

Antoni, Conny H.; Tatar, Alexandra

Article — Published Version

Learning processes as mediators of the impact of workplace coaching interventions on goal attainment

Journal of Occupational and Organizational Psychology

Provided in Cooperation with:

John Wiley & Sons

Suggested Citation: Antoni, Conny H.; Tatar, Alexandra (2025) : Learning processes as mediators of the impact of workplace coaching interventions on goal attainment, Journal of Occupational and Organizational Psychology, ISSN 2044-8325, Wiley Periodicals, Inc., Hoboken, NJ, Vol. 98, Iss. 1, <https://doi.org/10.1111/joop.70004>

This Version is available at:

<https://hdl.handle.net/10419/313704>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



<http://creativecommons.org/licenses/by-nc-nd/4.0/>

RESEARCH ARTICLE

Learning processes as mediators of the impact of workplace coaching interventions on goal attainment

Conny H. Antoni  | Alexandra Tatar

Trier University, Trier, Germany

Correspondence

Conny H. Antoni, Work and Organizational Psychology, Trier University, Trier 54286, Germany.
Email: antoni@uni-trier.de

Abstract

This study contributes to research on how workplace coaching works by examining learning processes as a mediating mechanism of the impact of problem-specific interventions on goal attainment. This has rarely been investigated. Fifty-five coach–coachee dyads with 51 coaches and 55 coachees participated in the study. Workplace coaching lasted seven to eight coaching sessions in average. Coaches and coachees gave ratings in each session. We analysed this data (NLevel2 = 55, NLevel1 = 335–407) using longitudinal multilevel structural equation modelling accounting for the nested data structure. As expected, coachees' perceived goal attainment increased throughout the coaching process. The results of the study also revealed the mediating role of learning processes in the impact of problem-specific interventions, specifically clarification of meaning and mastery/coping, and, but to a lesser extent, implementation actuation, on goal attainment in coaching. Data for all hypothesised models showed a good or acceptable model fit. In contrast, the model fit was poor, when we explored differential mediation effects, which supported only single-loop learning as a mediator. These results underscore the importance of stimulating learning processes through specific interventions to improve the effectiveness of workplace coaching.

KEYWORDS

clarification of meaning, coaching effectiveness, coaching processes, common factors, implementation actuation, mastery/coping

Conny H. Antoni and Alexandra Tatar share the first authorship.

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2025 The Author(s). *Journal of Occupational and Organizational Psychology* published by John Wiley & Sons Ltd on behalf of The British Psychological Society.

Practitioner points

- Coaches can stimulate different types of self-regulation and learning processes according to coachee's needs through problem-specific interventions that facilitate goal attainment. These include supporting coachees in adapting their action strategies, reflecting on and clarifying their problems and goals and experiencing the associated emotions.
- By supporting coachees in modifying their action plans to better achieve their goals, coaches facilitate their single-loop learning, enhancing goal attainment.
- If coaches realise that coachees cannot attain their goals by adapting their actions and action plans alone (single-loop learning), they should support double-loop learning. This means that coaches support coachees in reflecting on the assumptions underlying their goals and work behaviour as well as the emotional experiences connected to these assumptions. Following this reflection, coaches assist their coachees in developing alternative action strategies aligned with their goals.

INTRODUCTION

Organisations are increasingly relying on coaching as a tool for human resource development (Bozer et al., 2022). Boyatzis et al. (2022) assert that coaching practices have outpaced research. Nevertheless, the number and quality of studies attesting to the efficacy of workplace coaching have increased, as evidenced by recent meta-analyses. Workplace coaching enhances personal and work-related outcomes, including well-being, skill development, self-efficacy, job performance and *goal attainment* (De Haan & Nilsson, 2023; Nicolau et al., 2023; Wang et al., 2022).

Systematic reviews have also identified the key inputs, processes and contextual factors influencing coaching effectiveness (Kotte & Bozer, 2022; Plotkina & Sri Ramalu, 2024). The identified input factors include the characteristics of the coach and coachee (such as the coach's educational background and the coachee's motivations). Contextual factors possibly influencing coaching effectiveness include the presence of a supportive organisational context. Process factors include the coach–coachee working alliance, identified as a key factor (Graßmann et al., 2020), as well as the specific coaching interventions employed. However, specific coaching interventions are particularly under-researched (Kotte & Bozer, 2022, pp. 978–979).

Coaching is a dynamic learning process (Erdös & Ramseyer, 2021), whereby the coach facilitates the coachee's learning capacity by fostering a goal-oriented self-regulatory process (Grant & O'Connor, 2022). Unfortunately, most studies analysing coaching processes employ between-subject designs (De Haan & Nilsson, 2023), which are inadequate for analysing the complexity and dynamics of within-person changes and learning processes.

Although learning is critical for positive coaching outcomes (De Haan et al., 2010), particularly goal attainment (Kizilcec et al., 2017), the role of *learning processes* in coaching remains largely underexplored. A recent longitudinal study (Weinberg & Hausfeld, 2024) proposed that personal learning mediates the level of coaching readiness and trust in the coach and the effectiveness of their work. However, the study's between-person design and simultaneous assessment of learning and work effectiveness restrict the ability to confirm mediation processes.

The sequential process model of coaching (Zimmermann & Antoni, 2018a) provides a framework for analysing how workplace coaching works. The model suggests that problem-specific coaching interventions, including *clarification of meaning*, *mastery/coping* and *implementation action*, facilitate goal attainment by adapting strategies and behaviours. Zimmermann and Antoni (2018b) employed the concept of *double-loop learning (DLL)* as proposed by Argyris and Schön (1974) to examine the mechanisms through which coaching facilitates goal attainment. Their findings support an indirect effect of DLL on goal attainment,

whereby the clarification of meaning and mastery/coping via DLL contributes to this outcome. However, *single-loop learning* (SLL), the second learning construct proposed by Argyris and Schön (1974), has not yet been investigated. Moreover, the researchers did not focus on workplace coaching, and the sample size was relatively limited, comprising both students and employees, which constrains the generalisability of their findings. Further studies, including both SLL and DLL, should verify whether the reported effects are consistent in workplace settings. This study aimed to address these limitations.

First, we evaluated the efficacy of goal-oriented workplace coaching by analysing how goal attainment progresses throughout the coaching process. Second, we build upon the findings of Zimmermann and Antoni (2018b) by integrating both SLL and DLL into the framework of learning processes. Third, we examined the mediating role of learning processes, encompassing SLL and DLL, on the impact of problem-specific interventions, including *clarification of meaning*, *mastery/coping* and *implementation actuation*, on goal attainment (cf. Figure 1). Fourth, we investigated the distinct roles of the SLL and DLL as mediators. Fifth, we addressed the lack of longitudinal methods in coaching research, as identified by Hinn et al. (2022), by employing different measures over time and accounting for nested data structures using longitudinal structural equation modelling.

HYPOTHESES DEVELOPMENT

Workplace coaching as a goal-oriented learning process

Bozer and Jones (2018) define coaching as a learning process that places the coachee at the centre of a learning experience. This pivotal role of learning is also reflected in the definition of workplace coaching as ‘a one-on-one learning and development intervention that uses a collaborative, reflective, and goal-focused relationship to achieve professional outcomes valued by the coachee’ (Jones et al., 2016, p. 250). Both definitions emphasise that workplace coaching aims to assist coachees in achieving their goals through learning. Consequently, coaching research has focused on goals and goal-related activities (Müller & Kotte, 2020) and has measured success by goal achievement (Theeboom et al., 2014). Although these definitions imply that learning mediates the effects of coaching interventions on goal attainment, little empirical research has been conducted on coaches' learning processes. Before analysing these in detail, we focused on the role of goals in coaching.

Goals are internal representations of desired outcomes (Austin & Vancouver, 1996). This is a fundamental aspect of all theories of self-regulation (Sitzmann & Ely, 2011). Challenging goals with frequent feedback on goal progress has been demonstrated to enhance motivation (Clark et al., 2020) and facilitate self-regulated actions (Carver & Scheier, 1998; Hacker, 2003; Wong et al., 2021). Goal setting theory differentiates between performance and learning goals. It proposes that to attain performance goals, one must use existing skills, whereas for learning goals, one must devise novel strategies for success (Latham & Locke, 2007; Locke & Latham, 2002). This approach fosters enhanced self-regulated learning (Sitzmann & Ely, 2011) and performance (McLucas et al., 2024).

Research supports that a goal-focused coach–coachee relationship is a stronger predictor of coaching success than satisfaction with a coach–coachee relationship or autonomy support and proximity to an ‘ideal’

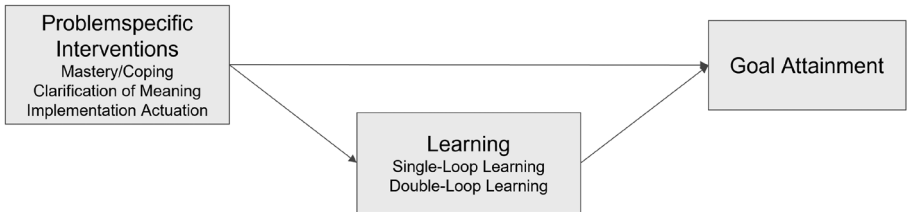


FIGURE 1 Conceptual model of our study.

relationship (Grant, 2014). Meta-analytical findings have confirmed that goal-oriented workplace coaching enhances coachees' goal-directed self-regulation (Theeboom et al., 2014) and goal attainment (Sonesh et al., 2015; Wang et al., 2022). In addition, stronger effects are found for goal attainment than for other outcomes, such as job skills and well-being, and the overall weighted effect (De Haan & Nilsson, 2023).

