



OPEN ACCESS

EDITED BY

Emilio Jesús Lizarte,
University of Granada, Spain

REVIEWED BY

Tingting Huan,
Sichuan Normal University, China
Meriem Khaled Gijón,
University of Granada, Spain

*CORRESPONDENCE

Hugh Jiliang Liu
✉ hugh.liu@rug.nl;
✉ J.Liu@pl.hanze.nl

RECEIVED 28 March 2025

ACCEPTED 08 September 2025

PUBLISHED 30 September 2025

CITATION

Liu HJ, De Jonge KMM, Den Hartigh RJR and Van Yperen NW (2025) Perceptual distance in coaching beginning teachers: a dyadic study of coaches' basic psychological need support and coachees' need satisfaction. *Front. Educ.* 10:1595274. doi: 10.3389/feduc.2025.1595274

COPYRIGHT

© 2025 Liu, De Jonge, Den Hartigh and Van Yperen. This is an open-access article distributed under the terms of the [Creative Commons Attribution License \(CC BY\)](https://creativecommons.org/licenses/by/4.0/). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

Perceptual distance in coaching beginning teachers: a dyadic study of coaches' basic psychological need support and coachees' need satisfaction

Hugh Jiliang Liu^{1,2*}, Kiki M. M. De Jonge^{1,3},
Ruud J. R. Den Hartigh¹ and Nico W. Van Yperen¹

¹Department of Psychology, Faculty of Behavioural and Social Sciences, University of Groningen, Groningen, Netherlands, ²International Business School, Hanze University of Applied Science, Groningen, Netherlands, ³Groeiflow, Groningen, Netherlands

Introduction: Self-Determination Theory (SDT) has been widely applied in coaching to support coachees' needs for autonomy, competence, and relatedness, which are collectively known as Basic Psychological Needs (BPNs). Although these BPNs are typically viewed as interpersonal constructs, there is a notable lack of dyadic studies that examine these interpersonal dynamics in the context of coaching beginning teachers. Addressing this gap is crucial, as discrepancies often exist between the perceptions of coaches and coachees concerning BPN support. Therefore, this study aimed to investigate this perceptual distance and its association with coachees' BPN satisfaction.

Methods: A sample of seventy-two dyads, consisting of coaches and their coachees (i.e. beginning teachers), completed self-report surveys immediately after completing their coaching program. We used polynomial regression and response surface analysis to examine the relationship between the perceptual distance and coachees' BPN satisfaction.

Results: The results revealed three groups of dyads: (1) dyads where coaches overreported their BPN support (i.e. reported their own behaviour more positively than their coachee did, ~ 31%), (2) dyads where coaches underreported their BPN support (i.e. reported their own behaviour less positively than their coachee did, ~ 27%), and (3) dyads where both parties agreed on the level of BPN support (~ 42%). Moreover, we found that coachees experienced higher BPN satisfaction when both parties agreed rather than disagreed. When perceptions aligned, BPN satisfaction was highest under high BPN support. When perceptions diverged, coachees' BPN satisfaction was higher when coaches underreported rather than overreported.

Discussion: These findings underscore the importance of aligning coaches' and coachees' perceptions through self-reflection and communication, while also emphasising the need for future dyadic-level research in education and beyond.

KEYWORDS

autonomy, competence, relatedness, interpersonal behaviour, coaching alliance

Introduction

Self-Determination Theory (SDT) has been widely applied in coaching to support coachees' needs of autonomy, competence, and relatedness, which are collectively known as Basic Psychological Needs (BPNs) (Ryan and Deci, 2017). In educational settings, coaching has increasingly been adopted as a form of professional support for beginning teachers to promote BPN satisfaction (Denmark and Podsen, 2016). According to SDT, when a coach cultivates an environment that nurtures these BPNs, coachees are likely to experience enhanced BPN satisfaction, which is essential for psychological wellbeing (Deci and Ryan, 2000; Ryan and Deci, 2017). Recent evidence, elaborately described in a meta-analysis by Liu et al. (2025), substantiates the positive relationship between coaches' BPN-supportive behaviours and coachees' BPN satisfaction. However, this review also reveals a significant gap in the literature: previous studies have predominantly utilised individual-level data from either coaches or coachees. Relying on self-reports from either coachees or coaches presupposes that coaches' reports of their behaviour align with how their coachees perceive these behaviours (Stebbing et al., 2012). However, significant distance may exist between coaches' and coachees' perceptions regarding the degree of BPN support that coaches provide (Graßmann and Schermuly, 2018). Despite its relevance, this perceptual distance has received limited scholarly attention (Gjesdal et al., 2019). This oversight is particularly noteworthy, considering the critical role of collaboration and interdependence in the coaching alliance (Kliwer and Wanjiku Ndirangu, 2019). Therefore, in the context of coaching beginning teachers, the objectives of the present dyadic study are (1) to investigate the relationship between coaches' self-reported BPN support and their coachees' perceptions of the support, as well as (2) how the perceptual distance within coach-coachee dyads relates to the coachees' BPN satisfaction.

Coaching for beginning teachers

Beginning teachers are newcomers to the education field, and their role is tightly linked to student success (Ibrahim, 2012). Unlike professionals in most sectors, many beginning teachers bear the same workload and responsibilities as their experienced counterparts (Ibrahim, 2012). Consequently, they often perceive the initial years in the classroom as among the most demanding and stressful periods of their careers (Ingersoll and Strong, 2011). Without adequate support, beginning teachers frequently report feelings of being "lost at sea" or experiencing a "sink or swim" scenario, where they are left to navigate their success or failure independently (Denmark and Podsen, 2016). Therefore, recognising and supporting beginning teachers' needs is emphasised as a fundamental pedagogical principle (Vermeulen et al., 2012). This study will focus on beginning teachers and BPN support from their coaches and will refer to beginning teachers as "coachees" throughout.

BPN-supportive coaching

Coaching is a dyadic process emphasising collaborative goal setting to facilitate solution construction and goal achievement,

promoting coachees' ongoing self-directed learning and psychological growth (Green et al., 2006). Consistent with the overall objectives of coaching, SDT focuses on improvement and self-development (Palmer and Whybrow, 2019). According to SDT, humans have innate tendencies to grow and integrate life experiences, and BPN satisfaction is essential for psychological growth (Deci and Ryan, 1985, 2000). In coaching grounded in SDT, a BPN-supportive approach aims to nurture the universal BPNs for autonomy, competence, and relatedness, which are essential for psychological wellbeing (Deci and Ryan, 2000).

The autonomy dimension of BPNs refers to individuals' need to act volitionally, make choices, and experience psychological freedom (Deci and Ryan, 2000; Wörtler et al., 2020). A coach's autonomy-supportive attitude is characterised by a curious, open-minded, and respectful approach that encourages coachees' self-initiation (Soenens and Vansteenkiste, 2010). In addition, an autonomy-supportive coach provides meaningful choices, offers a rationale for decisions and recommendations, acknowledges the coachee's opinions and feelings, and supports their initiative in personal development (Conroy and Coatsworth, 2007). When coaches satisfy coachees' need for autonomy, those coachees feel empowered to express opinions, experiencing authenticity, a sense of volition, and psychological freedom (Van den Berghe et al., 2014).

