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# The impact of cognitive-behavioural stress management coaching on changes in cognitive appraisal and the stress response: a field experiment

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## ABSTRACT

Building on the transactional model of stress and coping, we examined the effectiveness of a cognitive-behavioural coaching programme. In a randomised controlled field study, undergraduates were instructed to formulate stress-related goals for themselves and were allocated to attend an intervention group receiving one-on-one stress management coaching (coaching;  $n=24$ ) or a control group receiving no additional intervention (goal formulation;  $n=20$ ). Results suggest that both coaching and goal formulation led to a significant increase in goal attainment that was maintained at a 4-week follow-up assessment. Compared with goal formulation, coaching positively affected participants' cognitive stress appraisal and led to reduced chronic stress levels (chronic stress screening scores, high work demands, and chronic worrying) 4 weeks after the intervention. The reduction of chronic stress was mediated by the change in participants' cognitive stress appraisal. Thus, cognitive-behavioural coaching appears effective in helping individuals develop strategies to deal with stress, while also remaining focused on relevant goals.

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## KEYWORDS

Occupational stress;  
transactional model of stress  
and coping; stress  
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## Practice points

1. Our research holds strong relevance for human resource development professionals and coaching practitioners, especially those working in the field of life, business, and health coaching.
2. Using a randomised controlled, longitudinal evaluation design, the contribution adds empirical evidence to the existing knowledge base on the effectiveness of coaching, particularly on the impact of cognitive-behavioural stress management coaching on clients' performance and well-being.

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### 3. Tangible implications are

- Cognitive–behavioural stress management coaching has the potential to enable clients to develop effective strategies to deal with stress, while also remaining focused on relevant goals.
- Helping clients to perceive the demands of their environment as less challenging or threatening and to experience a higher sense of control and competence when dealing with a given stressor provides effective support to mitigate stress.

## Theoretical framework

In today's modern world of work, dealing with occupational stress and its related consequences is a major concern for individuals and organisations. The annual Stress in America Survey, for instance, reveals that work has been mentioned as a common and consistent source of stress for more than a decade (American Psychological Association, 2017). Further, occupational stress is the second most frequently reported work-related health problem in Europe, and 50–60% of all workday absences result from stress at work (International Labour Organization, 2018).

In light of the severe human and economic costs associated with employees' experience of stress, the development and implementation of approaches that effectively prevent or mitigate work-related stress are highly relevant undertakings (Noblet & Lamontagne, 2006). Accordingly, the impact of various stress management programmes has been studied in recent years. A meta-analytic review on primary resilience-building interventions intended to prevent absenteeism, counterproductive work behaviour, and stress-related issues revealed positive effects for prevention efforts within organisations (Vanhove et al., 2016). Concerning programme design, dyadic interventions such as coaching turned out to be superior to classroom-based group, train-the-trainer, and computer-based delivery formats. Further meta-analyses (Richardson & Rothstein, 2008; van der Klink et al., 2001) summarised the effectiveness of secondary intervention techniques intended to minimise sources of occupational stress. The authors found that cognitive–behavioural interventions were consistently more beneficial than other stress management strategies such as relaxation and meditation techniques, organisational-level interventions (e.g., social support groups), the combination of various methods, or alternative approaches (e.g., electromyographic biofeedback). Considering these findings, a supportive dyadic relationship that draws from a cognitive–behavioural framework might thus be a promising approach to addressing occupational stress.

Therefore, the first aim of our study was to investigate the impact of a cognitive–behavioural coaching to reduce work-related stress. As a second aim, we sought to identify the underlying process by which coaching has its beneficial effect on stress. We specifically built on Lazarus and Folkman's (1984) well-established conceptual model of stress and coping, as a guiding framework to examine whether the change in clients' cognitive stress appraisal would mediate the relationship between coaching and stress.

## *The impact of cognitive-behavioural coaching*

Within organisations, dyadic executive or workplace coaching is widely used to improve professional functioning and facilitate the personal effectiveness, development, and

growth of managers, executives, and employees (Hamlin et al., 2008). The scope of application covers the development of the ability to deal with stress that may result from job demands, interpersonal relationships at work, and conflicts among work and non-work priorities (Biron et al., 2014). For example, coaching has been used to reduce stress through helping employees maintain performance and withstand turbulence during times of organisational change (Grant, 2014), extend leadership skills to enhance effective communication with others (Grant & Hartley, 2013), and strengthen boundary setting and prioritisation, self-compassion and self-care, and self-awareness to increase resilience and well-being (Schneider et al., 2014).

While research findings appear promising, the majority of the outcome studies have utilised evaluation designs that lack methodological rigour (for an overview, see Shadish et al., 2002): Most of the conclusions that coaching reduced stress were based either on a one-group pre–post assessment that failed to rule out plausible alternatives for improvement unrelated to the coaching intervention (e.g., maturation effects) or on comparing coaching against a nonrandomised control group where the observed effect on stress might have been due to systematic differences between the groups other than participating in coaching (e.g., selection effects). In contrast, only a few of the studies are likely to provide reliable and unbiased estimates of the effectiveness of coaching by way of random assignment to a coaching or control group with pre- and post-measurements over time (Farrington, 2003; Shadish et al., 2002). In the current coaching literature, the shortage of conclusive evidence regarding the impact of coaching is still being emphasised (Burt & Talati, 2017; Jones et al., 2016; Theeboom et al., 2014), and more rigorous outcome studies that allow for inferring causality are therefore strongly needed. Addressing this limitation, our first aim was to examine the effectiveness of a stress management coaching intervention using a randomised controlled, longitudinal design.

Therefore, we conducted a field experiment to examine the effects of a dyadic cognitive–behavioural coaching intervention in comparison to a non-intervention control condition. For this purpose, we designed a dyadic coaching intervention with a cognitive–behavioural approach (Grant, 2003; Neenan, 2008) aimed at undergraduate students facing the challenges of their academic environment. In order to evaluate the effectiveness of the coaching intervention regarding its intended effects, the specification of appropriate outcome criteria was required. In stress management coaching, a coach and a client work collaboratively through the process of setting personally meaningful goals, identifying and using personal resources and strengths, developing tailored solutions, monitoring and evaluating progress, and modifying action steps to overcome clients' stress-related issues (Grant, 2017). Thereby, the coach's role is to help clients raise awareness of the interrelation between the environment and their thoughts, feelings, and behaviours and managing these elements to reach goal attainment (Grant, 2017; Grant et al., 2009). As can be seen in the literature, facilitating the achievement of clients' personal coaching goals is at the core of coaching conversations (Grant, 2012), and thus goal attainment is considered a key outcome criterion in coaching research (Grant & Cavanagh, 2007; Jones et al., 2016). Current meta-analytic findings (Burt & Talati, 2017; Jones et al., 2016) and research on the effects of stress management coaching approaches (Grant et al., 2009, 2010) show that coaching interventions have a significant positive effect on goal attainment, with weaker effects for control groups

that received no coaching. We therefore hypothesised that goal attainment would increase significantly more for participants in the coaching intervention than for participants in the control condition (*Hypothesis 1*).

