Influence of self-efficacy on performance in youth football players mediated by recovery

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Abstract

Self-efficacy is known to enhance athletic performance, but the mechanisms underlying this relationship remain unclear. One potential pathway is perceived recovery, athletes' subjective sense of physical and mental readiness, which may mediate the effect of self-efficacy on performance. The present study investigated whether perceived recovery mediates the relationship between self-efficacy and perceived performance in elite Dutch football academy players. We hypothesized positive direct effects of self-efficacy on both recovery and performance, as well as a significant indirect effect via recovery. Daily self-reports of self-efficacy, perceived recovery, and perceived performance were collected across two seasons from 42 male players (aged 15–20), yielding 12,035 observations. After mean imputation (≤20% missing data) and scale normalization, a simple mediation analysis was conducted using PROCESS. Self-efficacy significantly predicted performance ($B = 0.205$, $p < .001$) and was positively associated with recovery ($B = 0.209$, $p < .001$); however, recovery did not predict performance ($B = 0.015$, $p = .507$), and the indirect effect was non-significant ($B = 0.006$, 95% CI = –0.005 to 0.017). These results suggest that while self-efficacy directly influences perceived performance and is linked to perceived recovery, recovery does not serve as a mediating mechanism in this context. This raises important questions about the validity of self-reported recovery as an indicator of performance readiness. Future research should integrate subjective assessments with objective physiological data to better understand how recovery perceptions align with actual performance capacity.

Keywords: self-efficacy, performance, recovery, youth athletes, football

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A player who scored 24 goals the previous season, scored the winning goal in the final of the European championship to lift the first Spanish international trophy in 44 years, would be seen by anyone as one of the best. Fernando Torres himself had a different view of his abilities. He once said, “I could not believe I was nominated” (Hughes, 2017), but he was. He was not just nominated for the Ballon d’Or, but finished third out of 30 nominees. The World Cup of 2010 should have been the peak of his career. Disaster struck when he injured his knee and needed to undergo surgery. After rushing back, he struggled for form and was dropped from the starting 11 after the quarter finals, even reinjuring himself in the final. His career and confidence were never the same; those same doubts about his own abilities now seemed true in everyone's eyes. It is a shame to see a player fall from grace because he couldn’t recover mentally or physically. A shame his confidence and flair were never the same. All in all, the importance of believing in one’s abilities and recovering properly from setbacks is essential to endured performance at the highest level (Critchley, 2019).

Self-efficacy in Sports

The concept of self-efficacy was first introduced by psychologist Albert Bandura in 1977 as part of his social cognitive theory (Bandura, 1977). Self-efficacy refers to an individual's belief in their ability to complete a task or achieve a goal. It is not simply about having the necessary skills but rather the confidence to use those skills effectively in different situations. Bandura emphasized that self-efficacy influences motivation, behavior, and emotional well-being. For example, a study by Ng and Lovibond (2019) showed that high self-efficacy reduced anxiety when trying to avert a negative outcome, suggesting that high self-efficacy leads to more persistence in the face of difficulties. Conversely, lower self-efficacy is associated with higher levels of anxiety, depression, worry, and social avoidance (Tahmassian & Moghadam, 2011)

Self-efficacy and sports performance

Research shows that athletes with higher self-efficacy set more ambitious goals, demonstrate greater persistence, and manage competitive pressure more effectively (Feltz et al., 2008). The findings of Lochbaum et al. (2023) suggest that confidence in one's abilities before competition is a strong predictor of successful outcomes. One of the key ways self-efficacy enhances performance is by influencing motivation and effort. People with stronger self-efficacy are perform better under pressure compared to those lower in self-efficacy (McKay et al., 2012). Moreover, high self-efficacy can reduce competitive anxiety, allowing athletes to remain composed during high-stakes situations (Moritz et al., 2000).

In 2023 Lochbaum et al. (2023) performed a meta-analysis on the effect of self-efficacy on sports performance. Multiple variables had a significant impact on this relationship. One of those was open-skilled sports versus closed-skilled sports. Open-skilled sports can be defined as those in which players have to react to a constantly changing environment (e.g. football, basketball, tennis). Closed-skilled sports can be defined as those with a predetermined set of actions, in which there is minimal to no influence from the environment (e.g. swimming, athletics) (Wang et al., 2013). In open-skilled sports, the effect was most of the time minimal to moderate (Lochbaum et al. 2023). As explained by Terry (1995), reducing the impact of external variables to a minimum or eliminating them completely, makes it easier to see the effects of psychological variables like self-efficacy on performance more clearly. The same explanation can be given for the stronger connection between self-efficacy and performance in elite athletes (Slobounov et al., 1997) versus non-elite athletes (Turner et al., 2020). In elite competitions, athletes will all be very fit and perform on a more consistent level, which takes away part of the variability and shows the influence of self-efficacy more clearly.

