

The effectiveness of workplace coaching: a meta-analysis of contemporary psychologically informed coaching approaches

Coaching
psychology
meta-analysis

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Qing Wang

*School of Psychology and Cognitive Science, East China Normal University,
Shanghai, China*

Yi-Ling Lai

Organizational Psychology, Birkbeck University of London, London, UK

Xiaobo Xu

*School of Psychology and Cognitive Science, East China Normal University,
Shanghai, China, and*

Almuth McDowall

Organizational Psychology, Birkbeck University of London, London, UK

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Abstract

Purpose – The authors examine psychologically informed coaching approaches for evidence-based work-applied management through a meta-analysis. This analysis synthesized previous empirical coaching research evidence on cognitive behavioral and positive psychology frameworks regarding a range of workplace outcomes, including learning, performance and psychological well-being.

Design/methodology/approach – The authors undertook a systematic literature search to identify primary studies ($k = 20, n = 957$), then conducted a meta-analysis with robust variance estimates (RVEs) to test the overall effect size and the effects of each moderator.

Findings – The results confirm that psychologically informed coaching approaches facilitated effective work-related outcomes, particularly on goal attainment ($g = 1.29$) and self-efficacy ($g = 0.59$). Besides, these identified coaching frameworks generated a greater impact on objective work performance rated by others (e.g. 360 feedback) than on coachees' self-reported performance. Moreover, a cognitive behavioral-oriented coaching process stimulated individuals' internal self-regulation and awareness to promote work satisfaction and facilitated sustainable changes. Yet, there was no statistically significant difference between popular and commonly used coaching approaches. Instead, an integrative coaching approach that combines different frameworks facilitated better outcomes ($g = 0.71$), including coachees' psychological well-being.

Practical implications – Effective coaching activities should integrate cognitive coping (e.g. combining cognitive behavioral and solution-focused technique), positive individual traits (i.e. strength-based approach) and contextual factors for an integrative approach to address the full range of coachees' values, motivators and organizational resources for yielding positive outcomes.

Originality/value – Building on previous meta-analyses and reviews of coaching, this synthesis offers a new insight into effective mechanisms to facilitate desired coaching results. Frameworks grounded in

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psychotherapy and positive appear most prominent in the literature, yet an integrative approach appears most effective.

Keywords Workplace coaching, Coaching psychology, Meta-analysis, Psychological well-being, Learning and development

Paper type Literature review

Introduction

Given the ever-growing popularity of coaching which some populist publications expect to surpass consultancy (Forbes, 2018) as a workplace learning and development (L&D) activity of choice, the effectiveness of coaching has attracted increasing attention from scholars, practitioners and clients. Several meta-analyses (e.g. Jones *et al.*, 2016; Theeboom *et al.*, 2014) have established that taking part in coaching activities has positive effects on individual-level outcomes. Yet, we still know little about “*how*” does coaching work from a psychological perspective (Bono *et al.*, 2009; Smither, 2011); what are the “*active ingredients*” and potential mechanisms that make coaching successful (Theeboom *et al.*, 2014). Recent meta-analysis (Graßmann *et al.*, 2020) confirmed the working alliance which refers to the coach–coachee relationship, as an antecedent of desired coaching outcomes. Our meta-analysis aims to synthesize extant psychologically informed coaching research evidence (e.g. cognitive behavioral approaches) to elicit better understanding of potential mechanisms to contribute to the development of work-applied management.

We framed workplace coaching (hereafter coaching) as a facilitative process for the purpose of coachees’ L&D and a greater working life (e.g. psychological well-being) through interpersonal interactions between the coach and coachee (Grant, 2017; Passmore and Fillery-Travis, 2011). The present analysis only included coaching offered by independent contracted specialists who use a wide variety of behavioral techniques and methods to help the coachee achieve a mutually identified set of goals, including professional performance, personal satisfaction as well as the effectiveness of the coachee’s organization within a formally defined coaching agreement (Kilburg, 1996, p. 142). Whereas certain organizations often conduct coaching through internal specialists such as in-house human resource (HR) professionals, external coaching engagements has larger influences on coachees’ affective learning outcomes and workplace well-being than internal coaching (Jones *et al.*, 2018). These affective and psychological welfare related outcomes are important determinants of sustainable behavior or performance improvement (Kraiger *et al.*, 1993). Accordingly, our primary study objective is to investigate whether coaching provided by independent practitioners applying psychologically informed approaches promotes longstanding outcomes.

Our study extends previous meta-analyses by focusing on psychological perspectives, for instance psychotherapy (Graßmann *et al.*, 2020; Gray, 2006) and positive psychology (Grant and Cavanagh, 2007), and draws on compatible paradigms and theoretical constructs to explain potential mechanisms of coaching interventions. Previous analyses (e.g. Jones *et al.*, 2016; Theeboom *et al.*, 2014) outlined several frequently used psychologically informed coaching approaches, including cognitive behavioral coaching (CBC) [1]. Nevertheless, we have sparse evidence on how different coaching approaches compare to one another in terms of outcomes produced (Athanasopoulou and Dopson, 2018; Smither, 2011). In addition, we contend that contemporary literature has neglected social complexity in workplace coaching settings; hence, coaches should apply integrative and flexible approaches to acknowledge fluctuating and complex organizational management scenarios (Shoukry and Cox, 2018). Accordingly, our analysis investigated whether an integrative psychological approach (e.g. CBC combined with other psychological approaches) with potentially more comprehensive consideration of individuals’ needs and organizational circumstances affects coaching outcomes.

Brief meta-review of previous systematic reviews and meta-analyses

Given the growing number of coaching-focused meta-analyses and systematic reviews referenced above, we undertook a succinct meta-review as summarized in [Table 1](#) to inform distinctions of our analysis.

Most reviews concurred that coaching overall had a positive impact on individuals' workplace learning and performance. Meanwhile, Theeboom *et al.*'s synthesis (2014) identified that coaching interventions have significant positive effects on employees' working life and psychological states, including coping mechanisms (e.g. resilience) and well-being. This finding accorded with the contemporary coaching literature suggesting that sustainable behavioral changes should be underpinned by personal life and learning experiences (Grant, 2014; Stelter, 2014). Therefore, coachees' personal values and meaning of their life and work are also important for desired coaching outcomes. In addition, three reviews specifically stressed on the professional helping relationship in the coaching dyad (Graßmann *et al.*, 2020; Lai and McDowall, 2014; Sonesh *et al.*, 2015) as central to coaching as a positive process and good outcomes; the focus of working alliance has set a road map for the future research between psychotherapy and coaching.