### **Evidence on the mechanisms of change**

Although available research has provided evidence on the value of stress management coaching, there are also inconsistent findings from studies that provided inconclusive evidence or could not detect positive effects of coaching on clients' level of stress (e.g., CompassPoint Nonprofit Services, 2003; Grant, 2014; Gyllensten & Palmer, 2005a, 2005b). This mixed evidence base is mirrored by recent meta-analyses that examined the impact of coaching across various outcomes such as performance and skills or coping (Burt & Talati, 2017; De Meuse et al., 2009; Jones et al., 2016; Sonesh et al., 2015; Theeboom et al., 2014). The quantitative summaries yielded considerably varying effect sizes ranging from no or even negative effects to very large effects, leading to the conclusion that improvement in client outcomes is not achieved by all coaching interventions (Kotte et al., 2016). There is broad consensus among coaching researchers that understanding the mechanisms of change through which coaching has an effect is a further substantial challenge in current coaching research (e.g., Bozer & Jones, 2018; de Haan et al., 2016; Sonesh et al., 2015; Theeboom et al., 2014).

With regard to research examining the impact of coaching on employees' stress response, facilitative mechanisms of change remain relatively unexplored. In general, cognitive-behavioural stress management interventions are intended to facilitate adaptive coping strategies by modifying clients' dysfunctional appraisal of stressors and resulting behavioural responses (Richardson & Rothstein, 2008). One of the outcome studies (Grant et al., 2017), for example, found that leadership coaching had a positive impact on participants' thinking styles (solution-focused thinking, perspective taking, tolerance of ambiguity, self-insight, and resilience) and leadership self-efficacy. In another study (Grant et al., 2009), the qualitative responses of leadership development programme attendees provide the valuable insight that coaching helped attendees increase self-confidence, gain professional and personal insight, build management skills, and enhance their ability to deal with organisational change. These findings suggest that coaching might have promoted functional cognitive or behavioural strategies that helped clients relieve stress. Whether these variables statistically accounted for the relation between coaching and clients' level of stress has not been examined.

Yet, there are two studies that examined the mediating effects of specific cognitive processes using a within-subject design. David et al. (2016) provided cognitive-behavioural coaching based on the rational emotive behaviour therapy approach (Ellis, 1962) with the aim of helping clients change maladaptive patterns of thoughts and beliefs. In particular, they investigated the influence of managers' rational and irrational beliefs on managerial skills and psychological distress represented by the subscale depressed mood. The findings suggest that coaching was effective in replacing managers' irrational beliefs (e.g., demandingness or low frustration tolerance) with rational (e.g., flexible and motivational preferences or frustration tolerance) ones. Rational beliefs further explained the effect of the coaching programme on managers' depressed mood and skills. In order to yield conclusive evidence on the mechanisms of change, however, the inclusion of a control group would have been necessary.

Further, Ladegård (2011) specifically drew on the transactional theory of stress and coping (Lazarus & Folkman, 1984). The theory states that stress results from the ongoing interplay (*transaction*) between a person who contributes specific motives (e.g., goals and values) and beliefs (e.g., self-esteem, mastery, sense of control) and the immediate environment that is characterised by certain demands (e.g., time pressure), resources (e.g., social support network), and constraints (e.g., company policies). The stress response thereby depends on the person's subjective cognitive appraisal that exposure to the given environmental conditions involves harm, threat, or challenge with respect to her or his personal goals and well-being (*primary appraisal*). The stress response is also affected by the person's subjective cognitive appraisal of available coping options and resources in that particular context (*secondary appraisal*). Once the person has appraised the environmental conditions (stressors) as straining or exceeding her or his coping capacity, stress occurs (Lazarus, 1990; Lazarus & Folkman, 1987). Subsequently, the person mobilises coping strategies for managing particular stressors and regulating the emotional stress (Lazarus & Folkman, 1987). The model further posits that the cognitive appraisal process is dynamic and recursive, so that the – more or less successful – coping strategies applied affect the person's subsequent appraisal and the quality and intensity of the stress response (Lazarus, 1990). That is, a person's subjective cognitive appraisal and coping efforts are the key elements that potentially cause dysfunction in the stress process. Ladegård proposed that workplace coaching may affect the stress process through (1) increasing employees' personal awareness of the current situation at work, (2) identifying personal resources conducive to the progress toward goals, and (3) building strategies to cope with the demanding work environment by developing action plans and evaluation and feedback mechanisms to facilitate goal achievement. The study findings indicate that altering employees' individual perceptions of job demands and job resources (i.e. job control and social support) mediated the effect of learning experiences acquired through coaching on employee stress. Apparently, the results support the view that coaching was an effective approach to changing employees' appraisal of environmental demands and resources. These variables, however, were measured by a questionnaire designed to map the psychosocial work environment (Dallner et al., 2000). For example, participants rated the occurrence of quantitative work demands (e.g., how often they had to work overtime) or received social support from colleagues and supervisors (e.g., how often their co-workers and immediate superiors were willing to listen to their work-related problems if needed). This measure provides direct information about the frequency with which employees perceive demanding and supportive events at work; however, that information is different from the theoretical appraisal construct that is concerned with the implications employees would draw from such information for their personal well-being (Lazarus & Folkman, 1987). To show whether coaching is successful in affecting employees' cognitive stress appraisal would therefore require further examination with a more valid measure of cognitive stress appraisal and comparison with a control group, as well.

As a second aim, we sought to identify the underlying process by which coaching has its beneficial effect on stress. We specifically built on Lazarus and Folkman's (1984) conceptual model of stress and coping as a guiding framework to examine if clients' cognitive stress appraisal would mediate the relationship between coaching and stress. More specifically, the cognitive-behavioural coaching should have an impact on participants'

level of stress by lowering the discrepancy between their appraisals of (1) the environmental stressors and (2) their coping efficacy (i.e. by reducing their *cognitive stress appraisal*). We therefore hypothesised that participants in the coaching condition would significantly report lower levels of stress than participants in the control condition (*Hypothesis 2*). We further hypothesised that coaching condition participants' cognitive stress appraisal would decrease significantly more than that of participants in the control condition (*Hypothesis 3*). We expected that the effect of the coaching intervention on stress would be explained by the decrease in participants' cognitive stress appraisals (*Hypothesis 4*).

## Method

### Design

We used a  $2 \times 3$  factorial design with the between-subjects factor intervention condition (coaching vs. control group) and the within-subject factor time of evaluation (pre-treatment T0 vs. post-treatment T1 vs. 4-week follow-up T2) to examine the impact of coaching on goal attainment and chronic stress.

### Participants and procedure

A total of 44 students (5 male, 39 female;  $M_{\text{age}} = 25.59$  years,  $SD_{\text{age}} = 7.73$ ) volunteered to participate in the study. After the registration deadline, participants were randomised to receive either dyadic coaching ( $n = 24$ ) or no intervention (control group,  $n = 20$ ). Following assignment to conditions, participants obtained information on the procedure of the specific condition (e.g., length of sessions for dyadic coaching condition or time points of data collection for control group condition), filled out a registration form, and signed written informed consent.

As goal attainment is considered a key outcome measure in coaching research (Spence, 2007), all participants were instructed to identify and formulate for themselves detailed personal stress-related goals they wanted to achieve in the course of the study. Next, they completed an online questionnaire to assess baseline scores at pre-treatment (T0). Starting 1 week later, coaching condition participants received three dyadic coaching sessions over a period of 3 weeks and completed online questionnaires 2 days after the termination of coaching (T1) and at a 4-week follow-up (T2). Participants in the control condition, in contrast, did not receive any further intervention during this time but answered T1 and T2 measures at comparable times. After the study was completed, participants in the control condition had the opportunity to receive a stress management intervention.