Furthermore, the relationship between self-efficacy and performance was stronger for subjective measures, such as player or coach rating (Yang, 2020), versus objective measures (Hayslip et al., 2010). This can be explained by the fact that objective measures don't always evaluate performance accurately for the individual in team sports (Terry, 1995). Lastly, self-efficacy and performance were related slightly stronger in longer sporting events (>10 min) versus shorter sporting events (<10 min) (Lochbaum et al. 2023).

Athletes with high self-efficacy demonstrate enhanced motivation and focus, which translates to more effective practice and performance under pressure. These characteristics are particularly valuable considering the demands of recovery, as the ability to self-regulate and maintain consistent effort is crucial for adherence to recovery protocols (Balk & Englert, 2020).

Recovery in Sports

Recovery is a multifaceted process (e.g., psychological, physiological, sociological) that serves to restore a (dynamic) homeostatic state of functioning in the body and is relative to time (Kellman et al. 2018). Recovery is needed after too much stress has depleted the personal resources to deal with this stress, to return to a homeostatic state. The state that occurs is known as underrecovery, which in turn can lead to impaired performance, lowered well-being or in extreme cases, burnout.

An important aspect of recovery is self-regulation. Self-regulation can be defined through three different subfunctions. The monitoring and awareness of one's behavior, its consequences, and its determinants, the personal judgment of this behavior, and the subsequent response. Self-efficacy is very important in the self-regulatory process with its influence on thought, mood, action, and motivation (Bandura, 1991).

Recovery and sports performance

Beyond the general need for recovery to restore homeostasis, research highlights that monitoring recovery status plays a crucial role in optimizing athletic performance (Kellman et al. 2018). Recently, mental fatigue has gotten more focus, since it affects both cognitive and physical performance. Mental fatigue can negatively influence decision-making, reaction time, and perceived effort (Van Cutsem et al., 2017), impacting sports that require sustained focus, such as football. Athletes and staff often struggle to differentiate mental fatigue from physical fatigue (Russell et al., 2019), complicating recovery strategies. Moreover, a lack of standardized protocols for managing mental fatigue in high-performance sports suggests a need for clearer, evidence-based guidelines (Russell et al., 2023). Effective mental recovery strategies include structured rest, cognitive workload modulation, and stress management techniques.

In the end, an athlete's ability to self-regulate recovery, including recognizing fatigue, interpreting its effects, and adjusting behaviors accordingly, is essential for sustained performance. Without proper recovery, accumulated fatigue leads to diminished performance, increased injury risk, and impaired well-being (Coutts et al., 2007).

Influence of self-efficacy on recovery

As previously explained, an important aspect of recovery is self-regulation. Self-efficacy is subsequently an important part of self-regulation, because it influences thought, mood, action, and motivation (Bandura 1991). A person who has higher self-efficacy is more likely to engage in proactive behavior and therefore also in proactive recovery (Tielemans et al., 2015; Kadden & Litt, 2011). For instance, a study of stroke victims found that higher self-efficacy was associated with better psychosocial outcomes, including increased participation satisfaction and improved health-related quality of life (Tielemans et al., 2015). Additionally, research on substance use disorders indicates that higher self-efficacy predicts better treatment outcomes, such as reduced substance use and increased abstinence rates (Kadden & Litt,

2011). Lastly, a systematic review examined the association between self-efficacy and return-to-work (RTW) outcomes for workers with upper-body musculoskeletal or psychological injuries. The findings indicated that higher levels of self-efficacy were consistently associated with positive RTW outcomes across various injury types and follow-up periods. The study also noted that the relationship between self-efficacy and RTW strengthened when the domain of self-efficacy was more specific to RTW and job behaviors (Black et al. 2017). These studies suggest that self-efficacy plays a crucial role in motivating individuals to adopt behaviors that promote recovery.

In the sports context, there has been no research looking into the influence of self-efficacy on recovery, but other fields of research suggests that self-efficacy can influence recovery as mentioned above (Tielemans et al., 2015; Kadden & Litt, 2011; Black et al., 2017), which in turn will affect performance. Important to note is that the studies mentioned above considered recovery from a different angle, namely either a major life event (stroke, substance use disorders) or long-term injuries.