Within-subject designs show stronger effects than between-subject designs (Theeboom et al., 2014), suggesting that goal-oriented workplace coaching supports changes within coachees over time, facilitating goal attainment.

Hypothesis 1. Goal-oriented workplace coaching supports changes in coachees over time, facilitating goal attainment.

Learning processes in coaching

Over the past few decades, numerous learning theories have been discussed in coaching literature to explain how coaching works, such as transformative learning theories (Cox, 2015), Bandura's (1991) social cognitive learning theory (Connolly, 2017) or behavioural, cognitive and social constructivism (Hurlow, 2022). Furthermore, the concepts of DLL and SLL (Argyris & Schön, 1974) have been used to develop the concept of double-loop leadership coaching (Witherspoon, 2014) and to examine sequential coaching processes (Zimmermann & Antoni, 2018b).

Single-loop and double-loop learning

Argyris and Schön (1974, 1978) proposed that individuals engage in self-monitoring to ascertain the efficacy of their actions and modify their strategies and behaviours per this assessment. Upon realising that their actions have failed to yield the intended results, individuals modify their behaviour to attain their goals. Should this behavioural adjustment proves efficacious in resolving the issue and achieving the desired outcome, Argyris and Schön (1974) designated it as SLL, signifying that the individual has acquired the capacity to adapt their behaviour to successfully address the problem. Hummelbrunner and Reynolds (2013) describe SLL as 'learning to adapt' (p. 1), with the fundamental question being 'Are we doing things right?' (p. 1). Furthermore, they characterised SLL as a method of addressing symptoms but not the underlying causes. Argyris and Schön (1974) contended that individuals are primarily inclined towards SLL when addressing matters involving others and contentious issues.

In cases where multiple behavioural adjustments fail to achieve the desired outcome, DLL is required. DLL involves individuals reflecting on their goals, situational conditions and underlying assumptions of their unsuccessful problem-solving attempts to gain insight into the fundamental causes of the problem and identify a novel and efficacious approach to problem-solving (Argyris & Schön, 1978). DLL prompts the question, 'Are we doing the right things?' It is described as 'learning to change' (Hummelbrunner & Reynolds, 2013, p. 1) or transformative learning to change meaning perspectives (Terblanche, 2020). Therefore, DLL is primarily a cognitive learning process in which the underlying assumptions of behavioural patterns are questioned and reflected upon (Terblanche, 2020). By contrast, SLL is primarily a behavioural learning process that leads to changes in plans and behaviours based on given assumptions (Hayes & Allinson, 1998). In this respect, DLL can be described as having a higher level of self-reflection than SLL (Greif, 2008).

Coaching as a cyclical process of self-regulation

Similar to SLL and DLL, self-monitoring and self-reflection on one's actions are at the core of the generic model of goal-directed self-regulation in coaching. Grant and O'Connor (2022) described

coaching as a cyclical process of self-regulation in six stages: (1) identifying the issue; (2) setting a goal; (3) developing an action plan; (4) acting; (5) monitoring, evaluating, changing what is working and doing more of what works and (6) success. If the result of Stage 5 is that the coachees' actions are ineffective in achieving their goals, they must change what is not working. This may prompt coachees to modify their actions, revert to Stage 3 and develop an alternative action plan, revert to Stage 2 and modify their goals or revert to Stage 1 and analyse the underlying causes of their problems before progression in this dynamic process, which involves some overlap in practice (Grant & O'Connor, 2022).

Changing one's actions or action plans without analysing the underlying causes of the problem or changing one's goals is consistent with SLL. Similarly, analysing the underlying causes of a problem or changing one's goals is consistent with DLL, which involves questioning one's underlying assumptions. Therefore, both SLL and DLL can be integrated into a cyclical model of goal-directed self-regulation in coaching, as both describe dynamic self-regulation processes with feedback loops.

In the following, we argue why problem-specific coaching interventions stimulate learning processes, including SLL and DLL.

Problem-specific interventions in coaching

The concept of common success factors (Grawe, 2007), which is empirically well established in psychotherapy research (Gómez-Penedo et al., 2023), is also one of the most influential concepts applied to coaching research (Behrendt & Greif, 2022). There are five common factors, which are divided into two categories (Grawe, 2007). The first category focuses on activating resources and the therapist–client working alliance to foster positive emotions and support. The second category comprises clarification of meaning, mastery/coping, and implementation actuation as problem-specific interventions. Psychotherapy research has shown that problem-specific interventions, particularly clarification of meaning and mastery/coping, can directly support clients' learning and change by potentially stimulating new neural connections and influencing therapy outcomes beyond the therapist–client working alliance, while the activation of resources is assumed to facilitate, but not directly influence, learning (Gómez-Penedo et al., 2023; Grawe, 2007). Therefore, this study focused on problem-specific interventions.

Coaches use clarification of meaning interventions to explore coachees' concerns and problems to establish mutual understanding and agreement on specific coaching goals. To achieve this, they encourage the coachees to reflect on their current behavioural patterns and goals. The objective is to enable coachees to better understand the motivational factors that underlie their behaviour and to identify the implicit meanings of their interactions. Clarification of meaning primarily focuses on cognitive processes, as it entails reflective questioning of coachees' behavioural patterns and goals to help them clarify their implicit assumptions, motives and goals.

To facilitate behavioural change and align action strategies with desired outcomes, coaches use mastery/coping interventions such as providing advice and instruction. Accordingly, mastery/coping interventions primarily focus on coachee behaviour to help them attain their goals.

Coaches use implementation actuation interventions (also referred to as problem actualisation) to facilitate coachees' emotional engagement with a given situation, thereby enhancing their ability to transfer alternative behaviours to their work environment.

Learning as a mediator between problem-specific interventions and goal attainment

As described above, we assume that problem-specific interventions can stimulate coachees' SLL and DLL and improve their self-regulation processes. As SLL and DLL lead to changes and improved

goal attainment, we assume that learning processes mediate the effects of problem-specific coaching interventions on goal attainment. Referring to the generic model of goal-directed self-regulation (Grant & O'Connor, 2022), coaches use problem-specific interventions to facilitate the self-regulation processes of their coachees to monitor, evaluate and adjust goal-directed actions (SLL). Further, if needed, reflect on and adapt their issues, goals and respective action strategies (DLL), thus indirectly supporting goal achievement through these learning processes. Definitions of coaching, which conceptualise it as a goal-oriented learning process (Bozer & Jones, 2018; Müller & Kotte, 2020), imply a cause–effect mechanism in which coaches' interventions stimulate their coachees' learning processes, which mediate the effects of their interventions on coaching success.

Problem-specific interventions to stimulate learning processes and facilitate the self-regulation processes of their coachees to monitor, evaluate and adjust goal-directed actions (SLL) and to reflect on and adapt their issues, goals and respective action strategies (DLL) encompass mastery/coping, clarification of meaning and implementation actuation. Therefore, we propose the following mediation hypothesis:

Hypothesis 2. Mastery/coping interventions lead to coachees' goal attainment through coachees' learning processes.

Hypothesis 3. Clarification of meaning interventions lead to coachees' goal attainment through their learning processes.

Hypothesis 4. Implementation actuation interventions lead to the coachees' goal attainment through their learning processes.

Exploratory research questions

An interesting question is whether mastery/coping, clarification of meaning and implementation actuation interventions stimulate differential learning processes. Given that coaches utilise clarification of meaning interventions to question coachees' current behavioural patterns and goals to help them identify implicit meanings and motivational factors that underlie their behaviour, it could be argued that they are more closely aligned with DLL than with SLL. This is because DLL describes how gaining insights into the fundamental causes of problems and identifying novel and effective problem-solving approaches. In contrast, coaches use mastery/coping interventions, such as providing advice and guidance, to facilitate the development or adaptation of their coachees' action plans for problem-solving. This suggests mastery/coping interventions may be more closely associated with SLL than with DLL. This is because SLL states that coachees have acquired the capacity to adapt their behaviour to successfully address their problems. Coaches employ implementation actuation interventions to engage with the emotional dimensions associated with their issues in specific situations, identifying the problem itself. It could be posited that this approach may assist coachees in reflecting and understanding the motivational dynamics, thus providing support for DLL.

However, given that Grant and O'Connor (2022) argue that the process of self-regulation is cyclical and dynamic, with overlapping stages, SLL and DLL may also be closely linked. For example, when coaches use clarification of meaning interventions and question coachees' goals, they may examine the underlying causes of their problems. Further, when they identify new causes, they may also obtain insights for alternative action plans better suited to solve their problems. Conversely, when coaches suggest alternative action plans, they may also obtain a different problem perspective and become aware of their behavioural patterns. Indeed, Zimmermann and Antoni (2018b) showed that both mastery/coping and the clarification of meaning stimulated DLL. As it seems difficult to substantiate clear predictions, we will explore the extent to which mastery/coping, clarification of meaning and implementation actuation interventions stimulate SLL and DLL differentially and thus influence goal attainment.

