

# Career adaptivity, adaptability, and adapting: A conceptual and empirical investigation



Andreas Hirschi <sup>a,\*</sup>, Anne Herrmann <sup>b</sup>, Anita C. Keller <sup>a</sup>

<sup>a</sup> University of Bern, Switzerland

<sup>b</sup> University of Applied Science Northwestern Switzerland, Switzerland

## ARTICLE INFO

### Article history:

Received 30 October 2014

Available online 29 November 2014

### Keywords:

Career adaptability

Proactivity

Core self-evaluations

Career maturity

## ABSTRACT

The literature on career adaptation is vast and based on a range of different measurement approaches. The present paper aims to explore how different operationalizations of career adaptability in terms of concern, control, curiosity, and confidence are related from a conceptual and empirical standpoint. Based on a cross-sectional analysis with 1260 German university students, we established that the adaptability resources of concern, control, curiosity, and confidence are significantly related to, but empirically distinct from, measures representing adapting in terms of career planning, career decision-making difficulties, career exploration, and occupational self-efficacy. In a follow-up survey six months later, we found that the career adaptability dimensions partially mediated the effects of adaptivity (i.e., core self-evaluations and proactivity) on planning, decision-making difficulties, exploration, and self-efficacy. Interestingly, in both analyses, there was no clear match between adaptability resources and theoretically corresponding aspects of career adapting in terms of behaviors, beliefs, and barriers. The results suggest that psychological career resources in terms of concern, control, curiosity, and confidence partially mediate the effects of more context-general, trait-like adaptivity on different career-specific behavioral forms of adapting.

© 2014 Elsevier Inc. All rights reserved.

## 1. Introduction

A major interest in the career literature over the past years has been to address the notion of *new careers*, which are characterized by increased flexibility and self-directedness on the part of individuals (Sullivan, 1999). One of the most prominent notions in this regard is career adaptability, which is proposed to be a key factor for career success (Morrison & Hall, 2002) and for current career counseling practice (van Vianen et al., 2009).

Not surprisingly, career adaptation has been explored in many empirical studies and its measurement, emergence, and predictive utility are of core interest in current career research.

However, career adaptation has been defined and measured in many different ways. Most likely, the most influential theorization stems from Savickas (1997, 2002); researchers have frequently used his model of the four C's (concern, control, curiosity, confidence) as a guiding framework when conceptualizing and assessing career adaptability (e.g., Hirschi, 2009; Klehe et al., 2011). Typically, the four C's were assessed with attitudinal or behavioral scales (e.g., career planning, career exploration). More recently, the notion of career adaptability has been refined and redefined as a set of psychosocial resources that condition adapting behaviors. Subsequently, a new measure, the career adapt-ability scale (CAAS), assessing this definition of career adaptability has been introduced in 10 languages (Savickas & Porfeli, 2012). This raises the important question of how this new conceptualization and operationalization of career

\* Corresponding author at: Institute of Psychology, University of Bern, Fabrikstrasse 8, CH-3012 Bern, Switzerland.  
E-mail address: [andreas.hirschi@psy.unibe.ch](mailto:andreas.hirschi@psy.unibe.ch) (A. Hirschi).

adaptability as a set of resources relates to the existing measurement approaches to adaptation in the literature, which operationalized career development or maturity in terms of career behaviors and attitudes, but also in regard to the same four dimensions of adaptability. Such knowledge is critical to compare and integrate the literatures on career adaptation and development.

The aim of the present study is to empirically evaluate a theoretical model of the relationships among important career adaptation and development variables. As such, the study makes several key contributions. On a general level, it reconsiders for the first time in 30 years (cf., Savickas, 1984) the unfortunate lack of coherence in the career literature where the same or similar terms are used to denote variables that are theoretically and empirically quite different. Specifically, the present study contributes towards a theoretical and empirical integration of the dispersed literature regarding career adaptation. Furthermore, it provides new insights into the concurrent, discriminant, and predictive validity of the newly developed career adapt-abilities scale (Savickas & Porfeli, 2012).

### 1.1. Defining and measuring career adaptability

Since its emergence, career adaptability has been conceptualized as a multi-dimensional construct, consisting of different dimensions that reflect a set of diverse aspects in terms of personality, motivation, readiness, strengths, behaviors, and attitudes (Goodman, 1994; Hartung et al., 2008). Within his career construction theory, Savickas (2002) conceptualized career adaptability as attitudes, behaviors, and competencies that individuals use in fitting themselves to work that suits them, consisting of the four dimensions of concern (planning, being planful), control (decision making, being decisive), curiosity (exploring, being inquisitive), and confidence (problem solving, being efficacious).

When investigating career adaptability using Savickas' (2013) model as a guiding framework, researchers usually assessed the proposed dimensions with different attitudinal or behavioral scales, measuring career planning (concern), career decidedness (control), career exploration (curiosity), and career self-efficacy beliefs (confidence) (Balin & Hirschi, 2010; Creed et al., 2009; Creed et al., 2011; Hirschi, 2009; Koen et al., 2010). Other times, researchers just used a subset of such measures to represent the construct of adaptability: for example, career decision self-efficacy and career commitment (Duffy & Blustein, 2005), or career exploration and career planning (Hirschi, 2010b; Klehe et al., 2011; Zikic & Klehe, 2006). These measurement approaches implement traditional notions of psychological career maturity (Crites, 1961; Super et al., 1981) yet also coincide with the more modern definition of psychosocial adaptability as a set of behaviors and attitudes (Savickas, 2002). Nevertheless, psychological career maturity is conceptually distinct from the most recent refinement and redefinition of career adaptability as "a psychosocial construct that denotes an individual's resources for coping with current and anticipated tasks, transitions, traumas in their occupational roles" (Savickas & Porfeli, 2012, p. 662). According to this definition, career adaptability is a strength or psychosocial resource that connects the person to the environment, in much the same fashion that identity connects the self-concept to a social role. In the present paper, we empirically address how this new conceptualization and assessment of career adaptability relates to similarly-named attitudinal and behavioral measurement approaches found in the career maturity literature. First, however, we attempt a theoretical clarification of their relationship, building upon the elaborations provided by Savickas (2013).

