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Exploring the dynamics of protean career orientation, career management behaviors, and subjective career success: An action regulation theory approach

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ABSTRACT

Due to increased dynamics in the world of work and the resulting responsibility of individuals to shape their careers more independently, there is an increased need to focus on the individual as an active agent in the development of a successful career. Drawing on action regulation theory, this four-wave longitudinal study investigates the dynamic relations between protean career orientation, engagement in career self-management behaviors, and subjective career success over time. Based on a sample of $N = 574$ German employees, we tested a random intercept cross-lagged panel model (RI-CLPM) to focus on within-person dynamics across four time-points while accounting for stable between-person differences. We found partial support for assumed dynamics in these variables, in that increases in protean career orientation predicted subsequent increases in career self-management behaviors. Moreover, increased protean career orientation and subjective career success (but not career self-management behaviors) predicted further increases in the same respective states. However, increases in career behaviors did not predict increases in subjective career success and increases in subjective career success did not predict increases in protean career orientation or career self-management behaviors. We discuss the findings in light of adopting a dynamic within-person approach to understand key career development constructs.

1. Introduction

Long-term, full-time employment within single organizations is no longer the norm (Biemann et al., 2012), and the prevalence of alternative work arrangements (e.g., part-time work, fixed-term contracts) have been growing dramatically over the past decade (Spreitzer et al., 2017). Alongside structural labor market changes, there have also been changes in the attitudes of many employees who seek to take more control of their own career progress (Direnzo & Greenhaus, 2011). Such employees strive to attain benefits and satisfaction according to their own standards, rather than relying upon their employer to derive such outcomes (Weng & McElroy, 2012).

A number of career-related constructs have been advanced to understand these and related phenomena. For example, researchers

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have paid increasing attention to factors that promote the attainment of *subjective career success* (SCS; Spurk et al., 2019), referring to the individual evaluation and experience of achieving personally meaningful career outcomes (Ng et al., 2005; Shockley et al., 2016; Spurk et al., 2019), typically measured in terms of career satisfaction (Greenhaus et al., 1990; Seibert et al., 2013; Spurk et al., 2019). Moreover, *career self-management* is becoming ever more important (King, 2004), as reflected in the large body of research on this concept produced over the past 25 years (Lent & Brown, 2013). Career self-management (CSM) is defined as "…a process by which individuals develop, implement, and monitor career goals and strategies…" (Greenhaus et al., 2010, p. 12). Complimenting SCS and CSM, the notion of *protean career orientation* (PCO; Hall, 1996; Hall et al., 2018) has gained importance in this literature. PCO is "…characterized by the exercise of self-direction and an intrinsic values orientation in the pursuit of psychological success" (Hall et al., 2018: p. 130). Given that many individuals face substantial levels of uncertainty as they navigate various challenges associated with their careers, today's employees must independently create their own career path that corresponds to their values (i.e., they must enact a PCO) through various CSM behaviors, and also independently evaluate whether or not they have achieved career success (i.e., through their perceptions of attained SCS).

PCO and CSM are typically treated as antecedents of SCS (for PCO; Hall et al., 2018; for CSM; Spurk et al., 2019). However, there is an increasing recognition that research needs to consider the possibility that many variables that are typically treated as antecedents of career success might just as well be outcomes thereof (Ng & Feldman, 2014; Spurk et al., 2019). Research on PCO suggests that individuals with a stronger PCO will prefer to autonomously direct and proactively manage their careers to achieve personally valued goals (Hall et al., 2018). In line with these assumptions, research has demonstrated significant positive relations between PCO, CSM, and SCS (e.g., Fuller & Marler, 2009; Herrmann et al., 2015; Seibert et al., 2001a). However, research has focused mainly on general levels of these variables and looked at between-person differences (i.e., how individuals compare to others) rather than within-person changes among these variables (i.e., how individuals themselves change over time). Although theoretical processes of change are usually presumed at the individual level, most studies only look at between-person change or are cross sectional in nature, which does not give adequate information on how individuals might change over time. Only a few studies on career-related constructs have investigated within-person changes within a shorter time frame (e.g., Hirschi & Freund, 2014; Zacher, 2015, 2016). Furthermore, short time lags provide essential information about expected causal effects over time (Dormann & Griffin, 2015). Thus, micro-episodes and cycles, as we presume it in our study, may occur often and in the short run. Separating within-person effects from between-person effects is even more important as PCO, CSM, and SCS presumably have stable (i.e., to some extent characterized by time-invariant stability reflecting a trait-like property, at least for the duration of the study) as well as malleable (i.e., intra-individual changes) components over time. In this line, longitudinal data can be thought of as multilevel data, in which measurement occasions are nested within individuals. Within-person effects represent fluctuations in the level of a variable for an individual over time, whereas between-person effects refer to stable, trait-like individual differences (Hamaker et al., 2015). Controlling for those stable, time-invariant, trait-like individual differences is therefore necessary to draw conclusions about intra-individual differences (Hamaker et al., 2015). Thus, to investigate how constructs are related over time, within-person analyses are needed which take into account the time-invariant trait-like differences that exists at the between-person level (Hamaker et al., 2015).

Indeed, although research has clearly pointed out that longitudinal designs are necessary to draw conclusions about within-person dynamics (Neal et al., 2017), little is known about intra-individual dynamics in relations among PCO, CSM, and SCS that may manifest over time, and a number of unanswered and theoretically relevant questions about such dynamics remain to be addressed. For example, if individuals show more CSM than usual, are they subsequently also more satisfied than they typically are? Does a higher level of PCO than usual lead to more subsequent engagement in CSM? Or does a higher level of PCO than usual change a person's subsequent career satisfaction? We currently lack knowledge about how much individuals tend to vary over time in these variables and how PCO, CSM, and SCS are related to one another within-individuals in more dynamic ways, and over time.

The general goal of this study is to expand the knowledge on the dynamic relation of PCO, CSM, and SCS at the within-person level over time. Taking into account recommendations from recent reviews (Hall et al., 2018; Spurk et al., 2019), we conducted a longitudinal design, wherein we assessed each variable at four timepoints. This design allows us to test reciprocal effects among PCO, CSM, and SCS, and explore, at the within-person level of analysis, if the relations between these constructs are unidirectional, reciprocal, or show other types of dynamics over time. Thus, the main objectives of our study are (1) to investigate the stability and change of SCS, PCO, and CSM over time; (2) to examine how SCS is not only an outcome of PCO and CSM but also a potential antecedent of changes in these variables; and (3) to explore how SCS, PCO, and CSM are linked in a dynamic feed-back process over time.

To investigate such dynamics, we build on action regulation theory (Frese & Zapf, 1994; Zacher & Frese, 2018) that highlights the agentic, goal-directed, and dynamic nature of behavior. According to action regulation theory, plans help transform general goals into specific implementation intentions, which then lead to goal-directed behaviors (Gollwitzer & Brandstätter, 1997). Furthermore, action regulation theory suggests the importance of feedback referring to stimuli that the person can interpret as information about the consequences of their actions (Raabe et al., 2007). When actions are successful so that goals are achieved and positive feedback is received, action regulation theory predicts positive affect (e.g., career satisfaction) to increase (Pekrun & Frese, 1992; Raabe et al., 2007).

In our study, we specifically propose that PCO represents an internally desired goal standard that affects the extent to which individuals engage in CSM behaviors (i.e., being self-directed and values-driven in one's career development). Moreover, we presume that people evaluate their goal progress and attainment, which is reflected in their evaluation of career satisfaction (i.e., SCS). This evaluation then leads to adjustments in their goals/standards (i.e., PCO) and actions (i.e., CSM). Furthermore, we presume that this process unfolds in a continuous feedback loop as people receive positive or negative feedback about their goal attainment (Zacher & Frese, 2018). According to Zacher and Frese (2018), positive feedback encourages the maintenance or repetition of behaviors, while negative feedback might result in changes in goals and/or actions in the context of learning and personal development. Such a dynamic

perspective can be highly useful to theoretically conceptualize how and why PCO, CSM, and SCS might be related to each other over time. However, the potential dynamics involved in how SCS is linked with PCO and CSM remain largely unexamined, despite calls to more closely investigate this issue (Hall et al., 2018; Spurk et al., 2019). In summary, based on action regulation theory, we focus on the dynamic interplay between attitudes which serve as goals/standards (i.e., PCO), behaviors (i.e., engagement in CSM), and evaluations of goal attainment (i.e., SCS) that occurs within-person, and over time.

With our study, we contribute to the literature in several ways. First, we add to an enhanced understanding of the dynamic nature of PCO, CSM, and SCS by using a within-person approach and a fully crossed and lagged longitudinal research design. The dynamic nature of theses constructs has been often unaddressed in existing research. Understanding both the relative stability and change of these constructs at the same time is an important issue for the continued development of theory. Indeed, these constructs might be stable to some extent because they are determined by past life experience and contextual factors. However, with changing experiences and context they might also exhibit meaningful change over time. With our approach, we are able to study *both* of these possibilities as between and within-person effects, simultaneously. Second, we provide a more dynamic view on PCO, and enrich the career success literature by investigating antecedents, consequences, and changes in PCO and SCS over time. Third, we contribute to the CSM literature by examining the dynamics of engaging in CSM behaviors, including introducing a novel within-person perspective on potential antecedents (i.e., SCS) and consequences (i.e., PCO) of CSM. Finally, we offer important insight into the question of the extent to which the examined career constructs can be deemed as relatively stable or more dynamic by using an action regulation theoretical framework. Action regulation theory is a dynamic theory which proposes interactions and dynamics across its key components (i.e., goals, actions, outcomes, and feedback evaluation).Thus, we make an important theoretical contribution to action regulation theory specifically and the careers literature generally by clarifying whether the trait versus state aspects of our focal constructs are of more interest as well as their relations with one-another over time.

