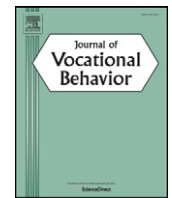


Contents lists available at [SciVerse ScienceDirect](http://SciVerse.Sciencedirect.com)

## Journal of Vocational Behavior

journal homepage: [www.elsevier.com/locate/jvb](http://www.elsevier.com/locate/jvb)

# Validation of the German version of the Career Adapt-Abilities Scale and its relation to orientations to happiness and work stress<sup>☆</sup>



Claire S. Johnston<sup>a,\*</sup>, Eva C. Luciano<sup>b</sup>, Christian Maggiori<sup>a</sup>, Willibald Ruch<sup>b,c</sup>, Jérôme Rossier<sup>a,d,\*\*</sup>

<sup>a</sup> Swiss National Centre of Competence in Research LIVES – Overcoming vulnerability: Life course perspectives (NCCR LIVES), University of Lausanne, Switzerland

<sup>b</sup> NCCR LIVES, University of Zurich, Switzerland

<sup>c</sup> Department of Psychology, University of Zurich, Switzerland

<sup>d</sup> Institute of Psychology, University of Lausanne, Switzerland

## ARTICLE INFO

### Article history:

Received 15 May 2013

Available online 18 June 2013

### Keywords:

Career adapt-ability

Mediator

Orientations to happiness

Work stress

## ABSTRACT

Career adapt-ability has recently gained momentum as a psychosocial construct that not only has much to offer the field of career development, but also contributes to positive coping, adjustment and self-regulation through the four dimensions of concern, control, curiosity and confidence. The positive psychology movement, with concepts such as the orientations to happiness, explores the factors that contribute to human flourishing and optimum functioning. This research has two main contributions; 1) to validate a German version of the Career Adapt-Abilities Scale (CAAS), and 2) to extend the contribution of adapt-abilities to the field of work stress and explore its mediating capacity in the relation between orientations to happiness and work stress. We used a representative sample of the German-speaking Swiss working population including 1204 participants (49.8% women), aged between 26 and 56 ( $M_{age} = 42.04$ ). Results indicated that the German version of the CAAS is valid, with overall high levels of model fit suggesting that the conceptual structure of career adapt-ability replicates well in this cultural context. Adapt-abilities showed a negative relationship to work stress, and a positive one with orientations to happiness. The engagement and pleasure scales of orientations to happiness also correlated negatively with work stress. Moreover, career adapt-ability mediates the relationship between orientations to happiness and work stress. In depth analysis of the mediating effect revealed that control is the only significant mediator. Thus control may be acting as a mechanism through which individuals attain their desired life at work subsequently contributing to reduced stress levels.

© 2013 Elsevier Inc. All rights reserved.

## 1. Introduction

Career adapt-ability has recently gained momentum as a psychosocial construct that not only has much to offer the field of career development, but also contributes to positive coping, adjustment and self-regulation through the four dimensions of concern, control, curiosity and confidence (Savickas, 2005). Orientations to happiness are part of the positive psychology movement that has shifted attention from all that is “wrong” to all that is “right” aiming to capture the aspects that add meaning to life and promote optimal

<sup>☆</sup> This publication benefited from the support of the Swiss National Centre of Competence in Research LIVES – Overcoming vulnerability: Life course perspective, which is financed by the Swiss National Science Foundation. The authors are grateful to the Swiss National Science Foundation for its financial assistance.

\* Correspondence to: C.S. Johnston, University of Lausanne, NCCR-LIVES, Quartier UNIL-Mouline, Géopolis-5552, CH-1015 Lausanne, Switzerland.

\*\* Correspondence to: J. Rossier, University of Lausanne, Institute of Psychology, Quartier UNIL-Mouline, Géopolis-4207, CH-1015 Lausanne, Switzerland.  
E-mail addresses: [claire.johnston@unil.ch](mailto:claire.johnston@unil.ch) (C.S. Johnston), [jerome.rossier@unil.ch](mailto:jerome.rossier@unil.ch) (J. Rossier).

functioning (Gable & Haidt, 2005; Seligman & Csikszentmihalyi, 2000). We test the capacity of adapt-abilities and orientations to happiness to contribute to lower levels of stress at work and thus furnish the literature on individual characteristics implicated in the stress response (Cooper, Dewe, & O'Driscoll, 2001; Lazarus & Folkman, 1984). Stress is expensive with the economic and social costs associated with strain-related consequences prompting an interest in the study of work stress (Bakker, van Veldhoven, & Xanthopoulos, 2010). We expect that both adapt-abilities and orientations to happiness function as personal resources and contribute to the reduction of work stress. An individual's endorsement of an orientation to happiness does not guarantee the enactment of a particular orientation (Peterson, Ruch, Beermann, Park, & Seligman, 2007) and thus an intervening variable may be required. Adapt-abilities are involved in the translation of individual dispositions into behavior (Rossier, Zecca, Stauffer, Maggiori, & Dauwalder, 2012) and may act as the mechanism variable that explains the relationship between orientations to happiness and work stress. This research proceeds in two parts with each making a unique contribution. First, we add to the growing body of international work on adapt-abilities by validating the German version of the Career Adapt-Abilities Scale (CAAS). A team of international researchers jointly developed the CAAS (Savickas & Porfeli, 2012). A necessary subsequent step is the validation of this measure in different countries with this laying a solid foundation for the continued utility of the CAAS. To date, the German version of the CAAS international form 2.0 is not yet available. Second, we test the capacity of adapt-abilities to function as a mediator in the relationship between orientations to happiness and work stress.

Adapt-abilities, as a part of career construction theory, are involved in the construction of a career reality and assist individuals in imposing meaning on their career related experiences (Savickas, 2005; Savickas et al., 2009). The adapt-ability dimensions of concern, control, curiosity and confidence assist individuals in preparing for and participating in the work role (Savickas, 1997). The application of adapt-abilities is not limited to career construction and career development. Career adapt-ability can be seen as a much broader concept consisting of one's readiness and resources to respond to the world of work through problem solving, coping and self-regulation (Savickas, 2005). Indeed, when faced with potentially stressful situations such as unemployment and career transitions, individuals respond with displays of adapt-abilities (Ebberwein, Krieshok, Ulven, & Prosser, 2004).