### 1.2. Theoretical integration of different measurement approaches

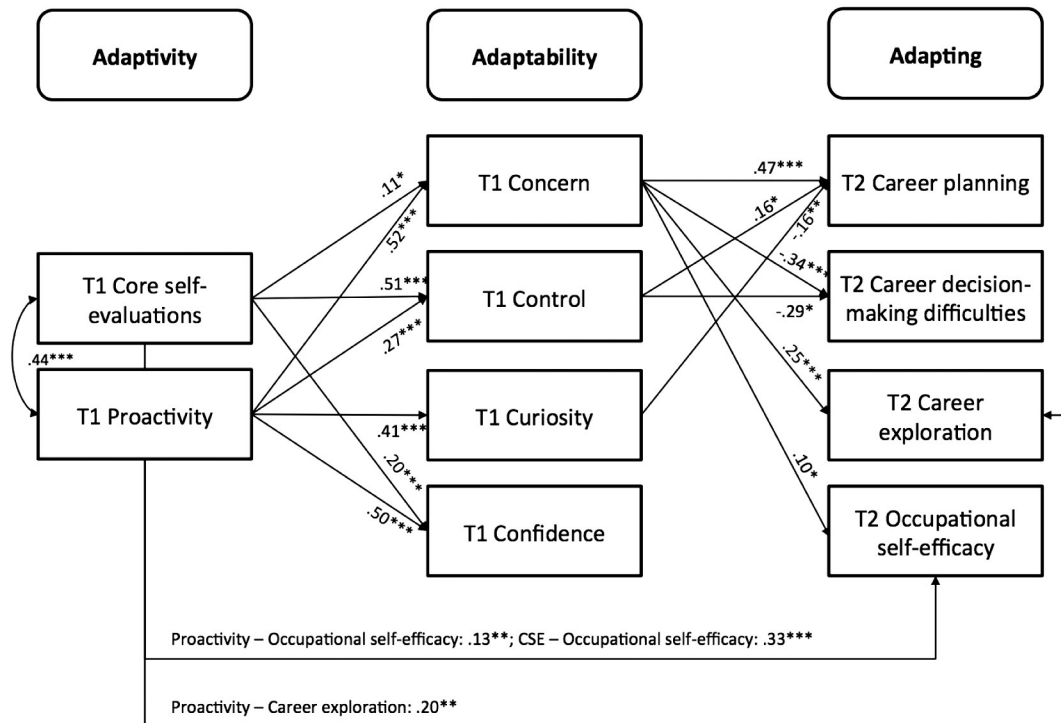
According to Savickas (2013), we must firstly distinguish between adaptive readiness, adaptability resources, adapting responses, and adaptation results. *Adaptivity*, or adaptive readiness, is the psychological trait of willingness to meet the unfamiliar, complex, and ill-defined problems presented by vocational development tasks, occupational transitions, and work traumas with fitting responses, often operationalized as proactivity or flexibility. *Adaptability resources* refers to the psychosocial strengths that condition self-regulation in coping with the tasks, transitions, and traumas. *Adaptability* is usually measured in terms of concern, control, curiosity, and confidence (Savickas & Porfeli, 2012). *Adapting*, or adapting responses, denotes performing adaptive behaviors that address changing conditions. We would argue that behaviors such as career planning and career exploration represent instances of *adapting* because people use these behaviors to address career development tasks and changing work and career conditions. Moreover, it could be argued that in addition to behaviors, beliefs and barriers also represent instances of adaptive reactions to career challenges and changes. Career beliefs include assumptions and generalizations about themselves and the world of work, such as self-efficacy beliefs that show confidence in one's ability to address the challenges in one's career. Barriers to career choice and adjustment are measured by scales that indicate career decision-making difficulties. And finally, *adaptation* results refer to the outcomes of adapting behaviors, often measured in terms of career decidedness, career commitment, job satisfaction, and work success.

In sum, operationalizations of career behaviors, beliefs, and barriers in terms of planning, deciding, exploring, and self-efficacy should be regarded as indicators of adapting and hence as responses in a more modern notion of adaptability resources and adaptation results (Fig. 1). In line with this assumption, Urbanaviciute et al. (2014) found significant correlations between the CAAS dimensions and measures of career exploration and career decidedness.

We propose:

**Hypothesis 1.** Career adaptability (i.e., concern, control, curiosity, confidence) is related to, but is empirically distinct from, adapting (i.e., career planning, career decision-making difficulties, career exploration, and occupational self-efficacy beliefs).

Second, adaptability needs to be distinguished from *adaptivity*, the "personality trait of flexibility or willingness to change" (Savickas & Porfeli, 2012, p. 662). Adaptivity should be regarded as an antecedent of the more malleable career adaptability strengths



**Fig. 1.** The conceptual framework of the present study proposing that *adaptability* in terms of personal resources of concern, control, curiosity, and confidence mediates the effects of more context-general *adaptivity* traits on more specific career attitudes and behaviors of *adapting*. The path diagram shows significant standardized parameters ( $n = 363$ ). For clarity, only significant paths are shown. \*\*\* $p < .001$ ; \*\* $p < .01$ ; \* $p < .05$ .

(Fig. 1). In the present study, we specifically focus on two personality characteristics that have gained increased attention in the career literature as indicators of *adaptivity*: core self-evaluations (CSE) and proactivity.

CSE represent the “basic, fundamental appraisal of one’s worthiness, effectiveness, and capability as a person” (Judge et al., 2003, p. 304). Numerous studies have shown that CSE are positively related to a range of job attitudes and different measures of career success, and it is assumed that CSE play an important role in managing careers (Judge & Kammeyer-Mueller, 2011). Due to their positive self-appraisal, people with high CSE can be expected to be more ambitious and confident in their career and to be more actively engaged in self-initiated career planning as well as in exploration and job search behaviors (Judge & Kammeyer-Mueller, 2011). Supporting its relation to career adaptability, Zacher (2014a, 2014b) found significant correlations between CSE and all four dimensions of the CAAS in two large samples of Australian employees.

Proactivity represents the relatively stable disposition to effect environmental change by taking personal initiative in a broad range of activities and situations (Crant, 2000). As such, it is a key factor of active adaptation. Meta-analyses have shown that proactive personality is positively related to networking behaviors and career initiative, as well as subjective and objective indicators of career success (Fuller & Marler, 2009; Thomas et al., 2010). Tolentino et al. (2014) also conceptualized proactivity as a form of adaptivity and found significant correlations with all four CAAS dimensions among a sample of Australian undergraduate students.