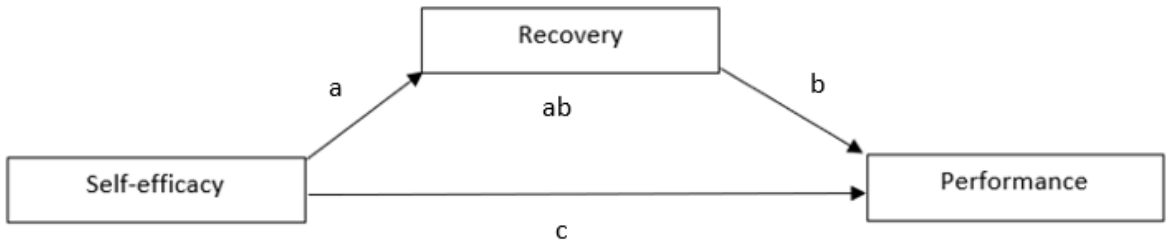
The Present Study

In the sports context, there has been no research on the influence of self-efficacy on recovery, but other fields of research suggest that self-efficacy can influence recovery as mentioned above (Tielemans et al., 2015; Kadden & Litt, 2011; Black et al., 2017), which in turn can affect performance. The current study will have a focus on daily perceived recovery from training and games by youth football players (ages 15 to 20) at an Eredivisie club in the Netherlands. The results could provide valuable insights into how self-efficacy, recovery, and performance are related in a sports context. From a practical standpoint, these findings may inform coaches and practitioners on how to support youth players from a psychological perspective, ultimately promoting more consistent and long-term performance in young athletes. This study will try to answer the following question: Is the relation between self-

efficacy and performance in elite youth football players mediated by the perceived recovery? Based on existing literature, I hypothesize that higher self-efficacy is positively associated with performance (H1). Next, I hypothesize that higher self-efficacy is positively associated with perceived recovery (H2). Furthermore, I hypothesize that higher perceived recovery is positively associated with performance (H3). Lastly, I hypothesize that the indirect effect of self-efficacy on performance mediated by perceived recovery is larger than the direct effect of self-efficacy on performance (H4).

Figure 1

The Mediation Model



Note. See above self-efficacy as the independent variable, recovery as the mediator variable, and performance as the dependent variable. Highlighted with the letters are the direct effect of self-efficacy on recovery (a), the direct effect of recovery on performance (b), the direct effect of self-efficacy on performance (c), and the indirect effect of self-efficacy through recovery on performance (ab).

Methods

This study was approved by the Ethics Committee of the Faculty of Behavioural and Social Sciences at the University of Groningen (PSY-2425-S-0016).

Subjects

Data was collected on 94 male football players from U-16, U-18, and U-21 (Age = 15-20) of a professional football club playing in the Eredivisie in the Netherlands.[1] 37 of these players met the inclusion criteria and were thus used in the data analysis (criteria are further explained in the section Data Pre-Processing). Players were informed of the data collection process when they started at the club. By signing an informed consent, they could choose to either consent to their data being used for research or not (all players used in this analysis consented). The players participated in the highest national league for their age group. Their weekly training schedule included six to eight sessions, consisting of two strength training sessions lasting between 60 and 75 minutes and four to six field sessions lasting between 75 and 90 minutes. Matches were played on weekends. The players had been introduced to strength training from the age of 12 and typically performed these sessions around midday, following the field training. To protect personal data, further potentially identifiable details (such as height, weight, playing position, team affiliation, or specific injury type) are not disclosed.

Design, Measures, and Procedures

For a maximum of two competitive seasons, psychological data were measured before and after every training and match. For the players, this meant answering self-report questions about self-efficacy, recovery, and performance on a tablet computer near the locker room without other players or staff being present. The players had been accustomed to daily data collection since the age of 15 or when they joined the academy (Saw et al., 2016). Monitoring

[1] A portion of the data used in this study has been analyzed in prior research, as some participants were included in earlier studies (Neumann et al., 2024; Neumann, Van Yperen, et al., 2024). Nonetheless, this manuscript presents a new approach, analysis, and interpretation aimed at addressing a separate research question.

represents a central element of the club's philosophy and plays a vital role in supporting each player's individual development. At the start of each season and multiple points during the season, coaches reiterated the value of this practice: to support individual progress, improve performance, and minimize injury risk. This systematic approach also helps to mitigate common drawbacks associated with subjective self-reporting, including socially desirable responses, response fatigue, and compliance issues (Saw et al., 2015).

The single-item self-reports utilized in this study consist of either a validated question

Table 1

Data Collection

Measured factor[1]	Self-report question	Measurement scale	Origin of measurement
Recovery	How good is your recovery?	CRS from 6 (very, very poor recovery) to 20 (very, very good recovery)	Kenttä and Hassmén (1998); Brink et al. (2010)
Self-efficacy	How confident are you that you can perform maximally today?	VAS from 0 (not at all confident) to 100 (very confident)	Wiese-Bjornstal (2019); Galambos et al. (2005)
Perceived performance	How well did you perform today?	VAS from 0 (very bad (far below my capabilities)) to 100 (maximally (to the best of my capabilities)	Hartigh et al. (2022); Brink, Nederhof, et al. (2010)

Note. CRS category-ratio scale, VAS visual analogue scale

[1]Recovery and self-efficacy were measured in the morning up to 30 minutes before the first training, whereas perceived performance was measured at the end of the day up to 30 minutes after the last training session or the match

(recovery; see Table 1) or questions previously used in research and recommended for contextual adaptation (self-efficacy, perceived performance; see Table 1). The rationale for using single-item measures is based on the need to minimize time, costs, and participant burden, as well as to facilitate repeated assessments before athlete performance evaluations (Song et al., 2023; Barte et al., 2019; Cohen et al., 2006). Nonetheless, I acknowledge that such measures may not entirely capture the complexity of certain constructs. However, literature supports their use, indicating that the added advantages of multi-item measures are generally modest (Song et al., 2023; Abdel-Khalek, 2006).