METHODS

To test the mediating hypotheses regarding the learning processes in workplace coaching, we focused on within-person effects using a quantitative longitudinal multilevel design. We analysed coach–coachee dyads in a workplace setting using established and validated scales to measure each model variable, with ratings provided by both the coach and coachee at the beginning and end of each session.

Participants

Fifty-five coach–coachee dyads, with 51 coaches and 55 coachees participated in this study. The coachees were between 21 and 62 years old ($M=36.89$, $SD=10.17$); 58.2% were female. All coachees were employed and came from different professional backgrounds, namely economics (27.27%), health care/social work (12.7%), IT (7.27%), psychology (3.63%), pedagogy (3.63%) and others (40%). The coachees worked between 20 and 60 h a week ($M=40.00$, $SD=8.20$) and were highly educated, with 59.69% holding a bachelor's degree or higher.

The coaches were between 22 and 67 years old ($M=38.49$, $SD=10.86$); 83.60% of the coaches were female, and 14.50% were male, reflecting the greater interest of women in coach training. One coach did not answer the gender question, and two did not indicate their age. Coaches were native German speakers and mainly employed (83.60%); 9.09% were students, and 5.45% had another status. 64.71% Of the coaches had at least a bachelor's degree, 15.69% did not report their degree. Coaches reported diverse occupations, including leadership/management (17.65%), economics (15.69%), psychology (15.69%), research/science (13.73%), human resources (13.73%), pedagogy (7.84%), health care/social work (5.88%) and others (9.80%). Only four had previously worked as professional coaches.

All the coaches participated in a coach training program offered by a German university. The program trainer was an experienced coach and supervisor and was not involved in this study. Conversely, we were not involved in the enrolment or training processes.

Coach training program

The training lasted 150h and was taught in German. It was aimed at consultants, human relations professionals and managers and was advertised online by the university. Before enrolment, the participants and the trainer clarified their mutual expectations and fit.

Each training session consisted of seven 2-day modules with a maximum of 10 participants. The five modules focused on knowledge transfer and practical training interventions for work-related issues, such as conflict resolution, employee motivation, stress management and self-improvement, using role plays, peer consultations, feedback and supervised practice. Training aimed to provide a comprehensive understanding of how common factors (Grawe, 2007; Greif, 2008) influence coaching success, train coaches to apply problem-specific interventions, activate coaches' resources and build a good working alliance. The last two modules are used for case-based supervision. Each coach was required to conduct at least one full coaching process with a coachee supervised by a program trainer. Coaches were responsible for recruiting their own coaches and determining the terms of coaching, including payment arrangements. The coaches and coachees were not allowed to know each other prior to the coaching session.

Research procedure and design

Before coaching began, coaches were informed about the study and provided informed consent to complete questionnaires throughout the coaching process, before and after each coaching session, using

an online portal. These questionnaires served both as tools for mutual feedback to monitor coaching progress and as a database for this study. The local ethics committee of the university approved this study in compliance with the ethical standards (EK Nr. 80/2018).

Coaching typically consisted of seven to eight sessions ($M=7.44$; $SD=2.15$; $Mdn=7.5$, range = 3–11), each lasting approximately 60–90 min, mostly over 6 months. The coaching sessions focused primarily on work-related challenges and goals such as career reorientation and leadership development. Table 1 illustrates the multilevel longitudinal study design.

During the first session, the coachee and coach agreed on the coaching goals and recorded them. Coaches helped their coachees to clarify, describe and set goals as specifically as possible in order to monitor progress together. Coachees were asked to describe situations reflecting different degrees of goal attainment, starting with the current state (0%) and then 50% and 100% goal attainment. In addition, coachees were asked to describe a situation illustrating a 25% deterioration from their current state. These different degrees served as anchor examples for the goal attainment scale, as explained below. Table 2 shows three examples of learning objectives based on coachees' professions and their objectives .

TABLE 1 Study design.

	Before the first session	At the beginning of every session (1 + n)	At the end of every session (1 + n)
Coachee	Demographics	Goal attainment	Single-loop learning Double-loop learning
Coach	Demographics		Mastery/coping Clarification of meaning Implementation actuation

TABLE 2 Goal setting examples.

Topics	Profession	–25%	0%	50%	100%
Leadership	Management	I make the situation so bad that the current purchasing manager leaves the company	I am dissatisfied with the distribution of tasks, especially in the purchasing department	I have a plan of where I want to go with my leadership and how I want to distribute the tasks	I want to find a way to distribute the tasks in such a way that there is a balanced workload for my employees and thus motivation is increased
Stress management	Team leader	In difficult and stressful situations, I take things so much to heart that they weigh heavily on me emotionally for days	In difficult and stressful situations, such as conflict situations, I take things very much to heart and take them with me into my private everyday life	I react appropriately in difficult and stressful situations. In my private life, these issues take up space only for a short period of time	In difficult or stressful situations, I react appropriately (factually and objectively), keep to myself and don't take the issues into my private life
Conflict management	Management	I lose my control and temper with the team or ignore the situation, tensions and conflicts	I feel uncomfortable in conflict situations and tensions, I hesitate with my role as a leader and struggle with a lack of self-confidence and a tendency to remain silent	I'm able to recognize that there is a conflict. I'm able to take a step out of my comfort zone and express my views and feelings about this conflict	I can recognize and anticipate the signs and act accordingly by trusting myself. I know when to engage and if I do so, I do it in a constructive way with a positive outcome for all involved

Note: Goal setting examples were translated into English by the authors.

Measures

The scales employed were established and validated in coaching research. To avoid attrition over time, we followed the recommendations for diary studies (Ohly et al., 2010) and focused on short scales.

Problem-specific interventions

To measure problem-specific interventions, we used the adapted Bern Post Session Report 2000 (BPSR-T, Flückiger, 2010). The BPSR-T is a reliable instrument in psychotherapy research with established construct validity (Flückiger et al., 2010). Its three subscales have been successfully adapted to coaching research by replacing the term *patient* with the term *client* (Zimmermann & Antoni, 2018b). Each subscale comprised three items. Responses ranged from 0 (strongly disagree) to 6 (strongly agree). Example items are for mastery/coping: ‘Today I worked towards making the client better able to cope with difficult situations for him/her’; for clarification of meaning: ‘Today I worked towards the client becoming clearer about his goals and motives’; and for implementation actuation: ‘Today, I specifically worked to engage the client emotionally’. All scales had good internal consistency (Cohen, 1988) averaged over the different measurement points (mastery/coping $\alpha = .92$, clarification of meaning $\alpha = .81$, implementation actuation $\alpha = .87$). Coaches completed the scales at the end of each session.

Learning processes

After each session, the coachees filled in an adapted version of the organisational learning instrument, which showed construct, discriminant and convergent validity (Jashapara, 2003). The items were successfully adapted to the coaching context by changing specific terms, such as *innovation*, to more general terms, such as *problems* (Zimmermann & Antoni, 2018b). SLL and DLL were measured with three items each (e.g., SLL: ‘In the last session I got an idea of how I can tackle my problems’. DLL: ‘In the last session I questioned the way I used to solve my problems before’). The items were rated on a 5-point Likert scale ranging from 0 (totally disagree) to 4 (totally agree). The average internal consistency across all measurement points was good (SLL $\alpha = .92$, DLL $\alpha = .82$; Cohen, 1988).

Goal attainment

We measured the coachees' perceived goal attainment using the revised version of the Goal Attainment Scale (GAS-R, Kiresuk & Lund, 1979). Following Zimmermann and Antoni (2018b), who had adapted this scale to the coaching context, we used a 7-point scale ranging from 0 (–50%) to 6 (100%) goal attainment, with a 25% increase or decrease between each step. In the first coaching session, goal attainment was defined as 2 (0%). Before each session, the participants rated their goal attainment relative to their baseline. The GAS-R score can indicate a meaningful change in goal attainment. However, it is difficult to determine the general validity of the GAS-R, given the different goal definitions and the range of scores across studies (Shankar et al., 2020).

Analytical strategy

Our data had a nested structure with sessions (Level 1) nested in persons (Level 2). To test for Hypothesis 1, we calculated a longitudinal multilevel model (Raudenbush & Bryk, 2002). First, we estimated a basic model to calculate the intra-class correlation coefficient (ICC) and determine the

characteristics of the dependent variable (Bryk & Raudenbush, 1992). In the second step, we added the session as a predictor variable.

Before testing Hypotheses 2–4, we performed confirmatory factor analysis (CFA) for the problem-specific interventions (mastery/coping, clarification of meaning and implementation actuation) and learning constructs (SLL and DLL) to determine their discriminant validity. We used maximum likelihood estimation and fixed the loading of every first factor at 1. For problem-specific interventions, we compared one 1-factor with three 2-factor and one 3-factor solution. For the learning variables, we compared a 1-factor with a 2-factor solution and a model with a second-order factor. The models were fitted with the open-source software R (R Core Team, 2023) using the lavaan-package (Version 16, Rosseel, 2012). We used CFI ($\geq .95$), TLI ($\geq .95$), RMSEA ($\leq .08$) and SRMR ($\leq .05$) as model quality criteria (Hooper et al., 2008) and AIC and BIC in the model comparisons.