An important aim of the present paper is to evaluate the proposed mediation model depicted in Fig. 1, which assumes that the more trait-like adaptivity affects adaptability strengths, which in turn promote adapting behaviors and beliefs. First, partial empirical support for this model stems from Zacher (2014b), who showed that changes in career adaptability, as measured by the CAAS, were predicted by CSE among Australian employees. Additionally, Tolentino et al. (2014) found that proactivity correlated positively with all four CAAS dimensions assessed four weeks later among Australian undergraduate students. Thus, these studies show that the indicators of adaptivity investigated herein prospectively predict career adaptability (as assessed with the CAAS). However, the indirect effects proposed herein (Fig. 1) were not assessed in these studies.

**Hypothesis 2.** There is an indirect effect of adaptivity (i.e., cse, proactivity) on adapting (i.e., career planning, career decision-making difficulties, career exploration, and occupational self-efficacy beliefs) through increased levels of career adaptability (i.e., concern, control, curiosity, and confidence).

### 1.3. The present study

To evaluate the proposed hypotheses, we conducted a study among German university students using both cross-sectional and longitudinal analyses. University students need to be concerned with career development and to be actively engaged in career

preparation in order to successfully address the challenge of transitioning from university to work (Hirschi et al., 2013). As such, the assessed constructs can be meaningfully evaluated within this group. Moreover, university students were frequently investigated in previous research on career adaptability (e.g., Tak, 2012; Tolentino et al., 2014; van Vianen et al., 2012), which allows for a direct comparison of our results with previous research.

We applied cross-sectional analyses (based on the first wave of data collection) to investigate the relationship between the measures of career adaptability (concern, control, curiosity, confidence) and adapting (career planning, career decision making, career exploration, occupational self-efficacy) (Hypothesis 1), because this provides a stringent test of their empirical similarities and distinctions. In contrast, for the mediation analyses (Hypothesis 2), we applied a longitudinal design that separated the criterion variable in time from the mediating and exogenous variables, because this represents a more stringent test for mediation effects than cross-sectional analyses. For this purpose, we conducted a follow-up survey assessing adaptivity again, six months after the first data collection.

## 2. Method

### 2.1. Participants and procedure

We contacted university students enrolled in a German university by email with addresses provided by the registration office ( $N = 3500$ ). Email recipients were invited to complete an online questionnaire containing the measures of CSE, proactivity, the CAAS scale, and the four indicators of adapting (career planning, career decision-making difficulties, career exploration, and occupational self-efficacy). The response rate was 36% ( $N = 1260$ ); 67% of the participants were female, with a mean age of 23.95 ( $SD = 3.14$ ) years. Participation in a lottery drawing offering two prizes of US\$ 500 each was offered as an incentive. Participants were enrolled in a range of majors, with the largest groups studying business administration and management (30%), teaching (19%), cultural studies and political sciences (16%), psychology and business psychology (11%), and environmental sciences (10%).

Participants who completed the questionnaire were asked if they would agree to be contacted again for a follow-up survey and 68% agreed. They were contacted six months later and invited to complete another questionnaire containing again the four indicators of career adapting. The response rate was 42%, resulting in a sample size of  $n = 363$  for the longitudinal analyses; 72% of the participants were female, with a mean age of 24.30 ( $SD = 2.95$ ) years. The same lottery as at T1 was offered as incentive. We compared the group that participated at T2 with the group that participated only at T1 and found no significant differences in gender, age, or any of the assessed constructs at T1.

### 2.2. Measures

Unless stated otherwise, all measures used a five-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Cronbach's alpha, means, standard deviations, and correlations between measures are reported in Table 1.

#### 2.2.1. Career adaptability

The four factors of career adaptability were assessed with the German career adapt-ability scale (CAAS international form 2.0) (Johnston et al., 2013; Savickas & Porfeli, 2012). The scale consists of 24 items that are divided equally into the four subscales: concern (e.g., "concerned about my career"), control (e.g., "making decisions by myself"), curiosity (e.g., "becoming curious about new opportunities"), and confidence (e.g., "performing tasks efficiently"). Participants answered the items on a five-point scale ranging from 1 (*I don't have the ability to*) to 5 (*I have a very strong ability to*). The study by Johnston et al. (2013) demonstrated good Cronbach's alpha for the four subscales ranging from .86 to .88 and replicated the four-factor structure. They found validity evidence in terms of negative relationships of the CAAS scale with work stress and positive relationships with orientations to happiness (Johnston et al., 2013).

#### 2.2.2. Adapting

*Career planning* was assessed with the six-item (e.g., "I have a strategy for reaching my career goals") career planning scale. The scale was developed by Gould (1979). The German translation by Abele and Wiese (2008) showed good reliability and construct validity among a large group of German professionals in terms of positive relationships with subjective and objective career success.

*Career decision-making difficulties* were assessed using the German-language adaptation of the Vocational Identity Scale (Holland, Daiger, & Power, 1980; Jörin, Stoll, Bergmann, & Eder, 2004). The scale consists of seven items (e.g., "I'm not sure yet which occupations I could perform successfully"). The German-language version of the scale was significantly correlated with other measures of career decidedness, career planning, and career exploration among adolescents and college students (Hirschi & Herrmann, 2012; Hirschi & Herrmann, 2013).

*Career exploration* was assessed with the Career Exploration Scale developed in German by Hirschi (2009). The scale consists of self-exploration and environmental exploration. Four items assess self-exploration behaviors (e.g., "reflection about personal interests") and six items assess environmental exploration (e.g., "gathering information about interesting career paths"). The measure correlated positively with other measures of career exploration, career decidedness, career planning, and career choice congruence (Hirschi, 2010a; Hirschi et al., 2011).

*Occupational self-efficacy* was measured with six items (e.g., "Whatever comes my way in my job, I can usually handle it"). These items are part of the short version of the German-language occupational self-efficacy scale developed and validated by Rigotti et al. (2008). Participants answered on a six-point scale ranging from 1 (*not at all true*) to 6 (*completely true*). The authors of the scale (Rigotti et al., 2008) reported significant relationships with job satisfaction, commitment, job performance, and job insecurity.

**Table 1**

Means, standard deviations, Cronbach's alpha, and correlation coefficients of study variables.