1.1. Dynamics between PCO, engagement in CSM, and SCS: an action regulation perspective

The links between PCO, engagement in CSM, and SCS have often been investigated. However, what we know about these relations is mostly based on studies examining between-person relations and restricted to uni-directional effects (e.g., PCO and SCM as antecedents of SCS). Such research does not address whether such relations manifest in a more dynamic way at the within-person level of analysis. In the present paper, we draw on action regulation theory (Frese & Zapf, 1994; Zacher & Frese, 2018) to conceptualize such dynamics. Action regulation theory aims to understand goal-directed behavior, as well as its predictors and outcomes in work and organizational contexts (Zacher et al., 2016; Zacher & Frese, 2018) and can be seen as a meta-theory that provides a framework for the regulation of goal-oriented behavior. Zacher and Frese (2018) point out that "action regulation is not a monolithic theory, but a set of theories" (p. 3). This perspective sees humans as active agents and examines how actions emerge, interact with, and change reality (Zacher & Frese, 2018). In applied psychology such as industrial, work, and organizational psychology, action regulation theory has been frequently applied (Frese & Sabini, 1985; Frese & Zapf, 1994; Hacker, 2003; Zacher & Frese, 2018).

The core components of an action regulation process include goal selection and development, orientation, plan development, and selection of action programs, monitoring of execution, and feedback processing (Frese, 2009; Zacher & Frese, 2018). In this process, goals are mental representations of desired future states (Austin & Vancouver, 1996) that serve as standards to guide goal pursuit and to signal goal achievement. Moreover, goals can be either self-set or assigned by others (i.e., tasks). In action regulation theory, actions describe goal-directed behaviors that are shaped by stable and dynamic personal factors (e.g., personality, orientations, affect) on the one hand and feedback from the physical and social environment on the other (Hacker, 1985) As explained by Zacher and Frese (2018), these actions, in turn, result in changes in the person and the environment and "action regulation theory explains how individuals regulate their behavior through cognitive processes such as goal development, planning, and feedback processing" (Zacher & Frese, 2018, p. 4). In addition, the phases of action regulation may need to be iterated (e.g., if goals are not satisfactorily met) and, if there are multiple goals, certain action phases may occur at the same time (Frese & Zapf, 1994).

Alongside goals and plans, feedback thus plays an important role in action regulation theory (Raabe et al., 2007). The term feedback in action regulation theory refers to stimuli that a person can interpret as information about the consequences of their actions. These feedback processes respond to the results of one's actions to achieve personally valued goals. Thus, this perspective describes a highly dynamic process, wherein individuals continuously adjust effort and strategies to maintain progress toward their goals and also adjust their goals if needed based on obtained feedback from actions (Tolli & Schmidt, 2008). In summary, action regulation refers to the extent to which people influence, modify, or control their own behavior (including their thoughts and feelings) according to goals or standards.

Based on this perspective, PCO, engagement in CSM, and SCS might represent a dynamic feedback process, resulting in self-reinforcing action-regulation cycles over time (Hall & Chandler, 2005; Hobfoll et al., 2018; Spurk & Abele, 2014). Specifically, based on action regulation theory, we can conceptualize PCO as an internal goal standard (i.e., the desire to be self-directed and values-driven in one's career) that directs career behaviors to attain these goals (i.e., promoting engagement in CSM). SCS represents the subjective evaluation of whether actions have been conducted properly to attain personally important career goals. Based on action regulation theory, this evaluation of goal attainment should have effects on subsequent behaviors and reinforce or diminish the desirability of existing goals/standards.

Applying this perspective implies the possibility that the achievement of a satisfactory individual state (i.e., SCS) can have a reinforcing impact on an individual's career orientation (i.e., PCO), motivating more engagement in behaviors to attain career goals (i.e., CSM). To illustrate, if a person attains a high level of career satisfaction, this might serve as a form of feedback, signaling to the person that their personal career goals have been attained, or that they are making good progress toward their attainment. Thus, SCS

could reinforce PCO because it signals to the person that their career can be successfully managed in a self-directed and values-directed manner. Likewise, SCS could increase one's confidence that goals can be attained and thereby promote increased engagement in CSM.

1.2. Linking PCO to engagement in CSM behaviors

A great deal of theoretical and empirical work has focused on understanding the relations between CSM, career orientations such as PCO, and attainment of SCS (Hall et al., 2018; Spurk et al., 2019). PCO reflects individuals' proclivity to manage their careers autonomously according to their own values and goals, that is, pursuing a form of career development over which they (vs. their organization) exert control (Hall et al., 2018). Given that PCO is characterized by a self-directed and value-driven career orientation, workers with strong PCO tend to be more proactive in career management activities that match their personally meaningful values (Briscoe et al., 2012).

Research on the protean career has focused primarily on PCO as a predictor of behaviors and outcomes (Hall et al., 2018). In the recent PCO literature, Hall et al. (2018) propose "that the elements of PCO are basic elements of human needs for growth […] and meaning" (p. 129) and "a key to psychological success in a changing world" (p. 131). In other words, PCO is seen as the basis for successfully responding to change, exercising choice, and meaning-making—ultimately leading to SCS. These protean mechanisms are seen as processes that explain the relations between PCO and individual and organizational outcomes (Hall et al., 2018). According to action regulation theory, individuals steer their own goal-directed behaviors in correspondence with their plans (Frese & Zapf, 1994) which are based on their internally desired standards/goals (Raabe et al., 2007). Many studies have confirmed this agentic pathway in which PCO is positively linked to CSM behaviors (e.g., De Vos & Soens, 2008), as well as SCS (De Vos & Soens, 2008; Herrmann et al., 2015). However, despite the growth of research on PCO, little is known about its possible within-person dynamics over time and there is a lack of research on stable vs. dynamic components in this regard. This is an important gap in this literature, because PCO is highly individualized, and it is reasonable to examine how this orientation might change within individuals over time and how such changes affect their career development (Hall et al., 2018). Therefore, to explore the agentic pathway at the within-person level of analysis, we test the following hypothesis between PCO and engagement in CSM:

Hypothesis 1. An increased state of protean career orientation is positively related to increased engagement in career self-management behaviors over time.

1.3. Engagement in CSM Behaviors and SCS

Most theoretical accounts suggest that CSM consists of a variety of different behaviors (e.g., Lent & Brown, 2013). Consistently, in our study, we focus on CSM at a general level as engagement in different CSM behaviors (i.e., networking, career exploration, and continuous learning). Similarly to PCO, research has demonstrated a positive relation between engagement in CSM and SCS (Spurk et al., 2019). In this literature, career behaviors are usually seen as predictors of career success because active CSM allows individuals to attain personally valued goals and thus experience career success (e.g., Herrmann et al., 2015; Hirschi et al., 2018; Hirschi et al., 2019).

Although researchers have paid increasing attention to CSM in recent years, little is known about its within-person dynamics over time. One exception to this is a recent study (i.e., Alisic & Wiese, 2020) that investigated the longitudinal interplay of career self-management, career insecurity, and self-efficacy using a within-person approach. In this study, Alisic and Wiese (2020) found support for the notion that career self-management and career insecurity are reciprocally and negatively associated over time. However, despite these findings, we still lack clear knowledge about how CSM and SCS are linked at the within-person level of analysis. This is an important gap because engagement in CSM has been framed as a dynamic, self-directed, and proactive process (De Bloom et al., 2020) and we can thus expect significant variation in CSM over time that might have meaningful effects on career outcomes. Additionally, according to action regulation theory, positive affective and/or cognitive reactions (e.g., career satisfaction) are expected when actions lead to achieving goals/desired standards (Pekrun & Frese, 1992; Raabe et al., 2007). In our study, we thus consider engagement in CSM as a predictor of experiencing SCS. Specifically, SCS serves as an evaluation of one's goal attainment, which is likely to result from goal directed behaviors such as CSM.

Hypothesis 2. An increased state of engagement in career self-management behaviors is positively related to an increased state of subjective career success over time.

There is an increasing interest in examining the potential consequences of career success and a need to focus on developing dynamic and reciprocal frameworks of career success that include both antecedents and outcomes (Spurk et al., 2019). To address this issue, and grounded in action regulation theory, we herein assume that SCS is not only a potential outcome but also a possible predictor of changes in PCO and CSM. Specifically, we presume in accordance with action regulation theory that experiencing SCS serves as a positive feedback for career goal attainment which in turn reinforces career goals/standards and actions.

Hypothesis 3. An increased state of subjective career success is positively related to an increased state of protean career orientation over time.

Hypothesis 4. An increased state of subjective career success is positively related to an increased engagement in career self-management behaviors.

Building open the previous hypotheses, we also propose the following indirect effects:

Table 1
Means, standard deviations, Cronbach's Alphas, and Pearson's correlations for the study variables.

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1 PCO (T1)	5.11	0.99	(0.82)											
2 PCO (T2)	5.05	1.02	0.53***	(0.83)										
3 PCO (T3)	5.06	1.04	0.44***	0.52***	(0.84)									
4 PCO (T4)	5.14	1.02	0.51***	0.50***	0.58***	(0.85)								
5 CSM (T1)	3.04	0.79	0.24***	0.22***	0.23***	0.25***	(0.93)							
6 CSM (T2)	3.02	0.79	0.23***	0.30***	0.29***	0.30***	0.75***	(0.93)						
7 CSM (T3)	3.04	0.80	0.24***	0.30***	0.32***	0.31***	0.77***	0.79***	(0.93)					
8 CSM (T4)	3.01	0.83	0.20***	0.24***	0.30***	0.33***	0.78***	0.79***	0.80***	(0.95)				
9 SCS (T1)	3.46	0.87	0.41***	0.39***	0.23***	0.33***	0.24***	0.17**	0.17**	0.17**	(0.91)			
10 SCS (T2)	3.44	0.82	0.37***	0.43***	0.32***	0.39***	0.21***	0.22***	0.21**	0.23***	0.76***	(0.89)		
11 SCS (T3)	3.42	0.83	0.36***	0.40***	0.39***	0.38***	0.27***	0.28***	0.33***	0.26***	0.72***	0.76***	(0.91)	
12 SCS (T4)	3.60	0.85	0.39***	0.43***	0.29***	0.37***	0.18***	0.20**	0.19**	0.21***	0.67***	0.70***	0.72***	(0.91)

Note. $N = 574$ (missing data estimated with full-maximum likelihood method). PCO = Protean Career Orientation; CSM = Engagement in Career Self-Management; SCS = Subjective Career Success. In brackets internal consistency (Cronbach's alphas for PCO and SCS, McDonald's total omega for CSM).