For the problem-specific interventions, the three-factor solution fitted the data best [$\chi^2(24) = 45.17$, $p = .006$, $CFI = .99$, $TLI = .98$, $RMSEA = .05$, $SRMR = .04$, $AIC = 10372.1$, $BIC = 10454.9$] with adequate to good factor loadings ($\lambda = .62-.94$; Table S1). For the learning variables, the two-factor solution fitted the data best [$\chi^2(8) = 16.70$, $p = .033$, $CFI = .99$, $TLI = .99$, $RMSEA = .05$, $SRMR = .02$, $AIC = 5247.3$, $BIC = 5299$] with adequate to good factor loadings ($\lambda = .76-.92$; Table S2). The model with the second-order factor *learning* had nearly the same fit [$\chi^2(7) = 16.70$, $p = .000$, $CFI = .99$, $TLI = .99$, $RMSEA = .06$, $SRMR = .02$, $AIC = 5249.3$, $BIC = 5304.9$]. From a theoretical perspective, we decided to work with the second-order factor because SLL and DLL are both forms of learning.

To test Hypotheses 2–4, we calculated three multi-level structural equation models (MSEM, Preacher et al., 2011) using a maximum likelihood estimator. MSEM allows for the disaggregation of the within- and between-variance components of variables; thus, we were able to identify the mediation process at the within-person level. We specified a 1-1-1 mediation model with problem-specific intervention as the independent variable, goal attainment as the dependent variable and learning (SLL and DLL) as the mediator. The aforementioned models were then fitted. As all the hypotheses postulated directed effects, we used one-sided significance tests.

The data and codes supporting the findings of this study are available from the corresponding author upon request.

RESULTS

Table 3 displays means, standard deviations and zero-order correlations between study variables.

Preliminary analysis

We first estimated a null model for goal attainment and calculated the intra-class correlation coefficient (ICC1) to determine the characteristics of the dependent variable (Bryk & Raudenbush, 1992). Intra-class correlation coefficient (ICC1) of goal attainment was .45, indicating that 45% of the variation in goal attainment was due to between-person differences and 55% was due to within-person variance. Following Bliese and Ployhart (2002), we assessed the error structure of the null model. Adding auto-correlations to the null model for goal attainment fitted the data better (LR = 129.68, $p < .001$), while heteroscedasticity was not present (LR = 2.25, $p = .133$). We consider the error structure of the null model in the following analyses.

Test of hypotheses

To test Hypothesis 1, that goal-oriented workplace coaching supports changes within the coachees over time, facilitating their goal attainment, we added the session as a predictor to the null model of goal

TABLE 3 Means, standard deviations and correlations on person-level and session-level with confidence intervals.

Variable	M	SD	1	2	3	4	5	6	7
1 Mastery/coping	4.09	1.36	–	.31**	.29**	.42**	.31**	.42**	.40**
2 Clarification of meaning	4.36	1.10	.76**	–	.44**	.20**	.21**	.23**	.22**
3 Implementation actuation	3.61	1.43	.68**	.68**	–	.09	.18**	.15**	.10
4 Single-loop learning	2.62	.93	–.09	–.11**	–.27**	–	.57**	.89**	.47**
5 Double-loop learning	2.44	.93	–.16**	–.16**	–.26**	.85**	–	.88**	.36**
6 Learning	2.53	.86	–.13**	–.14**	–.27**	.96**	.96**	–	.47**
7 Goal attainment	4.09	1.4	.49**	.40**	.45**	–.12*	–.18**	–.16**	–

Note: Correlations below the diagonal are between-person correlations (N = 55), and correlations above the diagonal are within-person correlations (N = 335–407). Values in square brackets indicate the 95% confidence intervals for each correlation.

Abbreviations: M, mean; SD, standard deviation.

* $p < .05$. ** $p < .01$.

attainment with autocorrelation in the residuals (Table 4). The number of sessions predicted goal attainment ($b_{\eta} = .34$, $SE = .02$, $p < .001$). Hypothesis 1 can be confirmed.

To test Hypothesis 2, that mastery/coping leads to goal attainment through a learning process, we fitted the model shown in Figure 2. The model showed a good fit to the data [$\chi^2(67) = 164.79$, $p < .001$, $CFI = .95$, $TLI = .93$, $RMSEA = .07$, $SRMR = .04$]. As hypothesised, mastery/coping positively affected goal attainment through learning ($b = .21$, $SE = .05$, $p < .001$). The total effect τ' was significant, too ($\tau' = .43$, $SE = .06$, $p < .001$). Hypothesis 2 can be confirmed.

Hypothesis 3 proposed a mediation effect of clarification of meaning on goal attainment via learning, as shown in Figure 3. The model fit was acceptable [$\chi^2(67) = 172.15$, $p < .001$, $CFI = .93$, $TLI = .90$, $RMSEA = .07$, $SRMR = .06$], and the significant indirect effect of clarification of meaning on goal attainment via learning ($b = .17$, $SE = .06$, $p < .001$) confirms our Hypothesis 3. The total effect was $\tau' = .35$ ($SE = .08$, $p < .001$).

TABLE 4 Parameter estimates and variance components session predicting the outcome goal attainment (Hypothesis 1).

Variable	Model 0			Model 1		
	Est	SE	t	Est	SE	t
Intercept	3.98	.15	25.97***	3.06	.16	19.68***
Session				.34	.02	14.50***
Level 1 intercept variance (SE)	2.15 (1.47)			.62 (.79)		
Level 2 intercept variance (SE)	.00 (.03)			.90 (.95)		
AIC	981.49			883.33		
BIC	996.84			902.51		
-2 × LL	486.75			436.67		

Note: First session = 0. Est, estimate; NLevel2 = 55, NLevel1 = 344.
Abbreviations: AIC, Akaike information criterion; BIC, Bayesian information criterion.
*** $p < .001$.

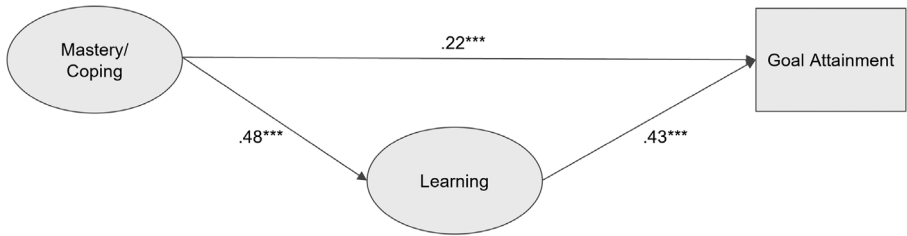


FIGURE 2 Results from the multi-level path model for Hypothesis 2 with standardised regression coefficients. * $p < .05$, ** $p < .01$, *** $p < .001$.

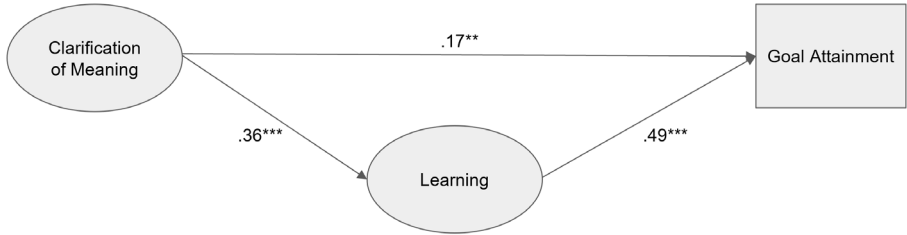


FIGURE 3 Results from the multi-level path model for Hypothesis 3 with standardised regression coefficients. * $p < .05$, ** $p < .01$, *** $p < .001$.

To test Hypothesis 4, that implementation actuation leads to goal attainment via learning, we fitted the model shown in Figure 4.

The model fit was acceptable [$\chi^2(67) = 154.24, p < .001, CFI = .94, TLI = .92, RMSEA = .06, SRMR = .05$], the indirect effect was significant ($b = .07, SE = .03, p = .046$) confirming Hypothesis 4. The total effect was significant ($\tau' = .15, SE = .05, p = .010$). Table 5 lists the effects of the three models.

Exploratory analyses and results

After testing the hypothesised mediation effects of the learning processes, we explored the differential mediation effects of SLL and DLL. We fitted three exploratory models for each problem-specific intervention with two separate mediation processes (SLL and DLL) for goal attainment.

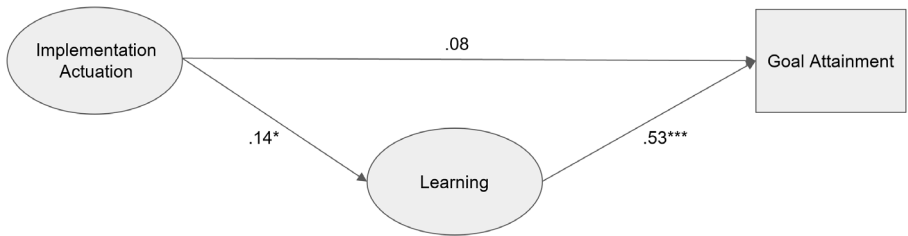


FIGURE 4 Results from the multi-level path model for Hypothesis 4 with standardised regression coefficients. * $p < .05$, ** $p < .01$, *** $p < .001$.

TABLE 5 Within results of multilevel SEMs (Hypotheses 2–4).