Data Set and Statistical Analysis

The data were analyzed using IBM SPSS Statistics (Version 28) and the PROCESS macro for SPSS (Hayes et al., 2024).

Data Pre-Processing

The following criteria were used to determine if a player would be included in the analysis. In sports research like this, missing data is a given; together with the club, it was determined that 20% of missing data at most is acceptable (this would mean missing roughly one day per week) (Neumann et al. 2024). Thus, all players with more than 20% of data points missing from one of three variables (self-efficacy, recovery, and performance) were excluded (Neumann et al. 2024). Furthermore, all players with a relatively low number of data points (in this case, <23) will be excluded from the analysis, because this may influence the power of the analysis (Oakes, 2017). Ultimately, the final sample consisted of 42 players with an average of 287 observations per player (range 84-430). The missing values were imputed with the averages per variable per player.[2] Finally, because two different scales were used, the

[2] Mean imputation was used as a basic method for imputation, since more complex methods lay outside the scope of the bachelor thesis. See further explanation in the discussion section.

data were normalized for analysis to compare results. To clarify, the recovery variable was divided by 20 (i.e., the maximum). The self-efficacy and performance variables were each divided by 100 (i.e., the maximum).

Data Analysis

A mediation analysis was conducted to examine whether recovery (mediator) explains the relationship between self-efficacy (predictor) and performance (outcome). The analysis was performed using the PROCESS macro for SPSS (Hayes et al., 2024). A bootstrap analysis was used to test the indirect effect of self-efficacy on performance through recovery. In addition, Multiple Regression was employed to assess the direct effects of self-efficacy (predictor) on both recovery (outcome) and performance (outcome), as well as the direct effect of recovery (predictor) on performance (outcome).

Results

Descriptives

Table 2 below shows the variables used in the analysis with means and standard deviations before normalization, whereas Table 3 shows the means and standard deviations of the same variables after normalization. The total observations used for the analysis was N = 12,035.

Table 2

Descriptive Statistics Before Normalization

	Mean	Standard Deviation
Recovery	14.700	1.114
Self-efficacy	75.920	11.989
Performance	72.346	12.425

Table 3

Descriptive Statistics After Normalization

	Mean	Standard Deviation
Recovery	.735	.056
Self-efficacy	.759	.120
Performance	.724	.124

Assumptions of Multiple Linear Regression

Firstly, the assumption of linearity assumes a linear relationship between predictors and response variable; this assumption can be checked by looking at the scatterplots from the regression and was not violated (see Figure 1, Figure 2, and Figure 3 in Appendix A). Next, the assumption of autocorrelation tests whether the residuals at one point in time are correlated with the residuals at another; this assumption was not violated (Durbin-Watson = 1.512). The assumption of multi-collinearity assumes that predictors are not strongly correlated; this assumption was not violated, as both variance inflation factor values were within proper limits (both 1.254). Additionally, the assumption of normality is unnecessary to check for this analysis because bootstrapping, as a resampling method, estimates the sampling distribution of a statistic directly rather than relying on theoretical distributions such as the normal distribution (Fernandes, 2020). Lastly, the assumption of homoscedasticity was also unnecessary to check because of bootstrapping, as bootstrapping is robust against a homoscedasticity violation (M. Ng & Lin, 2015).

Results Analysis

A simple mediation analysis was conducted using the PROCESS macro for SPSS (Hayes et al., 2024). The results showed that recovery did not significantly mediate the relationship between self-efficacy and performance. As shown in Figure 2 and Table 4, self-efficacy was positively associated with recovery (a = 0.465) and self-efficacy positively

predicted performance (c = 0.205); however, recovery was not positively associated with performance (b = 0.012). The bootstrap confidence interval for the indirect effect (ab = 0.006), based on 5,000 bootstrap resamples, included zero (-0.005 to 0.017), indicating that recovery does not mediate the relationship between self-efficacy and performance.