The adapt-ability dimensions of concern, control, curiosity and confidence are comprised of attitudes, beliefs and competencies (Savickas, 2005) that allow conceptual links between adapt-abilities and work related outcomes, such as work stress. Career concern, with the associated attitude of and competence in planning, fosters coping behaviors of awareness and preparation, assisting individuals to respond to the demands of the work environment. Control fosters personal responsibility for one's career and work experiences. A decisive attitude, engaging in decision-making and behaving in an assertive manner may assist individuals to create the desired work experience. Career curiosity facilitates a good fit between the self and the world of work, and through exploration and risk-taking suggests that individuals gain new knowledge and competences. Confidence has been likened to self-esteem and self-efficacy (Savickas, 2005) with this belief in the self to master challenges and solve problems suggesting a capacity to respond to stressful situations. Through preparation, action, exploration, and problem solving individuals should perceive their work environment, and their capacity to respond adequately, more favorably and subsequently experience less work stress.

The term "stress" has been theorized differently in stimulus based models (Dohrenwend & Dohrenwend, 1974; Holmes & Rahe, 1967), response based models (Selye, 1982), and transactional models (e.g. Lazarus & Folkman, 1984). In this study, we focus on stress produced by the life domain of work, which is defined as "an uncomfortable state of psychological tensions that results from an appraisal that the perceived demands of the workplace exceeds the individual's perceived resources to successfully meet the demands" (De Bruin, 2006, p. 68). We focus on the psychological nature of the stress response (rather than the behavioral or physical) as a potential threat to well-being and consider that individual characteristics or resources may offer some protection against stress (Cooper et al., 2001; Lazarus & Folkman, 1984). Rather than only focusing on negative traits such as neuroticism (Schneider, 2004), some approaches to well-being have considered positive characteristics, such as optimism (Seligman & Csikszentmihalyi, 2000).

The main focus of positive psychology is what makes our lives most worth living (Seligman & Csikszentmihalyi, 2000) and the aspects that enable human flourishing and optimal functioning (Gable & Haidt, 2005; Giannopoulos & Vella-Brodrick, 2011). Three topics are at the center of positive psychology: a) positive subjective experiences, b) positive traits, and c) positive institutions (Peterson, 2006; Seligman & Csikszentmihalyi, 2000). Happiness is one aspect of well-being (Diener, 2000) and consequentially the positive characteristic of orientations to happiness that proposes different pathways to happiness may contribute to work-related well-being (Peterson, 2006; Seligman, 2002). Seligman (2002) first developed the concept of orientations to happiness, with Peterson, Park, and Seligman (2005) later developing the Orientations to Happiness questionnaire. First, the pleasure orientation suggests that the maximization of pleasure and the minimization of pain are the chief route to happiness. Engagement, or the experience of flow enabled by a good match between demands and competences at work, is another route to happiness. A third option suggests that true happiness entails identifying one's virtues, cultivating them, and living in accordance with them. There is first empirical evidence that orientations to happiness are pertinent at work and in the career context showing relations to subjective and objective career success (Proyer, Annen, Eggimann, Schneider, & Ruch, 2012). Further, the three orientations to happiness are related to vocational identity achievement (Hirschi, 2011). Vocational identity achievement together with career adapt-ability are defined as the major meta-competencies in career construction theory (Savickas, 2011; Stauffer, Maggiori, Froidevaux, & Rossier, in press) and are empirically related to each other (Porfeli & Savickas, 2012). These relationships suggest that orientations to happiness and career adapt-abilities may be related to each other and simultaneously implicated in the stress response.

In this study, we propose that adapt-abilities will mediate the relationship between orientations to happiness and work stress. As individual use adapt-abilities to achieve their desired life, as framed by their orientations to happiness, we expect that they will experience reduced work stress. Orientations to happiness alone may not be enough to realize behavioral adjustments or changes to one's work environment. Adapt-ability, a behaviorally oriented individual characteristic, provides an important link between one's dispositions and experience of the work context (Rossier, in press). Previous research indicates the mediating effect of adapt-abilities

in the relationship between personality traits and work engagement, and suggests that “career adapt-ability might be considered as a process variable contributing to the adjustment to work-related contextual constraints” (Rossier et al., 2012, p. 742). In this sense, one’s dominant orientation to happiness may prompt the use of adapt-abilities, which in turn may lower work stress.

Orientations to happiness predict the planning and pursuit of activities in different life domains (Ruch, Harzer, Proyer, Park, & Peterson, 2010), but adapt-abilities may be necessary to realize the required behavior. Adapt-abilities may assist individuals to find a job characterized by pleasant rather than unpleasant experiences. Curiosity may contribute to finding this match, whereas confidence enables the realization of this match (Savickas et al., 2009). Control and confidence, enable individuals to take responsibility for creating a favorable work environment conducive to engagement (Savickas, 1997). Individuals with a meaning orientation aim to discover and realize their purpose through the application of their virtues and strengths. To find meaningful work where work is seen as a calling, or as a source of purpose (Dik & Duffy, 2009), career concern with the associated planning and exploration may be necessary. The presence of meaning in life has been linked to well-being in terms of life satisfaction, positive affect, optimism, and self-esteem (Compton, Smith, Cornish, & Qualls, 1996) and may thus contribute to reduced work stress.

## 2. Method

### 2.1. Participants

The representative sample of German-speaking working adults in Switzerland aged between 26 and 56 consisted of 1204 participants ( $M_{age} = 42.04$ ,  $SD = 8.76$ ) with 49.8% women ( $n = 599$ ) and 50.2% men ( $n = 605$ ). All participants were employed with a mean activity rate of 86% ( $SD = 19.7$ ). The majority of the participants were Swiss ( $n = 1003$ ) and 16.7% were non-Swiss ( $n = 201$ ).