The competence dimension of BPNs refers to individuals' need to engage with their environment in ways that enable them to tackle meaningful challenges and achieve mastery (Deci and Ryan, 2000). A coach's competence-supportive attitude is characterised by focusing on the coachees' developmental processes and by providing learning-oriented feedback to facilitate growth from mistakes (Deci and Ryan, 2000). Additionally, a competence-supportive coach offers a coachee optimal challenges, encouragement, and clear expectations during task execution, as well as specific motivational feedback (Deci and Ryan, 2000; Fransen et al., 2018). When coaches satisfy coachees' need for competence, those coachees are more likely to find tasks intrinsically rewarding and feel capable of overcoming challenging obstacles (Van den Berghe et al., 2014).

The relatedness dimension of BPNs refers to individuals' need to establish meaningful connections with others (Deci and Ryan, 2000). A coach's relatedness-supportive attitude is characterised by unconditional acceptance, genuine respect, and care for their coachees as individuals (Reynders et al., 2019). Coaches can demonstrate relatedness-support by being approachable, expressing authentic concern for their coachees' wellbeing, and creating a sense of security, especially during challenging situations. When coaches satisfy coachees' need for relatedness, those coachees feel valued, experience profound connections, and develop a stronger sense of belonging within the coach-coachee relationship (Deci and Ryan, 2000; Van den Berghe et al., 2014).

Perceptual distance of BPN support

In the existing literature, most studies on BPN support have predominantly relied on self-reports from either coachees or coaches, implicitly assuming that coachees accurately perceive their coaches' supportive behaviours and that coaches can accurately evaluate and report the support they offer (Liu et al., 2025; Stebbings et al., 2012). However, research indicates that coaches' perceptions of their own behaviours do

not always align with how their coachees experience them (Rocchi and Pelletier, 2018). The goodness-of-fit theory suggests that the effectiveness of interpersonal relationships depends on the alignment between the characteristics and needs of the individuals involved (Nelemans et al., 2016). In this context, coaches may feel that they provide support, while coachees may perceive this differently, which creates a mismatch that could be referred to as *perceptual distance*. From a similar line of reasoning, the stage-environment fit theory emphasises the importance of the alignment between an individual's developmental stage and the environmental resources or demands they encounter (Eccles et al., 1993). Within the coach-coachee relationship, this theory implies that if coaches are not attuned to the specific developmental needs of their coachees, this lack of misalignment may contribute to perceptual distance regarding the need-support.

Previous studies on coaching have underscored a notable discrepancy between coaches' and coachees' perceptions of the coaches' interpersonal behaviours (Lemonidis et al., 2014). For instance, a randomised controlled field experiment in the career coaching domain found a significant distance between coaches' and coachees' views on the negative effects of coaching (Graßmann and Schermuly, 2018). In sports coaching, studies have indicated that in the majority of cases (around 60%), there is a discrepancy between coaches' and coachees' perceptions of the coaches' interpersonal behaviours (Rocchi and Pelletier, 2018). Interestingly, 30% of the coaches tend to overestimate, whereas the other 30% tend to underestimate the positivity of their behaviour compared to how their coachees perceive it (Rocchi and Pelletier, 2018; Rodrigues et al., 2021; Smith et al., 2016). These percentages may serve as "benchmarks," reflecting the proportion of coaches who may either overreport (30%) or underreport (30%) their interpersonal behaviour by being overly optimistic or pessimistic, respectively.

These findings have significant implications for the validity of single-source research on BPN-supportive coaching. Existing literature suggests that closer alignment between the perceptions of coaches and coachees regarding coaching behaviour is associated with improved coachee performance and satisfaction (Gjesdal et al., 2019). Consequently, there is a pressing need for dyadic studies to examine the prevalence of both coaches' over-reporting (i.e., the coach reporting their behaviour more positively than the coachee does) and underreporting (i.e., the coach reporting less positively than the coachee does; Rocchi and Pelletier, 2018). Therefore, the first objective of this study is to assess the degree of agreement or disagreement between coach-coachee dyads regarding the coach's BPN support. Specifically, separately for each BPN dimension—namely, autonomy, competence, and relatedness—this study aims to evaluate the extent to which coaches overreport, underreport, or agree with the coachees' perception regarding the coaches' BPN support. Based on the preliminary benchmarks for overreporting (30%) and underreporting (30%) BPN support (Rocchi and Pelletier, 2018; Rodrigues et al., 2021; Smith et al., 2016), *Hypothesis 1a* posits that 30% of coach-coachee dyads will show disagreement through coaches' overreporting of their BPN support, and *Hypothesis 1b* posits that 30% will show disagreement through underreporting.

The relationship between perceptual distance and BPN satisfaction

Previous studies have shown that agreement between leaders and followers regarding positive social support is associated with

favourable outcomes, such as improved performance and reduced conflict (Bashshur et al., 2011). Additionally, perceptual agreement between coaches and coachees about coaching behaviours has been linked to reduced anxiety levels (Kenow and Williams, 1999). In the context of sports coaching, Rocchi and Pelletier (2018) were the first to investigate the relationship between the perceptual distance of the coaches' self-reporting of BPN support and their athletes' perceptions. They found that agreement on high levels of BPN support predicted greater athlete BPN satisfaction. Based on these findings, we propose two hypotheses to advance our understanding of the link between perceptual distance and coachees' BPN satisfaction in the educational context. *Hypothesis 2* posits that as agreement increases, coachees will experience higher levels of BPN satisfaction. As both parties may agree on either high or low levels of BPN support, *Hypothesis 3* posits that coachees will experience higher BPN satisfaction when there is agreement on high levels of BPN support rather than on low levels.

Furthermore, coaches may either overreport or underreport their BPN-supportive behaviours relative to their coachees' perceptions. Research suggests that individuals' perception of another person's behaviour has more impact than the actual behaviour itself in shaping their feelings or actions toward that person (Shaver, 2016). This implies that when coaches underreport, that is, they report their behaviour less positively than their coachees do, their coachees' BPN satisfaction will be relatively high. Hence, *Hypothesis 4* posits that coachees experience greater BPN satisfaction when their coaches underreport rather than overreport their own supportive behaviour. This hypothesis will also be tested separately for each dimension of BPNs (i.e., autonomy, competence, and relatedness).

Methods

Participants

To determine the appropriate sample size for the current study, a power analysis was conducted using G*Power (Version 3; Faul et al., 2007); see Appendix A for the detailed procedure and results. The predetermined sample size was met, resulting in a final sample of 144 respondents, 72 dyads of coaches ($N_{\text{male}} = 19$, $N_{\text{female}} = 51$, $N_{\text{unknown}} = 2$) and their coachees ($N_{\text{male}} = 17$, $N_{\text{female}} = 48$; $N_{\text{unknown}} = 7$). The coaches were MSc-level students ($M_{\text{age}} = 24.15$ years, $SD = 2.42$), recruited through an MSc course they participated in at a university in the Netherlands. This course aimed to establish and implement a coaching program for BA-level coachees ($M_{\text{age}} = 22.94$ years, $SD = 3.53$). These coachees, or beginning teachers, were trained for a teacher-assistantship in first- and second-year undergraduate courses.