*** $p < .001$.

** $p < .01$.

Hypothesis 5. There is a positive indirect effect from protean career orientation on subjective career success through increased engagement in career self-management behaviors.

Hypothesis 6. There is a positive indirect effect from engagement in career self-management behaviors on protean career orientation through increased subjective career success.

Hypothesis 7. There is a positive indirect effect from subjective career success on engagement in career self-management behaviors through increased protean career orientation.

2. Method

2.1. Sample and procedure

Data were collected through a German online panel service based on several selection criteria: Participants had to be employed in private industry (not self-employed or in public service), aged between 18 and 65 to capture the typical working age ($M = 43.24$, $SD = 11.42$), and working a minimum of 16 h/week. Respondents completed four surveys, each separated by approximately 4 weeks, and PCO, CSM, and SCS were assessed at each time point. Initially, 734 people filled in the survey at Time 1 (T1). We excluded 160 (22%) participants because they failed to correctly answer quality check items ($n = 148$) or showed patterns of speeding or streamlining ($n = 12$). The final sample of 574 people was invited to participate at T2 (395 responders; response rate of 69%), at T3 (360 responders; total response rate from T1 63%), and at T4 (331 responders; total response rate from T1 58%). To avoid listwise deletion which can bias results, we analyzed the data for the entire T1 sample ($N = 574$), and missing data were accounted for by using the Full Information Maximum Likelihood (FIML) estimator implemented in the R package 'lavaan' (Rosseel, 2012).

The final sample ($N = 574$) included 55% women. In terms of the highest level of educational achievement, 30% obtained secondary school degrees, 13% obtained a high-school degree, 33% completed vocational training, and 23% had a university degree. The majority of the participants were German (98%), worked an average of 35 h per week (ranging from 16 to 80 h), and had an average organizational tenure of 10 years (ranging from 0 to 45 years). Participants worked in a wide array of fields, including health care (14%), trade (12%), private services (7%), transport/logistics (7%) production (6%), education (6%), construction (3%), financial services (3%), and IT (3%). The data presented in this article were part of a larger data collection effort, and another article has been published using a different set of variables (a data transparency matrix has been provided to the editor).

2.2. Measures

Protean career orientation was measured on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The other measures were answered on a 5-point scale ranging from 1 (*not true at all*) to 5 (*completely true*). Means, standard deviations, and reliability coefficients are reported in Table 1.

2.2.1. Protean career orientation

PCO was assessed with the short form questionnaire by Porter et al. (2016) based on the original scale by Briscoe et al. (2006). The German version of the questionnaire was taken from Steiner et al. (2019). The questionnaire assesses self-directed (4 items; e.g., "I am responsible for my success or failure in my career.") and values-driven career orientation (3 items; e.g., "What's most important to me is how I feel about my career success, not how other people feel."). In existing research, this scale showed positive correlations with other measures of PCO, job satisfaction, career satisfaction, and proactive career behaviors (Porter et al., 2016). Consistent with past research (Supeli & Creed, 2016; Waters et al., 2014), we treated PCO as a unidimensional construct. Confirmatory factor analyses specifying a single factor provided a good fit for the data for all measurement time points in our sample (CFI = 0.92–0.94, TLI = 0.88–0.92, RMSEA = 0.10–0.13, SRMR = 0.04–0.05, $\chi^2_{(14)} = 70.71–99.93$). Across all four time points, the average coefficient alpha for the scale was $\bar{\alpha} = 0.84$ ($SD = 0.01$, *Range* 0.82 to 0.85).

2.2.2. Engagement in CSM

We assessed three specific CSM behaviors with the *CSM activities* scale from the German version of the Career Resources Questionnaire (CRQ; Hirschi et al., 2019). Specifically, we assessed: networking (3 items; e.g., "I frequently build contacts with other people who are important for my career development."), career exploration (3 items; e.g., "I regularly collect information about career opportunities."), and continuous learning (3 items; e.g., "I continuously develop my work-related abilities."). Hirschi et al. provide support for the construct validity of the scales in terms of high correlations to other scales measuring closely related constructs and to career success. To confirm the factor structure of CSM behaviors, we conducted a confirmatory factor analysis, specifying a hierarchical structure in which the three subscales (networking, career exploration, continuous learning), indicated by their respective items, loaded onto a higher-order dimension (i.e., engagement in CSM). The results confirmed this hierarchical three factor structure as also demonstrated in the validation study by Hirschi et al., (2018; 2019) (CFI = 0.93–0.96, TLI = 0.89–0.94, RMSEA = 0.10–0.12, SRMR = 0.07–0.08, $\chi^2_{(24)} = 120.17–238.40$). Thus, the three behaviors jointly represent a high engagement in CSM behaviors more generally. For simplicity in our final model, we therefore used the overall CSM activities score by taking the mean across all three more specific CSM behaviors. Nevertheless, in supplementary exploratory analyses, we assessed the proposed models with each of the three CSM behavior separately. Across all four time points, McDonald's reliability coefficient omega for the composite engagement in CSM scale showed high reliability (ω_{total} between 0.93 and 0.95; $\omega_{hierarchical}$ between 0.69 and 0.73).

2.2.3. Career satisfaction

To assess SCS, we used the scale developed by Greenhaus et al. (1990). The German version of the questionnaire was taken from Abele and Spurk (2009). The questionnaire consists of five items (e.g., "I am satisfied with the progress I have made toward meeting my overall career goals") and is frequently used in career development studies. Factor analyses confirm the one-factor structure for all time points (CFI = 0.99–1.00, TLI = 0.99–1.00, RMSEA = 0.03–0.05, SRMR = 0.01, $\chi^2_{(5)} = 6.52–9.01$), with an average coefficient alpha of $\bar{\alpha} = 0.91$ (*SD* = 0.01, *Range* 0.89 to 0.91).

2.3. Attrition analysis and control variables

We checked our data for possible systematic effects of attrition by conducting independent samples *t*-tests and multiple logistic regressions. Specifically, we assessed whether dropouts (i.e., participants who missed one, two, or three measurement time points) differed from stayers (i.e., completed all measurement time points) on the T1 demographic and study variables. First, we conducted a series of independent samples t-tests, comparing T1 levels of PCO, CSM, and SCS between the participants who responded in all four waves ($n = 236$; 41% of the total sample) and the others ($n = 338$; 59% of the total sample). No significant differences were found in any variable, PCO, $t(572) = 0.55$, $p = .860$, CSM, $t(571) = -0.18$, $p = .860$, and SCS, $t(572) = 1.72$, $p = .586$. Thus, we conclude that regarding average T1 differences on our focal constructs, attrition was not a concern.

Second, to strengthen our confidence in this conclusion, we followed the advice of Goodman and Blum (1996) and specified a model, in which we regressed the pattern of attrition onto substantive variables measured at T1. To identify these patterns of loss to follow-up, participants were partitioned into four different groups according to their response pattern from T1-T4, including a group of "all responses" with participants who responded to all four waves; as well as groups of "three responses", "two responses", and "one response", depending on the number of measurement waves at which they participated in the survey. We then specified a multinomial logistic regression model in which patterns of attrition (i.e., the four-level categorical variable, representing "all responses", "three responses," etc.) were regressed onto participant's T1 levels of PCO, CSM, and SCS. The "all responses" participants were chosen as the reference category. In summary, the fit of this model to the data was not significantly better than a null model (i.e., an "intercept only" model, specified without any predictors; $\chi^2(9) = 4.822$, $p = .850$) and none of the predictors were significant for the other three groups.

Third, an additional attrition analysis was conducted to assess whether participant demographics (i.e., age, gender, and organizational tenure) predicted attrition over time, using the same multinomial logistic regression framework described above. In summary, the results showed that age, but not gender or organizational tenure, differentiated the participant's response pattern. However, age did not account for any appreciable amount of variance explained in attrition patterns (i.e., $R^2_{\text{McFadden-Adjusted}} \leq 0.01$). Taken together, these results suggest that attrition bias was only a minor concern.

To test the robustness of the obtained results, we also considered age, gender, and organizational tenure as control variables in the final model, but the results did not change when including these controls neither for predicting observed variables nor for random intercepts (for details see Appendix A). Therefore, to clarify parameter interpretation, we report the results without including any control variables.

2.4. Analytical procedure

The analyses were conducted in R (version 3.6.3; R Core Team, 2017). First, we tested the data for multivariate normality and found subtle deviations. However, the deviations were within the norm of ±1.5 S.D. for skewness and ±1.5 S.D. for kurtosis (*SD* = 0.79 to 1.04) supporting the assumption of the symmetry and low outlier-prone distribution. All models were estimated via the maximum likelihood estimation method (i.e., "ML" in "lavaan"; Rosseel, 2012) which is robust to moderate deviations from normality in the data (Gravetter et al., 2020). Model fits were assessed with the root mean squared error of approximation (RMSEA), standardized root mean residual (SRMR), comparative fit index (CFI), and Tucker-Lewis index (TLI). Values below 0.08 for RMSEA, below 0.10 for SRMR, and above 0.90 for CFI and TLI indicate a good model fit (Cheung & Rensvold, 2002; Vandenberg & Lance, 2000).