### 2.2. Measures

#### 2.2.1. Career Adapt-Abilities Scale

The 24-item CAAS international form 2.0 (Savickas & Porfeld, 2012) yields a total score indicating a person’s adapt-ability. The response format consists of 5 options with 1 indicating “I don’t have the ability to .../This is not a resource for me” and 5 indicating “I have a very strong ability to .../This is a very important resource for me”. Items are divided equally into the four subscales of concern (e.g. “thinking about what my future will be like”), control (e.g. “taking responsibility for my actions”), curiosity (e.g. “exploring my surroundings”) and confidence (e.g. “learning new skills”). Reliabilities for this study are good with  $\alpha = .88$  for concern,  $\alpha = .87$  for control,  $\alpha = .86$  for curiosity, and  $\alpha = .87$  for confidence. The reliability of the total scale was also very high, with an alpha of .94.

#### 2.2.2. Orientations to happiness

A short 9-item version of the Peterson et al. (2005) Orientations to Happiness questionnaire was used (Ruch, Brouwers, & Luciano, 2013). The endorsement of each orientation to happiness dimension is measured with three items: engagement (e.g., “I am always very absorbed in what I do”); pleasure (e.g., “Life is too short to postpone the pleasures it can provide”); and meaning (e.g., “My life serves a higher purpose”). Each item requires the respondent to answer on a 5-point scale the degree to which the item applies (1 = “very much unlike me” through 5 = “very much like me”). Reliability analysis provided the following alpha values; .72 for pleasure, .56 for engagement, and .68 for meaning. The three orientations to happiness are considered separately and not combined into a total score.

#### 2.2.3. Work stress

The 9-item General Work Stress Scale is a one-dimensional measure of the level of stress caused by work (De Bruin & Taylor, 2005). Individuals respond to items (e.g. “Do you become so stressed that you would resign?”) using a 5-point Likert type scale ranging from 1 = “never” to 5 = “always”. For this study, the Cronbach alpha is .86.

#### 2.2.4. Control variables

To isolate the effects of orientations to happiness and adapt-abilities on work stress, we included the control variables of age, gender, nationality and activity rate. Age, gender and ethnicity can influence well-being outcomes (Lent, 2004) and are thus included as controls. Age was measured as a continuous variable, and gender was coded as 1 = *man*, and 2 = *woman*. Nationality was coded as 1 = *Swiss*, and 2 = *non-Swiss*, with the Swiss category including those with a dual citizenship, one of which is Swiss. In Switzerland, a 100% activity rate corresponds to a 42-hour workweek. As such, total activity rate, assessed in percentages, was included as individuals who spend more time at work may experience more stress.

### 2.3. Procedure

A representative sample of the German-speaking Swiss working population was drawn based on a sampling list from the Swiss Federal Statistics Office. Instruments were translated into German and then back-translated into English. The back-translations were sent to the authors of the scales for their comments. Adjustments were made with subsequent checks from the scale authors. Concerning the German version of the CAAS, the author of the scale, Mark Savickas, suggested that the item “working up to my

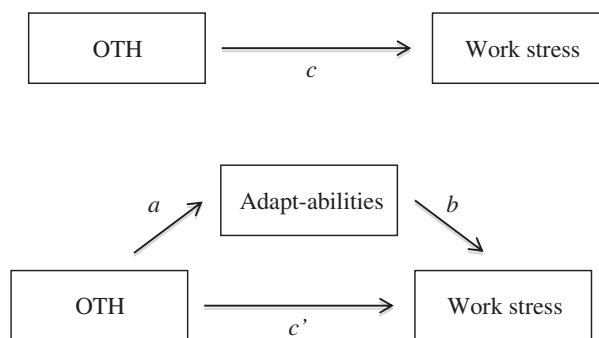


Fig. 1. Career adapt-ability as a mediator between orientations to happiness and work stress.

abilities” did not translate very well in German and proposed to consider an additional item “use the best of my competence” that could be compared to the original item.

### 2.3.1. Analysis

To validate the structure of the German version of the CAAS, we conducted confirmatory factor analysis using Amos version 19 (Arbuckle, 2010) with maximum likelihood estimation. A hierarchical model was proposed with four second-order variables (concern, control, confidence, and curiosity) and one third-order latent construct: adapt-abilities. All of the items were specified to load onto their designated factor only. We tested two separate models, one including the original items as specified in the international form 2.0, and one replacing the original confidence item “working up to my abilities” with the suggested item “use the best of my competence”.

To predict work stress from the control variables, career adapt-abilities and orientations to happiness, a series of hierarchical regression analyses were done. Control variables of age, gender, nationality and activity rate were entered in the first step. In a first model, career adapt-abilities were entered in the second step, followed by orientations to happiness. In a second model, the orientations to happiness dimensions were entered first, followed by career adapt-abilities in the third step. This was done to test the incremental validity of each concept in relation to the other. Missing data was removed with list wise deletion.

A mediation model was suggested to better clarify the relationships between work stress, career adapt-abilities and orientations to happiness. The methodology proposed by Preacher and Hayes (2004, 2008) was adopted. This approach involves the use of bootstrapping with 1000 samples to obtain a point estimate of the indirect effect of the IV on the DV through the mediator(s) as well as 95% percentile based confidence intervals (CI) for this estimate. This technique permits the identification of an indirect effect even if X does not predict Y (Hayes, 2009; Preacher & Hayes, 2004). In these cases, the language of “indirect effect” is preferred over “mediator effect” (Hayes, 2009). In this analysis, various pathways are considered; pathway *c* (*X*’s total effect on *Y*), pathway *a* (*X* predicts *M*), pathway *b* (*M* predicts *Y*), and pathway *c*’ (*X*’s direct effect on *Y*, when *M* is controlled). The product of pathways *a* and *b* (*ab*) represents the indirect effect of *X* on *Y* through *M*. All the pathways described above can be calculated while controlling for the effect of the control variables. See Fig. 1 for an illustration of this mediation model.

