArticles, with the keywords ["sport" OR "athlete"]. The results indicated that four models have been applied to the sport context with more than five publications in this context (Table 1), namely the Goal Setting Theory, the Theory of Transformational Leadership, the Conservation Of Resources Theory, and the Demand-Induced Strain

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Table 1
Number of peer-reviewed articles retrieved from the databases for each of the theoretical models.

	Goal Setting Theory	Theory of Transformational Leadership	Conservation Of Resources Theory	Demand-Induced Strain Compensation- Recovery Model	Person-Environment Fit Theory	Job-Demands Resources Model	Effort-Reward Imbalance Model
Work and Organizational context	"Goal setting theory" AND ("work" OR "organization" OR "employee") 649	"Transformational leadership" AND ("work" OR "organization" OR "employee") 2966	"Conservation of resources theory" AND ("work" OR "organization" OR "employee") 1018	"Demand-induced strain compensation" AND "organization" OR "employee" 29	"Person-environment fit theory" AND ("work" OR "organization" OR "employee") 150	("Job-demands resources model" OR "Job-demands resources theory") AND ("work" OR "organization" OR "employee") 1496	"Effort-Reward Imbalance Model" AND ("work" OR "organization" OR "employee") 237
Sports context	"Goal setting theory" AND ("sport" OR "athlete") 146 (22.5%)	"Transformational leadership" AND ("sport" OR "athlete") 237 (8%)	"Conservation of resources theory" AND ("sport" OR "athlete") 13 (1.3%)	"Demand-induced strain compensation" AND ("sport" OR "athlete") 6 (20.7%)	"Person-environment fit theory" AND ("sport" OR "athlete") 2 (1.3%)	("Job-demands resources model" OR "Job-demands resources theory") AND ("sport" OR "athlete") 2 (0.13%)	"Effort-Reward Imbalance Model" AND ("sport" OR "athlete") 1 (0.42%)

Note. Search conducted in the entire text of the articles the October 28, 2022 in PsycInfo, SportDiscus, Psychology and Behavioral Sciences Collection & PsycArticles databases. Grey literature and articles in languages other than English were excluded.

Compensation-Recovery Model (for a summary of main assumptions, see Table 2).

1. What similarities does the sports context have with the work and organizational context?

The sports and the W/O contexts have numerous similarities, particularly given that the professional lives of elite athletes have become more akin to work-like endeavors (Simpson et al., 2021). For instance, elite athletes invest a considerable amount of time and effort into sport-related activities, such as training, competition, and sponsor commitments. They also relinquish some control to belong to a sports organization, set and strive to achieve goals, and are rewarded based on their performance, which mirrors the experiences of an employee in a work context (Rigauer, 1981). Additionally, sports managers, sports coaches and (elite) athletes also act in a working environment, similar to managers and employees in regular organizations. While amateur athletes may not receive monetary compensation, they still receive intrinsic and extrinsic rewards such as recognition and playing time, similar to those in the W/O context. Several elite athletes have even equated their profession to an actual job, exemplified by Dutch speed skater and multiple Olympic champion Sven Kramer, who stated: "I love speed skating, but it is also my job" (Balk, 2018, p. 13), and French trail and ski mountaineering athlete Kilian Jornet, who has stated, "For me, it's a job" (interview for nutri-site.com, October 2010). Therefore, the psychological aspects of work life are also critical in the sports context,

Table 2
Main theoretical assumptions of the theoretical models.

Theoretical Models	Theoretical Assumptions
Goal Setting Theory (GST, Locke & Latham, 1990)	<ul style="list-style-type: none"> Five characteristics of a goal have a direct impact on the effectiveness of goal setting: goal difficulty, goal specificity, goal proximity, goal source, and goal types. The ability of the individual, goal commitment, feedback on progress, task complexity, and task knowledge and resources are important mediators of the relation between goals and performance.
Theory of Transformational Leadership (TFL, Bass, 1985)	<ul style="list-style-type: none"> Transformational leaders inspire motivation, have individual considerations, lead to intellectual stimulation, have an idealized influence, have high performance expectations, and foster acceptance of group goals. Transformational leadership leads to positive outcomes for followers, such as better performance, motivation, self-efficacy, identification with the leader and job satisfaction.
Conservation Of Resources theory (COR, Hobfoll, 1989)	<ul style="list-style-type: none"> Individuals are motivated to acquire, conserve, strengthen, and protect their resources. Losses of resources lead to stress. Gains of resources increase the individual's ability to cope with stress.
Demand-Induced Strain Compensation-Recovery model (DISC-R, De Jonge & Dormann, 2003)	<ul style="list-style-type: none"> A balance between high job demands and job resources is crucial for optimal employee health, well-being, and performance. The stress buffering and activation enhancement effects of the job resources would largely depend on the so-called 'match' or 'fit' between specific types of demands and resources at work. Recovery is important to allow employees to recover from accumulated strain at work.

especially for professional athletes. Moreover, modern sports organizations should aim not just for sporting success but also strive to create workplaces that safeguard the health, well-being, and performance of their employees, i.e., athletes (Wagstaff, 2017). Thus, athlete health, well-being, and performance are increasingly being studied from a W/O perspective, which includes W/O psychology (Wagstaff, 2017).