### Coaching condition and coaches

The dyadic coaching consisted of three 2-h sessions that took place once a week. The short-term coaching programme pursued a goal- and solution-focused approach to systematically support clients' goal-directed thoughts, emotions, and behaviours (for more details regarding the coaching intervention, see Zanchetta, Pömmmer, et al., 2020).



Coaches were master's students in psychology who had successfully completed a professionally supervised 1-year coaching training (about 220 h) with a focus on career planning (for education concept see Braumandl et al., 2013). The three coaches (two female and one male) were randomly assigned to the clients and did not know them in advance. Each coach carried out about eight coaching processes.

### Measures

All primary (goal attainment, perceived chronic stress) and secondary (cognitive stress appraisal) outcomes were measured at pre-treatment (T0), post-treatment (T1), and at 4-week follow-up (T2).

#### Goal attainment

Participants rated their degree of goal attainment ('As of right now, to what extent have you attained this goal?') on a scale (Biberacher, 2010; Braumandl & Dirscherl, 2005; Mühlberger & Traut-Mattausch, 2015) ranging from 1 (*not at all achieved*) to 10 (*fully achieved*).

#### Perceived chronic stress

We used the German version of the Trier Inventory for Chronic Stress (TICS; Schulz et al., 2004) to measure students' perceived chronic stress with three scales: (1) The High Work Demands scale assessed two factors, work overload (e.g., 'I feel overwhelmed by my tasks') and pressure to perform (e.g., 'I have tasks to fulfill that pressure me to prove myself'); (2) the Lack of Need Satisfaction scale assessed five factors, work discontent (e.g., 'There are times when none of my tasks seem meaningful to me'), excessive demands at work (e.g., 'In spite of the effort I make, I am unable to manage my tasks properly'), lack of social recognition (e.g., 'I feel that my performance is not recognised enough'), social tensions (e.g., 'I have unnecessary conflicts with others'), and social isolation (e.g., 'There are times when I have too little contact with other people'); and (3) the Chronic Worrying scale (e.g., 'Sometimes I am consumed by my worries') assessed the extent of worries that are strongly associated with chronic stress. The scales comprise 52 items, of which 12 constitute the Chronic Stress Screening Scale. One scale (Social Overload) was dropped from the measure as it was not a focus of the investigation. However, we included one item of the scale ('Sometimes I feel overburdened by my responsibilities toward others') as it was part of the Chronic Stress Screening Scale (TICS; Schulz et al., 2004).

At T0 and T2, participants rated the occurrence of certain situations or experiences in the last 3 months on a 5-point scale ranging from 0 (*never*) to 4 (*very often*). At T1, the time frame was shortened to 3 weeks to suit the duration of the coaching intervention. Internal consistency measures for the Chronic Stress Screening ( $\alpha_{T0} = .93$ ;  $\alpha_{T1} = .92$ ;  $\alpha_{T2} = .93$ ), High Work Demands ( $\alpha_{T0} = .89$ ;  $\alpha_{T1} = .92$ ;  $\alpha_{T2} = .93$ ), Lack of Need Satisfaction ( $\alpha_{T0} = .90$ ;  $\alpha_{T1} = .92$ ;  $\alpha_{T2} = .95$ ), and Chronic Worrying ( $\alpha_{T0} = .87$ ;  $\alpha_{T1} = .90$ ;  $\alpha_{T2} = .87$ ) scales indicated good to very good reliability.

#### Cognitive stress appraisal

The German version of the Primary Appraisal Secondary Appraisal Scale (PASA; Gaab et al., 2005) is based on the transactional stress theory proposed by Lazarus and Folkman (1984)



and measures anticipatory, situation-specific cognitive stress appraisals. The measure is composed of the four primary scales Threat, Challenge, Self-Concept of Own Competence, and Control Expectancy. The four scales can further be combined into two secondary scales: Primary Appraisal (Threat, Challenge), referring to the evaluation of a situation as relevant to one's well-being, and Secondary Appraisal (Self-Concept of Own Competence, Control Expectancy), referring to an individual's assessment of available resources to cope with a stressor. By the difference between the Primary Appraisal and Secondary Appraisal scales, an individual's transactional stress perception expressed by the global PASA Index can be determined – the lower the global PASA Index score, the lower an individual's cognitive stress appraisal. Participants rated four items per primary scale on a 6-point scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Internal consistency measures for the primary scales Threat ( $\alpha_{T0} = .82$ ;  $\alpha_{T1} = .72$ ;  $\alpha_{T2} = .86$ ), Challenge ( $\alpha_{T0} = .56$ ;  $\alpha_{T1} = .81$ ;  $\alpha_{T2} = .66$ ), Self-Concept of Own Competence ( $\alpha_{T0} = .88$ ;  $\alpha_{T1} = .85$ ;  $\alpha_{T2} = .79$ ), and Control Expectancy ( $\alpha_{T0} = .83$ ;  $\alpha_{T1} = .85$ ;  $\alpha_{T2} = .82$ ) indicated questionable to good reliability. The secondary scales Primary Appraisal ( $\alpha_{T0} = .77$ ;  $\alpha_{T1} = .73$ ;  $\alpha_{T2} = .81$ ) and Secondary Appraisal ( $\alpha_{T0} = .87$ ;  $\alpha_{T1} = .87$ ;  $\alpha_{T2} = .85$ ) showed reasonable to very good reliability.

## Results

### Preliminary analyses

To evaluate whether preintervention differences existed on chronic stress screening and subscale scores, a  $4 \times 2$  multivariate ANOVA with chronic stress scales (Chronic Stress Screening, High Work Demand, Lack of Need Satisfaction, Chronic Worrying) as within-subject factor and intervention condition as between-subjects factor was performed on the scores achieved before intervention (T0). There was no significant effect of intervention conditions on the Chronic Stress Screening Scale and subscales,  $F(4,39) < 1$ ,  $p = .719$ ,  $\eta_p^2 = .05$ . Using a univariate ANOVA, we found no significant difference between the intervention conditions in participants' T0 goal attainment scores,  $F(1,42) < 1$ ,  $p = .379$ ,  $\eta_p^2 = 0.02$ , or cognitive stress appraisal,  $F(1,42) < 1$ ,  $p = .692$ ,  $\eta_p^2 = .00$  (for mean values and standard deviations see Table 1). Based on the results, we can conclude that there are no preliminary differences in perceived chronic stress, cognitive stress appraisal, and goal attainment between the coaching and the control condition at T0.

### Main analyses

#### Primary outcomes: goal attainment and perceived chronic stress

In Hypothesis 1, it was assumed that goal attainment would increase significantly more for participants in the coaching interventions than for participants in the control condition. To test this Hypothesis, we conducted variance analyses. However, the intervention conditions did not significantly differ in the change in goal attainment at T1,  $F(1, 41) = 2.48$ ,  $p = .123$ ,  $\eta_p^2 = .06$ , or T2,  $F(1, 41) < 1$ ,  $p = .501$ ,  $\eta_p^2 = .01$ . Thus, Hypothesis 1 was not supported.

Further analyses showed, as indicated by the reported means presented in Table 1, both the coaching ( $p < .001$ ) and the control condition ( $p = .001$ ) participants' goal attainment scores increased significantly from T0 to T1 and remained stable at the 4-week follow-up ( $p = .853$ ;  $p = .180$ ).