We noted the following implications for future research. First, there is a need for greater clarity to distinguish approaches to coaching, since synthesized data of previous reviews comprised different types of coaching, such as grouping together internal and external coaching (Jones *et al.*, 2016), group and peer coaching (Theeboom *et al.*, 2014), or workplace and life coaching (Graßmann *et al.*, 2020). Yet there are fundamental differences between coaching modalities (Jones *et al.*, 2018) including purpose (life or work-related coaching) and contracting (internal or external coaching). Second, all reviews suggested that future research could emphasize sound theoretical constructs, including those derived from psychotherapy or counselling to investigate more clearly articulated models for coaching outcomes. To date, several psychological determinants appear important for the coaching process. For instance, the strength of the working alliance, a concept originating in psychotherapy, has positive impacts on coachees' self-efficacy and self-reflection (Graßmann *et al.*, 2020). Although these analyses conducted by Jones *et al.* (2016) and Theeboom *et al.* (2014) included several primary studies drawn from psychology such as CBC and solution-focused coaching (SFC) [2], they did not go as far as a comparative evaluation of different approaches, which we took on as a key focus for the present study. Building on these review and synthesis results for a future coaching research agenda, we propose a meta-analytic synthesis of existing psychologically informed empirical evidence. Although we acknowledge the role other disciplines (e.g. adult learning and management) play in coaching practice, a more extensive cross-examination between psychology and other coaching domains was not feasible due to challenges regarding literature searching and screening. This is because many existing coaching studies do not specify coaching designs or paradigms in necessary detail (Jones *et al.*, 2016). The comprehensive theoretical foundations and explanations of our analysis are presented below.

Psychologically informed approaches to coaching

Given the central importance of psychological theories in previous reviews, we revisit these in the context of contemporary coaching literature. Several theoretical frameworks originating from psychotherapy and positive psychology have been frequently applied in extant coaching practice regardless of concrete empirical evidence for their effectiveness (Palmer and Lai, 2019). Grant (2001) carried out a pioneering literature review of cognitive behavioral therapy (CBT), addressing identifying negative cognitive patterns and solution-focused therapy (SFT), emphasizing self-developed and future focused plans for behavior change, as L&D interventions for nonclinical population coaching. This review indicated that understanding coachees' socio-cognitive characteristics, such as psychological mindedness, self-awareness

Table 1.
A meta-review of
contemporary meta-
analyses and
systematic reviews on
coaching

Meta-analysis	References	Coaching types	No. of papers	Main findings	Future suggestions
	Theeboom <i>et al.</i> (2014)	(1) Workplace coaching (2) Both external and internal	$k = 18$	Effect sizes from $g = 0.43$ (coping) to $g = 0.74$ (goal-directed self-regulation)	A need for theoretical enrichment, such as self-determination theory (SDT), working alliance, characteristics of coaches and motivational components
	Somesh <i>et al.</i> (2015)	Executive, leadership and business coaching	$k = 24$	The impact of coaching on overall relationship outcomes was significant ($g = 0.32$, 95% CI [0.27, 0.38])	(1) To what extent is coaching effectiveness attributable to positive shifts in coachees' relational and psychological states? (2) What specific coach behaviors contribute to a strong positive coach-coachee relationship? (3) What coach behaviors, strategies, and techniques contribute to successful coaching engagements?
	Jones <i>et al.</i> (2016)	(1) Workplace coaching (2) Both external and internal	$k = 17$	(1) Coaching had a positive effect on all outcomes ($d = 0.36$, 90% CI [0.16, 0.50]) (2) Coaching had greater outcomes when coaching was provided without multisource feedback ($d = 0.88$ vs $d = 0.21$) (3) Research design does not appear to moderate the effects of coaching on outcome coaching provided in the face-to-face format with blended formats (4) The effects of coaching on outcomes were weaker for external coaches in comparison with internal coaches (5) Neither longevity in weeks of the coaching intervention nor number of coaching sessions moderated overall coaching effectiveness	(1) To examine cognitive, team or organizational-level results' outcome criteria (2) To examine how the relative impact of coaching on different kinds of criteria and compare this with other forms of L&D intervention (e.g. training) (3) A need for the development of theory concerning why, how and in what ways coaching leads to the positive effects we reported in this study

(continued)

Meta-analysis	References	Coaching types	No. of papers	Main findings	Future suggestions
	Burt and Talati (2017)	Workplace and life coaching	$k = 11$	Coaching had a moderate significant positive effect on coachees, $d = 0.42$	(1) The need for more performance rating and the coach-coachee relationship evaluation in the coaching literature (2) A need to conduct longitudinal explorations and measure engagement across teams and the wider organizational level outcomes To examine the role of the coaching relationship perspective in more detail
	Grafmann <i>et al.</i> (2020)	Workplace, life and career coaching	$k = 27$ ($n = 3,563$)	A moderate and consistent overall relationship between a high-quality working alliance and coaching outcomes for clients ($r = 0.41, 95\% \text{ CI } [0.34, 0.48], p < 0.0001$)	
	<i>Systematic review</i> Lai and McDowall (2014)	Workplace, life and personal coaching	$k = 140$	(1) Key factors for a positive coaching relationship were identified, such as building trust, two-way communication and transparent contracting process (2) Essential attributes required for a professional coach in psychology area: theoretical knowledge (e.g. psychology and leadership), attitude (e.g. non-judgmental) and interpersonal skills	The future research should emphasize on the improvement of research methods and coaching result evaluation approaches to ensure producing more rigorous and replicable study results
	Blackman <i>et al.</i> (2016)	Business coaching (external only)	$k = 111$	(1) Coaching had positive effects on individual L&D outcomes (2) There is no sufficient evidence to indicate coaching was more effective than other L&D approaches (3) Key factors were identified to contribute to effective business coaching outcomes: the coach's (e.g. communication skills) and coachee's (e.g. self-efficacy) characteristics, coach-coachee relationship and organizational context (4) Skills or expertise in the sector or in executive management were preferable	The future research should focus on developing sound theoretical models based on more sophisticated research

(continued)

Table 1.