Procedures

Before data collection commenced, the present study received approval from the Ethics Committee of the Department of Psychology, University of Groningen (reference number: PSY-1920-S-0479). Participants were invited to join the study via an in-class announcement or a prerecorded message. Participation was entirely voluntary, and informed consent was obtained from both coaches and coachees before completing the online survey. Each coach-coachee pair was assigned a unique identification code to maintain participant

anonymity throughout the process. The coaching program included three sessions, spanning a total of four to five weeks. After the final session, coaches completed an online survey to self-report their BPN support. At the same time, coachees completed a corresponding survey that measured both their perceptions of their coaches' BPN support and their own BPN satisfaction.

Measures

Basic psychological need-supportive behaviours (BPN support)

Coach-rated (see [Appendix B](#)) and coachee-rated (see [Appendix C](#)) BPN-supportive behaviours of the coach were measured, respectively, using two adapted (to the context) 12-item versions of the *Interpersonal Behaviour Questionnaire (IBQ)* ([Rocchi et al., 2017](#)). The stems of the scales were changed into “At the three coaching sessions in the past coaching trajectory, ... when I coach my coachee, I ... (coach-rated version) / my coach ... (coachee-rated version).” Specifically, four items were used to measure each BPN dimension (i.e., autonomy, competence and relatedness) on a scale ranging from (1) *Do not agree at all* to (7) *Completely agree*. The examples of autonomy-supportive items are “... gave my coachee the freedom to make their own choices” (coach-rated version) and “... gave me the freedom to make my own choices” (coachee-rated version). The examples of competence-supportive items are “... acknowledged their ability to achieve their goals” (coach-rated version) and “... acknowledged my ability to achieve my goals” (coachee-rated version). The examples of relatedness-supportive items are “... was interested in what they did” (coach-rated version) and “... was interested in what I did” (coachee-rated version).

Basic psychological need (BPN) satisfaction

Coachees' BPN satisfaction experienced during the coaching trajectory was measured using an adapted (to the context) 12-item version of the *Basic Psychological Need Satisfaction and Frustration Scale: Domain-Specific Measures: Training (BPNSFS-Training; Aelterman et al., 2016)* (see [Appendix D](#)). This scale consists of three subscales which measure the satisfaction of each BPN dimension, with each need being assessed using four items. The stem of the scale was changed into “During the past coaching trajectory, in the three coaching sessions” Participants responded to items on a scale ranging from (1) *not at all true* to (5) *totally true*. Examples of items include “... I felt a sense of choice and freedom in the things I thought and did” (autonomy satisfaction), “... I felt capable of applying the proposed strategies into practice” (competence satisfaction), and “... I experienced a good bond with my coach” (relatedness satisfaction).

Results

Data screening and preliminary analyses

[Table 1](#) displays the means, standard deviations, and intercorrelations among all variables. [Appendix E](#) displays the detailed results of data screening and preliminary analyses, including each variable's Cronbach's Alpha values, which indicate reliability ranging from acceptable to excellent. Based on [Table 1](#), several significant correlations can be highlighted. Notably, strong positive correlations were observed between the three dimensions of BPN support perceived by coachees and their BPN satisfaction: autonomy, competence, and relatedness. Furthermore, moderate to weak positive correlations were found between the three dimensions of BPN support as perceived by coaches and coachees' BPN satisfaction.

TABLE 1 Summary of means, standard deviations, and intercorrelations among variables.

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
1. Autonomy support reported by coach	5.99	0.71	—								
2. Competence support reported by coach	5.98	0.63	0.61*	—							
3. Relatedness support reported by coach	5.82	0.87	0.36*	0.39*	—						
4. Autonomy support perceived by coachee	5.86	0.95	0.50*	0.39*	0.15	—					
5. Competence support perceived by coachee	5.95	0.83	0.40*	0.36*	0.26*	0.56*	—				
6. Relatedness support perceived by coachee	5.57	1.13	0.28*	0.46*	0.25*	0.46*	0.64*	—			
7. Coachee's autonomy satisfaction	5.83	0.95	0.46*	0.45*	0.23	0.84*	0.58*	0.43*	—		
8. Coachee's competence satisfaction	5.98	0.84	0.42*	0.57*	0.17	0.54*	0.79*	0.44*	0.67*	—	
9. Coachee's relatedness satisfaction	5.55	0.83	0.26*	0.21	0.26*	0.47*	0.63*	0.89*	0.50*	0.51*	—

N = 72 coachees; *n* = 72 coaches; *M* = mean; *SD* = standard deviation. **p* < 0.05. All variables range 1–7.

Perceptual distance in coach-coachee dyads

Hypothesis 1a posits that 30% of coach-coachee dyads will show disagreement through coaches' overreporting of their BPN support, and *Hypothesis 1b* posits that 30% will show disagreement through underreporting. To calculate the distance between coaches' self-reporting and their coachees' perceptions of BPN support, we first standardised both the coaches' and coachees' scores. Second, separately for each BPN, coachees' scores were subtracted from their coaches' scores. Following Fleenor et al. (1997) and Rocchi and Pelletier (2018), discrepancies greater or smaller than one-half standard deviation were classified as disagreement. Third, separately for each dimension of BPN support, we calculated the percentages of coach-coachee dyads where there was overreporting disagreement (i.e., coach scoring higher than coachee), agreement, or underreporting disagreement (i.e., coach scoring lower than coachee). The results are presented in Table 2.

Lastly, we conducted binomial tests for each BPN dimension by comparing the percentage of overreporting with the 30% benchmark (Ntoumanis, 2012; Smith et al., 2016). Consistent with our hypothesis, the analysis revealed that the observed percentages (see Table 2) were not significantly different from the 30% benchmark ($ps > 0.29$). The percentages in Table 2 also suggest that underreporting is approximately 30% across all three dimensions of BPNs. Indeed, additional binomial tests revealed that the observed percentages were not significantly different from 30% ($ps > 0.29$).

Perceptual distance and BPN satisfaction

To test *Hypotheses 2, 3, and 4*, a series of polynomial regressions with response surface analysis were performed, following the guidelines provided by Shanock et al. (2010); see Appendix F for a more detailed analytical procedure and interpretation. These analyses were conducted separately for each of the three BPNs. The results are presented in Table 3 and Figure 1.

The unstandardised regression coefficients from the polynomial regression analyses were used to estimate four surface values (see Table 3 and Figure 1). α_1 (used to test *Hypothesis 2*) reflects the linear relationship between the degree of agreement regarding the coach's BPN support in the coach-coachee dyad and the coachee's BPN satisfaction. A significant positive value indicates that as the degree of agreement increases, so does the coachee's BPN satisfaction. In contrast, a significant negative value indicates that as the degree of agreement increases, the coachee's BPN satisfaction decreases. α_2 (used to test *Hypothesis 3*) reflects the nonlinear relationship between the degree of coach-coachee agreement and the coachee's BPN satisfaction. A significant positive value indicates that the effect of agreement strengthens at a higher level of agreement, whereas a significant negative value indicates it weakens. α_3 (used to test *Hypothesis 4*) estimates how the direction of coach-coachee disagreement is related to the coachee's BPN satisfaction. A significant positive value indicates that when the coach reports higher levels of BPN support than the coachee perceives, it is associated with higher BPN satisfaction for the coachee. In contrast, a significant negative value indicates that when the coachee perceives higher levels of BPN support compared with their coach's self-report, it is associated with higher BPN satisfaction. Lastly, α_4 indexes the association between the magnitude of coach-coachee discrepancy and the coachee's BPN satisfaction. A significant positive value indicates that larger (absolute) differences in perceived BPN support relate to lower satisfaction, but with diminishing declines. Conversely, a significant negative value indicates that as disagreement increases, its adverse effect on satisfaction accelerates.