**Table 1.** Means (standard deviations) and within-condition effects over time for the primary (goal attainment, chronic stress) and secondary (cognitive stress appraisal) outcomes.

Outcome	T0	T1	T2	df	F	$p$ , $\eta_p^2$
Goal attainment						
Coaching condition <sup>a,b</sup>	3.92 (1.86)	7.04 (0.91)	7.13 (1.85)	2	31.08	.000, .58
Control condition <sup>a,b</sup>	4.45 (2.11)	6.40 (2.11)	6.90 (1.97)	2	16.69	.000, .47
Chronic Stress Screening						
Coaching condition <sup>a,b</sup>	2.04 (0.82)	1.58 (0.67)	1.52 (0.71)	2	6.88	.002, .23
Control condition	1.83 (0.85)	1.60 (0.89)	1.93 (0.81)	2	2.27	.117, .11
High work demands						
Coaching condition <sup>a,b</sup>	2.25 (0.70)	1.91 (0.67)	1.84 (0.64)	2	5.14	.010, .18
Control condition	2.00 (0.58)	1.83 (0.77)	2.15 (0.76)	2	2.78	.074, .13
Lack of need satisfaction						
Coaching condition <sup>a,b</sup>	1.46 (0.43)	1.25 (0.52)	1.20 (0.51)	2	5.10	.010, .18
Control condition	1.45 (0.63)	1.29 (0.56)	1.53 (0.82)	2	1.15	.329, .06
Chronic worrying						
Coaching condition <sup>a,b</sup>	2.32 (0.95)	1.72 (0.80)	1.60 (0.95)	2	6.70	.016, .23
Control condition	2.09 (0.96)	1.71 (1.13)	2.16 (0.94)	2	3.17	.053, .14
Cognitive stress appraisal						
Coaching condition <sup>a,b</sup>	0.65 (1.37)	-0.18 (1.19)	-0.73 (1.29)	2	7.50	.012, .25
Control condition	0.48 (1.55)	0.19 (1.29)	0.21 (1.15)	2	< 1	.487, .03

Note. T0 = pre-treatment; T1 = post-treatment; T2 = 4-week follow-up. <sup>a</sup> T0 vs. T1  $p < .050$ . <sup>b</sup> T0 vs. T2  $p < .050$ . The response format of the goal attainment measure was from 1 (*not at all achieved*) to 10 (*fully achieved*), of the chronic stress screening measure was from 0 (*never*) to 4 (*very often*), and of the cognitive stress appraisal measure was from 1 (*strongly disagree*) to 6 (*strongly agree*). The cognitive stress appraisal was calculated by the difference between the Primary Appraisal and Secondary Appraisal scales (PASA index); the lower the difference score, the lower an individual's cognitive stress appraisal.

We ran further variance analyses to test Hypothesis 2, which states that participants in the coaching condition would report significantly lower levels of stress than participants in the control condition. There was no significant difference between the intervention conditions at T1,  $F(1, 41) < 1$ ,  $p = .446$ ,  $\eta_p^2 = .01$ . At the 4-week follow-up (T2), however, participants in the coaching condition exhibited significantly lower scores on the Chronic Stress Screening Scale than participants in the control condition,  $F(1, 41) = 6.35$ ,  $p = .016$ ,  $\eta_p^2 = .13$ . These differences remained significant when including age and semester as covariates,  $F(1, 37) = 6.99$ ,  $p = .012$ ,  $\eta_p^2 = .16$ . Immediately after the intervention (T1), there was no significant difference between the intervention conditions on the High Work Demands,  $F(1, 41) < 1$ ,  $p = .685$ ,  $\eta_p^2 = .00$ , Lack of Need Satisfaction,  $F(1, 41) < 1$ ,  $p = .697$ ,  $\eta_p^2 = .00$ , and Chronic Worrying,  $F(1, 41) < 1$ ,  $p = .657$ ,  $\eta_p^2 = .01$ , scales. In contrast, participants in the coaching condition reported significantly lower work demands,  $F(1, 41) = 6.08$ ,  $p = .018$ ,  $\eta_p^2 = .13$ , and chronic worrying,  $F(1, 41) = 6.01$ ,  $p = .019$ ,  $\eta_p^2 = .13$ , than participants in the control condition at the 4-week follow-up (T2). These differences remained significant after controlling for age and semester,  $F(1, 37) = 5.77$ ,  $p = .021$ ,  $\eta_p^2 = .14$ , and  $F(1, 37) = 8.57$ ,  $p = .006$ ,  $\eta^2 = .19$ . However, we found a minor effect of the intervention conditions on lack of need satisfaction at T2 that only tended toward statistical significance,  $F(1, 41) = 3.41$ ,  $p = .072$ ,  $\eta_p^2 = .08$ , and  $F(1, 37) = 2.89$ ,  $p = .097$ ,  $\eta_p^2 = .07$ , after considering the control variables. In sum, we found partial support for Hypothesis 2.

Further analyses showed, that the coaching condition participants showed a significant decrease from T0 to T1,  $p = .010$ , that remained stable at the 4-week follow-up (T2),  $p = .708$ . In contrast, participants in the control condition showed

no appreciable change in Chronic Stress Screening scores over time (see Table 1). Moreover, coaching condition participants showed a decrease on the three chronic stress scales over time, as indicated by the means and comparisons in Table 1. High Work Demands, Lack of Need Satisfaction, and Chronic Worrying scores reduced significantly from T0 to T1 ( $p = .041$ ;  $p = .038$ ;  $p = .009$ ) and from T0 to T2 ( $p = .004$ ;  $p = .004$ ;  $p = .007$ ). In contrast, control condition participants' scores on the chronic stress scales did not significantly change from T0 to T1 or from T0 to T2 (all  $ps > .050$ ).