		<i>M</i>	<i>SD</i>	$\alpha$	1	2	3	4	5	6	7	8	9	10	11	12	13
1	T1 CSE	3.72	.57	.84													
2	T1 Proactivity	3.57	.57	.79	.42***												
3	T1 Concern	3.61	.66	.83	.34***	.47***											
4	T1 Control	3.91	.68	.84	.61***	.45***	.41***										
5	T1 Curiosity	3.66	.65	.81	.29***	.44***	.41***	.50***									
6	T1 Confidence	3.97	.59	.84	.46***	.53***	.51***	.60***	.50***								
7	T1 Career planning	3.28	.89	.87	.32***	.30***	.53***	.25***	.11***	.23***							
8	T1 CDM difficulties	2.48	.91	.88	-.47***	-.33***	-.45***	-.36***	-.19***	-.30***	-.73***						
9	T1 Career exploration	3.03	.83	.89	.10*	.33***	.42***	.14*	.25***	.22***	.25***	-.18***					
10	T1 Occ. self-efficacy	4.25	.71	.83	.58***	.52***	.42***	.50***	.38***	.47***	.38***	-.46***	.23***				
11	T2 Career planning	3.38	.93	.87	.24***	.32***	.44***	.23***	.06	.17**	.70***	-.64***	.25***	.34***			
12	T2 CDM difficulties	2.41	.87	.89	-.35***	-.32***	-.38***	-.34***	-.15**	-.21***	-.59***	.71***	-.20***	-.41***	-.76***		
13	T2 Career exploration	3.12	.83	.89	.11*	.33***	.35***	.14**	.22***	.21***	.14*	-.12*	.56***	.18***	.23***	-.15**	
14	T2 Occ. self-efficacy	4.35	.74	.83	.56***	.47***	.38***	.50***	.35***	.41***	.33***	-.42***	.23***	.68***	.38***	-.45***	.29***

Note. CSE = core self-evaluations. CDM difficulties = career decision-making difficulties. Occ. self-efficacy = occupational self-efficacy. Correlations among T1 variables based on  $N = 1260$ , correlations with T2 variables based on  $n = 363$ .

\*\*\*  $p < .001$ .

\*\*  $p < .01$ .

\*  $p < .05$ .



### 2.2.3. Adaptivity

Core self-evaluations (CSE) were assessed using the 12-item German-language version of the CSE scale originally developed by Judge et al. (Judge et al., 2003; Stumpp et al., 2009). Research with the German-language version of the scale replicated the one-factor structure and positive relationships with job satisfaction and organizational commitment (Stumpp et al., 2009).

Proactivity was assessed as participants' self-reported proactive disposition using the German-language seven-item (e.g., "I actively attack problems") personal initiative questionnaire developed by Frese et al. (1997). The scale is widely used and the authors demonstrated its validity in several studies: for example in relation to knowledge, other personality variables, and performance (e.g., Fay & Frese, 2001).

## 3. Results

### 3.1. Empirical distinctness of career adaptability and adapting

To test Hypothesis 1, which states that career adaptability is significantly related to yet empirically distinct from adapting, we applied confirmatory factor analysis (CFA) using Mplus version 7 and robust maximum likelihood estimation (Muthén & Muthén, 1998–2012). Model fit was assessed using the indices recommended as being most useful (Hu & Bentler, 1999): root mean squared error of approximation (RMSEA), comparative fit index (CFI), and the standardized root mean squared residual (SRMR). Values below .08 for RMSEA and SRMR complemented by a CFI close to .95 or above indicate a good model fit. For the model comparison, the Satorra–Bentler corrected ( $SB-\chi^2$ ) significance test (2001) was used.

To test Hypothesis 1, we specified a model using data from the T1 sample ( $N = 1260$ ) with the items of each scale loading onto their respective factor, while all other paths between items and factors were fixed to zero. Because we expected non-zero relationships between the constructs, we allowed the latent variables to co-vary. The model fit obtained for the eight-factor model did not reach the cut-offs outlined above ( $SB-\chi^2 = 5790.23$ ,  $df = 1297$ ,  $p < .001$ ; CFI = .85; RMSEA = .05; SRMR = .06). An examination of the modification indices revealed several highly correlated error terms of items within a scale. In a stepwise process, each time releasing the highest correlated error term, we released ten error terms until an acceptable model fit was reached ( $SB-\chi^2 = 4235.80$ ,  $df = 1287$ ,  $p < .001$ ; CFI = .90; RMSEA = .04; SRMR = .06). As hypothesized, the correlations between all eight factors were highly significant, ranging from .16 to .84 in absolute values (see Table 1 for the respective results based on the manifest scale scores).

To provide stronger evidence that career adaptability and adapting are indeed distinct constructs, a four-factor model was specified, where each factor is the result of combining two corresponding scales from career adaptability and adapting, respectively (e.g., curiosity/career exploration; see Fig. 1). Very poor model fit was obtained ( $SB-\chi^2 = 10,269.92$ ,  $df = 1309$ ,  $p < .001$ ; CFI = .70; RMSEA = .07; SRMR = .12). Next, we compared the four-factor and the eight-factor models and found the latter to exhibit significantly better model fit (Satorra–Bentler scaled chi-square difference test:  $SB$ -corrected  $\Delta-\chi^2 = 6478.14$ ,  $\Delta df = 22$ ,  $p < .001$ ). Both, the poor model fit of the four-factor model and the significantly better model fit of the eight-factor model, support Hypothesis 1 and indicate that the constructs constituting career adaptability and adapting, respectively, are indeed distinct.

To further support this notion, we applied a test proposed by Fornell and Larcker (1981) to the eight-factor model. In this test, the means of the squared items loadings within each of the two factors are compared with the squared correlation between the two corresponding factors. In each of these four comparisons, the means of the squared item loadings within each factor (ranging from .41 to .54) were considerably higher than the squared correlation between the corresponding factors (ranging from .07 to .37). Obtaining considerably higher loadings within each factor compared to the correlations between the corresponding constructs confirms that the constructs constituting career adaptability and adapting respectively are indeed distinct.

### 3.2. Bivariate correlations among the assessed constructs

Table 1 shows the means, standard deviations, Cronbach's alpha reliability coefficients, and correlations among all study variables. Correlations between career adaptability and adapting variables ranged from  $r = .14$  ( $p < .05$ ) to  $r = .53$  ( $p < .001$ ) in absolute values. The correlations reported in Table 1 and results of confirmatory factor analysis reported above show that career adaptability and adapting variables, although related, are empirically distinct from each other. These findings are in line with our first hypothesis.

CSE and proactivity were moderately correlated with each other ( $r = .42$ ,  $p < .001$ ). Both indicators of adaptivity correlated significantly with career adaptability and adapting variables. Except for career control, proactivity correlated somewhat higher with adaptability variables than with CSE. CSE and proactivity also showed positive associations with career planning, career exploration, and occupational self-efficacy beliefs and negative associations with career decision-making difficulties. The highest correlations were found between adaptivity variables and occupational self-efficacy. As one would expect, the correlation coefficients between CSE and proactivity, both assessed at T1, and adapting variables assessed at T1 were somewhat higher than with adapting variables assessed at T2.