Meta-analysis References	Coaching types	No. of papers	Main findings	Future suggestions
Grover and Fumham (2016)	Executive, leadership and business coaching (both external and internal)	$k = 52$	<ol style="list-style-type: none"> (1) In general, coaching had positive effects on coaches' self-efficacy (2) Coaching had positive effects on psychological outcomes, such as stress, anxiety, well-being, etc. (3) There were mixed results between coaching and coaches' work or like satisfaction and performance (4) Current research evidence indicated coaching generated longitudinal outcomes; however, more empirical research is required (5) There was no adequate empirical evidence to confirm that coaching had positive impact on organizational-level outcomes (6) Several mechanisms were identified: coaches' self-efficacy and motivation, coaches' interpersonal skills and the quality of coaching relationship, etc. 	To establish an independent working group that consists of coaches, academics, organizations that use coaching and any stakeholders, and the research method should include methodological and statistical procedures, minimum sample sizes and a set of outcome variables
Athanasopoulou and Dopson (2018)	Executive coaching (external only)	$k = 110$	<ol style="list-style-type: none"> (1) It is difficult to integrate the research evidence due to the diversity of research methods (2) Social context and organizational-level outcomes have been overlooked in current research (3) The research evidence on the effectiveness of coaching was not mixed <p>Seven essential factors were identified: self-efficacy, coaching motivation, goal orientation, trust, interpersonal attraction, feedback intervention and supervisory support</p>	<ol style="list-style-type: none"> (1) The future research should be a more context-sensitive based and better research designed (2) 25 future research questions were outlined, such as compare coaching models' level of effectiveness and what makes outcomes sustainable?
Bozer and Jones (2018)	Workplace coaching (both external and internal)	$k = 117$	<ol style="list-style-type: none"> (1) Is coaching motivation an affective outcome of workplace coaching? (2) Is learning goal orientation an affective outcome of workplace coaching? 	<ol style="list-style-type: none"> (1) 15 future research questions were outlined, such as (2) Is learning goal orientation an affective outcome of workplace coaching?

and self-regulation, can advance coachees' purposeful behavioral changes. The application of theories in psychotherapy offers a holistic picture of coachees, including their intrinsic motivations, personal history and current life, and may make a significant contribution to coachees' sustainable changes (Williams *et al.*, 2002). Nevertheless, the workplace coaching usually requires a systematic focus and developmental partnership and often involves a complicated as triadic contracting process among the coach, coachee and organization (Louis and Fatien Diochon, 2014; Smither, 2011); hence, theories and techniques in coaching might matter more than in psychotherapy. To revisit the boundaries between coaching and psychotherapy, Grant and Cavanagh (2007) proposed that positive psychology, which is identifying and utilizing positive traits of people, may strengthen coaching outcome, such as workplace satisfaction, performance and well-being can be enhanced. Nevertheless, there is still lack of rigor in many of the claims and much of the published work in coaching. Accordingly, the future coaching research should focus on in what way psychology can contribute to coaching (Bono *et al.*, 2009) and directly compares the efficacy of different theoretical frameworks and approaches to executive coaching (Smither, 2011).

Outcome criteria for workplace coaching

Outcome criteria in contemporary coaching research have been criticized due to the lack of consistency and validity (Lai and Palmer, 2019); hence, we drew on established criterion models from similar interventions, such as training and learning for coaching evaluations. To build on previous meta-analyses, we combined multi-level training evaluation (Kraiger *et al.*, 1993) with the Engagement and Well-being Matrix® (Grant, 2014) in the present analysis. Given that expectations of coaching have been expanded to a broader view of working life, including employee relations, engagement, motivation to change and psychological well-being (Grant, 2014), our coaching outcome evaluation criteria across four individual domains are affective, cognitive, behavioral (skills/performance) outcomes and psychological well-being (See Table 2 below).

To summarize, the first two questions guiding our meta-analysis are as follows:

Outcome criteria	Description	Measurement
(A) <i>Affective outcomes</i>	Attitudinal, commitment and motivational outcomes	Organizational commitment, job satisfaction and intention to leave
(B) <i>Cognitive outcomes</i>	Knowledge acquisition, knowledge organization and cognitive strategies (i.e. meta-cognition), such as clients' self-reflection, self-awareness and self-understanding of learning progress and strategy	Self-awareness and self-efficacy
(B1) General perceived efficacy	Self-awareness of knowledge gain and deficiency. Planning, monitoring and revising goal appropriate behaviors	Self-awareness and self-efficacy
(B2) Goal attainment	Trainees' self-assessment of specific learning outcomes	Goal attainment scaling
(C) <i>Skill-based/ Performance outcomes</i>	The development of technical skills that links goal	
(C1) Self-rated performance	Perceived improvements in work performance	Self-rated performance questionnaire
(C2) Other-rated performance	Objective improvements in work performance	360-degree assessment or the multifactor leadership questionnaire (MLQ)
(D) <i>Workplace psychological well-being</i>	Self-acceptance, purpose in life, positive relations with others, environmental mastery and autonomy	Psychopathology (mental health) or resilience

Table 2.
Proposed coaching
evaluation criteria
framework

- Q1. Do psychologically informed coaching approaches have positive effects on the following learning outcomes; (a) affective; (b) cognitive; (c) skills-based/performance and (d) psychological well-being?
- Q2. Is there a difference among the effectiveness of various frequently used psychological frameworks such as CBC and SFC on coaching outcomes?

Contextual factors in the coaching process

Despite certain prominent psychologically informed approaches (e.g. CBC) having been widely applied in coaching studies, contextual factors (e.g. organizational characteristics) have been overlooked in research evidence (Shoukry and Cox, 2018). Indeed, workplace coaching requires comprehensive approaches due to a sophisticated triangular relationship between the coach, coachee and organization (Louis and Fatien Diochon, 2014). Therefore, coaching is regarded as a social process where contingent factors including organizational structure, political dynamics and power relationships are important influences on the coaching relationship (Louis and Fatien Diochon, 2018; Shoukry and Cox, 2018). Specifically, interpersonal interactions between the coach and coachee were altered by the context and relation-specific scenarios (de Haan and Nieß, 2015; Ianiro et al., 2015), in which a more flexible and integrated coaching process is essential.

Consequently, our third review question is

- Q3. Do integrative psychologically informed coaching frameworks have better effects on coaching outcomes than a singular formed coaching framework?

Based on the above, we developed a conceptual model to guide our analysis (See Figure 1 below).

Method

Literature search and screening

We used a systematic search strategy to identify relevant peer-reviewed papers, unpublished doctoral theses and conference proceedings (Denyer and Tranfield, 2011). Search terms