### *Secondary outcome: cognitive stress appraisal*

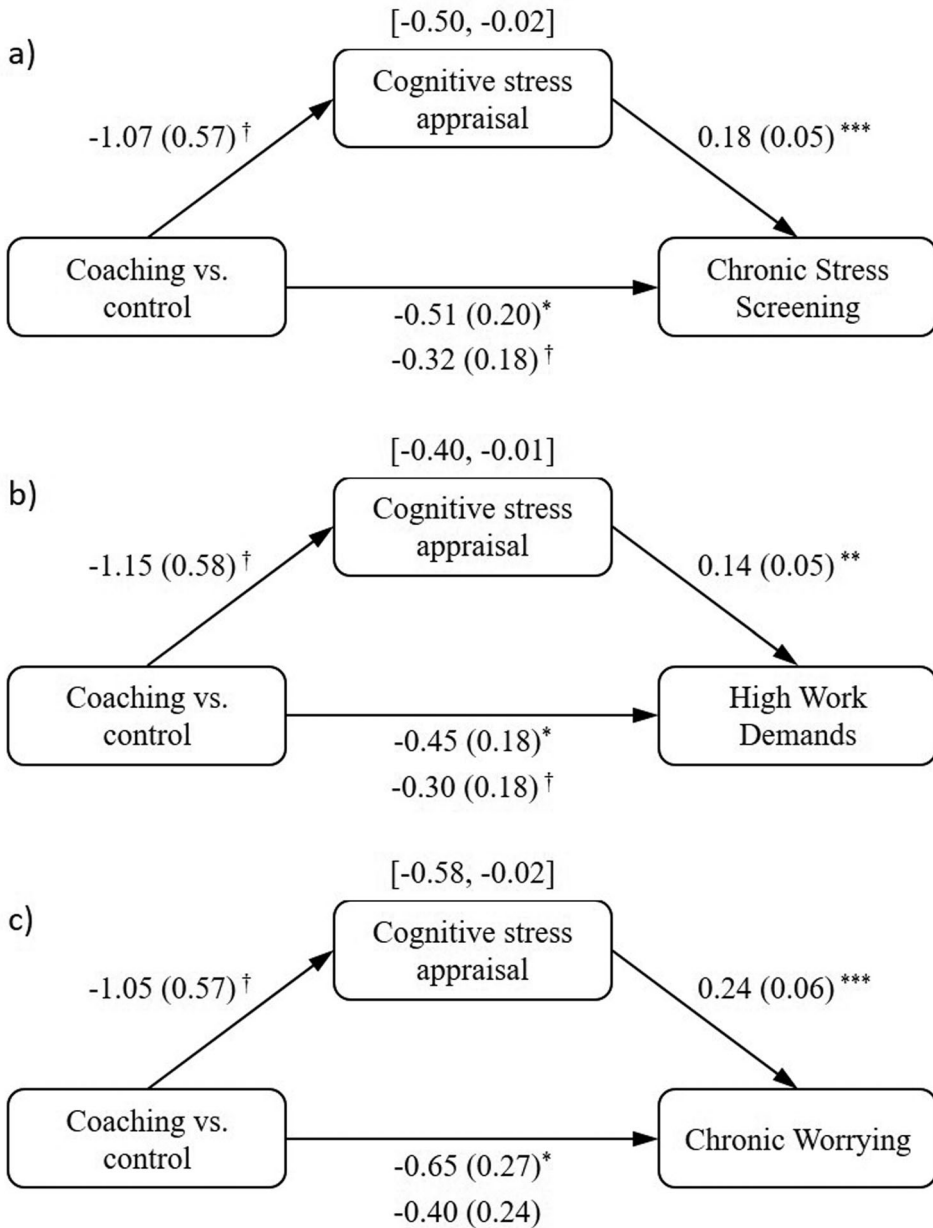
In Hypothesis 3, it was assumed that cognitive stress appraisal would decrease significantly more for participants in the coaching interventions than for participants in the control condition. We conducted further variance analyses to test this Hypothesis. Regarding participants' cognitive stress appraisal represented by the PASA Index score there was no significant difference between the intervention conditions at T1,  $F(1, 41) = 1.44$ ,  $p = .237$ ,  $\eta_p^2 = .03$ . Four weeks after the intervention (T2), however, the PASA Index score decreased significantly more for participants in the coaching condition compared to those in the control condition,  $F(1, 41) = 6.41$ ,  $p = .015$ ,  $\eta_p^2 = .14$ . When we controlled for age and semester, this difference remained significant,  $F(1, 37) = 7.10$ ,  $p = .011$ ,  $\eta_p^2 = .16$ . Thus, we found support for Hypothesis 3.

Further analyses showed that the coaching condition participants showed a significant decrease from T0 to T1,  $p = .026$ , and from T0 to T2,  $p = .003$ . In contrast, the PASA Index score of control condition participants did not change substantially over time (all  $ps > .050$ ).

### *Mediation analyses*

To examine if cognitive stress appraisal mediated the effects of the coaching condition on chronic stress as assumed in Hypothesis 4, we conducted simple mediation analyses using PROCESS (Hayes, 2013, Model 4). Participants' change in cognitive stress appraisal was expressed by the difference between participants' PASA Index scores at T0 and T2. We used this difference measure because we assumed that the coaching intervention would cause a change in the cognitive stress appraisal, which in turn should be responsible for the effect on the chronic stress measure. Using our findings from the main analyses, we entered the intervention condition as independent variable to examine the effects on the dependent variables Chronic Stress Screening, High Work Demands, and Chronic Worrying scores (with T0 scores as a covariate). The mediation models are illustrated in Figure 1.

In line with the reported findings that coaching reduced chronic stress, we found a significant total effect of the coaching condition on Chronic Stress Screening,  $b = -0.51$ ,  $SE = 0.20$ ,  $t(41) = -2.52$ ,  $p = .016$ , High Work Demands,  $b = -0.45$ ,  $SE = 0.18$ ,  $t(41) = -2.46$ ,  $p = .018$ , and Chronic Worrying,  $b = -0.65$ ,  $SE = 0.27$ ,  $t(41) = -2.45$ ,  $p = .019$ , scores. This effect was considerably reduced when the potential mediator cognitive stress appraisal was added to the predictions,  $b = -0.32$ ,  $SE = 0.18$ ,  $t(40) = -1.72$ ,  $p = .093$ ;  $b = -0.30$ ,  $SE = 0.18$ ,  $t(40) = -1.69$ ,  $p = .099$ ;  $b = -0.40$ ,  $SE = 0.24$ ,  $t(40) = -1.67$ ,  $p = .104$ . As expected in Hypothesis 4, the indirect effects through cognitive stress appraisal on Chronic Stress Screening,  $b = -0.19$ ,  $SE = 0.12$ , 95% BC CI  $[-0.50, -0.02]$ , High Work Demands,



**Figure 1.** The effects of the coaching condition on chronic stress subscales via cognitive stress appraisal. Participants' change in cognitive stress appraisal was expressed by the difference between participants' PASA Index scores at T0 and T2. The intervention condition was entered as independent variable to examine the effects on the dependent variables Chronic Stress Screening, High Work Demands, and Chronic Worrying scores at T2 (with T0 scores as a covariate). Values in square brackets represent the 95% bias-corrected confidence interval for indirect effects.  $\dagger p < .10$ ,  $*p < .05$ ,  $**p < .01$ ,  $***p < .001$ .

$b = -0.16$ ,  $SE = 0.10$ , 95% BC CI  $[-0.40, -0.01]$ , and Chronic Worrying,  $b = -0.25$ ,  $SE = 0.14$ , 95% BC CI  $[-0.58, -0.02]$ , scores were significant in a negative direction, as the 95% BC CIs were below zero.

## Discussion

The objective of this field study was to investigate the impact of a cognitive–behavioural coaching intervention on participants’ goal attainment, perceived chronic stress, and cognitive stress appraisal. The results indicate that coaching led to significant improvements in the stress-related outcome criteria. First, coaching effectively supported participants in achieving personal stress-related goals such as developing time management skills, optimising learning strategies, extending their social network, or reducing anxiety, as indicated by the significant increase in their goal attainment scores immediately after the intervention and also four weeks later. Moreover, 6 h of one-on-one coaching had substantial effects with respect to the reduction of overall perceived chronic stress and the related factors work demands and chronic worrying (with minor effects observed for lack of need satisfaction) immediately after the intervention and also four weeks later.