Predictor and effect	<i>b</i>	<i>SE</i>	95% CI	<i>p</i>	<i>ß</i>
Hypothesis 2					
a—Path mastery learning	.25	.04	[.18, .33]	.000	.48
b—Path learning goal attainment	.83	.18	[.48, 1.18]	.000	.43
c’—Path mastery goal attainment	.23	.07	[.09, .37]	.001	.22
Indirect effect	.21	.05	[.11, .31]	.000	.21
Total effect	.44	.06	[.32, .56]	.000	.43
Hypothesis 3					
a—Path clarification learning	.21	.05	[.11, .31]	.000	.36
b—Path learning goal attainment	.97	.18	[.63, 1.32]	.000	.49
c’—Path clarification goal attainment	.21	.08	[.04, .37]	.007	.17
Indirect effect	.21	.06	[.09, .32]	.001	.17
Total effect	.41	.08	[.25, .58]	.000	.35
Hypothesis 4					
a—Path actuation learning	.06	.03	[−.00, .12]	.033	.14
b—Path learning goal attainment	.99	.17	[.66, 1.33]	.000	.53
c’—Path actuation goal attainment	.06	.05	[−.00, .15]	.108	.08
Indirect effect	.06	.03	[−.01, .13]	.046	.07
Total effect	.12	.05	[.02, .21]	.010	.15

Abbreviations: actuation, implementation actuation; CI, confidence interval; clarification, clarification of meaning; Mastery, mastery/coping.

The model, specified for mastery/coping leading to goal attainment via SLL and DLL, showed a poor fit to the data [$\chi^2(67) = 239.54, p < .001, CFI = .91, TLI = .87, RMSEA = .09, SRMR = .13$]. Mastery/coping had a positive effect on goal attainment via SLL ($b = .16, SE = .04, p < .001$), but not via DLL ($b = .05, SE = .03, p = .074$). The total effect τ' was significant ($\tau' = .44, SE = .06, p < .001$). The model, that was specified for clarification of meaning leading to goal attainment via SLL and DLL, also showed a poor fit to the data [$\chi^2(67) = 251.73, p < .001, CFI = .87, TLI = .83, RMSEA = .09, SRMR = .14$]. The indirect effect of clarification of meaning on goal attainment via SLL was significant ($b = .14, SE = .05, p < .001$), whereas the indirect effect via DLL was non-significant ($b = .04, SE = .05, p = .130$). The total effect τ' was significant ($\tau' = .39, SE = .08, p < .001$).

Also, the model specified for implementation actuation showed a poor fit to the data [$\chi^2(67) = 247.68, p < .001, CFI = .88, TLI = .84, RMSEA = .09, SRMR = .16$]. Implementation actuation had a significant effect on goal attainment via SLL ($b = .06, SE = .03, p = .041$) and a non-significant effect via DLL ($b = .03, SE = .02, p = .121$). The model indicated a significant total effect ($\tau' = .17, SE = .05, p = .005$).

In conclusion, comparative analyses of the differential mediation effects of SLL and DLL revealed an overall poor model fit. However, the results indicated that the effects of the three problem-specific interventions via SLL, but not DLL, on goal attainment were significant. However, when we analysed the mediation effect of SLL and DLL separately, we were able to replicate Zimmermann and Antoni's (2018b) finding that DLL mediates the effect of mastery/coping and clarification of meaning on goal attainment. Furthermore, DLL mediated the effect of implementation actuation on goal attainment (Table S3).

DISCUSSION

This study aimed to examine the underlying mechanisms through which learning processes mediate the impact of workplace coaching interventions on goal attainment. First, we analysed the development of goal attainment during the coaching process. The findings indicated that the coachees reported an improvement in their goal attainment. This finding supports changes within coachees over time that facilitate goal attainment, confirming Hypothesis 1. This is also consistent with existing research using within-subject designs (Theeboom et al., 2014), as well as the outcomes of between-subject studies (De Haan & Nilsson, 2023). We examined the mediating role of learning processes (SLL and DLL) on the effects of problem-specific interventions on goal attainment. As expected, mastery/coping, clarification of meaning and implementation actuation interventions led to goal attainment through learning processes, thus confirming Hypotheses 2–4.

We replicated Zimmermann and Antoni's (2018b) finding that DLL mediated the effects of mastery/coping and clarification of meaning on goal attainment when we explored the mediation effects of SLL and DLL separately. Contrary to their results, we found a significant indirect effect of implementation actuation on goal attainment via DLL, although this was the smallest of the three. This suggests that focusing on the emotional elements of situations that coachees encounter not only helps them change their behaviour but also their underlying assumptions. Furthermore, we extend the findings of Zimmermann and Antoni (2018b) by demonstrating that learning processes, including DLL and SLL processes as part of a second-level latent learning variable, act as mediators between problem-specific interventions on goal attainment. These findings underscore the importance of learning processes as mediating mechanisms in the impact of problem-specific interventions on goal attainment in workplace coaching.

Implications for theory and research

Our findings support the assumptions of models of goal-directed self-regulation in coaching (Grant & O'Connor, 2022) and self-regulated learning (Sitzmann & Ely, 2011), which help explain how coaching

works. Goals stimulate self-regulation strategy development, monitoring their implementation and, where necessary, adjustments to ensure goal attainment. The DLL ensures that the premises of goals and actions are reflected and changed when needed (Argyris & Schön, 1974). Coaches can facilitate this process by clarification of meaning interventions such as asking incisive questions that stimulate reflection and alternative perspectives (Terblanche, 2020). Coaches can also support their self-regulation by fostering a working alliance and image of self-perspective-taking, thus indirectly contributing to coaching success (Mühlberger et al., 2024). Future research should test both coachees' self-regulation competency and learning as predictors of goal attainment in coaching.

A body of literature compares solution- and problem-focused coaching (Braunstein & Grant, 2016; Grant, 2012). While problem-focused questions in coaching 'invite casual analysis', 'solution-focused questions invite goal identification and the development of action pathways' (Grant & O'Connor, 2018, p. 2). Building on this approach, we assigned learning concepts to two foci. SLL focuses on adapting behaviours to reach goals and is thus primarily a solution-focused behavioural learning process (Hayes & Allinson, 1998), whereas DLL aims to reflect on the premises of one's problem-solving approaches (Argyris & Schön, 1974; Terblanche, 2020), making it more problem-focused. Problem-specific interventions can be classified into two categories: solutions and problem focus. Clarification of meaning interventions, which explore current behavioural patterns prior to goal setting, and implementation actualisation, which aims to evoke feelings that the coachee might otherwise avoid, both align with the focus on reflection and can thus be classified as problem-focused. Conversely, mastery/coping and SLL adopt a solution-focused approach to modify behaviours to enhance goal attainment.

Studies using student samples have suggested that both problem- and solution-focused coaching questions improve goal attainment. However, solution-focused questions lead to a higher goal approach, the generation of more action steps, higher self-efficacy and an increase in positive affect while decreasing negative affect, compared to the problem-focused approach (Braunstein & Grant, 2016; Grant & O'Connor, 2018). This may explain our observation that SLL and mastery/coping are more strongly associated with goal attainment than the other interventions. With regard to solution-oriented interventions that support implementing solutions in the workplace and thus goal attainment, Greif (2022) suggests that implementation support, such as through shadowing or text messaging, is particularly effective. As he reported on initial empirical support, it may be worthwhile to analyse the differential effect of implementation support, in addition to general mastery/coping factors, in further studies.

Mühlberger et al. (2023) compared the efficacy of coaching among individuals with a dominant promotion or dominant prevention focus. These two self-regulatory systems are described in Higgins' (1997) regulatory focus theory. The authors posit that these concepts are comparable to those of solution and problem focus. They argued that solution-focused coaching, such as promotion focus, focuses on solutions rather than problems, whereas problem-focused coaching involves analysing clients' problems, similar to prevention focus. They found that a higher promotion focus than a prevention focus was related to coaching success. They also found that coaches can facilitate coachees' goal attainment using promotion-oriented rather than prevention-oriented language. It may be promising for future research to analyse whether using a different language by coaches results in different learning approaches (SLL/DLL) and, subsequently, in varying degrees of goal attainment.

Workplace coaching typically involves a combination of problem- and solution-focused interventions. To address this issue, Grant and Gerrard (2019) compared the effects of solution-focused coaching questions with questions that combined both problem and solution focuses in an undergraduate sample. Participants in both conditions were asked to respond to these questions regarding a personal real-life problem. The results showed that solution-focused questions were more effective at increasing goal attainment, self-efficacy, positive affect and decreasing negative affect than questions that combined problem- and solution-focused approaches. The authors' analysis was limited to a single session, with no consideration of the interaction processes between the coach and the coachee or the review and evaluation of implemented action plans. This necessitates a study on multiple-session coaching, as was conducted in this study. Additionally, it is reasonable to hypothesise that students are unlikely to select complex problems for coaching exercises, as with employees

and managers. Thus, whether a problem- or solution-focused approach to workplace coaching is more effective remains an open question for future research. This might depend on the severity and complexity of coaches' problems (Theeboom et al., 2014), as well as on cultural and coaching contexts (Bozer & Delegach, 2019).