2. Which theoretical models from W/O psychology have been applied to sports psychology?

Academic work conducted in the sports domain that has been inspired by theories from the W/O domain is largely based on four theories: the Goal Setting Theory (Locke & Latham, 1990, 2002, 2019); the Theory of Transformational Leadership (Bass, 1985), the Conservation of Resources Theory (Hobfoll, 1989), and the Demand-Induced Strain Compensation (Recovery) Model (de Jonge & Dormann, 2003, 2006). The subsequent paragraphs will provide a brief overview of each of these theories, including their empirical findings and how they can be applied to the sports context.

2.1. Goal Setting Theory

Goal Setting Theory (GST; Locke & Latham, 1990; 2002, 2019) is a theory of motivation that explains the relation between goals and task performance. This theory is based on an inductive approach gathering hundreds of studies in different contexts such as organization and sport. A goal is generally defined as “the object or aim of an action, for example, to attain a specific standard of proficiency, usually within a specified time limit” (Locke & Latham, 2002, p. 705).

The GST proposes that five characteristics of a goal have a direct impact on the effectiveness of goal setting. These characteristics include (a) goal difficulty (more difficult, but achievable goals lead to higher performance), (b) goal specificity (specific goals predict higher performance than vague goals), (c) goal proximity (setting both proximal and distal goals helps facilitate goal attainment), (d) goal source (whether a goal is self-set, participatively set, or assigned), and (e) goal types (performance goals focus on achieving desired performance results, while learning goals focus on the development of task-related plans) (Locke & Latham, 1990, 2002, 2019).

Scholars studying GST have also investigated the factors that influence the relation between goal setting and performance. Among these factors are ability (i.e., more qualified individuals are more likely to achieve their goals than those with lower qualifications), goal commitment (i.e., higher commitment leads to more effective goal setting), feedback (i.e., receiving feedback on progress towards a goal helps individuals allocate resources more effectively), task complexity (i.e., goal setting is less effective for tasks that are beyond an individual’s capabilities), and task knowledge and resources (i.e., goals are more likely to lead to performance when individuals have the necessary resources to complete the task) (Jeong et al., 2021; Locke & Latham, 1990, 2002).

More than 600 studies have been conducted on GST (Table 1), and several meta-analyses reviewed the effects of goals on task performance in the W/O context (Locke & Latham, 1990). Meta-analyses have demonstrated that more difficult goals generally produce higher levels of effort and performance, with effect sizes ranging from 0.52 to 0.82. In addition, individuals with specific and challenging goals tend to outperform those with vague, “do your best” goals (effect sizes ranging from 0.42 to 0.80).

Despite the abundant literature on GST in the W/O context, there are several limitations: (a) if an employee lacks skills, goal setting can fail and lead to performance undermining; (b) very difficult and complex goals could stimulate riskier behaviors; (c) organizational goals are sometimes contradictory to management goals and may have a negative impact on performance if they induce incompatible action drift; and (d) there is no evidence that goal-setting is linked to work-related well-being.

Goals are widely used in the sports context by athletes, teams, and coaches to enhance motivation and improve performance, highlighting the relevance of GST in this domain (Weinberg, 1994). Almost 150 studies have been conducted on goal setting in sports (Table 1), with empirical findings that are sometimes consistent with theoretical predictions and sometimes contradict them. Regarding the effectiveness of GST on performance, a meta-analysis by Kylo and Landers (1995) found that goal setting improved physical task performance compared to control conditions in a laboratory setting, with an effect size of 0.34. However, the meta-analysis also showed that only moderately difficult goals had a significant effect on performance, while easy and very difficult goals did not. In contrast, a recent systematic review (Jeong et al., 2021) highlighted that goal difficulty does not appear to contribute to the effect of a goal setting intervention in sports. In terms of goal specificity, empirical studies in sports do not consistently support the theoretical hypothesis that specific goals lead to greater performance (Jeong et al., 2021). Consistent with these findings, Locke and Latham (2019) suggested that goal specificity should be combined with goal difficulty for effective goal setting. With regards to goal proximity, mixed support was found in GST (Jeong et al., 2021; Kylo & Landers, 1995), showing that a combination of short-term and long-term goals is more effective than using either goal alone or control groups (Locke & Latham, 2002). Regarding goal sources, Kylo and Landers (1995) found that self-set and participatively set goals resulted in significantly higher performance than assigned goals. Lastly, research studies in sport have used three goal types: process (i.e., focusing on learning specific skills), performance (i.e., improving one’s performance standards), and outcome goals (focusing on the outcome of a competition) whereas in the W/O domain only learning and performance goals were used. In the sports context, it has been found that each goal type has distinct effects on the result of goal setting (Filby et al., 1999). However, there have been few empirical studies in sports which directly compared process, performance, and outcome goals (Jeong et al., 2021).