### 3.3. Mediating effects

To assess the proposed mediation model (Hypothesis 2) where adaptability mediates the effects of adaptivity on adapting, we conducted path analyses. We used the same software, estimation methods and cutoffs as outlined for the CFA above. For the mediation analyses, we calculated indirect effects using 5000 bootstrap iterations. If the 95% confidence interval (CI) does not include zero, the indirect effect is considered to be significant. We report the sum of indirect effects and specific effects, if significant, in Table 2.

**Table 2**  
Standardized parameters of indirect effects based on bootstrapped analyses.

	Specific indirect	Sum of indirect	95% CI
CSE–planning	.10**	[.03, .17]	
CSE–concern–planning	.05*		[.01, .10]
CSE–control–planning	.08**		[.03, .14]
Proactivity–planning		.18***	[.09, .26]
Proactivity–concern–planning	.24***		[.16, .32]
Proactivity–control–planning	.04*		[.01, .08]
Proactivity–curiosity–planning	−.06*		[−.11, −.02]
CSE–CDM difficulties		−.16*	[−.10, −.23]
CSE–concern–CDM difficulties	−.04*		[−.01, −.07]
CSE–control–CDM difficulties	−.15***		[−.09, −.21]
Proactivity–CDM difficulties		−.17*	[−.10, −.24]
Proactivity–concern–CDM difficulties	−.17***		[−.10, −.25]
Proactivity–control–CDM difficulties	−.08***		[−.04, −.12]
		−.02 (ns)	[−.09, .05]
Proactivity–exploration		.14**	[.06, .22]
Proactivity–concern–exploration	.13***		[.06, .20]
CSE–self-efficacy		.09*	[.02, .16]
Proactivity–self-efficacy		.14**	[.06, .22]
Proactivity–concern–self-efficacy	.05*		[.01, .11]

Note.  $n = 363$ ; CDM difficulties = career decision-making difficulties.

\*\*\*  $p < .001$ .

\*\*  $p < .01$ .

\*  $p < .05$ .

We estimated a path model including all ten variables: the two adaptivity variables (CSE, proactivity), the four career adaptability dimensions (concern, control, curiosity, confidence) all assessed at T1, and the four adapting variables (planning, decision-making difficulties, exploration, occupational self-efficacy) assessed at T2, among the samples who participated in both measurement points ( $n = 363$ ). In our first model, CSE and proactivity predicted career adaptability which in turn predicted adapting variables. This model did not include any direct effect from CSE and proactivity on adapting variables. To assess an alternative model, we also evaluated a model where the two indicators of adaptivity mediated the effects of the four career adaptability resources on the four indicators of adapting. However, this model provided a significantly worse fit than our proposed model with career adaptability as the mediator ( $SB-\chi^2 = 93.7$ ,  $df = 17$ ,  $p < .001$ ; CFI = .92; RMSEA = .11; SRMR = .05; SB-corrected  $\Delta-\chi^2 = 25.4$ ,  $\Delta df = 9$ ,  $p < .001$ ).

For our proposed model, all fit indices except for RMSEA were acceptable ( $SB-\chi^2 = 73.2$ ,  $df = 8$ ,  $p < .001$ ; CFI = .95; RMSEA = .15; SRMR = .04). An examination of the modification indices revealed that the inclusion of a path from CSE and proactivity on self-efficacy as well as a path from proactivity on career exploration would improve the model fit. We included these three direct paths between adaptivity and adapting. The adapted model fitted the data well ( $SB-\chi^2 = 16.0$ ,  $df = 5$ ,  $p < .01$ ; CFI = .99; RMSEA = .08; SRMR = .03).

Fig. 1 shows that CSE and proactivity predicted significantly all four career adaptability variables, with the exception of the path from CSE on curiosity. In sum, this indicates that higher levels of adaptivity were related to higher levels of adaptability. Career concern was significantly related to all four indicators of career adapting: Higher levels of concern predicted higher levels of career planning, exploration, and self-efficacy as well as fewer decision-making difficulties six months later. Control predicted positively career planning and negatively decision-making difficulties. Curiosity predicted career planning negatively: Higher levels of curiosity were associated with less career planning six months later. Of the four adaptability variables, confidence was the only one predicting none of the four career adapting variables.

The estimated indirect effects from adaptivity to adapting via adaptability are presented in Table 2. Concern and control were significant mediators of both adaptivity indicators and career planning as well as decision-making difficulties. This implies that individuals who perceive themselves as taking initiative as well as being confident and efficacious tended to report higher levels of concern and control which in turn increases career planning and certainty about career-related decisions. Furthermore, concern was a significant mediator of the relationship between proactivity and career exploration and the relationship between proactivity and self-efficacy. Again, individuals who reported higher levels of proactivity tended to be more concerned about their career which in turn was associated with more career exploration and higher occupational self-efficacy beliefs. We also found a significant indirect effect from proactivity through curiosity on career planning. However, contrary to our assumption, this indirect effect was negative: People who perceived themselves as taking initiative tended to be more explorative and inquisitive, which in turn was related to less career planning. We found no significant indirect effects for the fourth indicator of adaptability (i.e., confidence). In sum, we confirmed mediating capabilities of concern and control, two of the four adaptability indicators, partially corroborating Hypothesis 2.

#### 4. Discussion

The present study theoretically and empirically clarified the relationships between measures representing adaptivity, adaptability, and adapting, more generally, and between different operationalizations of the four C's of career adaptability (Savickas, 2002):

concern, control, curiosity, and confidence. We found support for our assumption that the applied measures for assessing adaptability and adaptivity were significantly correlated but empirically distinct. This provides important insights into the nature of career adaptability in terms of concern, control, curiosity, and confidence. As our results show, these four aspects of adaptability can be understood more in terms of psychosocial resources of career adaptabilities as done in the CAAS scales (Savickas & Porfeli, 2012), rather than in terms of career behaviors, beliefs, and behaviors – such as career planning, career decision-making difficulties, career exploration, and occupational self-efficacy beliefs – that represent adapting (Balin & Hirschi, 2010; Creed et al., 2009; Creed et al., 2011; Hirschi, 2009; Koen et al., 2010). Our results suggest that adaptability and adapting assess theoretically and empirically different second-order constructs. For research on adaptability, this implies that researchers should justify and match their selection of measures based on the four C's depending on their research questions and their conceptual research model.