## 3. Results

### 3.1. Descriptives and correlations

Table 1 provides an overview of the means, standard deviations and correlations between the variables. Regarding the significant relationships between variables, age shows small negative correlations with nationality and activity rate. Gender correlates negatively and moderately with activity rate. Age has small positive correlations with control and curiosity, and a small negative correlation with engagement and meaning. Gender shows no significant relation to any of the study variables, whereas nationality only has a small positive correlation with concern. Activity rate is positively correlated with concern, confidence, engagement, pleasure, and work stress, but is negatively correlated with meaning. All of the adapt-ability dimensions correlate positively with the orientations to happiness dimensions. Total adapt-abilities correlate strongly and positively with the four separate adapt-ability dimensions and moderately with orientations to happiness. Lastly, considering work stress, we find a positive relationship with activity rate, and negative relationships between work stress and all the adapt-ability dimensions and the total score, as well as with pleasure and engagement. Work stress is not significantly related to meaning. The associations between the study variables provide first indications that it is warranted to conduct further analyses in the form of a mediation model. Two dimensions of orientations to happiness, pleasure and engagement, are related to work stress, and the proposed mediator adapt-abilities are related to both work stress and orientations to happiness.

**Table 1**  
Descriptives and correlations of study and control variables.

	<i>M</i>	<i>(SD)</i>	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Age	42.04	(8.76)													
2. Gender	1.50	(0.50)	-.01												
3. Nationality	1.16	(0.37)	-.10**	-.10											
4. Activity rate	86.00	(19.70)	-.15**	-.52**	.06										
5. Concern	3.52	(.64)	-.05	-.04	.07**	.08*	(.88)								
6. Control	3.96	(.59)	.06**	.00	-.01	.05	.57**	(.87)							
7. Curiosity	3.63	(.62)	.08**	.03	.04	.00	.60**	.59**	(.86)						
8. Confidence	3.91	(.57)	-.01	-.00	.05	.07*	.56**	.71**	.63**	(.88)					
9. Adapt-ability	3.74	(.51)	.02	-.01	.05	.06*	.82**	.85**	.84**	.85**	(.94)				
10. OTH Pleasure	3.63	(.74)	-.05	-.01	-.01	.80**	.20**	.27**	.23**	.26**	.29**	(.87)			
11. OTH Engagement	3.48	(.66)	.10**	-.04	.01	-.07*	.25**	.30**	.24**	.33**	.42**	.42**	(.56)		
12. OTH Meaning	3.07	(.84)	.10**	.04	-.05	-.06*	.28**	.18**	.35**	.24**	.31**	.20**	.38**	(.68)	
13. Work stress	1.81	(.56)	-.02	-.04	.02	.09**	-.14**	-.22**	-.10**	-.16**	-.18**	-.14**	-.12**	-.05	(.86)

Notes. Reliabilities are shown in parentheses along the diagonal. For all correlations, *n* between 1'184 and 1'204. Nationality is coded 1 = Swiss, 2 = non-Swiss. Gender is coded as 1 = man, 2 = woman. Activity rate is in percentages.

\*  $p < .05$ .

\*\*  $p < .01$ .

### 3.2. Validation of the Career Adapt-Abilities Scale German-form

As suggested by various authors (Cheung & Rensvold, 2002; Vandenberg & Lance, 2000), we chose to consider a variety of goodness-of-fit indices;  $\chi^2$  per degree of freedom ( $\chi^2/df$ ), the goodness of fit index (GFI), the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the root mean square error of approximation (RMSEA). A model is considered to have an acceptable fit if the  $\chi^2/df$  is equal to or below 3, the GFI and CFI values are about .90 or above, the TLI values are above .95 and the RMSEA value is .05 or less, with values less than .08 considered acceptable (Cheung & Rensvold, 2002; Vandenberg & Lance, 2000).

As seen in Table 2, the hierarchical four-factor model provided a moderate degree of fit to the data. The standardized loadings from the items to the corresponding factor ranged from .62 to .80 ( $Mdn = .74$ ), and the loadings from the second-order variables (concern, control, curiosity and confidence) to adapt-abilities from .75 to .90 ( $Mdn = .84$ ). A four-factor model that took into account modification indices (MI) greater than 20 associated with the covariances between the error terms within each dimension was also tested. This model accounts for the shared variance between items within a dimension. This resulted in a significant improvement in model fit with results indicating a substantial degree of model fit. The correlations between error terms were all below .47. The standardized loadings ranged from .60 to .81 ( $Mdn = .74$ ) for the items, and from .75 to .92 ( $Mdn = .84$ ) for the second-order variables. The degree of model fit as well as the loadings is comparable to the results of the international validation of the CAAS in 13 countries (Savickas & Porfeldt, 2012).

Finally, the hierarchical four-factor model that utilized item parceling was tested (Bandalos, 2002). Items with the highest correlation were paired creating three homogenous parcels per scale, and then using the mean score of the two items in the analysis (Rogers & Schmitt, 2004). This technique provided good model fit for the CAAS French-language form (Johnston et al., 2013) and thus we tested this strategy with the German-language form. This model proved to have similar fit to the model with modification indices as seen in Table 2. Standardized parcel weights ranged from .71 to .88 ( $Mdn = .78$ ) and loadings from second-order to third-order constructs between .74 and .94 ( $Mdn = .85$ ).

As mentioned previously, due to translation reasons, the author of the CAAS suggested including an alternate item for the confidence scale. The use of this alternate item provided an improvement in model fit with the following model fit statistics;  $\chi^2/df = 6.52$ ,  $p < .001$ , GFI = .89, CFI = .91, TLI = .90 and RMSEA = .068. The standardized loadings from the items to the

**Table 2**  
Confirmatory Factor Analyses of the CAAS German.

Career Adapt-Abilities Scale	$\chi^2$	<i>df</i>	$\chi^2/df$	<i>p</i>	GFI	CFI	TLI	RMSEA
Hierarchical 4 factor model	2028.35	248	8.179	<.001	.869	.887	.875	.078
Hierarchical 4 factor model (MI > 20)	779.55	225	3.465	<.001	.949	.965	.957	.045
Hierarchical 4 factor model with parcels	324.48	50	6.489	<.001	.957	.966	.956	.068

Note. Only modification indices >20 associated with covariances between error terms within each dimension were considered.