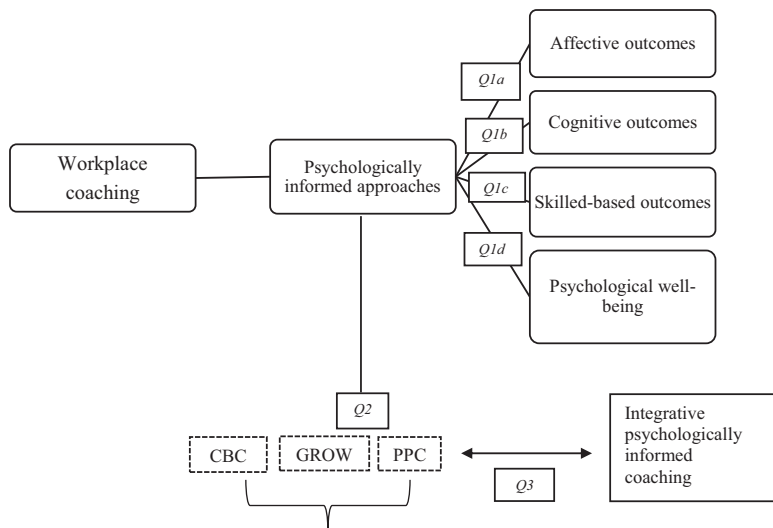


Figure 1.
Conceptual framework of the present meta-analysis

associated with psychologically informed coaching approaches (e.g. cogniti* and coaching) and psychological assessments (e.g. psychometric* and coaching) were used across eight databases, such as PsyINFO and Business Source Complete. Inclusion criteria were (1) written in English; (2) published between 1995 and 2018; (3) empirical quantitative trial settings with clear research methods, participants, evaluations and outcomes; (4) focused external one-on-one workplace coaching; (5) clearly stated psychologically informed coaching approaches and frameworks, such as CBC, SFC GROW [3] and so forth. Please see [Figure 2](#) for the flow chart of literature search process.

A total of 20 studies ($k = 20$, $n = 957$, 63 effect sizes) meeting the above criteria were included in the final review. Overall, most of the included studies were conducted in English speaking countries (e.g. UK, USA and Australia) and continental Europe (e.g. Italy, Netherlands, Spain, etc.). This aligns to a recent global coaching consumer report by the [International Coach Federation \(ICF, 2017\)](#), indicating USA and Europe as established coaching markets. A comparative analysis between countries was out of scope due to insufficient numbers of primary studies. An overview of the included studies is displayed in [Table 3](#).

Calculating the effect sizes

We used Hedges's g as the indicator of effect size, which adjusts the small sample overestimation bias of Cohen's d ([Hedges, 1981](#)) and is usually interpreted as the standardized mean difference calculated by using the means, standard deviations and sample sizes of treatment and comparison groups. In cases when the above statistic information was not available, we estimated this indicator by transforming F , Z or t values according to the formula described in [Card \(2011, p. 97\)](#).

There are three types of research design in the present meta-analysis: (1) posttest only with control design (POWC), (b) single group pretest–posttest design (SGPP) and (c) pretest–posttest with control design (PPWC). For those which employed two cohorts with nonequivalent control design (e.g. [MacKie, 2014](#); [MacKie, 2015](#)), we aggregated the precoaching and postcoaching data of the first coaching group and the waitlist first group and treated them as SGPP. Accordingly, we employed different formulas to calculate the effect sizes and variances for each research design as illustrated in [Table 4](#). For POWC research design studies, the effect size was defined as the difference between the mean posttest scores of the treatment and control groups divided by the pooled standard deviation of the two groups ([Carlson and Schmidt, 1999, p. 852, 855](#); [Rubio-Aparicio et al., 2017, p. 2059](#)). For SGPP research design studies, the effect size was defined as the average

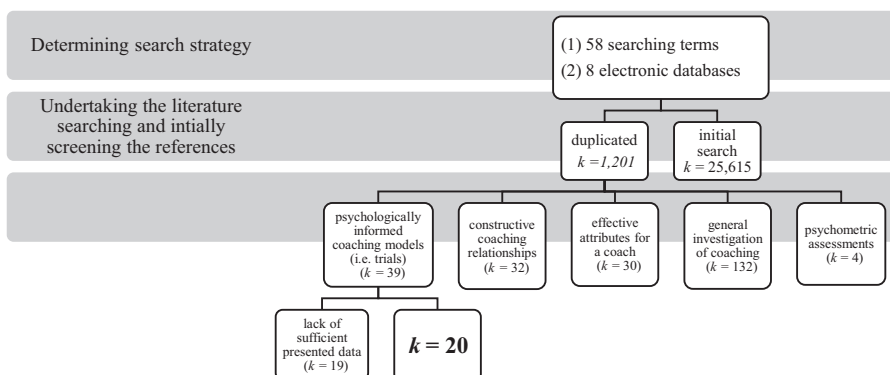


Figure 2.
Literature search and
screening

Table 3.
Characteristics of
psychologically
informed studies and
nonpsychologically
informed studies
included in this meta-
analysis

Authors and date of publication	N	Coaching method	Research design	Outcome	Outcome Category	g	Research location	Duration of the trial
Bozer and Sarros (2012)	96	CBC	BET	Self-reported job performance	C1	-0.12	Israel	10-12 weeks
				Self-awareness	B1	0.25		
				Job affective commitment	A	0.17		
				Career satisfaction	A	0.83		
				Job performance rated by supervisor	C2	-0.03		
				Supervisory-rated task performance	C2	-0.67		
Bright and Crockett (2012)	115	CBC	BET	Performance strategy	C1	0.03	USA	9-10 weeks
				Self-concordance	A	0.35	United Kingdom	1 session
Burke and Linley (2007)	26	GROW	WSD	Personal values	A	0.26		
				Commitment	A	0.90		
Cerni <i>et al.</i> (2010a, b)	14	CBC	BET	Transformational leadership	C2	0.07	Australia	10 weeks
				Psychopathology (mental health)	D	0.19	Italy	24 weeks
David <i>et al.</i> (2016)	59	CBC	WSD	Performance	C2	0.13		
				Irrational beliefs	B1	0.92		
Evers <i>et al.</i> (2006)	60	GROW	BET	Irrational cognition	B1	1.28		
				Goal attainment	B2	0.09	Netherlands	16 weeks
				Acting with balance	B1	0.26		
				Living and working mindfully	B1	0.25		
				Transformational leadership-supervisor rated	C2	0.30		
				Transformational leadership-self rated	C1	-0.02		

(continued)

Authors and date of publication	N	Coaching method	Research design	Outcome	Outcome Category	<i>g</i>	Research location	Duration of the trial
Grant <i>et al.</i> (2009)	42	INTEGRATIVE (CBC + SFC + GROW)	BET	Goal attainment	B2	1.61	Australia	10 weeks
				Resilience	D	0.90		
				Psychopathology (mental health)	D	0.41		
Grant <i>et al.</i> (2010)	44	INTEGRATIVE (CBC + SFC + GROW)	BET	workplace well-being	D	0.47		20 weeks
				Goal attainment	B2	2.06	Australia	
				Resilience	D	0.46		
Grant (2014)	31	INTEGRATIVE (CBC + SFC)	WSD	Psychopathology (mental health)	D	0.40		16 weeks
				Workplace well-being	D	0.49		
				Goal attainment	B2	1.38	14 geographical locations	
				Solution-focused thinking	B1	0.38		
				Change readiness	B1	0.23		
				Leadership self-efficacy	B1	0.35		
				Psychopathology (mental health)	D	0.19		
				Resilience	D	0.21		
				Workplace satisfaction	A	0.02		
				Leader role efficacy	B1	1.20	Norway	
Leader's trust in subordinates	A	1.58						
Ladegard and Gjerde (2014)	30	INTEGRATIVE (SFC + PPC)	BET	Turnover intentions	A	0.75		24 weeks
				Multi-factor leadership	C2	0.53	Australia	
MacKie (2014)	28	POSITIVE	WSD	Coaching readiness	B1	0.70	Australia	12 weeks
				Core self-evaluation	B1	0.50		
MacKie (2015)	27	POSITIVE	WSD	Developmental readiness	B1	0.46		12 weeks
				Goal attainment	B2	1.27	USA	
Markus (2016)	71	CBC	BET					8 weeks

(continued)

Table 3.