Interestingly, we did not find a clear match between theoretically corresponding measures of adaptability and adapting, such as, for example, between concern and career planning or between curiosity and career exploration. In fact, the correlations were often times higher between different measures across the four C's. This pattern was also confirmed in our longitudinal analyses where, for example, no specific direct effects of curiosity on exploration or of confidence on occupational self-efficacy were found. To illustrate, career exploration was more related to career concern than to the theoretically corresponding adaptability resource of curiosity. This suggests that although the measures conceptually assess the same four C's, there is no support in our data that there is a clear match between adaptability resources and their theoretically corresponding aspects of behavioral career adapting. Overall, these cross-sectional and longitudinal analyses suggest that the four resources of adaptability as measured by the CAAS have a broad impact on different manifestations of adapting and not just, or even primarily, on the form of adapting conceptually corresponding to the same resource.

Our results especially highlight the important role of the adaptability resource of concern which showed on average the highest correlation to different adapting measures in both the cross-sectional and the longitudinal analyses. This implies that not all of the four career resources are equally strong predictors of career outcomes, as already suggested by previous research regarding subjective career success (Zacher, 2014a), work stress (Johnston et al., 2013), or job search self-efficacy (Guan et al., 2013). This suggests that researchers should treat career adaptability as a multidimensional construct whose components are not mutually interchangeable and thus merit an investigation of the differential effects of different career adaptability dimensions regarding outcomes of interest.

Our results further demonstrate that the empirical overlap between measures of career adaptability and adapting according to the four C's can partially be explained by their mutual relation to more basic adaptivity constructs, specifically core self-evaluations and proactivity. This finding replicates previous studies that found positive relations between all of the CAAS dimensions and core self-evaluations (Zacher, 2014a, 2014b) and proactivity (Tolentino et al., 2014). On a more general level, our results support the proposed importance of core self-evaluations (Judge & Kammeyer-Mueller, 2011) and proactivity (Fuller & Marler, 2009; Thomas et al., 2010) for the current career environment, specifically regarding different forms of adaptability and adapting. In the longitudinal mediation analyses, we found, as hypothesized, a number of significant indirect effects. Especially, concern emerged as an important mediator of CSE and proactivity on all indicators of adapting. In addition, control acted as a mediator between the two adaptivity indicators and measures of adapting in terms of planning and decision-making difficulties. For our theoretical understanding of career adaptability, these results mean that career adaptability resources can be conceptualized as a construct in between more basic aspects of personality, representing adaptivity capacities, and more specific forms of adapting attitudes and behaviors.

However, there were also specific direct effects from the two assessed personality (adaptivity) constructs on two of the adapting measures. This implies that the adaptability resources do not completely mediate the effects of adaptivity on adapting and that adaptivity has effects on adapting beyond the four adaptability resources. For future research, this means that an exploration of additional mediators might be fruitful to enrich our understanding of pathways through which more context-general adaptivity is manifested in adaptive attitudes and behaviors in the career domain.

It is finally noteworthy that some proposed effects were not observed. First, not all career adaptability dimensions acted as mediators between proactivity and CSE and the four indicators of adapting. Because the adaptability dimensions were all positively correlated with all indicators of adapting, this can largely be explained by the shared variance among the adaptability dimensions. As our results showed, concern and control were positively related to adapting, reducing the unique variance that can be explained by the other adaptability dimensions. Second, curiosity was not related to career planning and even emerged as a negative predictor in the longitudinal mediation analyses. This implies that being curious and inquisitive can be unrelated to, and even inhibit, career planning, especially when considering the part of curiosity that is unrelated to the other adaptability dimensions of concern, control, and confidence. Of course, individuals who are still curious and exploring are not yet ready to make plans. Future research should examine under what circumstances and for which outcomes the career adaptability resource of curiosity might be beneficial or harmful for positive career development.

## 5. Limitations

One limitation of our study is that we relied on a sample of university students. While this sample is adequate to investigate the stated aims of the study and allows for meaningful comparisons to other studies on the same topic with similar samples, it implies that our results cannot necessarily be generalized and applied to a working population. Future research should attempt to replicate our findings with different samples to provide more generalizable knowledge of how different operationalizations of the four C's are related. Second, we applied self-report measures, which can induce shared method bias that might affect the observed relationships between the applied measures (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). However, we attempted to reduce the shared method bias by separating the mediator and criterion variable in time, randomizing questions in the online questionnaire, and providing clear and easy to understand instructions and items in our questionnaires. A final limitation is that we did not assess additional criterion variables



that would help to address the question regarding differential effects of adaptivity, adaptability, and adapting measures on outcomes of adaptation such as work stress, job performance, or career success. Based on bandwidth-fidelity considerations (Ones & Viswesvaran, 1996), we would speculate that for more general outcomes, such as life satisfaction or overall job satisfaction, the adaptability resources would be better predictors, while for more specific outcomes, such as salary gain or job search success, the adapting measures would show stronger predictive utility. However, future research should empirically examine these assumptions.

## 6. Implications and conclusions

In sum, our results enhance our theoretical and empirical understanding of how different operationalizations of career adaptation found in the current literature are related. Our study shows that adaptivity, adaptability, and adapting are related but distinct constructs. Moreover, there is no clear empirical match between adaptability resources and their theoretically corresponding aspects of attitudinal and behavioral career adapting. As a consequence, researchers should choose their respective measurement approach in accordance with their research questions: more context-general, trait-like adaptivity measures; psychological career resource dimensions; or career-specific behaviors and attitudes. As our study shows, conceptual clarity in this regard is important because results obtained with one operationalization of the four C's of career adaptability are not directly transferable to other measures of the same conceptual career adaptability aspects. Our conceptual and empirical analyses in this paper can provide a guideline for future research on career adaptability in this regard.

## Acknowledgment

Part of this research was supported by an individual research grant awarded to Andreas Hirschi by the Deutsche Forschungsgemeinschaft (DFG), GZ: HI 1530/2-1. The funding source had no involvement in study design, in the collection, analysis and interpretation of data, in the writing of the report, or in the decision to submit the article for publication.