Hypothesis 2 posited that as agreement increased, coachees would experience higher levels of BPN satisfaction for each of the three BPN dimensions. As indicated by the significant positive α_1 values presented in Table 3 and the visualisation in Figure 1, the results of polynomial regression with response surface analysis empirically support this hypothesis for both autonomy and competence. The significant positive α_1 values indicate that as the degree of agreement on coaches' autonomy-supportive and competence-supportive behaviours increases, the coachees' autonomy and competence satisfaction also linearly increase,

TABLE 2 Percentages, means, and standard deviations of coach-coachee dyads where there was agreement, over reporting disagreement, or underreporting disagreement.

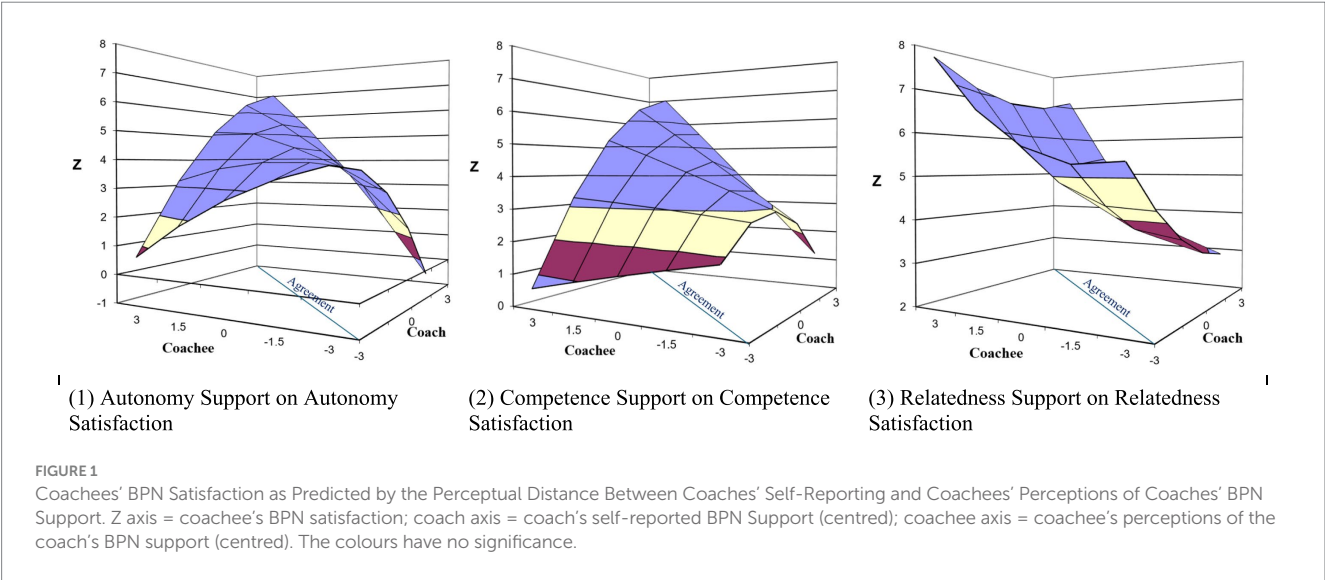
Variables	%	$M_{\text{coach}} (SD)$	$M_{\text{coachee}} (SD)$
Autonomy support			
Overreporting (coach > coachee)	32	6.17 (0.41)	5.07 (0.70)
Agreement (coach = coachee)	39	6.14 (0.93)	6.10 (0.93)
Underreporting (coach < coachee)	29	5.58 (0.44)	6.42 (0.59)
Competence support			
Overreporting (coach > coachee)	27	6.14 (0.48)	5.23 (0.82)
Agreement (coach = coachee)	47	6.18 (0.50)	6.15 (0.58)
Underreporting (coach < coachee)	26	5.46 (0.69)	6.31 (0.81)
Relatedness support			
Overreporting (coach > coachee)	33	6.34 (0.62)	4.53 (1.26)
Agreement (coach = coachee)	40	6.09 (0.58)	5.95 (0.76)
Underreporting (coach < coachee)	27	5.08 (0.86)	5.94 (0.89)

N = 72 dyads.

TABLE 3 Results of the polynomial regression analyses and surface values predicting coaches' BPN satisfaction.

Models	Variance	Surface value				Unstandardized regression coefficients				
	r^2	α_1	α_2	α_3	α_4	Coach perception (bx_1)	Coachee perception (bx_2)	Coach perception squared (bx_3)	Coachee perception squared (bx_4)	Coach $\times$ Coachee (bx_5)
Autonomy support	0.74*	0.54*	0.11*	-0.22	-0.49	0.16 (0.40) [-0.64, 0.96]	0.38 (0.38) [-0.38, 1.13]	-0.14 (0.17) [-0.49, 0.21]	-0.05 (0.07) [-0.19, 0.09]	0.30 (0.17) [-0.04, 0.64]
Competence support	0.70*	0.86*	0.04	0.09	-0.36	0.48 (0.34) [-0.20, 1.15]	0.38 (0.24) * [-0.09, 0.86]	-0.16 (0.11) [-0.37, 0.06]	-0.01 (0.06) * [-0.12, 0.11]	-0.20 (0.12) [-0.04, 0.43]
Relatedness support	0.83*	0.31	0.21*	-0.80*	0.10	0.25 (0.18) [-0.60, 0.11]	0.55 (0.15) * [0.26, 0.85]	0.06 (0.06) [-0.05, 0.17]	0.10 (0.03) [0.03, 0.16]	0.05 (0.06) [-0.07, 0.18]

* $p < 0.05$; () standard errors. [] 95% confidence intervals. Surface values were calculated using the unstandardised coefficients from the polynomial regression analyses ($x_1 = bx_1$, $x_2 = bx_2$, $x_1^2 = bx_3$, $x_2^2 = bx_4$, and $x_1 \times x_2 = bx_5$). $\alpha_1(bx_1 + bx_5)$ reflects the linear relationship between the degree of agreement between coaches' reports, coaches' perceptions, and coaches' BPN satisfaction. $\alpha_2(bx_3 + bx_4 + bx_5)$ represents the nonlinear relationship between the degree of agreement between coaches' reports and coaches' perceptions and coaches' BPN satisfaction. $\alpha_3(bx_1 - bx_2)$ estimates how much the direction of the disagreement between coaches' self-reporting and coaches' perceptions is related to coaches' BPN satisfaction. $\alpha_4(bx_3 - bx_4 + bx_5)$ reflects the degree of differentiation between coaches' reports and coaches' perceptions related to coaches' BPN satisfaction.



respectively. The coachees' satisfaction with relatedness exhibited a similar trend, but the corresponding α_1 value was non-significant.

Hypothesis 3 posited that coachees would experience higher BPN satisfaction when there was agreement on high levels of BPN support rather than on low levels, for each of the three dimensions of BPNs. As indicated by the significant positive α_2 values in Table 3 and the visualisation in Figure 1, the results of polynomial regression with response surface analysis empirically support this hypothesis for both autonomy and relatedness. The α_2 values reflect the nonlinear relationship between the degree of coach-coachee agreement on BPN support and the coachees' BPN satisfaction. The significant positive α_2 values indicate that the effect of the coach-coachee agreement is more pronounced at higher levels of agreement on high autonomy and relatedness support. The coachees' satisfaction with competence exhibited a similar trend, but the corresponding positive α_2 value was non-significant.