In addition, we also endeavoured to demonstrate whether coaching would have an effect on stress through positively affecting participants’ cognitive stress appraisal. Our findings suggest that participation in coaching was associated with a significant decrease in cognitive stress appraisal over time, which was reflected in participants’ lower PASA Index scores. That is, coaching participants reported perceiving the demands of their academic environment as less challenging or threatening (*primary appraisal*), and they experienced a higher sense of control and competence when dealing with relevant demands (*secondary appraisal*) immediately after the intervention and also four weeks later. Thus it seems that challenging clients’ distorted beliefs and exploring negative feelings about oneself and the environment helped them in reframing work-related experiences and attitudes (Grant, 2001; Neenan, 2008). This is in line with research indicating, for instance, that clients reported a higher tolerance of ambiguity (Grant et al., 2017) and frustration tolerance (David et al., 2016), more beneficial causal attributions in achievement situations (Moen & Skaalvik, 2009) and less fear of negative evaluations (Zanchetta, Junker, et al., 2020) following coaching – important variables highly related to stress (e.g., Bowling & Eschleman, 2010; Chwalisz et al., 1992). Our result further fosters the assumption that coaching has the potential to develop functional behavioural responses to stressful situations (Grant, 2017). Support has been provided by research findings that coaching helped professionals discover and use personal strengths that facilitate the fulfilment of their job role (Grant et al., 2010; MacKie, 2014; Zanchetta, Junker, et al., 2020), develop health-promoting behaviours to better balance work and non-work obligations (Schneider et al., 2014), increase their experience of task-relevant self-efficacy (Grant, 2014) and environmental mastery (Green et al., 2006; Spence et al., 2008). Finally, we identified a mediation effect of cognitive stress appraisal on the relationship between the coaching condition and participants’ level of stress. These results add to the existing knowledge base on the mechanisms of change (David et al., 2016; Grant et al., 2009, 2017; Ladegård, 2011) and provide significant evidence that cognitive–behavioural stress management coaching had the intended effect on a change between the start of the coaching intervention and the follow-up measurement four weeks later in an individual’s cognitive appraisal and the resulting stress response four weeks after the intervention.

Interestingly, we found that the chronic stress scores of both the coaching and the control group participants did not significantly differ immediately. Only four weeks after the end of the coaching intervention, a difference between the two groups became apparent. Past research provides mixed support to this result, as some studies were

able to find an immediate reduction in stress that was sustained for up to several months (e.g., Ogbuanya et al., 2017), while others also failed to demonstrate an immediate effect on stress (e.g., Gyllensten & Palmer, 2005a). However, our mediation results suggest that a change in the cognitive stress appraisal is responsible for the difference in the chronic stress scores between the intervention and the control condition. Therefore, it can be assumed that as soon as an intervention brings about positive changes in the cognitive stress appraisal, the stress experience also changes positively.

Furthermore, only four weeks after the end of the coaching intervention, the coaching and the control group differ in their cognitive stress appraisal. At this point in time, the PASA Index score was *negative* for the coaching group, which means that the experienced sense of control and competence prevail the perceived demands, however, the PASA index score was still *positive* for the control group, which means that the perceived demands prevail the experienced sense of control and competence. This could be an indication that the clients needed a certain period of time, amounting to four weeks, after the coaching intervention for further cognitive examination and re-evaluation resulting in the perception of less threatening demands (*primary appraisal*) and/or in the experience of more control and competence (*secondary appraisal*).

Moreover, our results show that participants who identified and formulated goals without receiving any further intervention also reported a significant increase in goal attainment immediately after the intervention, as well as four weeks later. These results are in line with past research showing that coaching interventions have a significant positive effect on goal attainment, with weaker but still significant effects for control groups that received no coaching (e.g., Grant et al., 2009, 2010; Zanchetta, Junker, et al., 2020). Considering goal-setting theory (Locke & Latham, 2002), the effect on goal attainment within control groups seems plausible: The theory states that goals enhance performance by directing attention and effort to goal-relevant actions, mobilising energy that increases effort, enhancing persistence, and motivating individuals to develop useful knowledge and strategies (Wood & Locke, 1990).

It is noteworthy, however, that we found that goal attainment of both the coaching and the control group participants did not significantly differ immediately after the coaching, as well as four weeks later. A potential explanation for that could be that influential moderating variables could have caused these similar effects on goal attainment in both groups. For example, participants with highly developed self-regulation competences such as planning skills, persistence, or control of hindrance achieve personally relevant goals relatively straightforwardly without any intervention, whereas those with poorly developed self-regulation greatly benefit from goal-focused interventions (Grant et al., 2009; Ladegård, 2011; Willms, 2004). Further research should investigate these personality traits and their moderating influence on goal attainment for participants who have or have not participated in a coaching intervention. Nevertheless, merely setting and achieving stress-related goals within the control group was not sufficient to change participants' cognitive stress appraisal as well as to relieve participants' experience of stress.

### **Limitations**

In the current study, we employed a randomised controlled, longitudinal design that allowed us to draw valid conclusions regarding the effectiveness of interventions.

However, we acknowledge several limitations in this study that could be addressed in future research. First, our design obtained mediator and outcome measures concurrently through pre- and post-treatment assessments. Thus, it is possible that change in perceived stress may have preceded or occurred concurrently with change in cognitive stress appraisal (Kazdin, 2007). Further, follow-up assessments were carried out 4 weeks after the intervention. Whether the positive effect of the coaching on cognitive appraisal and resulting stress are maintained over a longer period of time is still an open question. Second, the study included a relatively small sample, which is associated with reduced statistical power. Third, the observed findings are based on an undergraduate sample that was overrepresented by female students (39 vs. 9 male). As coping styles and the reactions to stress have been found to differ by gender (Matud, 2004), the results may not generalise to study populations characterised by a different gender ratio. It is further questionable if our findings can be extended to a working sample in the organisational environment.

### **Implications and future research**

Taking these limitations into account, our study findings provide important implications for future coaching research and practice. By examining the link between cognitive-behavioural stress management coaching and an individuals' stress response, an important factor – cognitive stress appraisal – was identified. We found that coaching led to a significant decrease in cognitive stress appraisal, suggesting that individuals appear to feel more confident about their ability to cope with a given stressor. Future studies should therefore build on our research by also taking into account an individual's actual coping efforts, another important mediator variable in the stress process (Lazarus, 1990). This is especially important, as potential process variables in the relation between coaching and stress have received little attention until now.

Furthermore, our research holds strong relevance for human resource development professionals. Given the high costs of coaching, it is important to gain reliable evidence on the potential expected outcomes and enhance knowledge on the specific features that characterise effective coaching interventions. We provided evidence that coaching interventions using a cognitive-behavioural approach may have a remarkable influence on employees' ability to deal with stress that arises from their occupational demands and job role. They also suggest that coaching may enable employees to develop useful strategies to manage their stress while putting effort into achieving relevant goals. Especially individuals who lack important resources required for goal striving (e.g., planning skills) might receive effective support through coaching in this regard. Organisations should therefore consider offering stress management coaching to their employees, as coaching has the potential to facilitate the achievement of goals, sustain performance and preserve well-being at the individual and organisational level.