For testing the hypothesized reciprocal relations between PCO, CSM, and SCS, we conducted random intercept cross-lagged panel model (RI-CLPM) analyses in R `lavaan` based on the recommendations introduced by Hamaker et al. (2015). This approach allows to disentangle (assumed) causal directions as well as between- and within-person effects and to investigate all potential relations between two or more constructs. Existing studies have applied the RI-CLPM in various areas of psychological research, for example in career research (Alisic & Wiese, 2020; Goetz et al., 2020; Rudolph & Zacher, 2020), developmental psychology (Becht et al., 2019; Krauss et al., 2020), or health psychology (Gómez-Pérez et al., 2020; Masselink et al., 2018).

Given that we assume that our focal constructs vary at both the between-person (i.e., inter-individual differences) and the within-person level (i.e., intra-individual changes over time), assessing the RI-CLPM is the appropriate analytic approach for testing our hypotheses using longitudinal data. The RI-CLPM focuses on within-person effects by examining cross-lagged paths while controlling for stable between-person differences. It thus provides insight into whether a within-person deviation from the trait level of one construct (e.g., general level of PCO) predicts subsequent change in the within-person deviation from the trait level of another construct (e.g., state-level of engagement in CSM). Furthermore, the RI-CLPM allows for examining these subsequent changes, as well as cross-lagged, potential reverse, reciprocal, and indirect effects. Because we focus on the individual as an active agent to develop a successful career and help to understand how people can successfully shape their careers, intra-individual changes in the focal variables are of particular interest.

For the simplicity of the model, we used manifest variables representing scale-level means of PCO, CSM, and SCS at each time point. First, the observed scores for PCO, CSM, and SCS were regressed on their own latent factors with the loadings constrained at one. Next,

we included three random intercepts (RI) in the model (one each for PCO, CSM, and SCS) with factor loadings constrained at one. These RI represent the stable trait-like differences between individuals concerning PCO, CSM, and SCS, and they are separated from the within-person processes. The correlations between the RI reflect how the stable between-person differences in each of our focal variables are associated with each other. The autoregressive paths in this model reflect to what extent within-person deviations in PCO, CSM, and SCS can be predicted by deviations from their own expected levels on PCO, CSM, and SCS, respectively. The cross-lagged paths in this model reflect to what extent the three variables are linked reciprocally, and they indicate whether a deviation from the expected level in one variable, for example in PCO, predicts a deviation from the expected level in another variable, for example CSM, one month later and vice versa. The within-person correlations at T1 reflect to what extent a person's individual deviation from the expected level on one variable, for example CSM at T1, is related to the deviation from the expected score on another variable, for example SCS at T1.

3. Results

Descriptive statistics and correlations of the study variables are displayed in Table 1. Bivariate correlations among the assessed constructs demonstrated that PCO, CSM, and SCS were all significantly ($p < .05$) positively related to each other among all measurement time points, with correlations ranging between $r_{xy} = 0.17$ and $r_{xy} = 0.80$ (Table 1).

3.1. Measurement invariance and confirmatory factor analyses

Before testing the RI-CLPM, we first established the foundation for the measurement model by calculating several CFA models to examine the appropriateness of representing the focal constructs separately (i.e., as unique variables) in our statistical models. Then, we explored the equivalence (i.e., invariance) of the measures across the four time points.

First, we specified five CFA models based on our data to confirm the factor structure of PCO, CSM, and SCS. The results revealed that the proposed three-factor solution (PCO, CSM, and SCS) fit the data best across all time points (T1: CFI = 0.95, TLI = 0.94, RMSEA = 0.07, SRMR = 0.06, $\chi^2_{(87)} = 308.19$; T2: CFI = 0.94, TLI = 0.93, RMSEA = 0.07, SRMR = 0.06, $\chi^2_{(87)} = 255.15$; T3: CFI = 0.93, TLI = 0.92, RMSEA = 0.08, SRMR = 0.07, $\chi^2_{(87)} = 280.00$; T4: CFI = 0.94, TLI = 0.92, RMSEA = 0.08, SRMR = 0.07, $\chi^2_{(87)} = 268.81$). Thus, the results suggest that the three measures are empirically distinct, and it is appropriate to conceptualize them separately in our subsequent models.

Second, based on the suggestions of Vandenberg and Lance (2000) and Putnick and Bornstein (2016), we conducted several measurement invariance analyses. Specifically, we fit three measurement models across the four time points for each focal variable (PCO, CSM, and SCS) with increasingly restrictive model comparisons. In a first step, we specified a model in which the factor structure was constrained to be equal across time (i.e., "configural" invariance). Second, we specified a model in which the factor loadings were constrained to be equal across time (i.e., "weak factorial" or "metric" invariance). Finally, we specified a third model in which factor loadings and intercepts were constrained to be equal across time (i.e., "strong factorial" or "scalar" invariance). As evidence of (in) variance, we observed changes in chi-square ($\Delta\chi^2$), and changes in CFI and RMSEA. For SCS, we found support for strong measurement invariance. For PCO and CSM, we found evidence for weak factorial invariance only. However, further support for the invariance over time was provided by differences in CFI and RMSEA observed across all models. These differences were no less than 0.01 and no greater than 0.015, respectively (Chen, 2007; Cheung & Rensvold, 2002). In sum, the measures exhibited sufficient invariance over time to conduct the subsequent change analyses. All results are displayed in Table 2.

3.2. Hypothesis tests

As an initial step in the analyses, we quantified the amount of within- and between person variability by computing ICC_1 statistics.

Table 2
Summary of measurement invariance tests.

	χ^2	df	CFI	RMSEA	AIC	BIC	$\Delta\chi^2$ (df)	p	ΔCFI	ΔRMSEA
PCO										
Configural invariance	556.765	302	0.926	0.060	20,561.885	21,019.111				
Weak invariance	579.183	320	0.925	0.059	20,548.304	20,943.180	22.419 (18)	0.214	0.001	0.001
Strong invariance	612.248	338	0.920	0.059	20,545.368	20,877.896	33.065 (18)	0.016*	0.004	0.000
CSM										
Overall score										
Configural invariance	1950.30	534	0.816	0.106	19,797.638	20,378.131				
Weak invariance	1970.00	558	0.816	0.104	19,769.356	20,266.923	19.719 (24)	0.713	0.001	0.002
Strong invariance	2011.10	582	0.814	0.102	19,762.408	20,177.047	41.052 (24)	0.016*	0.002	0.002
SCS										
Configural invariance	191.261	134	0.988	0.043	8674.909	9007.029				
Weak invariance	196.589	146	0.989	0.038	8656.237	8946.842	5.3282 (12)	0.946	0.001	0.004
Strong invariance	213.074	158	0.988	0.039	8648.723	8897.813	16.4854 (12)	0.170	0.001	0.000

Note. PCO = Protean career orientation; CSM = Engagement in career self-management, SCS = Subjective career success.
* $p < .05$.

We found a significant degree of within-person variance in all three variables. For PCO, $ICC_1 = 0.50$ suggesting that 50% of the variance in PCO occurred within-person. For engagement in CSM, $ICC_1 = 0.78$ suggesting that 22% of the variance in engagement in CSM occurred within-person. For SCS, $ICC_1 = 0.72$ suggesting that 28% of the variance in SCS occurred within-person. It should be mentioned that the within-person variance score includes true within-person variance, but also error variance.

Then, we specified two different RI-CLPM models to test the proposed hypotheses. In the first model, the unconstrained RI-CLPM, all over-time parameters (i.e., autoregressive and cross-lagged paths) were specified to be time variant. In the second model, the constrained RI-CLPM, the same parameters were specified to be time-invariant. In summary, the time invariant model did not fit the data significantly worse than the time variant model ($\chi^2_{(18)} = 21.447$, $p = .257$), which justifies restricting the over-time parameters to equality. Fit indices for both models are displayed in Table 3.

3.3. Within-person results

For Model 2 (constrained RI-CLPM) we obtained excellent model fit including trait-like and state-like elements of each constructs as well as autoregressive prediction of all state-like elements at later points in time by the state-like elements at earlier points in time, CFI = 0.99, TLI = 0.99, RMSEA = 0.03, SRMR = 0.04, $\chi^2_{(51)} = 72.20$, $p = .027$. The unstandardized estimates for state variables for both autoregressive and hypothesized cross-lagged effects are reported in Table 4. Fig. 1 depicts the autoregressive and cross-lagged paths for state PCO, CSM, and SCS, and also the associations between state and trait variables within each time point (also see Table 5). Summarizing the autoregressive effects from Fig. 1, earlier state PCO predicted future state PCO ($\beta = 0.13$, $p = .011$). Likewise, earlier state of SCS predicted future state of SCS ($\beta = 0.16$, $p = .005$). The autoregressive paths for state CSM were nonsignificant ($\beta = -0.01$; $p = .901$), which suggests that state-like aspects of CSM at an earlier time did not predict CSM at a later time. This finding indicates that state-like CSM did not endure across our observed occasions. Instead, the consistency of CSM across time was due to trait-like elements.

Summarizing the cross-lagged effects from Fig. 1, earlier states of PCO positively predicted future states of CSM ($\beta = 0.05$, $p = .037$), supporting Hypothesis 1. The remaining cross-lagged effects (i.e., between PCO and CSM, PCO and SCS, CSM and SCS, SCS and PCO, SCS and CSM) were not statistically significant, rejecting Hypothesis 2, 3, and 4.

3.4. Between-person results

At the between-person level, there were moderately strong correlations between the random intercept factors of PCO and CSM ($r_{xy} = 0.39$, $p < .001$), PCO and SCS ($r_{xy} = 0.61$, $p < .001$), and CSM and SCS ($r_{xy} = 0.28$, $p < .001$).