In the context of sports, the findings of studies conducted on GST appear to only partially support the hypotheses formulated in the W/O context (Kylo & Landers, 1995). These discrepancies suggest that goal setting in the sports context may have different characteristics than in the W/O context, such as the mobilization of different types of goals. Thus, it is important to conduct further research to examine the relevance of GST in the sports context, using empirical approaches that are informed by the perspectives of athletes, coaches, and/or staff. For example, qualitative approaches that seek to integrate the viewpoints of different actors could be used to gain a more comprehensive understanding of this topic (Jeong et al., 2021).

2.2. Theory of Transformational Leadership

Another W/O theoretical model that has found application in the sports context is the Theory of Transformational Leadership (TFL) (Bass, 1985, 1998). Burns (1978) defines the *transformational leader* as someone who “looks for potential motives in followers, seeks to satisfy higher-level needs, and engages the full person of the follower” (p. 4). Transformational leaders successfully motivate their subordinates to go beyond their own interests for the purpose of the group’s vision. This style of leadership has become one of the most popular topics in the leadership literature in the last decade (i.e., TFL; Bass, 1985, 1998). Researchers (Bass, 1985, 1999) firstly identified four key transformational leader behaviors: (a) *inspirational motivation* (i.e., the degree to which a leader articulates the vision that is appealing and inspirational to followers); (b) *individual consideration* (i.e., paying attention to each follower, or dealing with his/her specific problems); (c) *intellectual stimulation* (i.e., behavior of the leaders who develop the employees’ ability and inclination to think about problems in a new way); and (d) *idealized influence* (i.e., ability of the leader to elicit pride, faith and respect). However, other researchers (Podsakoff et al., 1990) proposed the existence of two more key transformational leader behaviors: (e)

high performance expectations (i.e., the leader showing that he or she expects high standards and excellence from the followers); and (f) *fostering acceptance of group goals* (i.e., leaders' behaviors which promote both teamwork/team spirit and working together to achieve a common goal). Research studies on TFL in the W/O context have raised a growing interest since the seminal definition provided by Burns in 1978. Bass (1999) highlighted that "applied research in TFL has been abundant" (p.22), and this has been confirmed in more recent review (Arnold, 2017). A database search reveals almost 3000 releases on TFL (Table 1).

The TFL theory is well established within the W/O psychology literature as research studies consistently demonstrate a positive association between TFL and follower outcomes, including employee well-being and performance (Ng, 2017). Specifically, Ng (2017) study examined the relation between TFL and follower performance outcomes, including task performance, innovative behavior, and organizational citizenship behavior. The study also investigated multiple mediation pathways through which TFL may influence followers performance. The study was conducted using a meta-analytic approach, which involved pooling the results of 61 studies. The findings indicated that TFL had a significant and positive relation with all three performance outcomes. The study also found that the relation between TFL and followers performance was mediated by several factors. TFL was found to increase followers motivation, self-efficacy, identification with the leader, and job satisfaction which in turn led to improved performance (Ng, 2017). Despite its popularity, several limitations of TFL theory have been highlighted, including the absence of a clear definition of transformational leadership, the lack of clearly articulated relations between the different subdimensions, the tendency to confuse TFL with its effects, and concerns about the validity of the most frequently used measures (van Knippenberg & Sitkin, 2013).

Over the past decade, there has been a growing interest in TFL as applied to sports (Arthur et al., 2011) resulting in more than 230 publications on the topic (Table 1). TFL is particularly relevant in sports for several reasons: (a) it places emphasis on the coach-athlete and coach-team relationships; (b) sports psychology can draw on and build upon the wealth of studies conducted in the W/O context; (c) quasi-experimental studies have demonstrated the teachability of TFL behaviors (e.g., Barling et al., 1996); and (d) leadership in groups and teams has been widely studied, making it worthwhile to replicate and examine these findings in the sports context (Hopton et al., 2007). The sports context is particularly interesting for examining the potential transformational impact of coaches, as social evaluations likely play a greater role in sports than in other social and economic contexts (Gomes, 2014). In line with the proposition in the W/O context, Callow et al. (2009) also described the six distinct factors that underlie the TFL behaviors of a leader in the sports context: (a) *individual consideration*; (b) *inspirational motivation*; (c) *intellectual stimulation*; (d) *fostering acceptance of group goals and promoting teamwork*; (e) *high performance expectations*; and (f) *appropriate role modelling*. Therefore, TFL was applied in the sports context without specific adjustments.

TFL has emerged as a crucial factor in predicting athlete attitudes and behaviors in the sport setting, as demonstrated by several studies (Arthur et al., 2017). In particular, studies have found that coaches who exhibit TFL behaviors are associated with positive outcomes, such as increased athlete motivation and performance (Arthur et al., 2011), reduced player aggression and increased moral behavior (Tucker et al., 2010), and improve team/task cohesion (Bosselut et al., 2018; Cronin et al., 2015).