Cyclical models of coaching (Grant & O'Connor, 2022) emphasise the dynamic interplay of problem identification, goal setting, action planning, action monitoring, evaluation and feedback processes to change ineffective or enhance effective behaviour. This cyclical process implies that coaching entails both problem- and solution-focused intervention. Problem-focused interventions involve clarification of meaning to identify and clarify problems, whereas solution-focused interventions involve mastery/coping to set goals and develop suitable action strategies to attain them. Additionally, these strategies allow for learning whether these action strategies are effective or require adaptation (SLL) or if problem causes and goals must be reanalysed and changed (DLL). This ultimately leads to the initiation of a new action-regulation cycle.

Hummelbrunner and Reynolds (2013) also indicated that both learning facets are required for deep learning, beginning with SLL and subsequently progressing to DLL. This is in line with the hierarchical and sequential structure of cyclical models of coaching and other models of action regulation (Carver & Scheier, 1998; Hacker, 2003). Once goals have been established and action plans have been defined, the coachee will act in accordance with them before modifying the goal or even reflecting on the underlying assumptions of the issue. We could not test this sequential model assumption because we analysed both learning facets as simultaneous mediators. When we explored the differential mediation processes of SLL and DLL, only SLL mediated the effects of problem-specific interventions on goal attainment. However, our differential mediation models showed a poor model fit, which may be attributed to the common variance between the two learning facets. SLL and DLL were highly correlated, both between and within individuals. A promising avenue for future research would be to investigate both learning aspects with larger samples and greater statistical power to test for even small effects while accounting for sequential effects.

Additionally, the stages of self-regulatory cycles have been shown to overlap (Grant & O'Connor, 2022). These dynamic and complex feedback processes in cyclical models may provide an additional rationale for the difficulty of differentiating between SLL and DLL in questionnaires following a coaching session. For instance, when coaches prompt coachees to reflect on the underlying causes of their problems, coachees may rapidly transition from identifying causes to potential solutions. Consequently, feedback cycles may occur over several coaching sessions, or shorter feedback cycles may occur within a single session (e.g. when coachees modify their goals based on their reflection of situational influencing factors). To analyse such shorter within-session feedback cycles, it is necessary to examine the actual interaction sequences between coaches and coachees (Gessnitzer & Kauffeld, 2015).

Furthermore, an analysis of coaches' and coachees' behaviour would facilitate a more comprehensive examination of the interplay and consequences of diverse coaching interventions and the learning processes of coachees. The design of the present study, which includes measurement points at the conclusion and commencement of each session, permits analysis of the coaching processes between sessions only. It would be beneficial for future studies to focus on analysing actual interaction sequences between coaches and coachees to gain a deeper understanding of the dynamics between interventions and SLL and DLL processes.

Strengths and limitations

The strength of our study lies in its longitudinal multi-level within-person design, which allowed us to disaggregate within- and between-person variance, facilitating the analysis of the mechanisms through which coaching exerts its effects. Furthermore, we analysed coaching sessions from a sample comprising solely employed coachees with 100% work-related objectives. Additionally, we used multimodal measures that considered both coaches' and coachees' perspectives. We used a multi-level structural equation

model (MSEM) and focused on within-subject effects to draw conclusions regarding the coaching process and behavioural modifications of each coach–coachee dyad. Problem-specific interventions were assessed by the coaches who rated their learning and goal attainment. In doing so, we reduce the common method bias (Podsakoff et al., 2012).

The coaches underwent extensive training before participating in the coaching process, also supervised by an experienced coach through case presentations and private sessions. The coachees were of different ages, had varying levels of professional experience and sought support for work-related issues. Thus, our findings are likely applicable to many workplace coaching scenarios, which enhances external validity.

Nevertheless, the coaches lacked experience, which may have influenced their coaching outcomes and our findings. However, meta-analytic research suggests that coaching expertise does not significantly moderate the relationship between coaching and goal attainment (Sonesh et al., 2015). Furthermore, similar research on psychotherapy has shown that therapist experience does not strongly impact psychotherapy outcomes (Newman, n.d.; Stein & Lambert, 1984). Future studies could further explore coaching experience, given the limited number of studies in the meta-analysis by Sonesh et al. (2015).

One might also question whether the number of coaching sessions analysed in this study is representative of workplace coaching. However, the median number of coaching sessions in our study was similar to that in previous meta-analyses (De Haan & Nilsson, 2023; Theeboom et al., 2014). Therefore, the results of our study are representative. Furthermore, these meta-analyses show no (Graßmann et al., 2020; Nicolau et al., 2023; Theeboom et al., 2014) or nearly no effect (De Haan & Nilsson, 2023) of the number of coaching sessions on coaching outcomes. Only Sonesh et al. (2015) reported a moderation effect, with the strongest effects for 7–9 sessions, and 1–3 sessions having stronger effects than 4–6 sessions.

By choosing MSEM over multi-level modelling, we gained the advantage of having a test statistic for model fit (Christ et al., 2017). The sample size for MSEM should be at least 50 Level 2 units to obtain trustworthy standard errors for Level 2-parameter estimates and global model tests (Sagan, 2019). We met these standards with 55 dyads (Level 2 units). Furthermore, the required sample size depends on the researcher's specific interests (Meuleman & Billiet, 2009). As we focused on within-person effects power analyses with the pwrSEM app, our $N = 335\text{--}407$ Level 1-data units provide sufficient power (91–1.0) for our statistical tests (Wang & Rhemtulla, 2021).

The lack of a control group is a major weakness in coaching literature (Hinn et al., 2022). Within the conditions of the training program in which the coaches sought out their coachees, we could not implement a control group or waiting-list control group. However, given our interest in within-person effects, a within-person design controls for the influences of differences between coachees, thus allowing for testing changes over time that would not be possible when relying solely on a traditional between-person design (McCormick et al., 2020). Nevertheless, combining a within-subject with a between-group design, for example, using a waitlist control group and randomised group assignment, would be promising for future research.

Practical implications

The findings indicate that all three problem-specific interventions facilitate goal attainment among coachees by enhancing their learning processes. Moreover, the results showed that both SLL and DLL facilitate goal attainment. Cyclical models of coaching, such as the model of goal-directed self-regulation (Grant & O'Connor, 2022), illustrate how coaches can use mastery/coping, clarify meaning and implementation actuation interventions to stimulate SLL and DLL, supporting coaches in attaining their goals.

Coaches can facilitate their coachees' SLL through mastery/coping interventions, such as offering advice on developing new action plans. Newly developed action plans can be implemented through role-playing exercises during coaching sessions and shadowing in the workplace. Role playing may also be

regarded as an implementation actuation intervention, as it facilitates coachees' emotional engagement with a given situation and their behavioural patterns, enhancing their capacity to transfer alternative behaviours to their work environment in the interval between sessions (Behrendt, 2006). It is essential to review and evaluate the implemented actions to check whether the solutions developed have solved the problem or improved the situation at work, leading to the coachee's goal attainment in the subsequent session. Frequent monitoring of goal progress, such as through an online feedback portal, supports goal achievement (Harkin et al., 2016).

If the action does not result in achieving the desired outcome, coaches may assist their coachees in modifying their behaviour by developing alternative solutions and action plans to enhance their SLL in the subsequent cycle. Alternatively, this may indicate that SLL has been ineffective, and that DLL is required to reflect the underlying assumptions of one's behaviour and goals. In particular, when coachees' workplace-related problems are deeply rooted in an organisational context in which interactions are based on shared values, principles and knowledge structures, DLL may be required to identify these mental models.

To facilitate DLL, coaches may employ various clarification of meaning techniques, including reflective questioning, active listening and regular feedback. It is possible that during DLL, coaches alter their coaching goals. It is recommended that coaches permit changes to goals, as adherence to the initial goals, once set, may prove unproductive for coachees in terms of goal attainment.

The qualitative study by Terblanche (2020) on the transition coaching of managers shows, in line with the assumptions of DLL (Argyris & Schön, 1974), that questioning and reflecting on current assumptions support transition learning that changes meaning perspectives. This may lead to individual goal attainment and increased self-efficacy (Bozer & Jones, 2018) and also stimulate organisational learning (Ellinger & Ellinger, 2021; Jashapara, 2003).

CONCLUSION

This study contributes to the existing body of coaching process outcome research by examining the role of learning processes as mediators of problem-specific coaching interventions, which has received limited attention in previous studies. The findings show that clarification of meaning, mastery/coping and implementation actuation interventions impact goal attainment via the SLL and DLL processes. We identified and specified the mechanisms of coaching interventions and empirically validated the knowledge available for practice and research. These insights can help improve coaching practices and refine and validate theoretical knowledge.

AUTHOR CONTRIBUTIONS

Conny H. Antoni: Conceptualization; writing – original draft; writing – review and editing; project administration; resources; supervision; methodology. **Alexandra Tatar:** Methodology; software; formal analysis; validation; data curation; visualization; writing – review and editing; investigation.