Tests of the proposed indirect effects are also embedded with the RI-CLPMs. Because we did not find significant paths from CSM to SCS at the within-person level, we tested the mediation only for the between-person effects. Please note that, with this analysis, we are not able to test prospective effects because the between-person (or trait-level) variables are based on all measurement points in RI-CLPM. Specifically, we estimated three models using bootstrap procedures (for the detailed figures, see Appendix B). In the first model (Hypothesis 5), PCO acted as predictor of CSM. Additionally, SCS was regressed on CSM and the direct path from PCO on SCS was included. The total indirect effect from PCO through CSM on SCS was not significant ($b = 0.02$, $p = .400$, CI = −0.030; 0.057), rejecting Hypothesis 5. In the second model (Hypothesis 6), CSM acted as predictor of SCS. Additionally, PCO was regressed on SCS and the direct path from CSM to PCO was included. The total indirect effect from CSM through SCS on PCO was significant ($b = 0.15$, $p < .001$, CI = 0.089; 0.225), partially supporting Hypothesis 6. In the third model (Hypothesis 7), SCS acted as predictor of PCO. Additionally, CSM was regressed on PCO and the direct path from SCS on CSM was included. The total indirect effect from SCS through PCO on CSM was significant ($b = 0.22$, $p < .001$, CI = 0.116; 0.342), partially supporting Hypothesis 7.

3.5. Supplemental analyses

To get more insight into the function of specific CSM behaviors (i.e., networking, career exploration, continuous learning), we ran

Table 3
Summary of RI-CLPM Fit Indices.

Model	χ2	df	*p*-value	CFI	TLI	AIC	BIC	RMSEA	90% CI	SRMR
Main analyses										
Model 1: Unconstrained RI-CLPM	50.749	33	0.025	0.994	0.987	10,120.794	10,368.894	0.031	0.011–0.047	0.029
Model 2: Constrained RI-CLPM	72.196	51	0.027	0.993	0.990	10,106.242	10,275.994	0.027	0.009–0.040	0.035
Supplemental analyses										
Model 3: Unconstrained RI-CLPM	46.168	33	0.064	0.995	0.990	11,050.790	11,298.890	0.026	0.000–0.043	0.031
Model 4: Constrained RI-CLPM	65.033	51	0.089	0.995	0.993	11,033.655	11,203.407	0.022	0.000–0.036	0.036
Model 5: Unconstrained RI-CLPM	48.378	33	0.041	0.994	0.988	11,499.880	11,747.980	0.028	0.006–0.045	0.029
Model 6: Constrained RI-CLPM	66.923	51	0.067	0.994	0.992	11,482.426	11,652.178	0.023	0.000–0.038	0.034
Model 7: Unconstrained RI-CLPM	54.256	33	0.011	0.992	0.984	10,527.587	10,775.687	0.033	0.016–0.049	0.028
Model 8: Constrained RI-CLPM	83.239	51	0.003	0.988	0.984	10,520.570	10,690.323	0.033	0.019–0.046	0.035

Note. Model 1 and 2 included protean career orientation, engagement in career self-management, and subjective career success. Model 3 and 4 included protean career orientation, CSM networking, and subjective career success. Model 5 and 6 included protean career orientation, CSM career exploration, and subjective career success. Model 7 and 8 included protean career orientation, CSM networking, and subjective career success.

Table 4
Summary of Model 2 state autoregressive and cross-lagged paths.

	β	SE	p
Autoregressive paths			
Protean career orientation T1 – Protean career orientation T2 – Protean career orientation T3 – Protean career orientation T4	0.134	0.053	0.011
Career self-management T1 – Career self-management T2 – Career self-management T3 – Career self-management T4	−0.006	0.052	0.901
Subjective career success T1 – Subjective career success T2 – Subjective career success T3 – Subjective career success T4	0.160	0.057	0.005
Hypothesized cross-lagged paths			
Protean career orientation Tx ➔ Career self-management Tx + 1	0.049	0.023	0.037
Career self-management Tx ➔ Subjective career success Tx + 1	−0.015	0.054	0.785
Subjective career Success Tx ➔ Protean career orientation Tx + 1	0.015	0.080	0.852
Subjective career success Tx ➔ Career self-management Tx + 1	−0.059	0.041	0.151

Note. Autoregressive and cross-lagged paths constrained to be equal from Time 1 to Time 4; Specific time points indicated by numbers after each variable. Unstandardized values are reported. SE refers to standard errors.

the models described above separately for each CSM activities subscale. Descriptive statistics and correlations are displayed in the Appendix C, Table C1. As in the main analysis, we confirmed measurement invariance over time for each CSM behavior (see Appendix, Table C2) and confirmed that constrained RI-CLPM models were appropriate to estimate autoregressive and cross-lagged effects. Fit indices for the additional tested models are displayed in Table 3.

For *CSM networking* autoregressive paths were nonsignificant and no significant cross-lagged effects were found. For *CSM career exploration*, the autoregressive effects were also nonsignificant, but similarly to the main analyses, earlier states of PCO positively predicted future states of CSM career exploration ($\beta = 0.08$, $p = .028$). Finally, for *CSM continuous learning*, the autoregressive effects were also nonsignificant. For the cross-lagged effects, earlier states of PCO positively predicted future states of CSM continuous learning ($\beta = 0.06$, $p = .036$), which is similar to the results of the main analyses. In addition, earlier states of SCS negatively predicted future states of CSM continuous learning ($\beta = -0.12$, $p = .015$), but not vice versa. Overall, the results replicate the general pattern of results for CSM career exploration and CSM continuous learning, whereas CSM networking seems to exhibit somewhat different effects. In the supplemental analyses, we did not test mediation effects.

4. Discussion

Although positive relations between PCO, CSM, and SCS have often been demonstrated (e.g., Fuller & Marler, 2009; Herrmann et al., 2015; Seibert et al., 2001b), researchers have mainly focused on general levels of these variables and investigated differences between persons. Hence, little is known about the intra-individual dynamics in relations among PCO, CSM, and SCS over time. This is important because, as suggested by action regulation theory, these relationships are likely to be dynamic, varying within-person and over time. To address this issue, the present study aimed to investigate the dynamics between PCO, engagement in CSM, and SCS using a within-person approach. Based on action regulation theory (Frese & Zapf, 1994; Zacher & Frese, 2018), we investigated the existence of reciprocal links between these three constructs using a four-wave longitudinal research design with time lags of one month between each wave. To study the postulated within-person effects, we used the recently introduced RI-CLPM (Hamaker et al., 2015). With this novel model, it is possible to separate within-person processes from stable, between-person differences through the inclusion of random intercepts.

4.1. Between-person effects

This study found support for the notion that the between-person components of PCO, engagement in CSM, and SCS are strongly and positively related. This indicates that employees who reported higher levels of PCO and higher levels of engagement in CSM compared to others also experienced more SCS across the four time points, and vice versa.

These findings are in line with previous theoretical and empirical work (Hall et al., 2018; Spurk et al., 2019). Action regulation theory suggests that goal attainment will influence future goals and actions. Although our results do not provide evidence for such a feedback loop at a within-person level, we found such effects at the between-person level. Our data showed significant indirect effects from engagement in CSM on PCO through SCS as well as from SCS on CSM through PCO (when considering trait-like aspects of PCO, CSM, and SCS over time). These findings highlight the importance of examining antecedents of PCO and outcomes of SCS in future research.

Going beyond existing research, by using the recently introduced RI-CLPM, we could distinguish between stable between-person differences and within-person effects. We demonstrated that there is appreciable between-person variance in PCO, engagement in CSM, and SCS, suggesting that all of these variables demonstrate stable trait-like aspects. Consistent with these findings, PCO is typically considered a rather stable career orientation (Hall et al., 2018). However, these results contribute to a refined understanding of CSM and SCS which are typically considered as more dynamic. As our results show, also CSM and SCS exhibit trait-like components which suggests that individuals meaningfully differ in their general, and rather stable, degree to which they engage in CSM and experience SCS. It is important to note that the RI-CLPM approach does not allow for the examination of prospective effects at the between-person level, which means that the between-person effects are modeled as correlations (i.e., as correlation between the random intercepts).