**Table 3**

Mediating effects of total career adapt-abilities in the relationship between orientations to happiness and work stress.

Independent variable	Effect of OTH on CAAS	Effect of CAAS on Stress	Total effect	Direct effect	Indirect effect	
(IV)	(a)	(b)	(c)	(c')	(ab paths)	95% CI
OTH-P	1.55***	-.065***	-.346***	-.245**	-.011	(-.153; -.057)
OTH-E	2.04***	-.067***	-.329***	-.191**	-.138	(-.206; -.075)
OTH-M	1.54***	-.080***	-.083	.041	-.124	(-.172; -.082)

Note. All models include activity rate as a control variable. Confidence intervals are percentile based confidence intervals. OTH = orientations to happiness; CAAS = career adapt-abilities.

\*\*  $p < .01$ .

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

corresponding factor ranged from .62 to .79 ( $Mdn = .74$ ), and the loadings from the second-order variables to adapt-abilities from .75 to .90 ( $Mdn = .84$ ). Although an improvement in model fit is gained by using this alternate item, there are no changes in scale reliability, and so for the sake of consistency with the international version, we chose to continue the analysis with the items originally specified in the international version.

### 3.3. Predicting work stress from career adapt-abilities and orientations to happiness

For the results of the regression models, standardized beta coefficients from the final model are presented. The VIF collinearity statistics are close to 1 and therefore we are not concerned about multi-collinearity. First we present the results pertaining to the model in which the adapt-ability dimensions were entered before the orientations to happiness dimensions. Concerning the control variables, the only significant one is the activity rate ( $b = .13$ ,  $p < .001$ ), which shows a positive relation to work stress,  $R^2 = .009$ ,  $F(4, 1186) = 2.67$ ,  $p < .05$ . The addition of the four adapt-ability dimensions adds 5.3% to the explained variance with  $F_{change}(4, 1182) = 16.64$ ,  $p < .001$ . Only the dimensions of control ( $b = -.18$ ,  $p < .001$ ) and curiosity ( $b = .08$ ,  $p < .05$ ) are significantly related to work stress. Adding the orientations to happiness to the model only adds 1.1% to the explained variance,  $F_{change}(3, 1179) = 4.84$ ,  $p < .01$ . Only pleasure ( $b = -.09$ ,  $p < .01$ ) is significantly and negatively related to work stress.

For the model with orientations to happiness entered first followed by career adapt-ability, once again only activity rate ( $b = .13$ ,  $p < .001$ ) is significant,  $R^2 = .009$ ,  $F(4, 1186) = 2.67$ ,  $p < .05$ . Orientations to happiness are able to explain an additional 2.9% of the variance in work stress,  $F_{change}(3, 1183) = 12.00$ ,  $p < .001$ . Pleasure ( $b = -.09$ ,  $p < .01$ ) shows a significant relationship to work stress. The career adapt-ability dimensions are able to explain an additional 3.5% of the variance in work stress,  $F_{change}(4, 1179) = 11.11$ ,  $p < .001$ . Control ( $b = -.18$ ,  $p < .001$ ) is negatively related to work stress and curiosity ( $b = .08$ ,  $p < .10$ ) shows a marginally significant positive association.

Two points from the above results are important for further analysis; 1) only activity rate will be retained as a control variable, and 2) the mediation models will clarify the relationships between the variables and will be tested for all three orientations to happiness dimensions. It is still possible to test for indirect effects in the absence of a significant IV–DV relationship (Hayes, 2009; Preacher & Hayes, 2004).

### 3.4. Mediating effects of adapt-abilities

Three separate mediation models were proposed; one for each orientation to happiness with total adapt-abilities as the mediator and work stress as the dependent variable. In all these models, activity rate was included as a control variable. Results of these mediation analyses are presented in Table 3. For the pleasure and engagement dimension, results show that adapt-ability partially mediates the effect of pleasure and engagement on work stress; the direct effect ( $c'$ ) of pleasure and engagement is diminished but remains significant. These mediating effects can be considered significant because the confidence intervals for the indirect effects ( $ab$ ) do not include zero. Meaning shows no significant relationship with work stress ( $c'$ ), but, as presented previously, it is possible to test for an indirect effect in the absence of this relationship. In this case, the confidence interval for the indirect effect of meaning on work stress through adapt-abilities does not contain zero. Thus, there is evidence that meaning does have an indirect effect on work stress, but only due to the presence of adapt-abilities.

### 3.5. Mediating effects of the separate adapt-ability dimensions

Further in-depth analysis was conducted to test which adapt-ability dimensions carry the mediating effect. Models were set up as above, replacing the single mediator total adapt-abilities with the four adapt-ability dimensions resulting in

**Table 4**  
Mediating effects of the career adapt-abilities dimensions in the relationship between OTH and work stress.

Independent variable	Mediating variable	Effect of OTH on CAAS	Effect of CAAS on stress	Total effect	Direct effect	Indirect effect	95% CI
(IV)	(M)	(a)	(b)	(c)	(c')	(ab paths)	
OTH-P	Concern	.350***	-.085	-.348***	-.236***	-.030	(-.074; .006)
	Control	.423***	-.265***			-.112	(-.179; -.052)
	Curiosity	.376***	.120*			.045	(-.002; .094)
	Confidence	.395***	-.038			-.015	(-.075; .044)
OTH-E	Concern	.480***	-.082	-.329***	-.176*	-.040	(-.093; .012)
	Control	.528***	-.277***			-.146	(-.237; -.078)
	Curiosity	.454***	.112*			.051	(-.003; .104)
	Confidence	.577***	-.030			-.018	(-.104; .071)
OTH-M	Concern	.431***	-.087	-.085	-.015	-.037	(-.085; .006)
	Control	.257***	-.287**			-.074	(-.119; -.037)
	Curiosity	.518***	.115*			.060	(-.001; -.125)
	Confidence	.334***	-.053			-.018	(-.067; .034)

Note. All models include activity rate as a control variable. Confidence intervals are percentile based confidence intervals. OTH = orientations to happiness; CAAS = career adapt-abilities.

\*  $p < .05$ .