Authors and date of publication	N	Coaching method	Research design	Outcome	Outcome Category	g	Research location	Duration of the trial
Nielsen <i>et al.</i> (2015)	101	GROW	BET	Safety leadership Safety knowledge Safety involvement Safety behavior Safety representatives commitment	C2 C2 C2 C2 A	0.51 0.53 0.48 0.05 -0.01	Denmark	16 weeks
Ratiu <i>et al.</i> (2017)	11	CBC	WSD	Affective commitment	A	0.07		
Sherlock-Storey <i>et al.</i> (2013)	12	POSITIVE	WSD	Trust	A	0.27		
Vidal-Salazar <i>et al.</i> (2012)	40	CBC	BET	Safety participation Multi-factor leadership Psychological capital Change efficacy Skill application	C1 C2 B1 B1 C1	0.38 0.14 0.77 0.81 0.47	Romania United Kingdom Ceuta, Spain	32 weeks 6 weeks 24 weeks
Wernberg (2016)	76	INTEGRATIVE (SFC + GROW)	BET	General health Workplace environment leadership competence	D B1 C2	0.36 0.30 0.50	United Kingdom USA	3 years 16-24 weeks
Williams and Lowman (2018)	64	GROW	WSD	Leadership practice Goal attainment	C2 B2	0.44 1.44	Australia	24 weeks
Yu <i>et al.</i> (2008)	10	INTEGRATIVE (CBC + SFC)	WSD	Subjective well-being Psychological well-being Meta-cognition Proactivity Role-breadth self-efficacy Core performance behavior	D D B1 C1 B1 C2	0.60 0.26 0.55 1.22 1.52 0.23		

Note(s): WSD = within subject design; BET = between subject design; A = affective outcomes (e.g. organizational commitment, satisfaction and turn over intention); B1 = general perceived efficacy and other cognitive outcomes (e.g. self-awareness, self-efficacy, attribution and self-regulation); B2 = goal-attainment (e.g. goal setting and goal attainment); C1 = self-rated performance; C2 = other-rated performance (e.g. 360 degree multifactor evaluation) and D = workplace well-being (e.g. burn out, stress and anxiety)

Study design	Effect size	Variance
POWC	$d = \left[1 - \frac{3}{4(n_1+n_2)-9} \right] \cdot \frac{\bar{y}_1 - \bar{y}_2}{\sqrt{(\bar{n}_1 - 1)S_1^2 + (\bar{n}_2 - 1)S_2^2}} \cdot \frac{1}{\sqrt{\frac{n_1+n_2-2}{n_1+n_2}}}$	$\hat{\sigma}_d^2 = \frac{n_1+n_2}{n_1 \cdot n_2} + \frac{d^2}{2(n_1+n_2)}$
SGPP	$d = \left[1 - \frac{3}{4(n-1)-1} \right] \cdot \frac{\bar{y}_{\text{post}} - \bar{y}_{\text{pre}}}{S_{\text{pre}}}$	$\hat{\sigma}_d^2 = \left[1 - \frac{3}{4(n-1)-1} \right]^2 \cdot \left(\frac{n-1}{n} \right) \cdot \left(\frac{n-1}{n-3} \right) \cdot \left(1 + \frac{n \cdot d^2}{2(1-r)} \right) - d^2$
PPWC	$d = \left[1 - \frac{3}{4(n_E+n_C-2)-1} \right] \cdot \frac{(\bar{y}_{\text{post},E} - \bar{y}_{\text{pre},E}) - (\bar{y}_{\text{post},C} - \bar{y}_{\text{pre},C})}{\sqrt{\frac{(n_E-1)S_{\text{pre},E}^2 + (n_C-1)S_{\text{pre},C}^2}{n_E+n_C-2}}} \cdot \frac{1}{\sqrt{\frac{n_E+n_C-2}{n_E+n_C}}}$	$\hat{\sigma}_d^2 = 2 \left[1 - \frac{3}{4(n_E+n_C-2)-1} \right]^2 \cdot (1-r) \cdot \left(\frac{n_E+n_C}{n_E n_C} \right) \cdot \left(\frac{n_E+n_C-2}{n_E+n_C-4} \right) \cdot \left(1 + \frac{n_E n_C d^2}{2(1-r)(n_E+n_C)} \right) - d^2$

Note(s): POWC = posttest only with control; SGPP = single group with pretest and posttest and PPWC = pretest and posttest with control

Table 4.
Effect size calculation
formulas for three
kinds of study design

pretest-follow-up change, divided by the pretest standard deviation (Morris and DeShon, 2002, p.114; Rubio-Aparicio *et al.*, 2017, p. 2059). Finally, for PPWC research design studies, the effect size index was computed as the difference between the average pretest-follow-up change of the experimental and control groups, divided by a pooled estimate of the pretest standard deviations of the two groups (Morris, 2008, p. 369; Rubio-Aparicio *et al.*, 2017, p. 2060). For SGPP and PPWC, Pearson correlation coefficient between the pretest and follow-up measures must be available to estimate the variance. As this information was seldom reported in the studies, a value of 0.70 was assumed for r , as recommended by Rosenthal (1991).

Meta-analysis with robust variance estimates

When a study provides multiple effect size estimates, a traditional approach is to aggregate effect sizes drawn from the same study (Borenstein *et al.*, 2009). However, this method usually eliminates the possibility of comparing multiple levels of a moderator within a single study. To overcome this limitation, the present study conducted a meta-analysis with robust variance estimates (RVEs; Hedges *et al.*, 2010), which can comprehensively analyze all the effect sizes and effectively accommodate the multiple sources of dependencies. Considering 70.00% (14 out of 20 studies) of the studies provided multiple effect sizes, this study employed the correlated effects weighting scheme for RVE, with the default assumed correlation ($r = 0.80$) among dependent effect sizes within each study.