One of the primary concerns of studies on TFL in the sports context is to investigate potential mediators of the relation between TFL and outcome variables. For example, intrinsic motivation, intra-team communication, and inside sacrifice have been found to mediate the relation between TFL and task cohesion (Cronin et al., 2015). Moreover, studies have shown that the satisfaction of basic psychological needs mediates the TFL-well-being relation (Stenling & Tafvelin, 2014), coaches' competencies mediate the TFL-athlete satisfaction association

(Kao & Tsai, 2016), support for innovation mediates the TFL-creativity relation (Bosselut et al., 2020). In addition, team tenure was found to be a moderator of the TFL-creativity relation (Bosselut et al., 2020), and win orientation and team performance to be moderators of the TFL-performance relation of players (Bormann et al., 2016). Low levels of TFL's facet of articulating a vision and providing an appropriate model respectively increased and decreased individual performance. Parallel to these studies on potential mediators and moderators, studies have also shown that TFL can promote personal development in youth (Vella et al., 2013), as higher scores of coaches TFL behaviors were associated with the development of personal, social, cognitive and goal setting skills, and initiative. Finally, a recent study in the sports context also found that athletes with higher individual goal achievement (compared to higher team goal) evaluated their coaches more positively. However, athletes with perceptions of higher team goal achievement ended the season with a more positive coach evaluation than at the beginning (Gomes et al., 2020). As in the W/O context, despite the promising results regarding TFL in sport, several limitations have been highlighted such as (a) theoretical confusions around the concept (i.e., confusion between what leadership is and its consequences), (b) the failure to consider the multidimensional aspect of TFL (i.e., studies tend to calculate a global score), and (c) the preponderance of cross-sectional studies that do not allow for the examination of causal links. Moreover, it was suggested to question how leadership is evaluated in the sports context. Indeed, some studies have highlighted problems with the use of tools developed in the W/O context with coaches (Charbonneau et al., 2001). Sports may have specific characteristics that should be considered when conceptualizing and assessing TFL (Gomes, 2014; Zhang et al., 1997).

The aforementioned studies reveal a striking resemblance between the sports context and the W/O context with regard to leadership. The findings obtained from studies conducted in the sports context align with those in the W/O context, such as the positive correlation between TFL and performance. Furthermore, both contexts share similar limitations in their research, including theoretical confusion and the use of global scores to measure TFL. Thus, the studies conducted in the W/O context has been successfully applied and adapted to the sports context, allowing for comparisons to be made between the two contexts, and demonstrating the need to further investigate the nature of a transformational leader.

2.3. Conservation of Resources Theory

A third theoretical framework from W/O psychology that has been applied in the context of sports is the Conservation of Resources (COR) Theory (Hobfoll, 1989; Hobfoll et al., 2018). This theory originally developed to explain occupational stress, posits that individuals naturally seek to obtain, retain, strengthen, and protect the resources they value. Hobfoll (1989, p. 516) defines these resources as "those objects, personal characteristics, conditions, or energies" that are important to the individual or that serve as a means for achieving their desired outcomes. The theory is based on four major principles. First, the "primacy of loss" principle suggests that the negative impact of losing a resource is much greater than the positive impact of gaining that same resource. Second, the "resource investment" principle highlights that individuals invest resources to compensate for past losses or to acquire new resources to protect themselves from future losses. Third, the "gain paradox" principle suggests that when individuals are experiencing resource loss, the gain of new resources becomes even more significant. Finally, the "desperation" principle suggests that when people's resources are depleted, they may become defensive, aggressive, or irrational in their behaviors. These principles offer valuable insight into the consequences of resource gains and losses experienced by employees. It is important to note that resources are typically acquired as a set, rather than individually. This means that the acquisition of one resource is often accompanied by the acquisition of other resources.

COR Theory proposes three corollaries that complement the four principles discussed earlier and offer further insight into the dynamics of resource loss and gain. The first corollary suggests that individuals with greater resources are less susceptible to resources loss and more adept at acquiring new resources, as they are more likely to invest in them. Conversely, those with fewer resources are more vulnerable to resources loss and have a harder time investing in new resources. The second corollary, called “resource loss cycles,” explains how losses are more intense than gains and how repeated losses create a spiral of stress that leaves individuals with fewer resources to compensate for future losses. This creates a vicious cycle of increasingly intense losses. The third corollary, “resource gain spirals,” represents the opposite of the second corollary. Because resources gain is slower and smaller than resources loss, gains tend to be weak and develop more slowly. Empirical studies have validated these principles and corollaries of the COR Theory (Halbesleben et al., 2014).

The body of work on COR Theory in the W/O context has grown considerably, with over 1000 publications (as shown in Table 1), making it one of the most influential stress theories in the field of organizational behavior (Wendling et al., 2018). Additionally, COR Theory has been extensively researched in the area of recovery (Sonnentag & Fritz, 2014). However, despite its popularity, certain limitations of COR Theory have been identified. Specifically, some authors have emphasized the importance of considering the dynamic nature of resources (Halbesleben et al., 2014), and the need to test the efficacy of interventions based on COR Theory, as it is uncertain whether its principles can be manipulated to bring about change (Hobfoll et al., 2018).