H1: Higher self-efficacy is positively associated with performance, has not been rejected as the direct effect of self-efficacy positively predicted performance (B = .205, p < .001). This means that individuals with higher self-efficacy tended to report higher

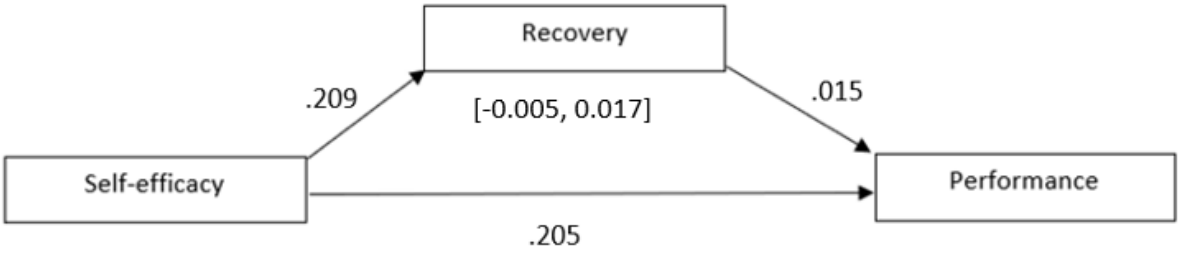
Table 4

Results of Mediation Analysis

		M (Recovery)				Y (Performance)		
Antecedent		*B*	*SE*	*p*		*B*	*SE*	*p*
X (Self-Efficacy)	a	.209	.004	<.001	c	0.205	0.010	<.001
M (Recovery)		-	-	-	b	.015	0.022	.507
		R^2 = .202				R^2 = .041		
		F(1, 12033) = 3050.375, p <.001				F(2, 12032) = 254.044, p <.001		

Figure 2

The Mediation Model with Coefficients



Note. The numbers in the figure represent the coefficients of the regression analysis and mediation analysis. The arrows show the direction of the interaction within the mediation model. Self-efficacy is the independent variable, recovery is the mediator, and performance is the dependent variable.

performance, and conversely, those with lower self-efficacy tended to report lower performance. H2: Higher self-efficacy is positively associated with perceived recovery, has not been rejected as self-efficacy is positively associated with perceived recovery (B = .209, p < .001). This means that individuals with higher perceived self-efficacy tended to report higher recovery, and conversely, those with lower self-efficacy tended to report lower recovery. H3: Higher perceived recovery is positively associated with performance, has been rejected as perceived recovery did not predict performance (B = .015, p = .507). This means that perceived recovery did not influence performance. H4: The indirect effect of self-efficacy on performance mediated by perceived recovery is larger than the direct effect of self-efficacy on performance, has been rejected (B = .006, SE = .005, 95% CI [-.005, .017]). This means that perceived recovery did not function as a mediator between self-efficacy and performance.

Discussion

The present study aimed to examine whether perceived recovery mediates the relationship between self-efficacy and perceived performance in elite youth football players. Grounded in Bandura's (1991) social cognitive theory, the study hypothesized that self-efficacy would positively influence both perceived recovery and perceived performance. Furthermore, it was expected that recovery would serve as a mediating variable, helping to explain how athletes' confidence in their abilities translates into better performance. The overarching aim was to explore how psychological and recovery-related processes might contribute to consistent high-level performance in youth football. As psychological attributes become increasingly recognized as critical components in elite athletic development, understanding how internal perceptions interact with recovery and performance is vital for both researchers and practitioners working in high-performance youth sport settings.

Interpretation of Findings in the Context of Literature

Self-efficacy and Performance

As predicted, self-efficacy was found to be a significant and positive predictor of perceived performance (H1). This conclusion is supported by the fact that perceived self-efficacy was measured in the morning before every training or match, whereas performance was measured at the end of the day. This supports a robust body of literature highlighting the central role of self-efficacy in influencing athletic outcomes (Feltz & Öncü, 2015; Lochbaum et al., 2023). Athletes who believe in their ability to succeed are more likely to approach challenges with confidence, persist through setbacks, and manage pressure effectively, all of which are essential in performance environments that are unpredictable and demanding.

This relationship may be especially salient in open-skilled sports such as football, where athletes must adapt to constantly shifting scenarios. In such contexts, the situational variability (opponent actions, weather, tactical changes) demands rapid decision-making and emotional resilience. Here, self-efficacy may act as a buffer for inconsistent performance as it helps players to adapt to a constantly changing environment, where they cannot rely on predetermined patterns of performance. The current study adds to this understanding by reinforcing that even in young elite athletes, many of whom are still developing both physically and mentally, self-efficacy remains a key factor in their performance.

Self-efficacy and Recovery

The data also showed a positive relationship between self-efficacy and perceived recovery (H2). This extends the existing evidence base, particularly from non-sport domains, which has shown that self-efficacy supports proactive recovery behaviors and better perceived recuperation (Tielemans et al., 2015; Kadden & Litt, 2011). These findings suggest that confident individuals are more likely to engage in effective recovery strategies or, at the very least, to feel more recovered due to a stronger belief in their resilience and ability to self-regulate.