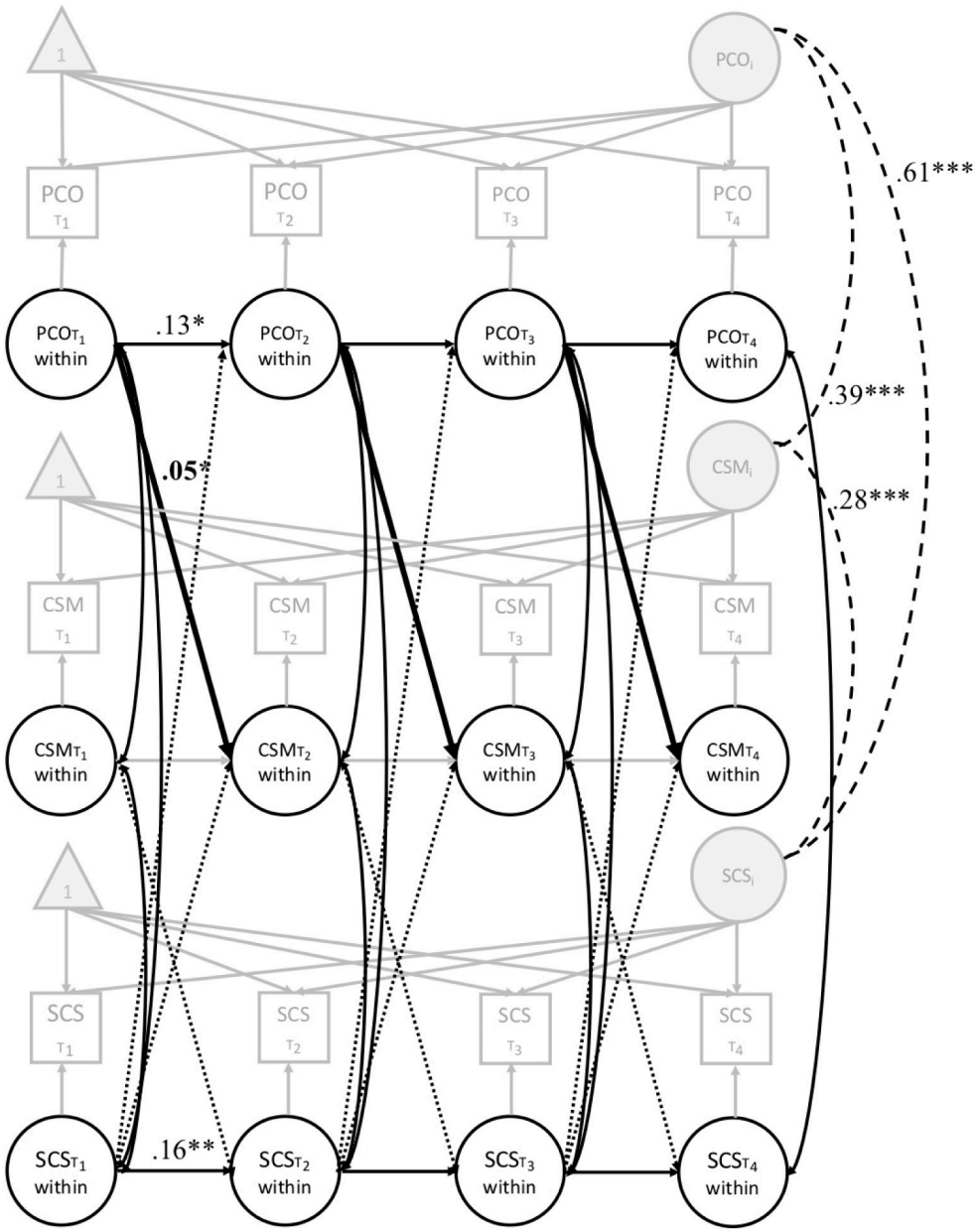

Fig. 1. Grey squares represent measurement from T1 to T4. "within" circles represent the within-person components of the construct over time. PCO_i, CSM_i, and CSM_i represent random intercepts (i.e., between-person effects) for PCO, CSM, and SCS, respectively. Solid bold directional arrows represent the significant within-person paths according to the postulated hypotheses (non-significant paths displayed as dotted arrows). Solid bi-directional arrows represent the state correlations (within-effects) between the variables. Dashed bi-directional arrows represent the between-person (i.e., stabile trait component of the variables) correlations. This figure was adapted from Hamaker et al. (2015). Certain parameters and paths have been omitted from this representation for sake of parsimony; see Table 4 for additional results.
** $p < .01$; * $p < .05$.

4.2. Within-person effects

Considering within-person effects, our results also contribute to a more dynamic understanding of PCO, CSM, and SCS beyond between-person effects. Specifically, the findings show that earlier states of PCO positively predict future states of PCO over time. This means that if someone exhibits a higher level of self-direction and intrinsic values orientation than his/her usual level at a certain time point, he/she will also subsequently report a higher-than-usual level which is also called within-person carry-over effect (Hamaker et al., 2015). Additionally, the degree of within-person variance in PCO suggests that up to 50% of the observed variability in PCO occurs within-person. This raises an interesting issue, as PCO is typically considered to be relatively stable. However, our findings

Table 5
Summary of Model 2 Correlations for Trait Variables and State Variables.

	r	*p*
Trait variable (between-person-effects)		
Protean career orientation with career self-management	0.392	0.000
Protean career orientation with subjective career success	0.614	0.000
Career self-management with subjective career success	0.280	0.000
State variable (within-person-effects)		
Protean career orientation T1 with career self-management T1	0.135	0.031
Protean career orientation T2–4 with career self-management T2–4	0.153	0.001
Protean career orientation T1 with subjective career success T1	0.181	0.006
Protean career orientation T2–4 with subjective career success T2–4	0.098	0.029
Career self-management T1 with subjective career success T1	0.268	0.000
Career self-management T2–4 with subjective career success T2–4	0.105	0.022

support the view that PCO might be more dynamic than traditionally presumed (Hall et al., 2018). We must therefore critically question whether a construct that fluctuates so much within-persons and over time can be considered as a relatively stable orientation, or whether it is better conceptualized as exhibiting both trait- and state-like qualities. Indeed, our findings suggest that PCO appears to be equally comprised of state- and trait-relevant variance, and this finding bears great potential for future research and theoretical development on protean careers. One possibility to explain the variance in PCO could be that in modern work contexts changes are more frequent, which implies the need for individuals to be more adaptive regarding career-related issues. Maybe the state-like component of PCO reflects such intra-individual adaptations to changing contexts and career situations. Such variability could also be moderated by career stage, for example that the relations might be stronger in early than in more advanced career stages.

Our findings also show similarities with the broader career literature. For example, career adaptability (i.e., a self-regulatory, psychosocial resource) demonstrated substantial within-person variability over short periods of time, suggesting that daily career adaptability and its dimensions fluctuated considerably across workdays (Zacher, 2015). Furthermore, according to action regulation theory, in our study, we frame PCO as a goal standard. As such, it is reasonable to expect that if behaviors have been enacted to achieve such a standard without success, the standard (PCO) will be changed accordingly. Thus, PCO will be flexible and malleable and thus an important antecedent the previous degree of success when aimed to realize them.

Similarly, we found that earlier states of SCS positively predict future states of SCS over time. Being more satisfied than usual at one point in time also predicts being subsequently more satisfied than one's own average. This finding points at a positive gain-spiral for subjective career success, where experiencing more satisfaction induces higher future satisfaction. This is in line with action regulation theory, which predicts that when actions are successful such that goals are achieved and positive feedback is received, positive affect (e.g., career satisfaction) increases (Pekrun & Frese, 1992; Raabe et al., 2007). However, this phenomenon could not be detected for engagement in CSM, which indicates that state-like engagement in CSM did not endure across time and the consistency of engagement in CSM across time was due to trait-like (rather than state-like) elements. In other words, deviations of one's own standard in engagement in CSM do not affect subsequent engagement in CSM, suggesting that future career-related behaviors are not predicted by previous behaviors. It could thus be that behaviors might be more directly driven by situational features and thus be more transient, episodic, and event-based, and executed only when it is necessary (e.g., when looking for a new job; when seeking to achieve a specific goal, such as a promotion).

For the cross-lagged effects, earlier states of PCO positively predicted later states of overall engagement in CSM. This finding is consistent with the existing literature on between-person effects which finds that PCO is positively linked to engagement in CSM (e.g., De Vos & Soens, 2008). Furthermore, according to action regulation theory, plans help transform general goals (i.e. PCO) into specific implementation intentions, which then lead to goal-directed behaviors (Gollwitzer & Brandstätter, 1997).

Adding to the existing literature, we demonstrated the relation between PCO and CSM also at the within-person level. As such, we could show that higher levels of PCO at one time point result in higher subsequent engagement in CSM. In line with our assumptions based on action regulation theory, we thus found evidence that PCO, representing an internally desired standard, positively affects the extent to which individuals engage in actions to attain this standard (i.e., CSM behaviors).

However, in contrast to our predictions, we did not find support for other cross-lagged effects. A possible explanation for the nonsignificant effect of CSM on SCS is that these relations need more time to develop at the within-person level than the three-month timeframe considered in our study. For instance, Neal et al. (2017) state that an unclarity remains whether the cycle time for concepts at higher levels of the goal hierarchy is longer than for concepts at lower levels. It is thus possible that it takes longer than the three months represented in our data to achieve a higher level of career satisfaction - compared to usual levels of career satisfaction - due to increased CSM.

We were also not able to demonstrate the entire postulated feedback-loop from increased experience of career satisfaction to subsequent adaptation in PCO and CSM at the within-person level. Again, considering cycle time (Neal et al., 2017), it could be that the effects of increased SCS on PCO and CSM take longer to develop than the timeframe considered here. In addition, as proposed by Cronin and Vancouver (2019), in dynamic processes, there may be not only feedback loops, but also inertia and asymmetric influence. The notion of inertia refers to the idea that some phenomena are difficult to change. So, it may be that relations among variables remain stable over time, even when examined in contexts characterized by high levels of change (Kirves et al., 2014). Future studies would therefore need to consider why and under what circumstances PCO, CSM, and SCS fluctuate or remain stable over time. Career

stage could play an important role in this regard. Although nowadays labor markets are much more flexible and job changes occur more often, this might not affect individuals in different career stages in the same way. Asymmetric influence involves the idea that factors that increase another factor are not necessarily the same factors that decrease that factor (Cronin & Vancouver, 2019). Thus, even though we did not find that increased experience of career satisfaction leads to subsequent increase in PCO and CSM at a later time point, there is the possibility that other variables could lead PCO and CSM to decrease which are themselves not positively affected by them (e.g., a personal crisis at home).

Another explanation could be that we did not distinguish between different dimensions of subjective career success as done in other studies that have used a multi-dimensional approach for assessing subjective career success (Haenggli & Hirschi, 2020; Shockley et al., 2016). In connection to self-directed and values-based career orientations, facets such as meaningful work, authenticity, or growth and development could exert specific effects on PCO which could be examined in future research.

4.3. Findings for different CSM behaviors

Beyond these general findings, we also found some differences for distinct CSM behaviors. While we found no effect of SCS on general CSM, SCS negatively predicted later states of CSM continuous learning. A possible explanation for this finding could be that when experiencing higher-than usual SCS, individuals may reduce motivations and behaviors aimed at learning new work-related knowledge. It could be that, when individuals experience a higher-than-usual level of SCS, they might be more motivated to exploit their existing knowledge (e.g., by consolidating knowledge or practicing newly acquired skills instead of exploring new knowledge domains). However, these effects occurred only at the within-person level of analysis. At the between-person level, the association between SCS and CSM continuous learning was positive.

Additionally, CSM networking seems to exhibit somewhat different effects compared to the other two studied CSM behaviors in relation to PCO, as PCO did not predict networking behaviors in the within-person cross-lagged effects. One explanation for this, is that networking is often used as a means to "build up" social capital for career advancement in terms of increasing objective career success (e.g., promotions). Because PCO is more focused in attaining intrinsic values and SCS (Hall et al., 2018), higher-than-usual PCO might not translate into more-than-usual networking. However, at the between-person level, PCO and CSM networking were positively related. Future research thus needs to more closely examine and potentially replicate this, potentially considering boundary conditions (e.g., career goal orientations) that might explain these different findings.