### **Declaration of interest statement**

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



## Data availability statement

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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## References

- American Psychological Association. (2017). *Stress in America: The State of Our Nation. Stress in America™ Survey*. <https://www.apa.org/news/press/releases/stress/2017/state-nation.pdf>
- Biberacher, L. (2010). *Evaluation einer Coachingausbildung* [Evaluation of a coaching formation] [Unpublished diploma thesis]. University of Regensburg, Regensburg, Germany.
- Biron, C., Burke, R. J., & Cooper, C. L. (2014). *Creating healthy workplaces: Stress reduction, improved well-being, and organizational effectiveness*. London: Routledge.
- Bowling, N. A., & Eschleman, K. J. (2010). Employee personality as a moderator of the relationships between work stressors and counterproductive work behavior. *Journal of Occupational Health Psychology, 15*(1), 91–103. <https://www.ncbi.nlm.nih.gov/pubmed/20063961>. <https://doi.org/10.1037/a0017326>
- Bozer, G., & Jones, R. J. (2018). Understanding the factors that determine workplace coaching effectiveness: A systematic literature review. *European Journal of Work and Organizational Psychology, 1*–20. <https://doi.org/10.1080/1359432x.2018.1446946>

- Braumandl, I., Amberger, B., Falkenberg, F., & Kauffeld, S. (2013). Coachen mit Struktur – Konzeptcoaching. Ausbildung zum Coach für Karriere- und Lebensplanung (CoBeCe). Konzept, Theorie und Forschungsergebnisse [Coaching with structure—Concept-coaching. Training to become a coach for career- and life-planning. Concept, theory, and research results]. In R. Wegener, A. Fritze, & M. Loebbert (Eds.), *Coaching-Praxisfelder. Forschung und Praxis im Dialog* (pp. 73–83). Springer Verlag.
- Braumandl, I., & Dirscherl, B. (2005). *Karrierecoachingkonzept für Studierende* [Careercoaching-concept for students] [Unpublished course concept]. University of Regensburg, Regensburg, Germany.
- Burt, D., & Talati, Z. (2017). The unsolved value of executive coaching: A meta-analysis of outcomes using randomised control trial studies. *International Journal of Evidence Based Coaching and Mentoring*, 15(2), 17–24. doi:10.24384/000248.
- Chwalisz, K., Altmaier, E. M., & Russell, D. W. (1992). Causal attributions, self-efficacy cognitions, and coping with stress. *Journal of Social and Clinical Psychology*, 11(4), 377–400. <https://doi.org/10.1521/jscp.1992.11.4.377>
- CompassPoint Nonprofit Services. (2003). *Executive coaching project: Evaluation of findings*. <http://www.compasspoint.org/>
- Dallner, M., Elo, A.-L., Gamberale, F., Hottinen, V., Knardahl, S., Lindström, K., Skogstad, A., & Orhede, E. (2000). *Validation of the general Nordic questionnaire (QPS-Nordic) for psychological and social factors at work*. Nordic Council of Ministers.
- David, O. A., Ionićoiu, I., Imbăruş, A. C., & Sava, F. A. (2016). Coaching Banking managers through the financial crisis: Effects on stress, resilience, and performance. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, 34(4), 267–281. <https://doi.org/10.1007/s10942-016-0244-0>
- de Haan, E., Grant, A. M., Burger, Y., & Eriksson, P.-O. (2016). A large-scale study of executive and workplace coaching: The relative contributions of relationship, personality match, and self-efficacy. *Consulting Psychology Journal: Practice and Research*, 68(3), 189–207. <https://doi.org/10.1037/cpb0000058>
- De Meuse, K. P., Dai, G., & Lee, R. J. (2009). Evaluating the effectiveness of executive coaching: Beyond ROI? *Coaching: An International Journal of Theory, Research and Practice*, 2(2), 117–134. <https://doi.org/10.1080/17521880902882413>
- Ellis, A. (1962). *Reason and emotion in psychotherapy*. Lyle Stuart.
- Farrington, D. P. (2003). Methodological quality standards for evaluation research. *The ANNALS of the American Academy of Political and Social Science*, 587(1), 49–68. <https://doi.org/10.1177/0002716202250789>
- Gaab, J., Rohleder, N., Nater, U. M., & Ehler, U. (2005). Psychological determinants of the cortisol stress response: The role of anticipatory cognitive appraisal. *Psychoneuroendocrinology*, 30(6), 599–610. <https://www.ncbi.nlm.nih.gov/pubmed/15808930>. <https://doi.org/10.1016/j.psyneuen.2005.02.001>
- Grant, A. M. (2001). *Towards a psychology of coaching: The impact of coaching on metacognition, mental health and goal attainment* [Dissertation]. Macquarie University, Sydney, Australia. Retrieved from <https://www.researchgate.net/publication/228598134>.
- Grant, A. M. (2003). The impact of life coaching on goal attainment, metacognition and mental health. *Social Behavior and Personality: an International Journal*, 31(3), 253–263. <https://doi.org/10.2224/sbp.2003.31.3.253>
- Grant, A. M. (2012). An integrated model of goal-focused coaching: An evidence-based framework for teaching and practice. *International Coaching Psychology Review*, 7(2), 146–165.
- Grant, A. M. (2014). The efficacy of executive coaching in times of organisational change. *Journal of Change Management*, 14(2), 258–280. <https://doi.org/10.1080/14697017.2013.805159>
- Grant, A. M. (2017). Solution-focused cognitive-behavioral coaching for sustainable high performance and circumventing stress, fatigue, and burnout. *Consulting Psychology Journal: Practice and Research*, 69(2), 98–111. <https://doi.org/10.1037/cpb0000086>
- Grant, A. M., & Cavanagh, M. J. (2007). Evidence-based coaching: Flourishing or languishing? *Australian Psychologist*, 42(4), 239–254. <https://doi.org/10.1080/00050060701648175>
- Grant, A. M., Curtaeyne, L., & Burton, G. (2009). Executive coaching enhances goal attainment, resilience and workplace well-being: A randomised controlled study. *The Journal of Positive Psychology*, 4(5), 396–407. <https://doi.org/10.1080/17439760902992456>