This is an important insight in athletic contexts, especially since there is limited literature within the sports context about this relation. By showing that self-efficacy is positively related to both performance and perceived recovery, the findings suggest a broader role for self-efficacy in athletes' day-to-day readiness. It may be that confident athletes engage more attentively in sleep, nutrition, and rest strategies, or they may simply interpret bodily signals more optimistically, believing themselves to be capable of coping regardless of fatigue. Either way, this relationship warrants further investigation, particularly with more objective recovery measures to determine if perceptions align with physiological states.

Recovery and Performance

Contrary to expectations and existing research, perceived recovery did not significantly predict perceived performance (H3). This result stands in contrast to several prominent studies suggesting that recovery, whether mental or physical, is crucial for maintaining and enhancing performance in athletes (Kellmann et al., 2018; Van Cutsem et al., 2017). The current finding challenges this assumption, at least when focusing solely on perceived (subjective) recovery and performance in a youth elite football setting.

There are several plausible explanations for this result. First, the use of perceived rather than objective recovery measures may limit the sensitivity of the data. There are several biomarkers identified for both performance and recovery (Lee et al., 2017), and these may help to take a more objective approach. While athletes may report feeling recovered, these perceptions may not relate to their physiological readiness or actual performance capacities. For example, due to high commitment or pressure to perform, young athletes might underreport fatigue or overstate readiness, thereby weakening any recovery–performance relationship in the data.

Mediation of Recovery

Mediation was not found (H4). Theoretically, this challenges some interpretations of Bandura's (1991) model, which explains that self-efficacy influences outcomes indirectly via behavioral processes such as preparation and recovery. In this study, although self-efficacy positively predicted both perceived recovery and performance independently, perceived recovery did not significantly predict performance, nor did it mediate the relationship between self-efficacy and performance. This may suggest that in youth athletes, recovery and performance perceptions are both individually influenced by self-efficacy beliefs

The lack of mediation may reflect the complexity of the recovery-performance link, which could require the integration of both psychological and physiological data for a clearer understanding. For instance, Simonelli et al. (2025) used both subjective recovery scales and machine learning with objective performance data to explain recovery-performance relationships in professional football. Future research that incorporates multimodal approaches could clarify whether the non-significant mediation effect observed here is due to measurement limitations or not.

Limitations and Strengths

First, all variables were assessed using subjective, self-report measures, which are vulnerable to various biases such as social desirability, misperception, and mood-related distortion (Saw et al., 2015). This is particularly relevant for high-performing youth athletes, who may feel compelled to present themselves in a positive light.

Second, the method used to handle missing data, mean imputation, was a practical choice within the scope of a bachelor's thesis research project. However, more sophisticated methods such as Multiple Imputation by Chained Equations (MICE) have demonstrated greater robustness and should be considered in future work. MICE accounts for uncertainty and variability in missing data, which may help reduce bias and improve the reliability of inferential statistics (Zhang, 2016).

Finally, the lack of objective performance metrics, such as GPS tracking, match statistics, or physiological biomarkers (e.g., cortisol levels, heart rate variability), limits the ecological validity of the findings. For example, Brink, Nederhof, et al. (2010) demonstrated that combining subjective recovery scores with objective training load data in youth football yielded better predictive power for injury and performance trends than subjective data alone.

Despite these limitations, the study has notable strengths. The use of a large, ecologically valid dataset comprising over 12,000 observations collected in a real-world elite sports academy enhances the reliability and applicability of the findings. Unlike controlled laboratory environments, this setting reflects the complexity and pressure of everyday elite sport, making the insights more transferable to practice. Moreover, daily monitoring over two full competitive seasons provides a rare longitudinal perspective in youth sport psychology research, enabling an understanding of psychological and recovery-related processes over time rather than as isolated snapshots.

Additionally, the focus on elite youth athletes, an understudied population in both sport psychology and recovery literature, addresses a critical gap. Much of the existing research either targets adult professionals (Bessa et al., 2013; Kellmann et al., 2018) or recreational athletes (Hayslip et al., 2010; Moritz et al., 2000), overlooking the experiences of young players navigating both athletic development and performance expectations. By capturing how self-efficacy and perceived recovery unfold daily in this group, the study sheds light on the psychological demands of high-performance youth environments and how these may influence perceived recovery and performance. These insights are particularly valuable for coaches, sport psychologists, and talent development practitioners seeking to support sustainable performance and well-being in youth athletes.

Future Research Directions

First, future research could focus on developing an integrated recovery model that incorporates both the athlete's perceptions and objective physiological markers (e.g., heart rate variability, sleep tracking, cortisol levels) to assess recovery. Many athletes and practitioners still emphasize physical aspects, often neglecting mental fatigue, which can significantly impact decision-making and concentration (Russell et al., 2019). The non-significant results found in the current research should not lessen the importance of mental recovery and its role within the professional sports environment.