Testing overall effects and moderators

To test the overall effect size and the effects of each moderator, we conducted an intercept-only random-effects meta-regression model with RVE using the R package, robumeta (Fisher and Tipton, 2015). The intercept of this model can be interpreted as the precision weighted overall effect size, adjusted for correlated-effect dependencies. Categorical moderators (e.g. coaching method and outcome category) were first dummy coded and then entered into meta-regression equations. To test whether there were significant differences across all levels of each moderator, we conducted approximate Hotelling-Zhang with small sample correction tests using the R package clubSandwich (Pustejovsky, 2015). This test produced an F -value, an atypical degree of freedom, and a p -value that indicated the significance of moderating effect.

Examining publication bias

Publication bias refers to the tendency of studies that report small or nonsignificant effects to be underrepresented in the published literature. Since publication bias analyses cannot be performed with RVEs, we used the R package MAD (Del Re and Hoyt, 2010) to aggregate dependent effect sizes with a prespecified correlation ($r = 0.5$) (Borenstein *et al.*, 2009). Then, we conducted the Orwin's fail-safe N analysis (Orwin, 1983) and the trim-and-fill analysis (Duval and Tweedie, 2000) with the R package metafor (Viechtbauer, 2010), based on the aggregated 20 effect sizes (one effect size per study). Orwin's fail-safe N indicates how many studies with null results ($g = 0$) would have to be added to reduce the present average effect size to a trivial level ($g = 0.1$, Hyde and Linn, 2006). Trim and Fill analysis indicated how many missing studies were needed to make the funnel plot symmetrical (Duval and Tweedie, 2000). The results indicated that it takes 87 overlooked studies with effect sizes of 0 to reduce our results to a trivial level. Furthermore, the results of Trim and Fill analysis implied that no studies were added in the funnel plot (Figure 3). Taken together, publication bias was probably not a problem in this meta-analysis.

Findings

RQ1. The effectiveness of psychologically informed coaching approaches on workplace outcomes

With regards to our first research question, the results of meta-regression with RVEs indicated a moderately positive effect across outcomes ($g = 0.51$, 95% CI, 0.35–0.66 and $p < 0.01$). However, the relatively large effect size of goal attainment in Grant's (2010, $g = 2.06$) study prompted us to perform a sensitivity analysis; namely, the above analysis was repeated while excluding the result of this outcome. The overall effect size dropped slightly but remained significant ($g = 0.48$, 95% CI, 0.33–0.64 and $p < 0.01$), indicating that the overall effect was not altered when Grant's (2001) study was excluded.

The effect sizes of each outcome category are illustrated in Table 5. Our analysis showed that coaching had significant positive effects on (1) cognitive outcomes with both general perceived efficacy ($g = 0.59$, 95% CI, 0.30–0.88 and $p < 0.01$) and goal attainment ($g = 1.29$, 95% CI, 0.56–2.01 and $p < 0.01$), (2) other-rated performance ($g = 0.24$, 95% CI, 0.00–0.48 and $p = 0.05$) and (3) workplace psychological well-being ($g = 0.28$, 95% CI, 0.08–0.49 and $p = 0.02$). In contrast, coaching had positive but not significant effects on affective outcomes ($g = 0.44$, 95% CI, -0.14–1.01 and $p = 0.10$) and self-rated performance ($g = 0.30$, 95% CI, -0.22–0.81 and $p = 0.18$). Although the coaching effect size was slightly higher for self-rated performance ($g = 0.30$) than for other-rated performance ($g = 0.24$), the difference was not significant ($F(1, 4.46) = 0.01$ and $p = 0.92$). Similarly, as the overall effect size estimation, we repeated the analysis for coachees' goal attainment level excluding the results of Grant's (2010, $g = 2.06$) study. Although the effect size dropped from 1.29 to 1.13, it remained significant ($g = 1.13$, 95% CI, 0.33–1.93 and $p = 0.02$).

RQ2. The effectiveness of various frequently used psychological coaching frameworks

The large amount of heterogeneity in the effect sizes ($T^2 = 0.12$ and $I^2 = 79.37$) suggested there may be meaningful differences that could be further explored through moderator analyses. Table 5 contains effect size estimates for each level of moderator analyses.

We first examined whether different coaching methods (CBC, GROW, PPC and integrative coaching) varied in their effects on outcomes addressing the second research question. The results indicated positive effects across all coaching methods: CBC ($g = 0.39$, 95% CI, -0.03–0.82 and $p = 0.07$), GROW ($g = 0.44$, 95% CI, 0.18–0.70 and $p < 0.01$), PPC ($g = 0.57$, 95% CI, 0.28–0.85 and $p = 0.02$) and integrative ($g = 0.71$, 95% CI, 0.21–1.21 and $p = 0.02$). Overall, we did not find evidence that coaching method significantly moderated coaching effect, $F(3, 6.27) = 0.78$ and $p = 0.54$.

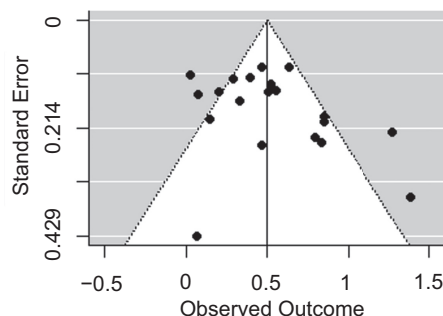


Figure 3.
Funnel plot

Moderator (<i>italics</i>) and level	<i>k</i>	Effect size	<i>n</i>	<i>g</i>	<i>F</i>	95% CI	<i>p</i>
<i>Outcome type</i>	20	63			1.48		0.33
A Affective outcomes	5	10	284	0.44		-0.14-1.01	0.10
B1 General perceived efficacy	9	17	401	0.59		0.30-0.88	<0.01
B2 Goal attainment	6	6	258	1.29		0.56-2.01	<0.01
C1 Self-reported performance	5	5	422	0.30		-0.22-0.81	0.18
C2 Other-rated performance	8	13	443	0.24		0.00-0.48	0.05
D Workplace psychological well-being	6	12	262	0.28		0.08-0.49	0.02
<i>Coaching method</i>	20	63			0.78		0.54
CBC	7	15	406	0.39		-0.03-0.82	0.07
GROW	4	20	251	0.44		0.18-0.70	<0.01
PPC	3	6	67	0.57		0.28-0.85	0.02
integrative	6	22	233	0.71		0.21-1.21	0.02
<i>CBC vs Others</i>	20	63			0.88		0.37
CBC	7	15	406	0.39		-0.03-0.82	0.07
others	13	48	551	0.55		0.40-0.70	<0.01
<i>Single vs Integrative</i>	20	63			1.83		0.23
single	15	41	724	0.45		0.27-0.64	<0.01
integrative	5	22	233	0.71		0.21-1.21	0.02

Note(s): *k* = number of studies; *n* = number of correlations; *F* = HTZ-F test comparing the levels of a given moderator. A = affective outcomes (e.g. organizational commitment, satisfaction and turn over intention); B1 = general perceived efficacy and other cognitive outcomes (e.g. self-awareness, self-efficacy, attribution and self-regulation); B2 = goal-attainment (e.g. goal setting and goal attainment); C1 = self-rated performance; C2 = other-rated performance (e.g. 360-degree multifactor evaluation) and D = workplace well-being (e.g. burn out, stress and anxiety)

Table 5.
Moderator analyses

Considering that CBC has been the most documented psychologically informed coaching approach in contemporary empirical studies (Lai and Palmer, 2019), we further compared the effect size between CBC and other coaching methods. The results indicated that the average effect size of other methods ($g = 0.55$, 95% CI, 0.40-0.70 and $p < 0.01$) was higher than CBC ($g = 0.39$, 95% CI, -0.03-0.82 and $p = 0.07$), but the difference was not significant, $F(1, 11.80) = 0.88$ and $p = 0.37$.