Hypothesis 4 posited that coachees would experience greater BPN satisfaction when their coaches underreported (i.e., the coach reporting their behaviour less positively than coachee does) rather than overreported (i.e., the coach reporting their behaviour more

positively than coachee does) their own supportive behaviour, for each BPN dimension. As indicated by the significant negative α_3 values in Table 3 and the visualisation in Figure 1, the results of polynomial regression with response surface analysis empirically supported this hypothesis only for relatedness. The α_3 value estimates the relationship between the direction of disagreement and the coachees' BPN satisfaction. The significant negative α_3 value indicates that relative to coaches' self-reported levels, coachees' own perceived relatedness support was associated with greater coachee relatedness satisfaction (see also Table 1). A similar trend was observed for coachees' autonomy satisfaction, but the corresponding α_3 value was non-significant. The somewhat different pattern observed for competence satisfaction was far from being significant.

Discussion

The present study seeks to fill significant gaps in the coaching literature by focusing on two key areas. First, we investigated the perceptual distance between coaches' self-reports and their coachees'

(i.e., beginning teachers') perceptions regarding the coaches' BPN support. Second, we explored how this perceptual distance relates to coaches' BPN satisfaction. The theoretical and practical implications of our findings will be discussed in relation to the identified patterns across the three dimensions of BPNs: autonomy, competence, and relatedness.

Perceptual distance

Perceptual distance has been observed in various social contexts, including education (Taylor and Ntoumanis, 2007), parenting (Korelitz and Garber, 2016), workplace (Bashshur et al., 2011; Tafvelin et al., 2017), and sports settings (Rocchi and Pelletier, 2018; Rodrigues et al., 2021; Smith et al., 2016). However, in only three studies, the rates of overreporting, underreporting, or agreement were quantified (Rocchi and Pelletier, 2018; Rodrigues et al., 2021; Smith et al., 2016). These studies, conducted in the sports domain, suggested "benchmarks" indicating that coaches may overreport (30%) or underreport (30%) their interpersonal behaviours. Consistent with these benchmarks, our research reveals that, within the context of teacher education, at least half of the coach-coachee dyads exhibit perceptual discrepancies. Specifically, approximately 30% of coaches overreport, while 30% underreport their BPN support compared to the perceptions of their coachees, who are beginning teachers. Notably, our study contributes to the existing literature by explicitly quantifying the extent of overreporting and underreporting of interpersonal behaviours in teacher education.

The 30% overreporting and 30% underreporting of coaches' BPN support indicate low levels of accuracy of coaches' self-awareness and self-assessments, which are crucial insights for enhancing coaching effectiveness (Rocchi and Pelletier, 2018). The 30% overreporting of coaches' BPN support may signal a tendency to inflate their perceived effectiveness in creating a supportive environment, compared to how their coachees view it. This misalignment could distort the true dynamics of the coach-coachee relationship and potentially result in missed opportunities for improvement. Conversely, the 30% of coaches who underreport their BPN support may fail to recognise their strengths and areas of influence, which could hinder their ability to foster a supportive coaching environment consistently.

Moreover, a clearer understanding of the proportion of these misalignments in perceptions between coaches and beginning teachers provides actionable insights into how tailored interventions could mitigate such perceptual distance in these dyads. For instance, if overreporting is prevalent, coaches could be encouraged to engage in more reflective practices or seek feedback from beginning teachers to gain a more accurate understanding of their interpersonal behaviours. In contrast, if underreporting is more common, coaches might be prompted to increase their awareness of their impact and refine their approach to better support the BPNs of beginning teachers. Therefore, future research should focus on examining the prevalence of coaches' inclination to overreport and underreport their coaching behaviour. Investigating these biases will provide a deeper understanding of their extent and contribute to achieving greater perceptual agreement between coaches and beginning teachers.

Perceptual agreement and BPN satisfaction

This study reveals that a stronger agreement between coaches' self-reporting and coachees' perceptions is linked to coachees' increased BPN satisfaction, particularly for autonomy and competence. These findings are consistent with the work of Rocchi and Pelletier (2018), which demonstrates that agreement on BPN support between coaches and athletes predicts higher BPN satisfaction among athletes. Furthermore, perceptual agreement between leaders and their followers has frequently been associated with beneficial outcomes, such as reduced conflict, enhanced learning, and improved team performance (e.g., Bashshur et al., 2011; Tafvelin et al., 2017).

One plausible explanation for this relationship between perceptual agreement and BPN satisfaction lies in the concept of *collective cognition* (Gibson et al., 2009). Collective cognition refers to the shared understanding, knowledge, or cognitive processes that emerge, not within an individual, but through the interactions among group members (Cannon-Bowers and Salas, 2001). In coaching, high levels of collective cognition within coach-coachee dyads foster a shared perception of tasks, goals, and the coaching context. This alignment in cognition and perception could enhance autonomy satisfaction, as coachees feel understood and valued by their coaches, reinforcing a sense of volition and ownership over their actions and decisions. Similarly, shared cognition and perceptual agreement could improve competence satisfaction, as coachees are more likely to feel capable of attaining coaching goals when both parties align on objectives, methods, and solutions. Practically, self-reflection and effective communication are important for facilitating collective cognition and, in turn, aligning the perceptions of coaches and beginning teachers (Gibson et al., 2009).

The current findings underscore the practical significance of aligning the perceptions of coaches and beginning teachers through self-reflection. Coaches need to recognise that beginning teachers may not fully benefit from the coaching process if coaches either overestimate or underestimate their own provision of support. Thus, it is essential for coaches to cultivate an awareness of their behaviours and how coachees, including beginning teachers, perceive them. In this context, coaches should not only prioritise the implementation of strategies that support BPNs but also emphasise techniques that enhance their own self-awareness and self-reflection (Gibson et al., 2009). For instance, employing tools such as audio or video recordings of coaching sessions allows coaches to analyse both verbal and non-verbal interactions (Allan et al., 2016). This reflective analysis can lead to more supportive behaviours that align with BPNs and foster a deeper understanding of the interpersonal dynamics. Furthermore, intervision (peer-to-peer) meetings offer coaches valuable opportunities to reflect on their experiences collaboratively with colleagues and can provide important feedback and insights into their BPN-supportive practices (Tuomola and Hogan, 2024).

The current findings also emphasise the practical importance of effective communication in aligning perceptions between coaches and beginning teachers. It is essential for both parties to understand that collaboration and interdependence are fundamental elements of their coaching alliance. Proactive communication is necessary to achieve perceptual alignment and to develop high levels of collective cognition within the dyads of the coach and beginning teacher. Both parties need to cultivate a shared understanding not only of coaching tasks and goals but also of the levels of BPN support provided by coaches.

This underscores the necessity for coaches to engage in active communication with the beginning teachers, fostering an environment where opinions and feelings are mutually shared, expectations are aligned, and feedback from beginning teachers is sought and valued.