ACKNOWLEDGEMENTS

We thank Lisa Zimmermann for her assistance in our project with study design, software development, data collection, preliminary analyses and writing of the abstract for the 2019 small group session on Advancing Theory, Research and Practice of Workplace Coaching.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interests.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ORCID

Conny H. Antoni  <https://orcid.org/0000-0003-0635-825X>

REFERENCES

- Argyris, C., & Schön, D. (1978). *Organizational learning: A theory of action approach*. Addison Wesley.
- Argyris, C., & Schön, D. A. (1974). *Theory in practice: Increasing professional effectiveness*. Jossey-Bass.
- Austin, J. T., & Vancouver, J. B. (1996). Goal constructs in psychology: Structure, process, and content. *Psychological Bulletin*, 120(3), 338–375. <https://doi.org/10.1037/0033-2909.120.3.338>
- Bandura, A. (1991). Social cognitive theory of self-regulation. *Organisational Behaviour and Human Decision Processes*, 50(2), 248–287. [https://doi.org/10.1016/0749-5978\(91\)90022-L](https://doi.org/10.1016/0749-5978(91)90022-L)
- Behrendt, P. (2006). Wirkung und Wirkfaktoren von psychodramatischem coaching—Eine experimentelle evaluationsstudie. *Zeitschrift für Psychodrama Und Soziometrie*, 5(1), 59–87. <https://doi.org/10.1007/s11620-006-0006-6>
- Behrendt, P., & Greif, S. (2022). Success factors in the coaching process. In S. Greif, H. Möller, W. Scholl, J. Passmore, & F. Müller (Eds.), *International handbook of evidence-based coaching* (pp. 877–888). Springer International Publishing. https://doi.org/10.1007/978-3-030-81938-5_72
- Bliese, P. D., & Ployhart, R. E. (2002). Growth modeling using random coefficient models: Model building, testing, and illustrations. *Organisational Research Methods*, 5(4), 362–387. <https://doi.org/10.1177/109442802237116>
- Boyatzis, R. E., Hullinger, A., Ehasz, S. F., Harvey, J., Tassarotti, S., Gallotti, A., & Penafort, F. (2022). The grand challenge for research on the future of coaching. *Journal of Applied Behavioural Science*, 58(2), 202–222. <https://doi.org/10.1177/00218863221079937>
- Bozer, G., & Delegach, M. (2019). Bringing context to workplace coaching: A theoretical framework based on uncertainty avoidance and regulatory focus. *Human Resource Development Review*, 18(3), 376–402. <https://doi.org/10.1177/1534484319853098>
- Bozer, G., Delegach, M., & Kotte, S. (2022). The influence of organisational coaching context on pre-coaching motivation and the role of regulatory focus: An experimental study. *Human Resource Development Quarterly*, 33(4), 383–403. <https://doi.org/10.1002/hrdq.21462>
- Bozer, G., & Jones, R. J. (2018). Understanding the factors that determine workplace coaching effectiveness: A systematic literature review. *European Journal of Work and Organisational Psychology*, 27(3), 342–361. <https://doi.org/10.1080/1359432X.2018.1446946>
- Braunstein, K., & Grant, A. M. (2016). Approaching solutions or avoiding problems? The differential effects of approach and avoidance goals with solution-focused and problem-focused coaching questions. *Coaching: An International Journal of Theory, Research and Practice*, 9(2), 93–109. <https://doi.org/10.1080/17521882.2016.1186705>
- Bryk, A. S., & Raudenbush, S. W. (1992). *Hierarchical linear models: Applications and data analysis methods*. Sage Publications, Inc.
- Carver, C. S., & Scheier, M. F. (1998). *On the self-regulation of behavior*. Cambridge University Press.
- Christ, O., Hewstone, M., Schmid, K., Green, E. G. T., Sarasin, O., Gollwitzer, M., & Wagner, U. (2017). Advanced multilevel modeling for a science of groups: A short primer on multilevel structural equation modeling. *Group Dynamics: Theory, Research, and Practice*, 21(3), 121–134. <https://doi.org/10.1037/gdn0000065>
- Clark, D., Gill, D., Prowse, V., & Rush, M. (2020). Using goals to motivate college students: Theory and evidence from field experiments. *Review of Economics and Statistics*, 102(4), 648–663. https://doi.org/10.1162/rest_a_00864
- Cohen, J. (1988). *Statistical power analysis for the behavioural sciences* (2nd ed.). Routledge. <https://doi.org/10.4324/9780203771587>
- Connolly, G. J. (2017). Applying social cognitive theory in coaching athletes: The power of positive role models. *Strategies*, 30(3), 23–29. <https://doi.org/10.1080/08924562.2017.1297750>
- Cox, E. (2015). Coaching and adult learning: Theory and practice. *New Directions for Adult and Continuing Education*, 2015(148), 27–38. <https://doi.org/10.1002/ace.20149>
- De Haan, E., Bertie, C., Day, A., & Sills, C. (2010). Client's critical moments of coaching: Toward a “Client Model” of executive coaching. *Academy of Management Learning & Education*, 9(4), 607–621. <https://doi.org/10.5465/amle.9.4.zqr607>
- De Haan, E., & Nilsson, V. O. (2023). What can we know about the effectiveness of coaching? A meta-analysis based only on randomized controlled trials. *Academy of Management Learning & Education*, 22(4), 641–661. <https://doi.org/10.5465/amle.2022.0107>
- Ellinger, A. D., & Ellinger, A. E. (2021). Providing strategic leadership for learning: Optimizing managerial coaching to build learning organisations. *Learning Organisation*, 28(4), 337–351. <https://doi.org/10.1108/TLO-05-2020-0070>
- Erdős, T., & Ramseyer, F. T. (2021). Change process in coaching: Interplay of nonverbal synchrony, working alliance, self-regulation, and goal attainment. *Frontiers in Psychology*, 12, 580351. <https://doi.org/10.3389/fpsyg.2021.580351>
- Flückiger, C., Regli, D., Zwahlen, D., Hostettler, S., & Caspar, F. (2010). Der Berner patienten- und therapeutenstundenbogen 2000: Ein instrument zur Erfassung von therapieprozessen. *Zeitschrift für Klinische Psychologie und Psychotherapie*, 39(2), 71–79. <https://doi.org/10.1026/1616-3443/a000015>
- Gessnitzer, S., & Kauffeld, S. (2015). The working alliance in coaching: Why behaviour is the key to success. *Journal of Applied Behavioural Science*, 51(2), 177–197. <https://doi.org/10.1177/0021886315576407>
- Gómez-Penedo, J. M., Babl, A., Dyresen, A., Fernández-Álvarez, J., Flückiger, C., & Grosse Holtforth, M. (2023). Problem mastery and motivational clarification as mechanisms of change in cognitive-behavioral therapy for depression: Secondary analysis of a randomized controlled trial. *Behaviour Research and Therapy*, 167, 104343. <https://doi.org/10.1016/j.brat.2023.104343>

- Grant, A. M. (2012). Making positive change: A randomized study comparing solution-focused vs. problem-focused coaching questions. *Journal of Systemic Therapies*, 31(2), 21–35. <https://doi.org/10.1521/jsyt.2012.31.2.21>
- 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., & Gerrard, B. (2019). Comparing problem-focused, solution-focused and combined problem-focused/Solution-focused coaching approach: Solution-focused coaching questions mitigate the negative impact of dysfunctional attitudes. *Coaching: An International Journal of Theory, Research and Practice*, 13(1), 61–77. <https://doi.org/10.1080/17521882.2019.1599030>
- Grant, A. M., & O'Connor, S. (2022). Goals in coaching practice. In S. Greif, H. Möller, W. Scholl, J. Passmore, & F. Müller (Eds.), *International handbook of evidence-based coaching: Theory, research and practice* (pp. 391–406). Springer International Publishing. https://doi.org/10.1007/978-3-030-81938-5_32
- Grant, A. M., & O'Connor, S. A. (2018). Broadening and building solution-focused coaching: Feeling good is not enough. *Coaching: An International Journal of Theory, Research and Practice*, 11(2), 165–185. <https://doi.org/10.1080/17521882.2018.1489868>
- Graßmann, C., Schölmerich, F., & Schermuly, C. C. (2020). The relationship between working alliance and client outcomes in coaching: A meta-analysis. *Human Relations*, 73(1), 35–58. <https://doi.org/10.1177/0018726718819725>
- Grawe, K. (2007). *Neuropsychotherapy: How the neurosciences inform effective psychotherapy*. Lawrence Erlbaum.
- Greif, S. (2008). *Coaching und ergebnisorientierte selbstreflexion*. Hogrefe.
- Greif, S. (2022). Motivation, volition, and implementation in coaching. In S. Greif, H. Möller, W. Scholl, J. Passmore, & F. Müller (Eds.), *International handbook of evidence-based coaching: Theory, research and practice* (pp. 649–664). Springer International Publishing.
- Hacker, W. (2003). Action regulation theory: A practical tool for the design of modern work processes? *European Journal of Work and Organisational Psychology*, 12(2), 105–130. <https://doi.org/10.1080/13594320344000075>
- Harkin, B., Webb, T. L., Chang, B. P. I., Prestwich, A., Conner, M., Kellar, I., Benn, Y., & Sheeran, P. (2016). Does monitoring goal progress promote goal attainment? A meta-analysis of the experimental evidence. *Psychological Bulletin*, 142(2), 198–229. <https://doi.org/10.1037/bul0000025>
- Hayes, J., & Allinson, C. W. (1998). Cognitive style and the theory and practice of individual and collective learning in organisations. *Human Relations*, 51(7), 847–871. <https://doi.org/10.1023/A:1016978926688>
- Higgins, E. T. (1997). Beyond pleasure and pain. *American Psychologist*, 52(12), 1280–1300. <https://doi.org/10.1037/0003-066X.52.12.1280>
- Hinn, D., Kotte, S., & Möller, H. (2022). Warum Beteiligten sich coaches an coaching-Forschung – und Warum Eigentlich Nicht? *Organisationsberatung, Supervision, Coaching*, 29(3), 347–364. <https://doi.org/10.1007/s11613-022-00772-5>
- Hooper, D., Coughlan, J., & Mullen, M. (2008). *Structural equation modelling: Guidelines for determining model fit*. University Press of America. <https://doi.org/10.21427/D7CF7R>
- Hummelbrunner, R., & Reynolds, M. (2013). Systems thinking, learning and values in evaluation. *Evaluation Connections: European Evaluation Society Newsletter*, 2013, 9–10.
- Hurlow, S. (2022). Revisiting the relationship between coaching and learning: The problems and possibilities. *Academy of Management Learning & Education*, 21(1), 121–138. <https://doi.org/10.5465/amle.2019.0345>
- Jashapara, A. (2003). Cognition, culture and competition: An empirical test of the learning organisation. *Learning Organisation*, 10(1), 31–50. <https://doi.org/10.1108/09696470310457487>
- 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 Organisational Psychology*, 89(2), 249–277. <https://doi.org/10.1111/joop.12119>
- Kiresuk, T. J., & Lund, S. H. (1979). Goal attainment scaling: Research, evaluation and utilization. *Program Evaluation in Health Fields*, 2, 214–237.
- Kizilcec, R. F., Pérez-Sanagustín, M., & Maldonado, J. J. (2017). Self-regulated learning strategies predict learner behaviour and goal attainment in massive open online courses. *Computers & Education*, 104, 18–33. <https://doi.org/10.1016/j.compedu.2016.10.001>
- Kotte, S., & Bozer, G. (2022). Workplace coaching research: Charted and uncharted territories. In S. Greif, H. Möller, W. Scholl, J. Passmore, & F. Müller (Eds.), *International handbook of evidence-based coaching* (pp. 971–982). Springer. https://doi.org/10.1007/978-3-030-81938-5_80
- Latham, G. P., & Locke, E. A. (2007). New developments in and directions for goal-setting research. *European Psychologist*, 12(4), 290–300. <https://doi.org/10.1027/1016-9040.12.4.290>
- 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>
- McCormick, B. W., Reeves, C. J., Downes, P. E., Li, N., & Ilies, R. (2020). Scientific contributions of within-person research in management: Making the juice worth the squeeze. *Journal of Management*, 46(2), 321–350. <https://doi.org/10.1177/0149206318788435>
- McLucas, A., Wine, B., & Espericueta Luna, W. A. (2024). A review of applied goal setting studies in the behaviour analytic literature (1990–2022). *Journal of Organizational Behaviour Management*, 1–14. <https://doi.org/10.1080/01608061.2024.2338723>