## References

- Abele, A.E., & Wiese, B.S. (2008). The nomological network of self-management strategies and career success. *Journal of Occupational and Organizational Psychology*, 81(4), 733–749. <http://dx.doi.org/10.1348/096317907X256726>.
- Balin, E., & Hirschi, A. (2010). Who seeks career counselling? A prospective study of personality and career variables among Swiss adolescents. *International Journal for Educational and Vocational Guidance*, 10(3), 161–176. <http://dx.doi.org/10.1007/s10775-010-9183-y>.
- Crant, J.M. (2000). Proactive behavior in organizations. *Journal of Management*, 26(3), 435–462. [http://dx.doi.org/10.1016/S0149-2063\(00\)00044-1](http://dx.doi.org/10.1016/S0149-2063(00)00044-1).
- Creed, P., Macpherson, J., & Hood, M. (2011). Predictors of “new economy” career orientation in an Australian sample of late adolescents. *Journal of Career Development*, 38(5), 369–389. <http://dx.doi.org/10.1177/0894845310378504>.
- Creed, P.A., Fallon, T., & Hood, M. (2009). The relationship between career adaptability, person and situation variables, and career concerns in young adults. *Journal of Vocational Behavior*, 74(2), 219–229. <http://dx.doi.org/10.1016/j.jvb.2008.12.004>.
- Crites, J.O. (1961). A model for the measurement of vocational maturity. *Journal of Counseling Psychology*, 8, 255–259.
- Duffy, R.D., & Blustein, D.L. (2005). The relationship between spirituality, religiousness, and career adaptability. *Journal of Vocational Behavior*, 67(3), 429–440. <http://dx.doi.org/10.1016/j.jvb.2004.09.003>.
- Fay, D., & Frese, M. (2001). The concept of personal initiative: An overview of validity studies. *Human Performance*, 14(1), 97–124. [http://dx.doi.org/10.1207/S15327043hup1401\\_06](http://dx.doi.org/10.1207/S15327043hup1401_06).
- Fornell, C., & Larcker, D.F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. <http://dx.doi.org/10.2307/3151312>.
- Frese, M., Fay, D., Hilburger, T., Leng, K., & Tag, A. (1997). The concept of personal initiative: Operationalization, reliability and validity in two German samples. *Journal of Occupational and Organizational Psychology*, 70(2), 139–161. <http://dx.doi.org/10.1111/j.2044-8325.1997.tb00639.x>.
- Fuller, J.B., & 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. doi: 410.1002/job.1613.
- Goodman, J. (1994). Career adaptability in adults: A construct whose time has come. *Career Development Quarterly*, 43(1), 74–84. <http://dx.doi.org/10.1002/j.2161-0045.1994.tb00848.x>.
- Gould, S. (1979). Characteristics of career planners in upwardly mobile occupations. *The Academy of Management Journal*, 22(3), 539–550. <http://dx.doi.org/10.2307/255743>.
- Guan, Y.J., Deng, H., Sun, J.Q., Wang, Y.N., Cai, Z.J., Ye, L.H., et al. (2013). Career adaptability, job search self-efficacy and outcomes: A three-wave investigation among Chinese university graduates. *Journal of Vocational Behavior*, 83(3), 561–570. <http://dx.doi.org/10.1016/j.jvb.2013.09.003>.
- Hartung, P.J., Porfeli, E.J., & Vondracek, F.W. (2008). Career adaptability in childhood. *Career Development Quarterly*, 57(1), 63–74. <http://dx.doi.org/10.1002/j.2161-0045.2008.tb00166.x>.
- Hirschi, A. (2009). Career adaptability development in adolescence: Multiple predictors and effect on sense of power and life satisfaction. *Journal of Vocational Behavior*, 74(2), 145–155. <http://dx.doi.org/10.1016/j.jvb.2009.01.002>.
- Hirschi, A. (2010a). Positive adolescent career development: The role of intrinsic and extrinsic work values. *Career Development Quarterly*, 58(3), 276–287. <http://dx.doi.org/10.1002/j.2161-0045.2010.tb00193.x>.
- Hirschi, A. (2010b). Swiss adolescents' career aspirations: Influence of context, age, and career adaptability. *Journal of Career Development*, 36(3), 228–245. <http://dx.doi.org/10.1177/0894845309345844>.
- Hirschi, A., & Herrmann, A. (2012). Vocational identity achievement as a mediator of presence of calling and life satisfaction. *Journal of Career Assessment*, 20(3), 309–321. <http://dx.doi.org/10.1177/1069072711436158>.
- Hirschi, A., & Herrmann, A. (2013). Assessing difficulties in career decision making among Swiss adolescents with the German My Vocational Situation Scale. *Swiss Journal of Psychology*, 72(1), 33–42. <http://dx.doi.org/10.1024/1421-0185/A000097>.
- Hirschi, A., Lee, B., Porfeli, E.J., & Vondracek, F.W. (2013). Proactive motivation and engagement in career behaviors: Investigating direct, mediated, and moderated effects. *Journal of Vocational Behavior*, 83(1), 31–40. <http://dx.doi.org/10.1016/j.jvb.2013.02.003>.
- Hirschi, A., Niles, S.G., & Akos, P. (2011). Engagement in adolescent career preparation: Social support, personality and the development of choice decidedness and congruence. *Journal of Adolescence*, 34(1), 173–182. <http://dx.doi.org/10.1016/j.adolescence.2009.12.009>.
- Holland, J. L., Daiger, D. C., & Power, P. G. (1980). *My Vocational Situation*. Palo Alto, CA: Consulting Psychologists Press.
- Hu, L., & Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1–55. <http://dx.doi.org/10.1080/10705519909540118>.