\*\*  $p < .01$ .

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

a multiple mediator model for each orientations to happiness dimension. Table 4 contains the results of these analyses. First, for both pleasure and engagement, results suggest both control and curiosity as partial mediators of the relation between the dimensions of orientations to happiness and work stress (see column *b*). However, inspection of the confidence intervals of the indirect effect (*ab*) shows that only control is the significant mediator, as this confidence interval does not contain zero. For the meaning dimension, the pattern of the results is the same as above, but considering the non-significant direct effect of meaning on stress, meaning is only associated to work stress through control. The other adapt-ability dimensions of concern, curiosity and confidence do not mediate the relationship between orientations to happiness and work stress.

#### 4. Discussion

This study had two main goals, to validate the German version of the CAAS and to test the mediating effect of adapt-abilities in the relationship between orientations to happiness and work stress. Results support both these aspects, and are discussed next starting with the validation of the CAAS.

##### 4.1. Validation of the German version of the Career Adapt-Abilities Scale

The results of our validation study provide support for the use of the German version of the CAAS international form 2.0. The overall high levels of fit between the model and the data suggest that the conceptual structure of adapt-abilities is stable in yet another country and provides further evidence for the validity of the CAAS. Career adapt-ability is gaining international momentum (Savickas & Porfeli, 2012) and the results of this study advance our confidence in the usefulness and broad applicability of this construct. An alternative item for the confidence scale “use the best of my competence” can replace “working up to my abilities” in the German version. Although only one item difference, using this item does result in an improvement in model fit. Users of this scale in a German-speaking context may want to include both items to have congruence with the international form 2.0.

##### 4.2. The relationships of orientations to happiness and adapt-abilities with work stress

We proposed that adapt-abilities would mediate the relationship between all the happiness orientations and work stress. Concerning engagement and pleasure, we found that adapt-ability partially mediates the relationship between these orientations and work stress. As such, part of the effect of pleasure and engagement on work stress is being transferred through the mechanism of adapt-abilities. However, pleasure and engagement still have an effect on work stress, independent of the effect through adapt-abilities. Considering the non-significant relationship of life of meaning to work stress, we found that meaning only has an indirect effect on work stress that is dependent on the presence of adapt-abilities. The absence of a negative direct effect between an orientation towards meaning and stress might reflect different mechanisms underlying the connection between the two constructs. Further, in contrast to a life of engagement, which is more related to the work context, other spheres of life besides work offer the possibility to find

meaning and purpose in (i.e. meaningful social relationships, helping others). Our results suggest that overall career adapt-ability plays an important role in implementing the endorsement of the orientations to happiness into practice in work life. Career adapt-ability seems to serve as one mechanism through which individuals attain their desired life at work.

#### 4.3. Control as an important intervening variable

When we consider the mediating effects of the separate adapt-ability dimensions, we find that only control acts as a mechanism variable. Control represents a self-directed and self-reliant perspective that is aimed at taking responsibility and making decisions that reflect an individual's self-interest contributing to a positive rather than negative work experience. Our results indicate control's unique ability to function as a mediator even in the presence of concern, curiosity and confidence (Preacher & Hayes, 2008). When mediators are correlated (as is the case in our data), the unique effects of each variable may be attenuated (Preacher & Hayes, 2008) which may explain why concern, curiosity and confidence are not significant mediators.

#### 4.4. Implications for theory and practice

Our results suggest that career adapt-ability and orientations to happiness are significantly and negatively related to perceiving stress at work. Given this relationship the question emerges whether these two constructs can be developed or increased by interventions, and if this increase would have further reductive effects on work stress. Promoting career adapt-ability may be one way to give individuals the tools necessary to accomplish their orientations to happiness in the work context. Career adapt-ability can be developed (Savickas, 1997; Savickas et al., 2009); concern through orientation exercises, control through decisional training, curiosity through information seeking activities, and confidence through self-esteem building activities (Savickas, 2005). There are indications that adapt-abilities may change in response to different situations. For example, unemployed individuals respond to job loss with increased levels of adapt-ability (Rossier, in press), and the transition from work to retirement prompted the display of adapt-ability (Ebberwein et al., 2004). Further, adolescents in France, Belgium, and Switzerland have different levels of career adapt-ability (Johnston et al., 2013). It seems then that adapt-abilities are not independent of context, and that interventions aimed at the development of career adapt-abilities may result in favorable personal and work outcomes.

Regarding the orientations to happiness, Giannopoulos and Vella-Brodrick (2011) showed that interventions, which draw individuals' attention to pleasurable, meaningful or engaging aspects of their life, had the potential for increasing well-being. Some orientations may be more easily developed than others with Peterson et al. (2005) pointing out that the orientation towards meaning and the orientation towards engagement are the ones most under personal control. Since we found a strong direct but also a mediated effect of the engagement orientation, for interventions aiming to reduce stress by promoting the orientations to happiness, the engagement orientation might be a logical point to start.

#### 4.5. Limitations and open questions

Common method bias is a potential risk as all data were collected using self-report methodology and at the same time. As this data is cross-sectional, there is always the possibility that perceived work stress contributes to changes in adapt-abilities or orientations to happiness. Further research is needed to examine the direction of these effects, as well if interventions focusing on increasing the orientations to happiness and adapt-abilities are successful. The reliability of the engagement orientation may appear low, but considering that the reliability score is similar to that found by others (Ruch et al., 2010), that the scale only has three items and that the sample size is large, we are confident that this has not jeopardized our results. Empirical studies of adapt-abilities do seem to support the theoretical conceptualization of adapt-abilities as a psychosocial variable involved in self-regulation (Rossier et al., 2012). But of course the question remains if adapt-abilities will show the same effects in relation to other work and non-related outcomes. This same question applies to orientations to happiness.