In the sports context, various resources are acquired through sports participation (Ford & Gordon, 1999; Grove & Stoll, 1999). For example, objects (e.g., financial reward), personal characteristics (e.g., self-esteem), conditions (e.g., position in the team/training group), and energies (e.g., vitality) might be valued by athletes and enable them to acquire new resources. Despite this significant presence of resources in the sports context, COR Theory has received limited attention in this context. Indeed, only about 10 studies have used this theory (Table 1). For example, using Hobfoll’s (1989) COR Theory, a study by Ford and Gordon (1999) examined the relations between different resources and injury using in-depth interviews with four athletes who underwent knee surgery. The results revealed that resources such as physical health, finances, mobility/independence, self-perception, achievements, and social roles were lost due to injury. In turn, support that involves encouragement, reassurance, advice, maintaining participation, personal assistance, and financial assistance may have covered losses or helped to recruit latent resources, thus reducing the stress of athletes. Another study examined the associations between resources and stress among 591 athletes and found that appraisal of the slump experience (i.e., a prolonged period of poor performance) as a loss of resources was by far the strongest predictor of perceived stress (Grove & Stoll, 1999). Other studies also used COR Theory to explain performance in different context such as career transition planning (Lavallee, 2019), and as a result of travel stress (Taylor et al., 2017).

To summarize, according to COR Theory, individuals are naturally driven to acquire more resources by investing some of what they already possess. They are also susceptible to losing or gaining multiple resources in a brief span of time. However, losing resources and the resulting spirals have a more immediate and severe impact on individuals than gaining resources. Studies conducted in the sports context support the hypotheses developed in the W/O context. It is striking that only few studies have employed COR Theory in the sports domain, despite its potential to provide insights into stress-related phenomena. One possible explanation for this is that the COR Theory is a higher-level theory (and therefore a more abstract theory) than other theories presented earlier, which can make its application in the sports context more challenging than other models.

2.4. Demand-Induced Strain Compensation (recovery) model

A fourth theoretical framework from W/O psychology that has been applied to sports psychology is the Demand-Induced Strain Compensation (DISC) Model (Balk et al., 2020; de Jonge & Dormann, 2003; van Iperen et al., 2020). The DISC Model posits that a balance between high job demands and job resources is crucial for optimal employee health, well-being, and performance, while an imbalance increases the risk of adverse outcomes. An innovative idea of the DISC Model is that the stress buffering and activation enhancement effects of these job resources would largely depend on the so-called ‘match’ or ‘fit’ between specific types of demands and resources at work. Job demands are defined as “work-related tasks that place brief or persistent requirements on workers, and that require physical and/or psychological effort to meet the tasks” (de Jonge et al., 2014, p. 102). Job resources, on the other hand, are “instrumental or psychological means at work that can be employed to deal with those job demands” (de Jonge et al., 2014, p. 102). The central idea here is that job resources enable employees to deal with demanding situations at work. This idea has led to the two key principles: (a) the multidimensionality principle and (b) the triple-match principle (TMP, de Jonge & Dormann, 2006). First, the multidimensionality principle of the model proposes that job demands, job resources, and job-related outcomes consist of a primarily cognitive, emotional, or physical element. Second, the TMP of the DISC Model states that moderating effects (or ‘interactions’) of demands and resources in the prediction of health, well-being and performance are stronger if demands, resources and outcomes are based on qualitatively identical dimensions (i.e., cognitive, emotional, physical). Furthermore, the TMP suggests not only that job-related demands and resources should match, but also that either demands or resources should match health, well-being and performance outcomes (e.g., emotional fatigue is the result of either too high emotional demands or too little emotional resources). According to the typology of the DISC Model, different degrees of match can be identified between job-related demands, resources, and outcomes (de Jonge & Dormann, 2003). First, a triple-match occurs when there is a match between corresponding types of demands, resources, as well as the health or performance outcomes. Second, a so-called double-match of common kind occurs when there is correspondence between job-related demands and resources, regardless of the type of outcomes. Furthermore, the health or performance outcomes can be considered as a source of match or nonmatch as well. Hence, the DISC Model speaks of double match of extended kind when there is a match between either job-related demands or resources on the one hand, and a health or performance outcome on the other. Finally, the so-called non-match occurs when there is no correspondence between any type of demands, resources, and outcomes. Accordingly, the DISC Model predicts that the degree of match increases the likelihood of detecting interaction effects between demands and resources in the prediction of health, well-being and performance.