RQ3. Integrative vs singular psychologically informed coaching frameworks

Addressing our third review question, we compared the effect size between studies employing integrative coaching methods and those based on a single coaching method. The average effect size for integrative coaching methods ($g = 0.71$, 95% CI, 0.21-1.21 and $p = 0.02$) was higher than for single coaching method ($g = 0.45$, 95% CI, 0.27-0.64 and $p < 0.01$), yet the difference was not significant, $F(1, 6.15) = 1.41$ and $p = 0.28$.

Discussion

The effects of psychologically informed coaching approaches on evaluative outcomes

The results demonstrated that coaching constructs, informed by psychotherapy and positive psychology, had an overall effective impact on all evaluative outcomes including individuals' cognitive and affective learning outcomes, objective work performance improvement and psychological well-being. The effective sizes ranged from $g = 0.25$ to 1.29. Whereas several previous meta-analyses (e.g. Theeboom *et al.*, 2014) also indicated support for effective coaching outcomes, these syntheses did not differentiate between psychological and nonpsychological coaching approaches as well as formats of coaching (e.g. peer and group coaching). Our analysis makes the distinction that psychologically informed approaches contribute to *external* workplace coaching processes and outcomes. This present analysis

revealed that psychological coaching approaches had significant impacts particularly on goal-related outcomes; this finding reflects on Bono *et al.*'s (2009) comparative analysis between psychologist and nonpsychologist coaches that the former tended to set specific "goals" triggering behavioral changes. In addition, our analysis identified that psychologically informed coaching approaches had substantial impacts on individuals' cognitive learning outcomes; for instance, meta-cognitive skills which process and organize information for the development and to plan, monitor and revise goal-oriented behaviors (Brown *et al.*, 1983; Kraiger *et al.*, 1993). Considering that coaching has been described as a *reflective process* to simulate people's self-awareness (Passmore and Travis, 2011), our analysis tallied with literature of learning that individuals' internal self-regulation and cognition stimulate purposeful mental (internal) and behavioral (external) changes (e.g. goal-attainment) through a continuous cognitive process (Anderson, 1982).

The second largest effect size in our analysis was the impact on coachees' affective outcomes ($g = 0.44$), such as work attitudes, organizational commitment, job satisfaction and intention to leave. Workplace coaching is a type of investment in people through supporting coachees' professional and personal development. This sort of social support either from the organization or supervisors indeed reinforced coachees' satisfaction of the coaching process (Zimmermann and Antoni, 2020) and therefore encouraged their motivation and efforts to change (Baron and Morin, 2010; Bozer and Jones, 2018). Our analysis indicated psychologically informed coaching, which provides a more holistic facilitation of coachees by understanding their internal motivators, emotions and unconscious assumptions (Gray, 2006), increased coachees' organizational commitment and job satisfaction listed above. Therefore, our study further clarifies that coaching approaches addressing self-directed process and underlying cognitive issues advanced coachees' perceived social support and attitude to organizational objectives.

Coachees' psychological well-being evaluative outcomes took place the third largest effect size ($g = 0.28$) in our analysis. This finding is an incremental contribution as previous meta-analyses mainly emphasized workplace performance or behavioral related evaluative indicators. Instead, we recognized people's quality of working life and challenges as important indicators for a sustainable behavioral or performance change (Grant, 2014). Our analysis indicated psychologically informed coaching emphasizes improvement of coachees' mental health, resilience, positive moods and reducing stress and psychopathologies (Grant, 2014; Yu *et al.*, 2008). Interestingly, most of the studies that examined psychological health outcomes adopted an integrative coaching approach (Grant, 2014; Grant *et al.*, 2009, 2014; Weinberg, 2016; Yu *et al.*, 2008). This finding is distinct to some contemporary coaching literature that advocates theories in positive psychology are the predominant ingredient to flourish individuals' workplace experiences and satisfaction (Biswas-Diener and Dean, 2007; Biswas-Diener, 2010). This synthesis result informs us that the combined approach of coaching may offer a comprehensive pathway to understand the full range of coachees' emotions, feelings and passion for life to promote their mental health.

Lastly, psychologically informed coaching had a positive impact on objective work performance rated by others ($g = 0.24$). Interestingly, coachees' self-reported work performance was not significantly improved after coaching. A possible explanation for this finding could be due to the self-reporting bias in interventional studies (Kumar and Yale, 2016; Rosenman *et al.*, 2011). The reference standards of respondents' judgment may change over time as coachees gain more realistic understating of respective strengths and weaknesses, a beta change (Millsap and Hartog, 1988). A similar phenomenon was noted in Mackie's study (2014) where senior managers in the experimental group reported less improvement in their leadership development after receiving coaching, although their "actual" improvements in leadership behaviors were better than participants in the control group, evaluated by objective 360-degree assessment.

The outcome equivalence of psychologically informed coaching frameworks

To offer a further insight of psychologically informed coaching approaches, we carried out a comparative analysis among all identified coaching constructs, namely, CBC, GROW, positive psychology coaching (PPC [4]) and integrative approaches (e.g. CBC combined with SFC). Our analysis suggests that the effect sizes of different psychologically informed coaching approaches were homogeneous. Precisely, there was no particular psychological approach to coaching more effective than others in terms of evaluative outcomes. This result is aligned with “outcome equivalence” in therapeutic research that there is no significant distinction in effectiveness between different approaches and techniques (Ahn and Wampold, 2001). Meanwhile, this synthesis clarifies the long-standing debate on coaching approaches by indicating that none of the popular and commonly used constructs are prominent than others (Smither, 2011).