Perceptual agreement, quality of BPN support, and BPN satisfaction

We detected that a high agreement within the dyad on the high level of BPN support creates an additional boost in coaches' BPN satisfaction. This result is supported by our results of polynomial regression, complemented by the three-dimensional visualisation generated through response surface analysis. A similar boost effect has been observed in the context of sports coaching (Rocchi and Pelletier, 2018; Rodrigues et al., 2021). A dyadic coaching relationship is characterised by interpersonal interdependence, a process in which the coach-coachee interactions influence each other's experiences (Van Lange and Balliet, 2015). Therefore, this observed boost in the coaches' BPN satisfaction may stem from the coaches benefiting both directly from their perceptions of the coaches' supportive behaviour and indirectly from the reciprocal nature of the coach-coachee dynamic.

In line with this reasoning, Liu et al. (2025) proposed a circular framework outlining five key pathways linking the relationships between coaches' BPN support, coaches' BPN satisfaction, coaches' autonomous motivation, coaches' BPN satisfaction, and coaches' autonomous motivation. Specifically, when coaches display behaviours that coachees perceive as highly BPN-supportive, coachees likely experience increased BPN satisfaction in response, which is subsequently linked to enhanced motivation and performance (Ryan and Deci, 2017). In turn, observing coachees' positive outcomes may boost coaches' own satisfaction and motivation (Rocchi and Pelletier, 2017). Satisfied and motivated coaches are more likely to invest further effort into supporting their coachees, thereby improving the quality of their coaching behaviours and enhancing BPN support (Rocchi et al., 2013). Consequently, when both parties strongly agree that the coaches are high in BPN support, coachees may benefit not only from the coaches' initial supportive behaviours, but also from their coaches' increased engagement and improved support. Indeed, previous research has shown that providing BPN support benefits both the recipient and the provider, enhancing relationship quality and wellbeing for both parties (e.g., Deci et al., 2006; Rocchi and Pelletier, 2018; Rodrigues et al., 2021).

From a practical perspective, our findings emphasise the importance of a dual focus: aligning perceptions of BPN support between coaches and beginning teachers, while simultaneously delivering high-quality BPN support. Coaches should be mindful of their behaviours, ensuring that they provide consistent and meaningful support that meets the needs of the beginning teachers. Additionally, developing an open and communicative relationship—one in which both parties feel equally invested and engaged in the coaching process—could amplify the benefits for both parties. Future coaching programs should focus on training coaches to facilitate these types of high-quality relationships, which could lead to enhanced motivation, improved performance, and greater wellbeing for both coaches and beginning teachers (Green et al., 2006).

Strengths and limitations of the present study

Considering the collaboration and interdependence inherent in coach-coachee dyads, our study underscores the need to move beyond one-way perspectives, emphasising that self-versus-other perceptions matter in predicting effective coaching outcomes. The study responds to the calls for investigating the perceptual distance in BPN-supportive coaching and its role in predicting BPN satisfaction (Rocchi and Pelletier, 2018; Rodrigues et al., 2021). Our findings provide deeper insights into the intricate interactions within the coach-coachee relationship and their association with coachees' BPN satisfaction. Specifically, we reveal that positive and congruent perceptions of BPN-supportive behaviours are crucial predictors of heightened BPN satisfaction among coachees. Generally, these findings reinforce the notion that coaching is best understood as a dyadic process where the quality of interaction is essential for achieving successful outcomes (Liu et al., 2025).

This study's use of polynomial regression with response surface analysis represents another significant strength, as it is the first application of this advanced statistical technique to examine the dyadic relationship between coaches and beginning teachers. This approach allows a more refined understanding of how two perspectives on interpersonal behaviours relate and predict BPN satisfaction. This method enables researchers to capture complex interactions that linear models might miss, making it particularly useful for capturing the true nature of perceptual distance, which often involves non-linear dynamics (Sedera and Atapattu, 2019). Additionally, response surface analysis provides a three-dimensional visualisation of the interaction effects between coaches' and coachees' perceptions of BPN support and coachees' BPN satisfaction. The visualisation helps to identify both general patterns of perceptual distance and specific areas where agreement or disagreement occurs.

While our study makes significant contributions to the literature on BPN-supportive coaching in educational settings, perceptual distance, and methodologies for examining dyadic interactions, several limitations are worth noting. First, as a cross-sectional study, it captures a snapshot of the dyadic relationship by collecting data from both the coach and the coachee simultaneously. This approach offers a real-time view of the perceptual distance and provides an immediate perspective on their relationship dynamics. However, the cross-sectional design limits the study's ability to infer causal relationships. Future research would benefit from a longitudinal approach, which would allow for observing behavioural and psychological changes within the dyad over time (e.g., Adie et al., 2012).

Additionally, the present study identified an additional boost effect in coachees' BPN satisfaction when both parties reported high BPN support with high levels of perceptual agreement. We propose that this observed boost effect may stem from the coachee benefiting both directly from their perceptions of the coach's supportive behaviour and indirectly from the reciprocal nature of the coach-coachee dynamic. However, we lack empirical evidence to determine whether this boost arises from the reciprocal effect of co-regulating BPN-supportive behaviour (e.g., Rocchi and Pelletier, 2018; Rodrigues et al., 2021) or from the reciprocal effect of experiencing BPN satisfaction within coach-coachee dyads (e.g., Rocchi and Pelletier, 2017). Reciprocal interdependence effects have also been frequently reported in the SDT literature, highlighting the reciprocal nature and complex interplay between motivational variables within social contexts (e.g., Stenling et al., 2015). Based on our findings and

existing research, we recommend that future dyadic studies conceptualise BPN satisfaction as an interpersonal construct and investigate how coaches' BPN satisfaction influences their coachees' BPN satisfaction, and vice versa.

Finally, our findings reveal some inconsistencies across the three specific dimensions of BPNs: autonomy, competence, and relatedness. *Hypothesis 2* (H2) was supported only for autonomy and competence, *Hypothesis 3* (H3) was supported only for autonomy and relatedness, and *Hypothesis 4* (H4) was supported only for relatedness. However, the nonsignificant patterns of relatedness (H2), competence (H3), and autonomy (H4) were entirely consistent with our predictions, and the somewhat different pattern observed for competence (H4) was far from statistically significant. While the current sample is sufficient for exploratory analysis and hypothesis testing in the present dyadic context, it may limit the generalizability of our findings to broader populations such as coaches-coachees, mentors-mentees, and leaders-followers. A larger and more diverse sample would allow for more robust modelling of subgroup effects, greater statistical precision, and ultimately stronger conclusions about the dynamics of need-supportive coaching across diverse dyadic settings.

Conclusion

Research on coaching through the lens of SDT plays a crucial role in fostering coachees' ongoing self-directed learning and psychological growth. This study explores the phenomenon of perceptual distance in coach-coachee dyads, an important yet underexamined area. The study contributes to the literature by using polynomial regression with response surface analysis to investigate three-dimensional relationships. Our findings underscore the significance of self-versus-other perception, showing that approximately 60% of coach-coachee dyads disagree on BPN support, and that coachees' perceptions are more predictive of BPN satisfaction than coaches' self-reporting. Additionally, the results show that agreement within the dyad enhances BPN satisfaction, especially when both parties perceive a high level of BPN support. This research improves our understanding of the dynamics in coaching relationships and emphasises the critical role of perceptual agreement in promoting coachees' psychological growth.

Data availability statement

The datasets presented in this study can be found in online repositories. The names of the repository/repositories and accession number(s) can be found in the article/[Supplementary material](#).