In 2011, de Jonge and Dormann integrated *recovery*, and specifically the dimension of detachment from work (Sonntag & Fritz, 2007), in their DISC Model as an additional explanatory variable related to employee health, well-being, and performance, resulting in the Demand-Induced Strain Compensation Recovery (DISC-R) Model (de Jonge et al., 2012). It is important to note here that recovery can be considered both as an outcome and as a process (Sonntag & Geurts, 2009). Recovery as an outcome refers to the physical or mental state achieved after recovery (e.g., at the end of the day). Recovery as a process refers to activities and experiences that lead to changes in physical or mental state. Hence, the recovery process of detachment from work can be seen as the most central diversionary strategy as far as job-related recovery is concerned (Sonntag & Fritz, 2007). Moreover, to recover from high job demands, it is important that employees engage in off-job activities that appeal to other systems or do not engage at all in effort-related activities (Geurts & Sonntag, 2006). In this context, Sonntag and Niessen (2008) proposed that a full degree of off-job

recovery is attained when the employee feels that cognitive, emotional, and physical systems called upon during work have returned to their baseline levels after work. So, it is assumed that detachment from work should encompass cognitive, emotional, and physical absence from work, which is in line with the three DISC dimensions. The DISC-R Model considers detachment as a complementary way to combat potential negative effects of (too) high demands (de Jonge et al., 2012). Identical to the proposed importance of matching demands, resources, and outcomes, the TMP of the DISC-R Model states that the stress-buffering effects of detachment will be most effective when it matches demands and outcomes (e.g., cognitive detachment in relation to cognitive demands and cognitive outcomes).

The DISC Model has been tested in different kinds of empirical studies resulting in about 30 publications in the W/O context (Table 1). van den Tooren et al. (2011) conducted an extensive review study of 29 high-quality DISC studies to investigate the empirical evidence for the key assumption of the model; that is, the TMP. Their review showed that the TMP was supported largely about the stress-buffering effect of matching job resources (i.e., the compensation mechanism). Specifically, there were 32 out of 108 tested triple-match interactions (29.6%), 36 out of 327 tested less-matching interactions (11.0%), and 6 out of 76 tested non-matching interactions (7.9%). Although, the review did not lend strong support to the so-called balance mechanism of matching job resources, more recent DISC-R studies are in favor of this effect (for an overview, see Niks et al., 2013). In summary, the review indicates that when it comes to stress-buffering effects, matching resources are more effective in dealing with specific types of demands than less-matching or non-matching resources.

One major limit of the DISC-R Model is its limited scope, as it solely concentrates on three specific types of demands and resources. As a result, other types of job demands, such as reorganization and role conflict, as well as job resources, such as developmental opportunities or equity, prove challenging to categorize within the framework of the DISC-R Model and, consequently, the TMP.

In the context of sports, it can be argued that athletes face demands and utilize resources across the three dimensions of the DISC-R Model (Balk et al., 2020). Sport-related cognitive demands primarily involve information processing, focus, tactics, and complex decision-making, as well as pressure from oneself and others (Hanton et al., 2005; Mellalieu et al., 2009). Athletes may also face emotional demands, such as dealing with criticism or negative feedback and managing disappointment or anger about their performance (e.g., Nicholls et al., 2006). Physical demands are primarily associated with the muscular-skeletal system and involve sensorimotor and physical aspects of sport behavior. Cognitive resources in sports are primarily associated with control and informational support, while emotional resources mainly concern the ability to express emotions freely or receive emotional support from others, such as teammates or coaches. Physical resources in sports are primarily focused on regulating physical exertion. Understanding the multidimensional nature of sport-related demands and resources can lead to a better understanding of the specific demands placed on athletes and the corresponding resources needed to manage them. This approach can also contribute to advancing knowledge in the field, which has traditionally focused on personal resources (Balk, 2018), and enable a more precise comparison of physical, cognitive, and emotional components of athletic health, well-being, and performance (Balk et al., 2020). Despite having only six publications in the sports context (Table 1), the DISC-R Model has been particularly relevant in this field.

Among DISC-R studies applied to sport, a recent one found support for the TMP among semi-professional and professional athletes (Balk et al., 2020). The study revealed that sport-related physical resources enhanced the positive relation between physical demands and strength, while emotional resources mitigated the negative relation between emotional demands and energy. According to the TMP, moderating effects of sport-related resources on the relation between sport-related demands and vigor occurred more often when there was a

triple-match compared to when there was less match or no match at all.