- Grant, A. M., Green, L. S., & Rynsaardt, J. (2010). Developmental coaching for high school teachers: Executive coaching goes to school. *Consulting Psychology Journal: Practice and Research*, 62(3), 151–168. <https://doi.org/10.1037/a0019212>
- Grant, A. M., & Hartley, M. (2013). Developing the leader as coach: Insights, strategies and tips for embedding coaching skills in the workplace. *Coaching: An International Journal of Theory, Research and Practice*, 6(2), 102–115. <https://doi.org/10.1080/17521882.2013.824015>
- Grant, A. M., Studholme, I., Verma, R., Kirkwood, L., Paton, B., & O'Connor, S. (2017). The impact of leadership coaching in an Australian healthcare setting. *Journal of Health Organization and Management*, 31(2), 237–252. <https://www.ncbi.nlm.nih.gov/pubmed/28482767>. <https://doi.org/10.1108/JHOM-09-2016-0187>
- Green, L. S., Oades, L. G., & Grant, A. M. (2006). Cognitive-behavioral, solution-focused life coaching: Enhancing goal striving, well-being, and hope. *The Journal of Positive Psychology*, 1(3), 142–149. <https://doi.org/10.1080/17439760600619849>
- Gyllensten, K., & Palmer, S. (2005a). Can coaching reduce workplace stress? A Quasi-experimental study. *International Journal of Evidence Based Coaching and Mentoring*, 3(2), 75–85.
- Gyllensten, K., & Palmer, S. (2005b). The relationship between coaching and workplace stress: A correlational study. *International Journal of Health Promotion and Education*, 43(3), 97–103. <https://doi.org/10.1080/14635240.2005.10708048>
- Hamlin, R. G., Ellinger, A. D., & Beattie, R. S. (2008). The emergent 'coaching industry': A wake-up call for HRD professionals. *Human Resource Development International*, 11(3), 287–305. <https://doi.org/10.1080/13678860802102534>
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Press.
- International Labour Organization. (2018). *Psychosocial risks and work-related stress*. [http://www.ilo.org/safework/areasofwork/workplace-health-promotion-and-well-being/WCMS\\_108557/lang-en/index.htm](http://www.ilo.org/safework/areasofwork/workplace-health-promotion-and-well-being/WCMS_108557/lang-en/index.htm)
- Jones, R. J., Woods, S. A., & Guillaume, Y. R. F. (2016). The effectiveness of workplace coaching: A meta-analysis of learning and performance outcomes from coaching. *Journal of Occupational and Organizational Psychology*, 89(2), 249–277. <https://doi.org/10.1111/joop.12119>
- Kazdin, A. E. (2007). Mediators and mechanisms of change in psychotherapy research. *Annual Review of Clinical Psychology*, 3(1), 1–27. <https://www.ncbi.nlm.nih.gov/pubmed/17716046>. <https://doi.org/10.1146/annurev.clinpsy.3.022806.091432>
- Kotte, S., Hinn, D., Oellerich, K., & Möller, H. (2016). Der Stand der Coachingforschung: Kernergebnisse der vorliegenden Metaanalysen. *Organisationsberatung, Supervision, Coaching*, 23(1), 5–23. <https://doi.org/10.1007/s11613-016-0444-6>
- Ladegård, G. (2011). Stress management through workplace coaching: The impact of learning experiences. *International Journal of Evidence Based Coaching and Mentoring*, 9(1), 29–43.
- Lazarus, R. S. (1990). Theory-based stress measurement. *Psychological Inquiry*, 1(1), 3–13. [https://doi.org/10.1207/s15327965pli0101\\_1](https://doi.org/10.1207/s15327965pli0101_1)
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer.
- Lazarus, R. S., & Folkman, S. (1987). Transactional theory and research on emotions and coping. *European Journal of Personality*, 1(3), 141–169. <https://doi.org/10.1002/per.2410010304>
- Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist*, 57(9), 705–717. <https://doi.org/10.1037/0003-066X.57.9.705>
- MacKie, D. (2014). The effectiveness of strength-based executive coaching in enhancing full range leadership development: A controlled study. *Consulting Psychology Journal: Practice and Research*, 66(2), 118–137. <https://doi.org/10.1037/cpb0000005>
- Matud, M. P. (2004). Gender differences in stress and coping styles. *Personality and Individual Differences*, 37(7), 1401–1415. <https://doi.org/10.1016/j.paid.2004.01.010>
- Moen, F., & Skaalvik, E. (2009). The effect from executive coaching on performance psychology. *International Journal of Evidence Based Coaching and Mentoring*, 7(2), 31–49.
- Mühlberger, M. D., & Traut-Mattausch, E. (2015). Leading to effectiveness: Comparing dyadic coaching and group coaching. *The Journal of Applied Behavioral Science*, 51(2), 198–230. <https://doi.org/10.1177/0021886315574331>

- Neenan, M. (2008). From cognitive behaviour therapy (CBT) to cognitive behaviour coaching (CBC). *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, 26(1), 3–15. <https://doi.org/10.1007/s10942-007-0073-2>
- Noblet, A., & Lamontagne, A. D. (2006). The role of workplace health promotion in addressing job stress. *Health Promotion International*, 21(4), 346–353. <https://www.ncbi.nlm.nih.gov/pubmed/16880197>. <https://doi.org/10.1093/heapro/dal029>
- Ogbuanya, T. C., Eseadi, C., Orji, C. T., Ohanu, I. B., Bakare, J., & Ede, M. O. (2017). Effects of rational emotive behavior coaching on occupational stress and work ability among electronics workshop instructors in Nigeria. *Medicine (Baltimore)*, 96(19), e6891. <https://www.ncbi.nlm.nih.gov/pubmed/28489795>. <https://doi.org/10.1097/MD.00000000000006891>
- Richardson, K. M., & Rothstein, H. R. (2008). Effects of occupational stress management intervention programs: A meta-analysis. *Journal of Occupational Health Psychology*, 13(1), 69–93. <https://www.ncbi.nlm.nih.gov/pubmed/18211170>. <https://doi.org/10.1037/1076-8998.13.1.69>
- Schneider, S., Kingsolver, K., & Rosdahl, J. (2014). Physician coaching to enhance well-being: A qualitative analysis of a pilot intervention. *EXPLORE*, 10(6), 372–379. <https://www.ncbi.nlm.nih.gov/pubmed/25240635>. <https://doi.org/10.1016/j.explore.2014.08.007>
- Schulz, P., Schlotz, W., & Becker, P. (2004). *Das Trierer Inventar zum chronischen stress (TICS)* [Trier Inventory for Chronic Stress (TICS)]. Hogrefe.
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Houghton, Mifflin and Company.
- Sonesh, S. C., Coultas, C. W., Lacerenza, C. N., Marlow, S. L., Benishek, L. E., & Salas, E. (2015). The power of coaching: A meta-analytic investigation. *Coaching: An International Journal of Theory, Research and Practice*, 8(2), 73–95. <https://doi.org/10.1080/17521882.2015.1071418>
- Spence, G. B. (2007). GAS powered coaching: Goal attainment scaling and its use in coaching research and practice. *International Coaching Psychology Review*, 2(2), 155–167.
- Spence, G. B., Cavanagh, M. J., & Grant, A. M. (2008). The integration of mindfulness training and health coaching: An exploratory study. *Coaching: An International Journal of Theory, Research and Practice*, 1(2), 145–163. <https://doi.org/10.1080/17521880802328178>
- Theeboom, T., Beersma, B., & van Vianen, A. (2014). Does coaching work? A meta-analysis on the effects of coaching on individual level outcomes in an organizational context. *The Journal of Positive Psychology*, 9(1), 1–18. <https://doi.org/10.1080/17439760.2013.837499>
- van der Klink, J. J. L., Blonk, R. W. B., Schene, A. H., & van Dijk, F. J. H. (2001). The benefits of interventions for work-related stress. *American Journal of Public Health*, 91(2), 270–276. <https://doi.org/10.2105/AJPH.91.2.270>
- Vanhove, A. J., Herian, M. N., Perez, A. L. U., Harms, P. D., & Lester, P. B. (2016). Can resilience be developed at work? A meta-analytic review of resilience-building programme effectiveness. *Journal of Occupational and Organizational Psychology*, 89(2), 278–307. <https://doi.org/10.1111/joop.12123>
- Willms, J.-F. (2004). *Coaching zur Umsetzung persönlicher Ziele. Entwicklung, Durchführung und Evaluation*. Universität Osnabrück.
- Wood, R., & Locke, E. A. (1990). Goal setting and strategy effects on complex tasks. In B. Staw, & L. Cummings (Eds.), *Research in organizational behavior* (pp. 73–109). JAI Press.
- Zanchetta, M., Junker, S., Wolf, A.-M., & Traut-Mattausch, E. (2020). “Overcoming the fear that haunts your success” – the effectiveness of interventions for reducing the impostor phenomenon. *Frontiers in Psychology*, 11(405), 1–15. <https://doi.org/10.3389/fpsyg.2020.00405>.
- Zanchetta, M., Pömmer, M., & Traut-Mattausch, E. (2020). A cognitive-behavioural stress management coaching. *Manuscript in Preperation*.