## 5. Conclusion

The literature on career adapt-abilities is growing and thus it is necessary to have tools available in different languages. The conceptual structure of career adapt-ability with concern, control, curiosity and confidence is replicable in German-speaking contexts. This research made the novel contribution of applying for the first time the concepts of adapt-abilities and orientations to happiness to the topic of stress at work. Adapt-abilities represent an important intervening variable between happiness orientations and work stress, suggesting that this mechanism is important for the translation of dispositions into behavior. Furthermore, this study provides evidence for the pertinence of positive psychology concepts such as orientations to happiness in the work environment. The different orientations of engagement, pleasure and meaning have different implications for work stress.



## Appendix A. Items in the CAAS German-language form

English items	German items
<i>Concern</i>	
Thinking about what my future will be like	Darüber nachzudenken, wie meine Zukunft sein wird
Realizing that today's choices shape my future	Mir darüber im Klaren zu sein, dass meine heutigen Entscheidungen meine Zukunft prägen
Preparing for the future	Mich für die Zukunft vorzubereiten
Becoming aware of the educational and career choices that I must make	Mir der Entscheidungen bewusst zu werden, die ich bezüglich Ausbildung und Beruf treffen muss
Planning how to achieve my goals	Zu planen, wie ich meine Ziele erreiche
Concerned about my career	Mich mit meiner Karriere zu befassen
<i>Control</i>	
Keeping upbeat	Optimistisch zu bleiben
Making decisions by myself	Selbst Entscheidungen zu treffen
Taking responsibility for my actions	Verantwortung für mein Handeln zu übernehmen
Sticking up for my beliefs	Mich für meine Überzeugungen einzusetzen
Counting on myself	Auf mich selbst zu zählen
Doing what is right for me	Das zu tun, was richtig ist für mich
<i>Curiosity</i>	
Exploring my surroundings	Meine Umwelt zu erkunden
Looking for opportunities to grow as a person	Nach Gelegenheiten zu suchen, um als Person zu wachsen
Investigating options before making a choice	Möglichkeiten zu erforschen bevor ich eine Entscheidung treffe
Observing different ways of doing things	Verschiedene Arten wahrnehmen Dinge zu tun
Probing deeply into questions I have	Den Fragen, die ich mir stelle, auf den Grund zu gehen
Becoming curious about new opportunities	Neugierig zu sein auf neue Gelegenheiten
<i>Confidence</i>	
Performing tasks efficiently	Aufgaben effizient auszuführen
Taking care to do things well <sup>a</sup>	Darauf zu achten, Dinge gut zu machen <sup>a</sup>
Learning new skills	Neue Fertigkeiten zu lernen
Working up to my ability	Meine Fähigkeiten zu entwickeln
Overcoming obstacles	Hindernisse zu überwinden
Solving problems	Probleme zu lösen

Note. In a German context, the item "Working up to my ability" (a) can be replaced by the item "use the best of my competence" at the suggestion of Mark Savickas, the author of the scale.

## References

- Arbuckle, J. L. (2010). *Amos (version 19.0) [computer program]*. Chicago, IL: SPSS.
- Bakker, A., van Veldhoven, M., & Xanthopoulou, D. (2010). Beyond the demand-control model. *Journal of Personnel Psychology*, 9, 3–16. <http://dx.doi.org/10.1027/1866-5888/a000006>.
- Bandalos, D. L. (2002). *The effects of item parceling on goodness-of-fit and parameter estimate bias in structural equation modeling*. Educational Psychology Papers and Publications. Paper 65 (Retrieved from <http://digitalcommons.unl.edu/edpsychpapers/65>).
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 9, 233–255. [http://dx.doi.org/10.1207/S15328007SEM0902\\_5](http://dx.doi.org/10.1207/S15328007SEM0902_5).
- Compton, W. C., Smith, M. L., Cornish, K. A., & Qualls, D. L. (1996). Factor structure of mental health measures. *Journal of Personality and Social Psychology*, 71, 406–413. <http://dx.doi.org/10.1037/0022-3514.71.2.406>.
- Cooper, C. L., Dewe, P. J., & O'Driscoll, M. P. (2001). *Organizational stress: A review and critique of theory, research, and applications*. Thousand Oaks, CA: Sage Publications.
- De Bruin, G. P. (2006). The dimensionality of the general work stress scale: A hierarchical exploratory factor analysis. *SA Journal of Industrial Psychology*, 32, 68–75. <http://dx.doi.org/10.4102/sajip.v32i4.250>.
- De Bruin, G. P., & Taylor, N. (2005). Development of the sources of work stress inventory. *South African Journal of Psychology*, 35, 748–765. <http://dx.doi.org/10.1177/008124630503500408>.
- Diener, E. (2000). Subjective well-being: The science of happiness and a proposal for a national index. *American Psychologist*, 55, 34–43. <http://dx.doi.org/10.1037/0003-066X.55.1.34>.
- Dik, B. J., & Duffy, R. D. (2009). Calling and vocation at work: Definitions and prospects for research and practice. *The Counseling Psychologist*, 37, 424–450. <http://dx.doi.org/10.1177/0011000008316430>.
- Dohrenwend, B. S., & Dohrenwend, B. P. (1974). *Stressful life events: Their nature and effects*. New York, NY: Wiley.
- Ebberwein, C. A., Krieshok, T. S., Ulven, J. C., & Prosser, E. C. (2004). Voices in transition: Lessons on career adapt-ability. *The Career Development Quarterly*, 52, 292–308. <http://dx.doi.org/10.1002/j.2161-0045.2004.tb00947.x>.
- Gable, S. L., & Haidt, J. (2005). What (and why) is positive psychology? *Review of General Psychology*, 9, 103–110. <http://dx.doi.org/10.1037/1089-2680.9.2.103>.
- Giannopoulos, V. L., & Vella-Brodick, D. A. (2011). Effects of positive interventions and orientations to happiness on subjective well-being. *The Journal of Positive Psychology*, 6, 95–105. <http://dx.doi.org/10.1080/17439760.2010.545428>.
- Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, 76, 408–420. <http://dx.doi.org/10.1080/03637750903310360>.
- Hirschi, A. (2011). Effects of orientations to happiness on vocational identity achievement. *The Career Development Quarterly*, 59, 367–378. <http://dx.doi.org/10.1002/j.2161-0045.2011.tb00075.x>.
- Holmes, T. H., & Rahe, R. H. (1967). The social readjustment rating scale. *Journal of Psychosomatic Research*, 11, 213–218. [http://dx.doi.org/10.1016/0022-3999\(67\)90010-4](http://dx.doi.org/10.1016/0022-3999(67)90010-4).