Furthermore, qualitative research is needed to better understand how elite youth football players conceptualize recovery and its influence on their perceived performance. Semi-structured interviews could uncover athletes' interpretations of recovery, emotional and physical readiness, coping strategies, and contextual influences (e.g., coach expectations, competitive pressure). For example, Russell et al. (2019) used focus groups with elite athletes and staff to identify misalignments between mental and physical recovery strategies and highlighted how unrecognized mental fatigue impacts performance. Incorporating similar qualitative designs in future research would allow for better insights into athletes' daily recovery experiences and may uncover gaps in recovery literacy that current monitoring overlooks. These findings could inform more personalized support systems within academies, promoting more complete recovery interventions that are focused on both mental and physical demands.

Practical Implications

A few important practical implications can be noted. First, they underline the critical role of psychological factors, particularly self-efficacy, in shaping both performance outcomes and perceptions of recovery. Developing self-efficacy in young players should have significant attention within a professional sports setting. Certain strategies used in different settings may be of use, such as performance-based techniques, modeling-based techniques,

persuasion-based techniques, and anxiety-reduction techniques (see Feltz and Öncü (2015) for further explanation).

Second, the study emphasizes the value of embedding psychological support and training into daily regimens, not only to optimize performance but also to support perceived readiness and well-being. Helping athletes recognize and manage their recovery perceptions may promote more adaptive behaviors and emotional regulation, even if such perceptions do not directly predict short-term performance outcomes.

Coaches and support staff should be careful not to take players' reported readiness at face value, as it might not always match their actual physical condition. Encouraging a team culture where athletes feel comfortable being honest about how they're feeling is important (Saw et al., 2016). At the same time, combining these self-reports with objective data can give a more complete picture. This approach can help improve performance while also looking after players' well-being.

Conclusion

This study contributes to the growing literature on psychological determinants of performance by confirming that self-efficacy significantly predicts perceived performance and is significantly associated with perceived recovery in elite youth football players. However, contrary to expectations, perceived recovery did not mediate the relationship between self-efficacy and performance. These findings suggest a different interplay of psychological variables compared to the relation stated in the present study. The importance of self-efficacy and the relations to perceived recovery and perceived performance are clear, but how perceived recovery influences perceived performance remains unclear.

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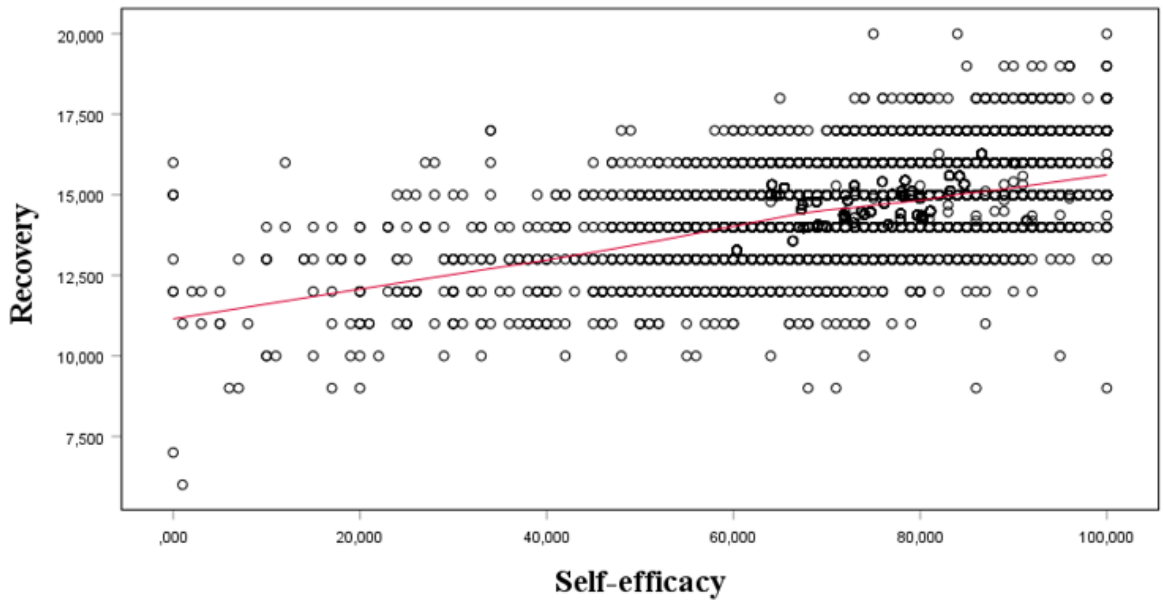
Appendix A