Ethics statement

The studies involving humans were approved by Ethics Committee of Psychology (ECP) of the University of Groningen (approval reference number: PSY-1920-S-0479). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

HL: Software, Resources, Writing – review & editing, Formal analysis, Writing – original draft, Methodology, Validation, Investigation, Visualization, Data curation, Funding acquisition, Conceptualization, Project administration. KJ: Writing – original draft, Supervision. RH: Writing – original draft, Supervision. NY: Writing – original draft, Supervision.

Funding

The author(s) declare that financial support was received for the research and/or publication of this article. This research was funded by the China Scholarship Council, the Graduate School of BSS of the University of Groningen, and the International Business School (IBS) of Hanze University of Applied Science.

Conflict of interest

KJ is the director of the company Groeiflow, Academy for Coaching & Training, Groningen, Netherlands.

The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The authors declare that Gen AI was used in the creation of this manuscript. ChatGPT to enhance sentence structures and improve language use. No content was generated from scratch using any AI tools.

Any alternative text (alt text) provided alongside figures in this article has been generated by Frontiers with the support of artificial intelligence and reasonable efforts have been made to ensure accuracy, including review by the authors wherever possible. If you identify any issues, please contact us.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Supplementary material

The Supplementary material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/feduc.2025.1595274/full#supplementary-material>