4.4. Limitations and future research

Our study is not without limitations. First, we relied on a single source and self-reported data. Although the use of a time-lagged design should reduce concerns about inflation of parameter estimates due to common method bias (Podsakoff et al., 2003), future studies could use multisource data (e.g., assessments of career self-management behaviors by supervisors and coworkers). Second, even though we assessed our constructs over four time points, it is possible that different time lags might produce different results, especially given the already discussed speculations about cycle time in self-regulation processes. Dormann and Griffin (2015) refer to the importance of choosing time lags "because effect sizes are positively skewed, time lags that are too short lead to slightly stronger decreases in effect size compared with time lags that are too long." (p. 6). However, they also highlight that shortitudinal studies (i.e., short time lags) provide essential information about expected causal effects over time. With the intervals of one month between the measurement time points, we could only investigate short-term changes. Given the scarcity of theory on temporal issues in work and career-related processes (Spector & Meier, 2014), our findings add important empirical insights into which timespans might and might not be appropriate to discover meaningful change in career-related constructs. Future studies should attempt to replicate the results over longer and potentially variable periods of time. Third, we focused on intra-individual processes and did not include measures of changes in contexts in which individuals are situated. More research is needed to further expand the understanding of the dynamics of PCO, CSM, and SCS, for example concerning (changes in) labor market conditions, cultural values, or organizational policies. We call for future studies that take into account environmental factors as well and subsequently to analyze the adaptability of the persons to fit their career goals to changes in the context. Finally, we drew from action regulation theory as an overarching theoretical framework for the hypotheses of our study. Here, we provide evidence for action regulation processes by demonstrating that an internally desired goal standard (i.e., PCO) affects the extent to which individuals engage in CSM behaviors. Furthermore, we demonstrate that goals/standards as well as the positive evaluation of goal progress and attainment increase over time at the within-person level. However, we did not test more detailed aspects of such models. For example, we did not control for the sequence, hierarchical structure, foci of action regulation, and the action-oriented mental model (Frese, 2009; Frese & Zapf, 1994), or affective components such as positive or negative affect (Carver & Scheier, 2001; Neal et al., 2017). Given the results of our study, more comprehensive tests of the proposed action regulation mechanisms seem warranted, especially those that consider sequence, hierarchical structure, and foci of action regulation (Frese, 2009; Frese & Zapf, 1994).

4.5. Implications for practice

Our study offers several insights important from a practical perspective. First, PCO seems to be more volatile at a within-person level than typically assumed. This suggests that PCO could be systematically modified through career interventions. Such interventions can be beneficial, because higher individual levels of PCO are related to several benefits for both individuals and organizations, such as better job performance, higher levels of organizational citizenship behavior, or organizational commitment and

employee wellbeing (e.g., Rodrigues et al., 2015). Our findings also suggest that increased levels of PCO predict increased engagement in CSM. Career counsellors could therefore encourage a self-directed and values-based mindset among clients to increase their active career engagement.

The finding that CSM and SCS contain a relatively large proportion of stable trait-like variance suggests that they are more stable than expected. Career counsellors typically encourage people to explore career opportunities, to network, and to keep their knowledge up-to-date, and to focus on how to attain more satisfaction in their career. However, our results suggest that career counsellors should take into consideration that individuals also differ meaningfully in their general level of CSM and SCS, which might not easily be changed. It is thus possible that fundamental changes in levels of exhibited CSM and experienced SCS require more long-term oriented career interventions and career education which go beyond typical career counseling sessions.

5. Conclusion

Our study provides an in-depth exploration of a dynamic feed-back process between PCO, engagement in CSM, and SCS by using a within-person approach and a fully crossed and lagged longitudinal research design. As such, we enrich the career literature by introducing a novel within-person perspective on potential antecedents, consequences, and changes in PCO, engagement in CSM, and SCS over time. Accordingly, our study offers new insights for a better understanding of the dynamic nature of key career development constructs and should serve to inspire future empirical research and theoretical (re)development.

CRediT authorship contribution statement

Madeleine Haenggli: Conceptualization, Methodology, Software, Formal analysis, Investigation, Resources, Data curation, Writing – original draft, Writing – review & editing, Visualization, Project administration. **Andreas Hirschi:** Conceptualization, Methodology, Resources, Writing – review & editing, Supervision, Funding acquisition. **Cort W. Rudolph:** Methodology, Formal analysis, Investigation, Resources, Writing – review & editing, Supervision. **José María Peiró:** Writing – review & editing, Resources, Supervision.

Declaration of competing interest

None.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jvb.2021.103650.

References

Abele, A. E., & Spurk, D. (2009). The longitudinal impact of self-efficacy and career goals on objective and subjective career success. *Journal of Vocational Behavior, 74*(1), 53–62. https://doi.org/10.1016/j.jvb.2008.10.005

Alisic, A., & Wiese, B. S. (2020). Keeping an insecure career under control: The longitudinal interplay of career insecurity, self-management, and self-efficacy. *Journal of Vocational Behavior, 103431*. https://doi.org/10.1016/j.jvb.2020.103431

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

Biemann, T., Zacher, H., & Feldman, D. C. (2012). Career patterns: A twenty-year panel study. *Journal of Vocational Behavior, 81*(2), 159–170. https://doi.org/10.1016/j.jvb.2012.06.003

Briscoe, J. P., Hall, D. T., & DeMuth, R. L. F. (2006). Protean and boundaryless careers: An empirical exploration. *Journal of Vocational Behavior, 69*(1), 30–47. https://doi.org/10.1016/j.jvb.2005.09.003

Briscoe, J. P., Henagan, S. C., Burton, J. P., & Murphy, W. M. (2012). Coping with an insecure employment environment: The differing roles of protean and boundaryless career orientations. *Journal of Vocational Behavior, 80*(2), 308–316. https://doi.org/10.1016/j.jvb.2011.12.008

Carver, C. S., & Scheier, M. F. (2001). *On the self-regulation of behavior*. Cambridge University Press.

Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling, 14*(3), 464–504. https://doi.org/10.1080/10705510701301834

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling, 9*(2), 233–255. https://doi.org/10.1207/S15328007SEM0902_5

Cronin, M. A., & Vancouver, J. B. (2019). The only constant is change: Expanding theory by incorporating dynamic properties into one’s models. In S. E. Humphrey, & J. M. LeBreton (Eds.), *The handbook of multilevel theory, measurement, and analysis* (pp. 89–114). American Psychological Association. https://doi.org/10.1037/0000115-005.