Figure 1

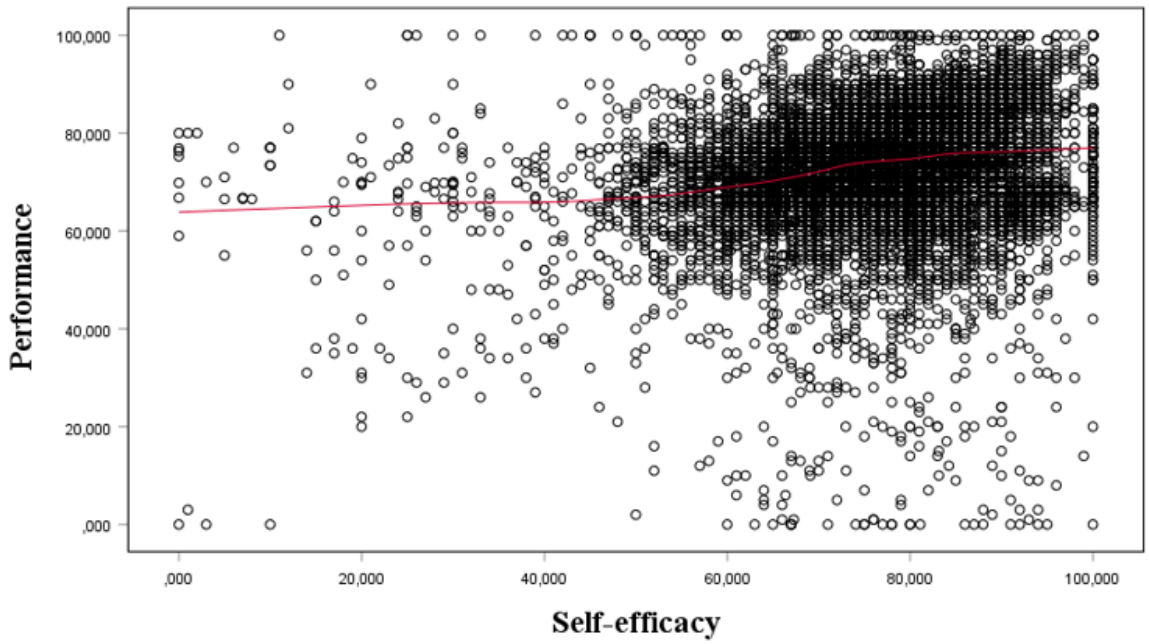
Scatterplot to Check Linearity Assumption (1)



Note. Scatterplot setting out self-efficacy (predictor) against recovery (mediator).

Figure 2

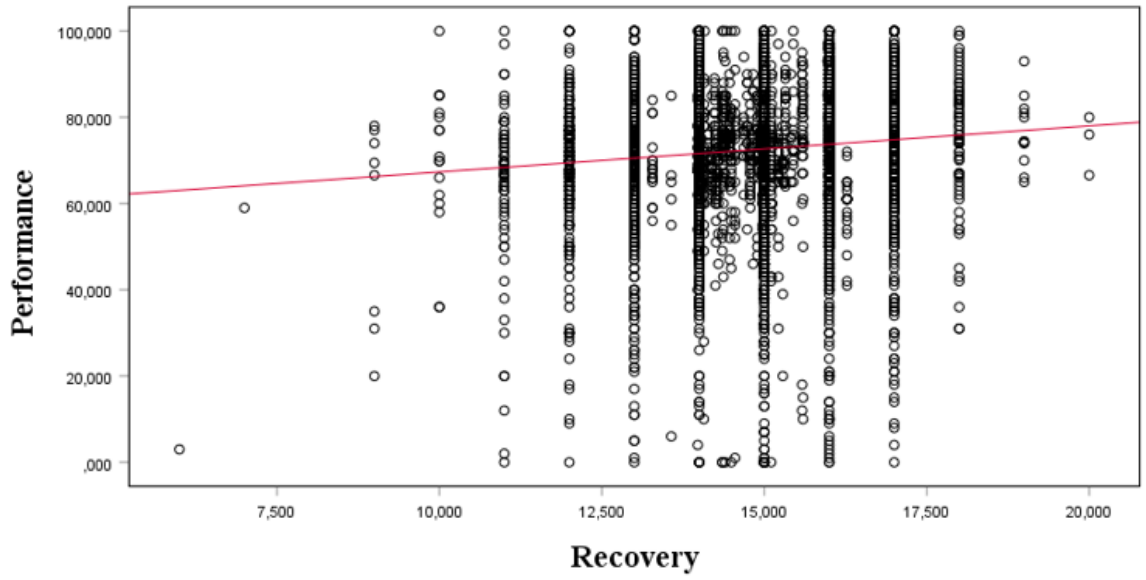
Scatterplot to Check Linearity Assumption (2)



Note. Scatterplot setting out self-efficacy (predictor) against performance (outcome)

Figure 3

Scatterplot to Check Linearity Assumption (3)



Note. Scatterplot setting out recovery (mediator) against performance (dependent variable).

Use of AI

ChatGPT (OpenAi., 2023. ChatGPT (GPT-4) [Large Language Model]. https://chat.openai.com/chat) has been used for rewriting purposes during the making of this thesis.