References

- Adie, J. W., Duda, J. L., and Ntoumanis, N. (2012). Perceived coach-autonomy support, basic need satisfaction and the well- and ill-being of elite youth soccer players: A longitudinal investigation. *Psychol. Sport Exerc.* 13, 51–59. doi: 10.1016/j.psychsport.2011.07.008
- Aelterman, N., Vansteenkiste, M., Van Keer, H., and Haerens, L. (2016). Changing teachers' beliefs regarding autonomy support and structure: The role of experienced psychological need satisfaction in teacher training. *Psychol. Sport Exerc.* 23, 64–72. doi: 10.1016/j.psychsport.2015.10.007
- Allan, V., Turnnidge, J., Vierimaa, M., Davis, P., and Côté, J. (2016). Development of the Assessment of Coach Emotions systematic observation instrument: A tool to evaluate coaches' emotions in the youth sport context. *Int. J. Sports Sci. Coaching* 11, 859–871. doi: 10.1177/1747954116676113
- Bashshur, M. R., Hernández, A., and González-Romá, V. (2011). When managers and their teams disagree: a longitudinal look at the consequences of differences in perceptions of organizational support. *J. Appl. Psychol.* 96, 558–573. doi: 10.1037/a0022675
- Cannon-Bowers, J. A., and Salas, E. (2001). Reflections on shared cognition. *J. Org. Behav. Int. J. Ind. Occup. Org. Psychol. Behav.* 22, 195–202. doi: 10.1002/job.82
- Conroy, D. E., and Coatsworth, J. D. (2007). Assessing autonomy-supportive coaching strategies in youth sport. *Psychol. Sport Exerc.* 8, 671–684. doi: 10.1016/j.psychsport.2006.12.001
- Deci, E. L., La Guardia, J. G., Moller, A. C., Scheiner, M. J., and Ryan, R. M. (2006). On the benefits of giving as well as receiving autonomy support: Mutuality in close friendships. *Personal. Soc. Psychol. Bull.* 32, 313–327. doi: 10.1177/0146167205282148
- Deci, E. L., and Ryan, R. M. (1985). The general causality orientations scale: Self-determination in personality. *J. Res. Pers.* 19, 109–134. doi: 10.1016/0092-6566(85)90023-6
- Deci, E. L., and Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychol. Inq.* 11, 227–268. doi: 10.1207/S15327965PLI1104_01
- Denmark, V., and Podsen, I. J. (2016). Coaching and mentoring first-year and student teachers. London: Routledge.
- Eccles, J. S., Midgley, C., Wigfield, A., Buchanan, C. M., Reuman, D., Flanagan, C., et al. (1993). Development during adolescence: The impact of stage-environment fit on young adolescents' experiences in schools and in families. *Am. Psychol.* 48, 90–101. doi: 10.1037/0003-066X.48.2.90
- Faul, F., Erdfelder, E., Lang, A. G., and Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behav. Res. Methods* 39, 175–191. doi: 10.3758/BF03193146
- Fleenor, J., McCauley, C., and Brutus, S. (1997). Self-other rating agreement and leader effectiveness. *Leadersh. Q.* 7, 487–506. doi: 10.1016/S1048-9843(96)90003-X
- Fransen, K., Boen, F., Vansteenkiste, M., Mertens, N., and Vande Broek, G. (2018). The power of competence support: The impact of coaches and athlete leaders on intrinsic motivation and performance. *Scand. J. Med. Sci. Sports* 28, 725–745. doi: 10.1111/sms.12950
- Gibson, C. B., Cooper, C. D., and Conger, J. A. (2009). Do you see what we see? The complex effects of perceptual distance between leaders and teams. *J. Appl. Psychol.* 94, 62–76. doi: 10.1037/a0013073
- Gjesdal, S., Stenling, A., Solstad, B. E., and Ommundsen, Y. (2019). A study of coach-team perceptual distance concerning the coach-created motivational climate in youth sport. *Scand. J. Med. Sci. Sports* 29, 132–143. doi: 10.1111/sms.13306
- Graßmann, C., and Schermuly, C. C. (2018). The role of neuroticism and supervision in the relationship between negative effects for clients and novice coaches. *Coaching Int. J. Theor. Res. Prac.* 11, 74–88. doi: 10.1080/17521882.2017.1381755
- Green, L. S., Oades, L. G., and Grant, A. M. (2006). Cognitive-behavioral, solution-focused life coaching: Enhancing goal striving, well-being, and hope. *J. Posit. Psychol.* 1, 142–149. doi: 10.1080/17439760600619849
- Ibrahim, A. S. (2012). Induction and mentoring of novice teachers: a scheme for the United Arab Emirates. *Teach. Dev.* 16, 235–253. doi: 10.1080/13664530.2012.688676
- Ingersoll, R. M., and Strong, M. (2011). The impact of induction and mentoring programs for beginning teachers: A critical review of the research. *Rev. Educ. Res.* 81, 201–233. doi: 10.3102/0034654311403323
- Kenow, L., and Williams, J. M. (1999). Coach-athlete compatibility and athlete's perception of coaching behaviors. *J. Sport Behav.* 22, 251–259.
- Kliwer, B., and Wanjiku Ndirangu, B. (2019). Advancing Reciprocity in Cross-Cultural Leadership Coaching. *J. Leadership Educ.* 18, 178–187. doi: 10.12806/v18/i4/a4
- Korelitz, K. E., and Garber, J. (2016). Congruence of parents' and children's perceptions of parenting: A meta-analysis. *J. Youth Adolesc.* 45, 1973–1995. doi: 10.1007/s10964-016-0524-0
- Lemonidis, N., Tzioumakis, Y., Karypidis, A., Michalopoulou, M., Gourgoulis, V., and Zourbanos, N. (2014). Coaching Behavior in Professional Basketball: Discrepancies between players' and coaches' perceptions. *Athletic Insight* 6:65–80.
- Liu, H. J., De Jonge, K., Den Hartigh, R., and Van Yperen, N. W. (2025). Basic psychological need support, need satisfaction, and autonomous motivation in coach-athlete relationships: a systematic review and meta-analysis. [Manuscript submitted for publication]. Groningen: Faculty of Behavioural and Social Sciences, University of Groningen.
- Nelemans, S. A., Branje, S. J. T., Hale, W. W., Goossens, L., Koot, H. M., Oldehinkel, A. J., et al. (2016). Discrepancies between perceptions of the parent-adolescent relationship and early adolescent depressive symptoms: An illustration of polynomial regression analysis. *J. Youth Adolesc.* 45, 2049–2063. doi: 10.1007/s10964-016-0503-5
- Ntoumanis, N. (2012). A self-determination theory perspective on motivation in sport and physical education: Current trends and possible future research directions. *Motiv. Sport Exercise* 3, 91–128. doi: 10.5040/9781492595182.ch-003
- Palmer, S., and Whybrow, A. (2019). Handbook of coaching psychology: A guide for practitioners. Second Edn. New York, NY: Routledge.
- Reynders, B., Vansteenkiste, M., Van Puyenbroeck, S., Aelterman, N., De Backer, M., Delrue, J., et al. (2019). Coaching the coach: Intervention effects on need-supportive coaching behaviour and athlete motivation and engagement. *Psychol. Sport Exerc.* 43, 288–300. doi: 10.1016/j.psychsport.2019.04.002
- Rocchi, M., and Pelletier, L. G. (2017). The antecedents of coaches' interpersonal behaviours: The role of the coaching context, coaches' psychological needs, and coaches' motivation. *J. Sport Exerc. Psychol.* 39, 366–378. doi: 10.1123/jsep.2016-0267
- Rocchi, M., and Pelletier, L. (2018). How does coaches' reported interpersonal behaviour align with athletes' perceptions? Consequences for female athletes' psychological needs in sport. *Sport Exerc. Perform. Psychol.* 7, 141–154. doi: 10.1037/spy0000116
- Rocchi, M., Pelletier, L., Cheung, S., Baxter, D., and Beaudry, S. (2017). Assessing need-supportive and need-thwarting interpersonal behaviours: The Interpersonal Behaviours Questionnaire (IBQ). *Personal. Individ. Differ.* 104, 423–433. doi: 10.1016/j.paid.2016.08.034
- Rocchi, M. A., Pelletier, L. G., and Couture, A. L. (2013). Determinants of coach motivation and autonomy supportive coaching behaviours. *Psychol. Sport Exerc.* 14, 852–859. doi: 10.1016/j.psychsport.2013.07.002
- Rodrigues, F., Pelletier, L. G., Rocchi, M., Neiva, H. P., Teixeira, D. S., Cid, L., et al. (2021). Trainer-exerciser relationship: The congruency effect on exerciser psychological needs using response surface analysis. *Scand. J. Med. Sci. Sports* 31, 226–241. doi: 10.1111/sms.13825
- Ryan, R., and Deci, E. (2017). Self-determination theory: Basic psychological needs in motivation, development, and wellness. New York, NY: Guilford Press.
- Sedera, D., and Atapattu, M. (2019). Polynomial regression and response surface methodology: theoretical non-linearity, tutorial and applications for information systems research. *Australas. J. Inf. Syst.* 23, 1–35. doi: 10.3127/ajis.v23i0.1966
- Shanock, L., Baran, B., Gentry, W., Pattison, S., and Heggstad, E. (2010). Polynomial regression with response surface analysis: A powerful approach for examining moderation and overcoming limitations of difference scores. *J. Bus. Psychol.* 25, 543–554. doi: 10.1007/s10869-010-9183-4
- Shaver, K. G. (2016). An introduction to attribution processes. Winthrop, MA: Routledge.
- Smith, N., Tessier, D., Tzioumakis, Y., Fabra, P., Quested, E., Appleton, P., et al. (2016). The relationship between observed and perceived assessments of the coach-created motivational environment and links to athlete motivation. *Psychol. Sport Exerc.* 23, 51–63. doi: 10.1016/j.psychsport.2015.11.001
- Soenens, B., and Vansteenkiste, M. (2010). A theoretical upgrade of the concept of parental psychological control: Proposing new insights on the basis of self-determination theory. *Dev. Rev.* 30, 74–99. doi: 10.1016/j.dr.2009.11.001
- Stebbing, J., Taylor, I. M., Spray, C. M., and Ntoumanis, N. (2012). Antecedents of perceived coach interpersonal behaviours: The coaching environment and coach psychological well- and ill-being. *J. Sport Exerc. Psychol.* 34, 481–502. doi: 10.1123/jsep.34.4.481
- Stenling, A., Lindwall, M., and Hassmén, P. (2015). Changes in perceived autonomy support, need satisfaction, motivation, and well-being in young elite athletes. *Sport Exerc. Perform. Psychol.* 4, 50–61. doi: 10.1037/spy0000027
- Tafvelin, S., von Thiele Schwarz, U., and Hasson, H. (2017). In agreement? Leader-team perceptual distance in organizational learning affects work performance. *J. Bus. Res.* 75, 1–7. doi: 10.1016/j.jbusres.2017.01.016
- Taylor, I. M., and Ntoumanis, N. (2007). Teacher motivational strategies and student self-determination in physical education. *J. Educ. Psychol.* 99, 747–760. doi: 10.1037/0022-0663.99.4.747
- Tuomola, J., and Hogan, D. (2024). "Peer Coaching Supervision and Intervention" in Solution Focused Coaching Supervision. eds. J. Tuomola and D. Hogan. 1st ed (London: Routledge), 177–191.
- Van den Berghe, L., Soenens, B., Aelterman, N., Cardon, G., Tallir, I. B., and Haerens, L. (2014). Within-person profiles of teachers' motivation to teach: Associations with need satisfaction at work, need-supportive teaching, and burnout. *Psychol. Sport Exerc.* 15, 407–417. doi: 10.1016/j.psychsport.2014.04.001
- Van Lange, P. A. M., and Balliet, D. (2015). "Interdependence theory" in APA handbook of personality and social psychology, Vol. 3. Interpersonal relations (pp. 65–92). eds. M. Mikulincer, P. R. Shaver, J. A. Simpson and J. F. Dovidio (New York, NY: American Psychological Association).
- Vermuelen, M., Castelijns, J., Kools, Q., and Koster, B. (2012). Measuring student teachers' basic psychological needs. *J. Educ. Teach.* 38, 453–467. doi: 10.1080/02607476.2012.688556
- Wörtler, B., Van Yperen, N. W., and Barelds, D. P. (2020). Do individual differences in need strength moderate the relations between basic psychological need satisfaction and organizational citizenship behavior? *Motiv. Emot.* 44, 315–328. doi: 10.1007/s11031-019-09775-9

Appendices

The following appendices are openly available in the Open Science Framework at <https://doi.org/10.17605/OSF.IO/45FWB>

Appendix A

Sample Size Determination with G*Power

Appendix B

Coach's Basic Psychological Need-Supportive Behaviours Scale (Coach's Self-Report).

Appendix C

Coachee's Perceived Basic Psychological Need-Supportive Behaviours Scale (Beginning Teacher's Report).

Appendix D

Coachee's Basic Psychological Need Satisfaction Scale (Beginning Teacher's Self-Report).

Appendix E

Results of Data Screening and Preliminary Analyses.

Appendix F

Procedure and Interpretation of Polynomial Regressions with Response Surface Analysis.