Whereas CBC had the most empirical data and largest sample size in our included papers, we found lower effects of CBC on desired coaching outcomes ($g = 0.39$) compared with other psychological frameworks ($g = 0.55$), although the difference was not significant. A possible explanation is that CBC, which combines cognitive-behavioral, imaginal and problem-solving techniques and strategies to enable clients to overcome blocks to change and achieve their goals (Palmer and Szymanska, 2019), may require a prolonged coaching program to cultivate or transfer the values and meanings of certain situations. Other psychologically informed coaching frameworks, such as SFC and PPC, are more outcome-oriented, competence-based and goal-focused procedures, and they may demonstrate effects in the short term that satisfy expectations in workplace coaching settings. We cannot rule out the possibility that a particular psychologically informed coaching framework generates better outcomes than other frameworks. However, we were not able to conduct a meta-analysis between each framework due to the small number of empirical studies up-to-date. Future research could investigate whether specific psychological approaches are more strongly associated with specific coaching effects.

Integrative coaching frameworks may work better than a single approach

Whereas recent coaching literature implied that a singular formed coaching framework understates the complexity of coaching processes (Shoukry and Cox, 2018), our study discovered several psychologically informed coaching frameworks were commonly used in an integrative way; for example, CBC was often combined with SFC (e.g. Grant, 2014). Our meta-analysis results revealed that the effectiveness of using an integrative approach ($g = 0.71$) was stronger than a singular formed framework ($g = 0.45$) on evaluative outcomes, though the difference was not significant. However, we note that only six studies ($n = 233$) used an integrating approach and 14 studies ($n = 724$) used singular formed models in our included papers. The discrepancy of study numbers and sample sizes was a limitation for robustly comparing these two groups, and yet integrative frameworks still demonstrated stronger impacts on evaluative outcomes. This result indicates that a more comprehensive approach may have addressed the social complexity in coaching process and captured a thorough picture of coachees’ and organizational characteristics to facilitate desired coaching outcomes (Shoukry and Cox, 2018). Overall, our meta-analysis indicates the positive impact of psychologically informed coaching approaches on relevant outcomes. However, we do not suggest a degree in psychology as prerequisite for all coaches. Rather, we advocate that a sound understanding of cognitive-behavioral-based science and appreciation of the coachee’s work-related context is a helpful basis for effective coaching processes.

Future research directions and practical implications

This study takes an initial step to synthesize relevant studies and confirms the role psychology plays in promoting certain workplace coaching outcomes; we draw out several

implications for future research following a number of limitations. In addition to the common suggestions in previous meta-analyses and systematic reviews demanding more thorough and rigorous studies and assessing longitudinal effects of coaching, we emphasize that, first, explicit coaching constructs or frameworks should be adequately addressed and discussed in future research since large numbers of existing empirical studies did not specify coaching design in sufficient detail. Second, a transparent data analysis and presentation is crucial as we had to disregard several studies due to missing data or unclear clarification from authors. Third, a comparison between psychologically informed approaches and other coaching disciplines (e.g. adult learning or management) might offer more comprehensive understanding of contemporary coaching research evidence on coachees' transformation and growth. Others may also wish to build on our groundwork to additionally investigate in what way coaches' cultural backgrounds and qualification impact on coaching outcome in both the internal and external coaching setting.

In terms of practical implications, we suggest that using integrative psychologically informed coaching frameworks with consideration of individual differences and social complexity in organizations is important. Our meta-analysis points out outcome equivalence of contemporary commonly used psychologically informed coaching frameworks (including CBC, SFC and PPC), thus corresponding with recent coaching practice trend that workplace coaching is associated with complex social factors. In other words, a combined approach may facilitate greater desirable outcomes. Our purpose is not to claim that applying psychological frameworks is the exclusive influential factor in coaching but rather to promote evidence-based practice by integrating scientific evidence of psychology. As the first meta-analysis of coaching that focuses on one specific theoretical domain, psychology, our review results indeed disclose that future practice need to pay more attention to the coaching process rather than use one particular coaching framework. Our review results can be considered a benchmark for coaches to reflect on their practice to facilitate sustainable coaching outcomes, for instance, whether coaches integrate coachees' cognitive coping, positive traits and strengths as well as social dynamics in the coachee's work environment. In addition, this analysis offers coaches a preliminary guideline to review whether their coaching evaluations consist of comprehensive angles, such as affective and cognitive learning, performance-related outcomes and psychological states.

Notes

1. CBC is an integrative approach which combines the use of cognitive, behavioral, imaginal and problem-solving techniques and strategies within a cognitive behavioral framework to enable coachees to achieve their realistic goals (Palmer and Szymanska, 2019, p. 108).
2. SFC is an outcome-oriented, competence-based approach to coaching. It helps coachees to achieve their preferred outcomes by evoking and co-constructing solutions to their problems (O'Connell and Palmer, 2019, p. 270).
3. The GROW model is grounded in behavioral science as a structured, process-derived relationship between a coach and coachee or group which includes the four action-focused stage: goal, reality, options and way forward (Passmore, 2018, pp. 99–101).
4. PPC is a scientifically-rooted approach to helping clients increase well-being, enhance and apply strengths, improve performance and achieve valued goals (Boniwell and Kauffman, 2018, p. 153).

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About the authors

Qing Wang (PhD, Cpsychol) is a chartered psychologist and accredited coaching psychologist. She is an Associate Professor in Educational and Coaching Psychology and leads Educational Coaching Research Group her current institution. Qing focuses her academic research and practice on coaching psychology in the field of education, including theoretical development, model construction and implementation with educators, teachers and students in various learning settings.

Yi-Ling Lai (PhD, CPsychol) is currently a Lecturer and Programme Director of MSc Organizational Psychology at the Birkbeck University of London. Her main research areas include common factors for an effective coaching alliance and the psychological effects on the workplace coaching outcomes. In addition, Yi-Ling's recent research project focuses on the application of psychological-focused interventions into workplace well-being and resilience. Yi-Ling has published several journal papers and book chapters on the psychological theories in the coaching process. Yi-Ling Lai is the corresponding author and can be contacted at: y.lai@bbk.ac.uk

Xiaobo Xu (PhD) is now a postdoctoral researcher from East China Normal University. His research interest focus on examining how family backgrounds (e.g. family socioeconomic status and parenting styles) and personality traits (e.g. authenticity and openness to experience) interact to influence students' learning outcomes and creative performance. He is also interested in conducting meta-analytic studies on the aforementioned topics.

Almuth McDowall (PhD, CPsychol) is Professor of Organisational Psychology at Birkbeck University of London where she leads her department and is part of her school's executive team. Her research has been funded by the Ministry of Defence, the College of Policing, the Chartered Institute of Personnel and Development and the Home Office as well as a range of other funders. Almuth has won awards for her research and her commitment to furthering the practice of psychology in the workplace in the United Kingdom. She is regularly contributing to the media fuelled by her belief that research needs to speak to organizations directly to have impact and contemporary relevance.

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