- Johnston, C., Broonen, J. P., Stauffer, S., Hamtiaux, A., Pouyau, J., Zecca, G., et al. (2013). Validation of an adapted French form of the Career Adapt-Abilities Scale in four Francophone countries. *Journal of Vocational Behavior*, 83, 1–10. <http://dx.doi.org/10.1016/j.jvb.2013.02.002>.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York, NY: Springer.
- Lent, R. W. (2004). Toward a unifying theoretical and practical perspective on well-being and psychosocial adjustment. *Journal of Counseling Psychology*, 51, 482–509. <http://dx.doi.org/10.1037/0022-0167.51.4.482>.
- Peterson, C. (2006). *A primer in positive psychology*. New York, NY: Oxford University Press.
- Peterson, C., Park, N., & Seligman, M. E. P. (2005). Orientations to happiness and life satisfaction: The full versus the empty life. *Journal of Happiness Studies*, 6, 25–41. <http://dx.doi.org/10.1007/s10902-004-1278-z>.
- Peterson, C., Ruch, W., Beermann, U., Park, N., & Seligman, M. E. P. (2007). Strengths of character, orientation to happiness, and life satisfaction. *The Journal of Positive Psychology*, 2, 149–156. <http://dx.doi.org/10.1080/17439760701228938>.
- Porfeli, E. J., & Savickas, M. L. (2012). The Career Adapt-Abilities Scale: Construction, reliability, and initial validity of the USA form. *Journal of Vocational Behavior*, 80, 748–753. <http://dx.doi.org/10.1016/j.jvb.2012.01.009>.
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, 36, 717–731. <http://dx.doi.org/10.3758/BF03206553>.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40, 879–891. <http://dx.doi.org/10.3758/BRM.40.3.879>.
- Proyer, R. T., Annen, H., Eggimann, N., Schneider, A., & Ruch, W. (2012). Assessing the “good life” in a military context: How does life and work-satisfaction relate to orientations to happiness and career-success among Swiss professional officers? *Social Indicators Research*, 106, 577–590. <http://dx.doi.org/10.1007/s11205-011-9823-8>.
- Rogers, W. M., & Schmitt, N. (2004). Parameter recovery and model fit using multidimensional composites: A comparison of four empirical parceling algorithms. *Multivariate Behavioral Research*, 39, 379–412. [http://dx.doi.org/10.1207/S15327906MBR3903\\_1](http://dx.doi.org/10.1207/S15327906MBR3903_1).
- Rossier, J. (2013). Personality and career interventions. In P. J. Hartung, M. L. Savickas, & W. B. Walsh (Eds.), *APA handbook of career intervention: Foundations, vol. 1*. Washington, DC: American Psychological Association (in press).
- Rossier, J., Zecca, G., Stauffer, S. D., Maggiori, C., & Dauwalder, J. P. (2012). Career adapt-abilities scale in a French-speaking Swiss sample: Psychometric properties and relationships to personality and work engagement. *Journal of Vocational Behavior*, 80, 734–743. <http://dx.doi.org/10.1016/j.jvb.2012.01.004>.
- Ruch, W., Brouwers, S. A., & Luciano, E. C. (2013). *Nine items to assess orientations to happiness: Development and validation of a short version of the OTH questionnaire*.
- Ruch, W., Harzer, C., Proyer, R. T., Park, N., & Peterson, C. (2010). Ways to happiness in German-speaking countries: The adaptation of the German version of the Orientations to Happiness questionnaire in paper-pencil and internet samples. *European Journal of Psychological Assessment*, 26, 227–234. <http://dx.doi.org/10.1027/1015-5759/a000030>.
- Savickas, M. L. (1997). Adaptability: An integrative construct for life-span, life-space theory. *The Career Development Quarterly*, 45, 247–259. <http://dx.doi.org/10.1002/j.2161-0045.1997.tb00469.x>.
- Savickas, M. L. (2005). The theory and practice of career construction. In S. D. Brown, & R. W. Lent (Eds.), *Career development and counseling: Putting theory and research to work* (pp. 42–70). Hoboken, NJ: Wiley.
- Savickas, M. L. (2011). *Career counseling*. Washington DC: American Psychological Association.
- Savickas, M. L., Nota, L., Rossier, J., Dauwalder, J. P., Duarte, M. E., Guichard, J., et al. (2009). Life designing: A paradigm for career construction in the 21st century. *Journal of Vocational Behavior*, 75, 239–250. <http://dx.doi.org/10.1016/j.jvb.2009.04.004>.
- Savickas, M. L., & Porfeli, E. J. (2012). The Career Adapt-Abilities Scale: Construction, reliability, and measurement equivalence across 13 countries. *Journal of Vocational Behavior*, 80, 661–673. <http://dx.doi.org/10.1016/j.jvb.2012.01.011>.
- Schneider, T. R. (2004). The role of neuroticism on psychological and physiological stress responses. *Journal of Experimental Social Psychology*, 40, 795–804. <http://dx.doi.org/10.1016/j.jesp.2004.04.005>.
- Seligman, M. E. P. (2002). *Authentic happiness: Using the new positive psychology to realize your potential for lasting fulfillment*. New York, NY: Free Press.
- Seligman, M. E., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist*, 55, 5–14. <http://dx.doi.org/10.1037/0003-066X.55.1.5>.
- Selye, H. (1982). *Handbook of stress: Theoretical and clinical aspects*. New York, NY: Free Press.
- Stauffer, S. D., Maggiori, C., Froidevaux, A., & Rossier, J. (in press). Adaptability in action: Using personality, aptitude, and interest data to help clients increase their emotional, social, and cognitive career meta-capacities. In M. Coetzer (Ed.), *Perspectives on psycho-social career meta-capacities*. New York, NY: Springer (in press).
- 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, 4–70. <http://dx.doi.org/10.1177/109442810031002>.