Regarding recovery, Balk et al. (2017) employed a diary study among elite athletes to investigate the relation between daily detachment from sport (recovery process) and daily recovery state at bedtime (recovery outcome). They showed that daily physical detachment was positively related to daily physical recovery, whereas daily emotional detachment was positively related to daily cognitive and emotional recovery. More importantly, the moderating effects of daily detachment on the relation between daily sport demands and daily recovery state occurred more often when there was a match between specific types of sport demands, detachment, and recovery state rather than when there was less match or no match. This study provided first support for the TMP of the DISC-R Model in the elite sports context and confirmed the assumptions made in the W/O context. Lately, van Iperen et al. (2020) tested the TMP of the DISC-R Model in a cross-sectional sample of 623 Dutch recreational long-distance runners. Evidence for the model was found for cognitive and emotional dimensions of the vigor of runners, revealing four significant moderating effects of running resources and recovery on the association between demands and vigor. Although van Iperen et al. (2020) found modest evidence for the proposed mechanisms, their findings confirm that running-related resources and recovery are important for runners' well-being and that they play a role in determining the relation between demands and vigor in long-distance running. As in the W/O context, despite the promising results regarding the DISC-R Model in sports, several limitations have been highlighted in these studies. For instance, the adaptation of the Demand-Induced Strain Compensation Questionnaire instrument to the sports domain leads to the conclusion that some items might be better suited for either the work or sports context, emphasizing the need for further work on the adaptation of the questionnaire to the sports context (Balk et al., 2018). In addition, some resources seem not to be evaluated in the same intensity by athletes as by employees, e.g., cognitive resources are generally rated lower in the sports context compared to the W/O context. This may come from that in elite sport, the coach mainly determines the method and intensity of training (Balk et al., 2020). Finally, results concerning the physical dimension have been highlighted in sports, underlining that this dimension is essential in the sports context. For example, "elite athletes seek to increase their physical strength and hence, positive outcomes may occur when high physical demands are couple with high physical resources" (Balk, 2018, p. 117).

To summarize, empirical evidence from studies utilizing the DISC (-R) Model has been found in both the W/O and the sports contexts. While this model has had less exposure in the sports context compared to the models discussed above, it has garnered significant attention with an increasing number of publications. Notably, studies conducted in the sports context have contributed to the ecological validity of the model by extending its application to the occupational domain of elite sports.

3. What are the overall benefits and pitfalls of applying theoretical models from W/O psychology to sports psychology?

The W/O psychology theoretical models mentioned above are concerned with concepts, questions, and problems that are also encountered in the sports context, such as the goals to be achieved, hierarchical relationships, resources and recovery available, and the demands that athletes must face. This leads to the issue of applicability of these models in the sports context. One of the key benefits of applying theoretical models from W/O psychology to sports psychology is that these models are typically generic, meaning that they can be adapted to a wide range of contexts. This makes them potentially well-suited for use in sports psychology, where there is a need for theoretical models that can account for the unique features of different sports and athletes. However, it is important to note that generic models should be carefully adapted to the specific context in which they are being used. This can inform and enrich research and practice in both domains. For instance, studies on

TFL in sports have considerably advanced knowledge of leadership in sports. At the same time, studies conducted among sports teams gave rise to new insights into effective TFL that were applicable to non-sports teams as well. The same observation can be made for GST. Indeed, the proposal of the existence of a third type of goal in the sports context (i.e., outcome goal) questions its application to some W/O domains and could enrich the research in this field. A second benefit of applying models from W/O psychology to sports psychology is that it allows sports researchers and practitioners to uncover novel approaches and solutions to problems that they may encounter with the help of knowledge from W/O psychology. For example, a sports psychologist can draw on mindfulness-based stress reduction interventions (Nowrouzi et al., 2015) designed in W/O psychology to build a specific sports intervention to reduce athletes' stress. Or a sports psychologist can use the assumptions of the DISC-R Model on how an athlete must cope with sport-related demands through sport-related resources and recovery – not only in a physical way but also in a mental way.

However, applying theoretical models from W/O psychology to sports psychology might also present some pitfalls. A first pitfall of applying models from W/O to sports psychology is that the limitations of these models can be easily transferred to the sports context. For example, there is still theoretical confusion around the definition of TFL and its components, both in W/O psychology and in sports psychology. This is an important issue to be aware of when adapting theoretical models from W/O to sports psychology, as it is important to ensure that the models are valid and reliable in the new context. A second pitfall is that the sports context can sometimes take on unique aspects that are not present in the W/O context. W/O psychological theoretical models applied to sports need more contextual information of the (unique) sports situation. For example, as most (elite) athletes deliberately encounter the boundaries of extreme physical exertion, they continuously must deal with a high chance of physical injuries or the fear of sustaining an injury. Consequently, theories and models developed in the W/O context are more generalizable compared to theories and models developed in a more distinctive sports context, since the idiosyncratic nature of sports is a boundary factor that could limit its ultimate applicability (e.g., existence of different goal types in the sports and the W/O context in GST). This implies the need to ensure that the relations assumed in the different models fit well in the sports context. In addition, it might be necessary to consider more significant modifications in a model in the case it is identified that it does not fit the sports context well. For example, when dealing with a population of young athletes, it would be relevant to question the applicability of models proposed in the W/O context, given that these models are mainly designed for adults. We can then question the influence of various factors, as developmental or situational factors, on the relations found in the theoretical W/O models (e.g., the greater importance given to certain resources related to the social context during adolescence; Wylleman & Lavallee, 2004). A final pitfall is that measurement instruments connected to various theories and models might need adaptation to the sports context. Although theoretical models may appear generic to both domains, which may benefit instrument adaptation (e.g., Balk et al., 2018), adapting existing instruments to sport might be an additional challenge for both researchers and practitioners.