- Meuleman, B., & Billiet, J. (2009). A Monte Carlo Sample Size Study: How many countries are needed for accurate multilevel SEM? Survey research. *Methods*, 3, 45–58. <https://doi.org/10.18148/SRM/2009.V3I1.666>
- Mühlberger, C., Böhm, A. M., Hansen, J., Behrendt, P., Wastian, M., & Jonas, E. (2023). Coaching as a growth- or security-oriented process—How regulatory fit increases coaching success. *PLoS One*, 18(10), e0286059. <https://doi.org/10.1371/journal.pone.0286059>
- Mühlberger, C., Zerle, G., Möller, J., Diller, S. J., Greif, S., Kinder, N., & Jonas, E. (2024). Zooming in on the self in workplace coaching: Self-regulation and its connection to coaching success. *Journal of Occupational and Organizational Psychology*, 12543. <https://doi.org/10.1111/joop.12543>
- Müller, A. A., & Kotte, S. (2020). Of SMART, GROW and goals gone Wild—A systematic literature review on the relevance of goal activities in workplace coaching. *International Coaching Psychology Review*, 15(2), 69–97.
- Newman, M. The effects of therapist training and experience on the outcomes of psychological therapy within an NHS setting. [PhD Thesis]. <https://uwe-repository.worktribe.com/output/909393>
- Nicolau, A., Candel, O. S., Constantin, T., & Kleingeld, A. (2023). The effects of executive coaching on behaviours, attitudes, and personal characteristics: A meta-analysis of randomized control trial studies. *Frontiers in Psychology*, 14, 1089797. <https://doi.org/10.3389/fpsyg.2023.1089797>
- Ohly, S., Sonnentag, S., Niessen, C., & Zapf, D. (2010). Diary studies in organisational research. *Journal of Personnel Psychology*, 9, 79–93. <https://doi.org/10.1027/1866-5888/a000009>
- Plotkina, L., & Sri Ramalu, S. (2024). Determinants and trends of executive coaching effectiveness in post-pandemic era: A critical systematic literature review analysis. *Management Review Quarterly*, 2, 1–39. <https://doi.org/10.1007/s11301-024-00428-x>
- Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, 63(1), 539–569. <https://doi.org/10.1146/annurev-psych-120710-100452>
- Preacher, K. J., Zhang, Z., Zyphur, M. J. (2011). Alternative methods for assessing mediation in multilevel data: The advantages of multilevel SEM. *Structural Equation Modeling: A Multidisciplinary Journal*, 18(2), 161–182. <https://doi.org/10.1080/10705511.2011.557329>
- R Core Team. (2023). R: A language and environment for statistical computing. <https://www.R-project.org/>
- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Sage Publications.
- Rosseel, Y. (2012). Lavaan: An R package for structural equation modeling. *Journal of Statistical Software*, 48(2), i02. <https://doi.org/10.18637/jss.v048.i02>
- Sagan, A. (2019). Sample size in multilevel structural equation modeling—The Monte Carlo Approach. *Econometrics*, 23(4), 63–79.
- Shankar, S., Marshall, S. K., & Zumbo, B. D. (2020). A systematic review of validation practices for the goal attainment scaling measure. *Journal of Psychoeducational Assessment*, 38(2), 236–255. <https://doi.org/10.1177/0734282919840948>
- Sitzmann, T., & Ely, K. (2011). A meta-analysis of self-regulated learning in work-related training and educational attainment: What we know and where we need to go. *Psychological Bulletin*, 137(3), 421–442. <https://doi.org/10.1037/a0022777>
- 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>
- Stein, D., & Lambert, M. J. (1984). On the relationship between therapist experience and psychotherapy outcome. *Clinical Psychology Review*, 4(2), 127–142. [https://doi.org/10.1016/0272-7358\(84\)90025-4](https://doi.org/10.1016/0272-7358(84)90025-4)
- Terblanche, N. (2020). Coaching techniques for sustained individual change during career transitions. *Human Resource Development Quarterly*, 32(1), 11–33. <https://doi.org/10.1002/hrdq.21405>
- Theeboom, T., Beersma, B., & Van Vianen, A. E. M. (2014). Does coaching work? A meta-analysis on the effects of coaching on individual level outcomes in an organisational context. *Journal of Positive Psychology*, 9(1), 1–18. <https://doi.org/10.1080/17439760.2013.837499>
- Wang, Q., Lai, Y. L., Xu, X., & McDowall, A. (2022). The effectiveness of workplace coaching: A meta-analysis of contemporary psychologically informed coaching approaches. *Journal of Work-Applied Management*, 14(1), 77–101. <https://doi.org/10.1108/JWAM-04-2021-0030>
- Wang, Y. A., & Rhemtulla, M. (2021). Power analysis for parameter estimation in structural equation modeling: A discussion and tutorial. *Advances in Methods and Practices in Psychological Science*, 4(1), 253. <https://doi.org/10.1177/2515245920918253>
- Weinberg, F. J., & Hausfeld, M. M. (2024). The role of relational mechanisms in the executive coaching process on client outcomes in distance coaching relationships. *Journal of Managerial Psychology*, 39, 695–715. <https://doi.org/10.1108/JMP-02-2023-0073>
- Witherspoon, R. (2014). Double-loop coaching for leadership development. *Journal of Applied Behavioural Science*, 50(3), 261–283. <https://doi.org/10.1177/0021886313510032>
- Wong, J., Baars, M., He, M., De Koning, B. B., & Paas, F. (2021). Facilitating goal setting and planning to enhance online self-regulation of learning. *Computers in Human Behaviour*, 124, 106913. <https://doi.org/10.1016/j.chb.2021.106913>
- Zimmermann, L., & Antoni, C. H. (2018a). Developing a sequential process model of coaching. *Zeitschrift Für Arbeits- Und Organisationspsychologie A&O*, 62(1), 14–24. <https://doi.org/10.1026/0932-4089/a000257>

Zimmermann, L. C., & Antoni, C. H. (2018b). Problem-specific coaching interventions influence goal attainment via double-loop learning. *Zeitschrift für Arbeits- Und Organisationspsychologie A&O*, 62(4), 188–201. <https://doi.org/10.1026/0932-4089/a000281>

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

Table S1.

Table S2.

Table S3.

How to cite this article: Antoni, C. H., & Tatar, A. (2025). Learning processes as mediators of the impact of workplace coaching interventions on goal attainment. *Journal of Occupational and Organizational Psychology*, 98, e70004. <https://doi.org/10.1111/joop.70004>