- Johnston, C.S., Luciano, E.C., Maggiori, C., Ruch, W., & Rossier, J. (2013). Validation of the German version of the Career Adapt-Abilities Scale and its relation to orientations to happiness and work stress. *Journal of Vocational Behavior*, 83(3), 295–304. <http://dx.doi.org/10.1016/j.jvb.2013.06.002>.
- Jörin, S., Stoll, F., Bergmann, C., & Eder, D. (2004). *Explorix® - das Werkzeug zur Berufswahl und Laufbahnplanung [Explorix - the tool for career choice and career planning]*. Berne, Switzerland: Hans Huber.
- Judge, T.A., Erez, A., Bono, J.E., & Thoresen, C.J. (2003). The Core Self-Evaluations Scale. Development of a measure. *Personnel Psychology*, 56(2), 303–331. <http://dx.doi.org/10.1111/j.1744-6570.2003.tb00152.x>.
- Judge, T.A., & Kammeyer-Mueller, J.D. (2011). Implications of core self-evaluations for a changing organizational context. *Human Resource Management Review*, 21(4), 331–341. <http://dx.doi.org/10.1016/j.hrmr.2010.10.003>.
- Klehe, U. -C., Zikic, J., Van Vianen, A.E.M., & De Pater, I.E. (2011). Career adaptability, turnover and loyalty during organizational downsizing. *Journal of Vocational Behavior*, 79(1), 217–229. <http://dx.doi.org/10.1016/j.jvb.2011.01.004>.
- Koen, J., Klehe, U. -C., Van Vianen, A.E.M., Zikic, J., & Nauta, A. (2010). Job-search strategies and reemployment quality: The impact of career adaptability. *Journal of Vocational Behavior*, 77(1), 126–139. <http://dx.doi.org/10.1016/j.jvb.2010.02.004>.
- Morrison, R.F., & Hall, D.T. (2002). Career adaptability. In D.T. Hall (Ed.), *Careers in and out of organizations* (pp. 205–233). Thousand Oaks, CA: Sage.
- Muthén, L.K., & Muthén, B.O. (1998–2012). *Mplus user's guide* (7th ed.). Los Angeles, CA: Muthén & Muthén.
- Ones, D.S., & Viswesvaran, C. (1996). Bandwidth-fidelity dilemma in personality measurement for personnel selection. *Journal of Organizational Behavior*, 17(6), 609–626. [http://dx.doi.org/10.1002/\(SICI\)1099-1379\(199611\)17:6<609::AID-JOB1828>3.0.CO;2-K](http://dx.doi.org/10.1002/(SICI)1099-1379(199611)17:6<609::AID-JOB1828>3.0.CO;2-K).
- Podsakoff, P.M., MacKenzie, S.B., Lee, J., & 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), 879–903. <http://dx.doi.org/10.1037/0021-9010.88.5.879>.
- Rigotti, T., Schyns, B., & Mohr, G. (2008). A short version of the Occupational Self-Efficacy Scale: Structural and construct validity across five countries. *Journal of Career Assessment*, 16(2), 238–255. <http://dx.doi.org/10.1177/1069072707305763>.
- Satorra, A., & Bentler, P.M. (2001). A scaled difference chi-square test statistic for moment structure analysis. *Psychometrika*, 66(4), 507–514. <http://dx.doi.org/10.1007/Bf02296192>.
- Savickas, M.L. (1984). Career maturity: The construct and its measurement. *Vocational Guidance Quarterly*, 32, 222–231.
- Savickas, M.L. (1997). Career adaptability: An integrative construct for life-span, life-space theory. *Career Development Quarterly*, 45, 247–259. <http://dx.doi.org/10.1002/j.2161-0045.1997.tb00469.x>.
- Savickas, M.L. (2002). *Career construction: A developmental theory of vocational behavior*. In D. Brown & Associates (Eds.), *Career choice and development* (Vol. 4th, pp. 149–205). San Francisco, CA: Jossey-Bass.
- Savickas, M.L., & Porfeli, E.J. (2012). Career Adapt-Abilities Scale: Construction, reliability, and measurement equivalence across 13 countries. *Journal of Vocational Behavior*, 80(3), 661–673. <http://dx.doi.org/10.1016/j.jvb.2012.01.011>.
- Savickas, M.L. (2013). Career Construction theory and practice. In S.D. Brown, & R.W. Lent (Eds.), *Career development and counseling: Putting theory and research to work* (pp. 42–70) (2nd ed.). Hoboken, NJ: Wiley.
- Stumpp, T., Hülshager, U.R., Muck, P.M., & Maier, G.W. (2009). Expanding the link between core self-evaluations and affective job attitudes. *European Journal of Work and Organizational Psychology*, 18(2), 148–166. <http://dx.doi.org/10.1080/13594320802281110>.
- Sullivan, S.E. (1999). The changing nature of careers: A review and research agenda. *Journal of Management*, 25(3), 457–484. <http://dx.doi.org/10.1177/014920639902500308>.
- Super, D.E., Thompson, A.S., Lindeman, R.H., Jordaan, J.P., & Myers, R.A. (1981). *Career Development Inventory*. Palo Alto, CA: Consulting Psychologists Press.
- Tak, J. (2012). Career Adapt-Abilities Scale – Korea Form: Psychometric properties and construct validity. *Journal of Vocational Behavior*, 80(3), 712–715. <http://dx.doi.org/10.1016/j.jvb.2012.01.008>.
- Thomas, J.P., Whitman, D.S., & Viswesvaran, C. (2010). Employee proactivity in organizations: A comparative meta-analysis of emergent proactive constructs. *Journal of Occupational and Organizational Psychology*, 83(2), 275–300. <http://dx.doi.org/10.1348/096317910x502359>.
- Tolentino, L.R., Garcia, P.R.J.M., Lu, V.N., Restubog, S.L.D., Bordia, P., & Plewa, C. (2014). Career adaptation: The relation of adaptability to goal orientation, proactive personality, and career optimism. *Journal of Vocational Behavior*, 84(1), 39–48. <http://dx.doi.org/10.1016/j.jvb.2013.11.004>.
- Urbanaviciute, I., Kairys, A., Pociute, B., & Liniauskaitė, A. (2014). Career adaptability in Lithuania: A test of psychometric properties and a theoretical model. *Journal of Vocational Behavior*, 85(3), 433–442. <http://dx.doi.org/10.1016/j.jvb.2014.09.005>.
- van Vianen, A.E.M., De Pater, I.E., & Preenen, P.T.Y. (2009). Adaptable careers: Maximizing less and exploring more. *The Career Development Quarterly*, 57(4), 298–309. <http://dx.doi.org/10.1002/j.2161-0045.2009.tb00115.x>.
- van Vianen, A.E.M., Klehe, U.C., Koen, J., & Dries, N. (2012). Career adapt-abilities scale – Netherlands form: Psychometric properties and relationships to ability, personality, and regulatory focus. *Journal of Vocational Behavior*, 80(3), 716–724. <http://dx.doi.org/10.1016/j.jvb.2012.01.002>.
- Zacher, H. (2014a). Career adaptability predicts subjective career success above and beyond personality traits and core self-evaluations. *Journal of Vocational Behavior*, 84(1), 21–30. <http://dx.doi.org/10.1016/j.jvb.2013.10.002>.
- Zacher, H. (2014b). Individual difference predictors of change in career adaptability over time. *Journal of Vocational Behavior*, 84(2), 188–198. <http://dx.doi.org/10.1016/j.jvb.2014.01.001>.
- Zikic, J., & Klehe, U. -C. (2006). Job loss as a blessing in disguise: The role of career exploration and career planning in predicting reemployment quality. *Journal of Vocational Behavior*, 69(3), 391–409. <http://dx.doi.org/10.1016/j.jvb.2006.05.007>.