4. Limits and suggestions for future research

This narrative review explores four theoretical models developed in the W/O psychology framework that have been applied in the sports context. While we have taken precautions to ensure the thoroughness of this review, one of its main limitations is the challenge of identifying all theoretical models developed in the W/O context that have been utilized in the sports context. To address this, we examined the main theoretical models featured in W/O psychology handbooks (Anderson et al., 2001; Cooper et al., 2015; Linley et al., 2010; Quick & Tetrick, 2011) and assessed their application to the sports domain. While we acknowledge

that our review may not be exhaustive, we believe it provides a comprehensive account of the most relevant theoretical models that demonstrate usefulness in both the W/O and sports domains.

The review of theoretical models and their applications in sports research has yielded valuable insights and recommendations for future investigations. Firstly, when using or adapting a model to the sports context, it seems necessary for researchers to describe the arguments they propose to justify why they should or should not adapt the model, concept, and sub-dimensions. Then, one of the differences between the W/O and sports context is that in the W/O context the studies necessarily focus on adults, whereas in the sports context some of the studies focus on youth or adolescents who are in high development and performance streams. Therefore, it seems relevant to examine the developmental aspects when adapting a theoretical model of W/O to the sports context (Vella et al., 2013). Furthermore, when researchers in the sports context study a concept, it is important to examine the literature in the W/O context as these two fields share similarities. This would allow the construction of hypotheses informed by research studies in this context. For example, in the sports context, studies on athlete burnout have rarely mobilized the contributions of the COR or the DISC-R frameworks. However, these theories are widely recognized in the W/O context and would allow to refine the hypotheses formulated in studies on athlete burnout. In a recent study (Gerber et al., 2022), the authors explicitly stated that they formulated no specific hypotheses regarding the predictive value of recovery-stress states for burnout, given the lack of previous studies on this subject. However, based on theoretical models such as the COR or the DISC-R, the authors could make some explicit assumptions about these relations. This suggestion is in line with recent ones made by various authors (e.g., Gustafsson et al., 2016; Isoard-Gauthier et al., 2018) and specialists of athlete burnout who underline the importance of investigating Shirom's (2003) conceptualization in the sports context. Finally, when seeking to apply a theoretical model developed in the W/O context, we suggest conducting qualitative studies based on the knowledge of the field actors (coaches, staff, athletes) to determine the specific elements of the sports context that would require an adaptation of the concepts and models developed specifically in the W/O context. These suggestions for future research not only apply to the sports context but also have broader implications for the adaptation and application of theoretical models in various domains. By providing a framework for researchers to critically examine and adapt theoretical models to different contexts, these suggestions have the potential to enhance the transferability and generalizability of research findings across fields.

5. Conclusions

This narrative review provides an overview of theoretical models from W/O psychology that have been applied to sports psychology. The corresponding theoretical and empirical studies have supported the assumption that theoretical models from the W/O context can be adapted to the sports context in some cases and situations. Concerning the TFL and the DISC-R Model, the transfer seems rather successful with empirical studies carried out in the sports context. These studies have contributed to the validity and generalization of these models. However, if we look at the transfer of the GST to the sports context, the results are somewhat contradictory. We questioned this transfer by underlining that it might be relevant to review whether the tenets of GST are applicable as they are in the sports context. Finally, concerning the COR Theory, this theory received surprisingly limited attention in the sports context although empirical findings in both domains were concordant. However, this theory is often used as an underlying theory for processes described in other models (e.g., resources and detachment functioning in the DISC-R Model).

It seems appropriate to further examine if other models from W/O psychology are transferable to the sports context (e.g., the Job Demands-Resources Model, the Person-Environment Fit Theory, and the Effort-

Reward Imbalance Model; Bakker & Demerouti, 2007; Edwards et al., 1998; Siegrist, 2016). We believe that theories and models developed in the domain of W/O psychology have the potential to advance theorization and scientific research in sports psychology. However, researchers should keep in mind that models specifically developed in the W/O context may also require specific adaptations and validation to the sports context (e.g., recommendations on TFL), and in this case, more empirical applied studies are needed. Despite the similarities presented in the introduction, the W/O and sports contexts may also have some differences that require adaptation of the models developed in the W/O context for use in the sports context. For example, in the sports context, athletes receive salient and immediate physiological feedbacks (e.g., fatigue and pain) that are not experienced by workers in the W/O context (Kyllo & Landers, 1995). These differences highlight the need for further conceptual and model development when applying work in the W/O context to the sports context and vice versa.

Declaration of interest statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Transparency and openness

The present narrative review followed the citation requirement and complied with the Journal Article Reporting Standards (JARS) for qualitative studies. Research questions and analytic plans of the present narrative review were not pre-registered.

Ethics

The present narrative review was declared exempt of IRB approval/consent.

Data availability

No data was used for the research described in the article.

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