De Bloom, J., Vaziri, H., Tay, L., & Kujanpää, M. (2020). An identity-based integrative needs model of crafting: Crafting within and across life domains. *Journal of Applied Psychology*. https://doi.org/10.1037/apl0000495
De Vos, A., & Soens, N. (2008). Protean attitude and career success: The mediating role of self-management. *Journal of Vocational Behavior, 73*(3), 449–456. https://doi.org/10.1016/j.jvb.2008.08.007
Direnzo, M. S., & Greenhaus, J. H. (2011). Job search and voluntary turnover in a boundaryless world: A control theory perspective. *Academy of Management Review, 36*(3), 567–589. https://doi.org/10.5465/amr.2009.0333
Dormann, C., & Griffin, M. A. (2015). Optimal time lags in panel studies. *Psychological Methods, 20*(4), 489. https://doi.org/10.1037/met0000041
Frese, M. (2009). Toward a psychology of entrepreneurship: An action theory perspective. In now publishers inc. *Foundations and Trends in Entrepreneurship, 5*(6), 437–496. https://doi.org/10.1561/0300000028
Frese, M., & Sabini, J. (1985). *Goal directed behavior: The concept of action in psychology*. Hillsdale, NJ: Erlbaum.
Frese, M., & Zapf, D. (1994). Action as the core of work psychology: A German approach. In H. C. Triandis, M. D. Dunnette, & L. M. Hough (Eds.), *4(2). Handbook of industrial and organizational psychology* (pp. 271–340).
Fuller, B., Jr., & Marler, L. E. (2009). Change driven by nature: A meta-analytic review of the proactive personality literature. *Journal of Vocational Behavior, 75*(3), 329–345. https://doi.org/10.1016/j.jvb.2009.05.008
Gollwitzer, P. M., & Brandstätter, V. (1997). Implementation intentions and effective goal pursuit. *Journal of Personality and Social Psychology, 73*(1), 186–199.
Goodman, J. S., & Blum, T. C. (1996). Assessing the non-random sampling effects of subject attrition in longitudinal research. *Journal of Management, 22*(4), 627–652.
Gravetter, F. J., Wallnau, L. B., Forzano, L.-A. B., & Witnauer, J. E. (2020). *Essentials of statistics for the behavioral sciences*. Cengage Learning.
Greenhaus, J. H., Parasuraman, S., & Wormley, W. M. (1990). Effects of race on organizational experiences, job performance evaluations, and career outcomes. *Academy of Management Journal, 33*(1), 64–86. https://doi.org/10.5465/256352
Greenhaus, J. H., Callanan, G. A., & Godshalk, V. M. (2010). *Career management*. Sage.
Hacker, W. (1985). Activity: A fruitful concept in industrial psychology. In M. Frese, & J. Sabini (Eds.), *Goal directed behavior: The concept of action in psychology* (pp. 262–284). Hillsdale, NJ: Erlbaum.
Hacker, W. (2003). Action regulation theory: A practical tool for the design of modern work processes? *European Journal of Work and Organizational Psychology, 12*(2), 105–130. https://doi.org/10.1080/13594320344000075
Haenggli, M., & Hirschi, A. (2020). Career adaptability and career success in the context of a broader career resources framework. *Journal of Vocational Behavior*. https://doi.org/10.1016/j.jvb.2020.103414
Hall, D. T. (1996). Protean careers of the 21st century. *Academy of Management Perspectives, 10*(4), 8–16. https://doi.org/10.5465/ame.1996.3145315
Hall, D. T., & Chandler, D. E. (2005). Psychological success: When the career is a calling. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior, 26*(2), 155–176. https://doi.org/10.1002/job.301
Hall, D. T., Yip, J., & Doiron, K. (2018). Protean careers at work: Self-direction and values orientation in psychological success. *Annual Review of Organizational Psychology and Organizational Behavior, 5*, 129–156. https://doi.org/10.1146/annurev-orgpsych-032117-104631
Hamaker, E. L., Kuiper, R. M., & Grasman, R. P. (2015). A critique of the cross-lagged panel model. *Psychological Methods, 20*(1), 102. https://doi.org/10.1037/a0038889
Herrmann, A., Hirschi, A., & Baruch, Y. (2015). 6//). The protean career orientation as predictor of career outcomes: Evaluation of incremental validity and mediation effects. *Journal of Vocational Behavior, 88*, 205–214. https://doi.org/10.1016/j.jvb.2015.03.008
Hirschi, A., & Freund, P. A. (2014). Career engagement: Investigating intraindividual predictors of weekly fluctuations in proactive career behaviors. *The Career Development Quarterly, 62*(1), 5–20. https://doi.org/10.1002/j.2161-0045.2014.00066.x
Hirschi, A., Nagy, N., Baumeler, F., Johnston, C., & Spurk, D. (2018). Assessing key predictors of career success: Development and validation of the career resources questionnaire. *Journal of Career Assessment*. https://doi.org/10.1177/1069072717695584
Hirschi, A., Haenggli, M., Nagy, N., Baumeler, F., Johnston, C., & Spurk, D. (2019). Karriere-ressourcen messen: Validierung der deutschsprachigen version des karriere-ressourcen fragebogens [Assessing career resources: Validation of the German version of the career resources Questionnaire]. *Diagnostica*. https://doi.org/10.1026/0012-1924/a000219
Hobfoll, S. E., Halbesleben, J., Neveu, J.-P., & Westman, M. (2018). Conservation of resources in the organizational context: The reality of resources and their consequences. *Annual Review of Organizational Psychology and Organizational Behavior, 5*, 103–128. https://doi.org/10.1146/annurev-orgpsych-032117-104640
King, Z. (2004). Career self-management: Its nature, causes and consequences. *Journal of Vocational Behavior, 65*(1), 112–133. https://doi.org/10.1016/S0001-8791(03)00052-6
Kirves, K., Kinnunen, U., De Cuyper, N., & Mäkikangas, A. (2014). Trajectories of perceived employability and their associations with well-being at work. *Journal of Personnel Psychology*. https://doi.org/10.1027/1866-5888/a000103
Lent, R. W., & Brown, S. D. (2013). Social cognitive model of career self-management: Toward a unifying view of adaptive career behavior across the life span. *Journal of Counseling Psychology, 60*(4), 557. https://doi.org/10.1037/a0033446
Neal, A., Ballard, T., & Vancouver, J. B. (2017). Dynamic self-regulation and multiple-goal pursuit. *Annual Review of Organizational Psychology and Organizational Behavior, 4*, 401–423. https://doi.org/10.1146/annurev-orgpsych-032516-113156
Ng, T. W., & Feldman, D. C. (2014). Subjective career success: A meta-analytic review. *Journal of Vocational Behavior, 85*(2), 169–179. https://doi.org/10.1016/j.jvb.2014.06.001
Ng, T. W., Eby, L. T., Sorensen, K. L., & Feldman, D. C. (2005). Predictors of objective and subjective career success: A meta-analysis. *Personnel Psychology, 58*(2), 367–408. https://doi.org/10.1111/j.1744-6570.2005.00515.x
Pekrun, R., & Frese, M. (1992). Emotions in work and achievement. In C. L. Cooper, & I. T. Robertson (Eds.), *International review of industrial and organizational psychology* (Vol. 7, pp. 153–200). Wiley.
Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879. https://doi.org/10.1037/0021-9010.88.5.879
Porter, C., Woo, S. E., & Tak, J. (2016). Developing and validating short form protean and boundaryless career attitudes scales. *Journal of Career Assessment, 24*(1), 162–181. https://doi.org/10.1177/1069072714565775
Putnick, D. L., & Bornstein, M. H. (2016). Measurement invariance conventions and reporting: The state of the art and future directions for psychological research. *Developmental Review, 41*, 71–90. https://doi.org/10.1016/j.dr.2016.06.004
Raabe, B., Frese, M., & Beehr, T. A. (2007). Action regulation theory and career self-management. *Journal of Vocational Behavior, 70*(2), 297–311. https://doi.org/10.1016/j.jvb.2006.10.005
Rodrigues, R., Guest, D., Oliveira, T., & Alfes, K. (2015). Who benefits from independent careers? Employees, organizations, or both? *Journal of Vocational Behavior, 91*, 23–34. https://doi.org/10.1016/j.jvb.2015.09.005
Rosseel, Y. (2012). Lavaan: An R package for structural equation modeling. *Journal of Statistical Software, 48*(2), 1–36. https://doi.org/10.18637/jss.v048.i02
Seibert, S. E., Kraimer, M. L., & Crant, J. M. (2001). What do proactive people do? A longitudinal model linking proactive personality and career success. *Personnel Psychology, 54*(4), 845–874.
Seibert, S. E., Kraimer, M. L., & Crant, J. M. (2001). What do proactive people do? A longitudinal model linking proactive personality and career success. *Personnel Psychology, 54*(4), 845–874. https://doi.org/10.1111/j.1744-6570.2001.tb00234.x
Seibert, S. E., Kraimer, M. L., Holtom, B. C., & Pierotti, A. J. (2013). Even the best laid plans sometimes go askew: Career self-management processes, career shocks, and the decision to pursue graduate education. *Journal of Applied Psychology, 98*(1), 169. https://doi.org/10.1037/a0030882
Shockley, K. M., Ureksoy, H., Rodopman, O. B., Poteat, L. F., & Dullaghan, T. R. (2016). Development of a new scale to measure subjective career success: A mixed-methods study. *Journal of Organizational Behavior, 37*(1), 128–153. https://doi.org/10.1002/job.2046
Spector, P. E., & Meier, L. L. (2014). Methodologies for the study of organizational behavior processes: How to find your keys in the dark. *Journal of Organizational Behavior, 35*(8), 1109–1119. https://doi.org/10.1002/job.1966

Spreitzer, G. M., Cameron, L., & Garrett, L. (2017). Alternative work arrangements: Two images of the New World of work. *Annual Review of Organizational Psychology and Organizational Behavior, 4*(1), 473–499. https://doi.org/10.1146/annurev-orgpsych-032516-113332

Spurk, D., & Abele, A. E. (2014). Synchronous and time-lagged effects between occupational self-efficacy and objective and subjective career success: Findings from a four-wave and 9-year longitudinal study. *Journal of Vocational Behavior, 84*(2), 119–132. https://doi.org/10.1016/j.jvb.2013.12.002

Spurk, D., Hirschi, A., & Dries, N. (2019). Antecedents and outcomes of objective versus subjective career success: Competing perspectives and future directions. *Journal of Management, 45*(1), 35–69. https://doi.org/10.1177/0149206318786563

Steiner, R. S., Hirschi, A., & Wang, M. (2019). Predictors of a protean career orientation and vocational training enrollment in the post-school transition. *Journal of Vocational Behavior, 112*, 216–228. https://doi.org/10.1016/j.jvb.2019.03.002

Supeli, A., & Creed, P. A. (2016). The longitudinal relationship between protean career orientation and job satisfaction, organizational commitment, and intention-to-quit. *Journal of Career Development, 43*(1), 66–80. https://doi.org/10.1177/0894845315581686

Team, R. C. (2017). *R: a language and environment for statistical computing*. Vienna: R Foundation for Statistical Computing. www.R-project.org.

Tolli, A. P., & Schmidt, A. M. (2008). The role of feedback, causal attributions, and self-efficacy in goal revision. *Journal of Applied Psychology, 93*(3), 692. https://doi.org/10.1037/0021-9010.93.3.692

Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods, 3*(1), 4–70. https://doi.org/10.1177/109442810031002

Waters, L., Briscoe, J. P., Hall, D. T., & Wang, L. (2014). Protean career attitudes during unemployment and reemployment: A longitudinal perspective. *Journal of Vocational Behavior, 84*(3), 405–419. https://doi.org/10.1016/j.jvb.2014.03.003

Weng, Q., & McElroy, J. C. (2012). Organizational career growth, affective occupational commitment and turnover intentions. *Journal of Vocational Behavior, 80*(2), 256–265. https://doi.org/10.1016/j.jvb.2012.01.014

Zacher, H. (2015). Daily manifestations of career adaptability: Relationships with job and career outcomes. *Journal of Vocational Behavior, 91*, 76–86. https://doi.org/10.1016/j.jvb.2015.09.003

Zacher, H. (2016). Within-person relationships between daily individual and job characteristics and daily manifestations of career adaptability. *Journal of Vocational Behavior, 92*, 105–115. https://doi.org/10.1016/j.jvb.2015.11.013

Zacher, H., & Frese, M. (2018). Action regulation theory: Foundations, current knowledge and future directions. In D. S. Ones, N. Anderson, C. Viswesvaran, & H. K. Sinangil (Eds.), *The SAGE handbook of industrial, work & organizational psychology: Organizational psychology* (pp. 122–144). Sage Reference.

Zacher, H., Hacker, W., & Frese, M. (2016). Action regulation across the adult lifespan (ARAL): A metatheory of work and aging, 2016-04-22 00:00:00 *Work, Aging and Retirement, 2*(3), 286–306. https://doi.org/10.1093/workar/waw015.