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Abstract

Careers today increasingly require engagement in proactive career behaviors; however, there is a lack of validated measures assessing the general degree to which somebody is engaged in such career behaviors. We describe the results of six studies with six independent samples of German university students (total $N = 2,854$), working professionals (total $N = 561$), and university graduates ($N = 141$) that report the development and validation of the Career Engagement scale—a measure of the degree to which somebody is proactively developing his or her career as expressed by diverse career behaviors. The studies provide support for measurement invariance across gender and time. In support of convergent and discriminant validity, we find that career engagement is more prevalent among working professionals than among university students and that this scale has incremental validity above several specific career behaviors regarding its relation to vocational identity clarity and career self-efficacy beliefs among students and to job and career satisfaction among employees. In support of incremental predictive validity, beyond the effects of several more specific career behaviors, career engagement while at university predicts higher job and career satisfaction several months later after beginning work.

Keywords

career development, proactivity, career behaviors, career counseling

Introduction

Due to changes in the nature of careers over the past three decades, people are increasingly responsible for the successful management of their careers (Hall, 2002). This development has increased the need to be engaged in proactive career behaviors for objective and subjective career success

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(Thomas, Whitman, & Viswesvaran, 2010). Numerous measures for distinct career behaviors such as career planning (Gould, 1979) or networking (Wolff, Schneider-Rahm, & Forret, 2011) exist. Although such measures assess conceptually distinct behaviors, extant empirical studies have shown that they are significantly correlated (e.g., Creed, Fallon, & Hood, 2009; De Vos, De Clippeleer, & Dewilde, 2009), indicating that people are usually engaged simultaneously in diverse proactive career behaviors.

Assessing this general degree of engagement in career behaviors seems promising because career development theories and research often do not distinguish between specific behaviors when asserting the importance of proactivity in career development (e.g., De Vos et al., 2009; Strauss, Griffin, & Parker, 2012). Hence, researchers and career counseling practitioners often want to assess the degree of active career management on a general level—without specifically addressing differences between distinct behaviors (e.g., between planning and networking). The usefulness of general constructs has gained increased recognition in organizational psychology as exemplified in the notions of core confidence (Stajkovic, 2006) or core self-evaluations (Judge, Erez, Bono, & Thoresen, 2003). General measures can be useful in research because they provide a more parsimonious assessment as compared to assessing each specific construct separately and can predict work-related outcomes above the variance explained by its more specific indicators (Judge et al., 2003).

Specific measures are useful if someone is interested in testing specific theories (e.g., the effects of networking on promotions). However, general measures also offer some distinct advantages (Judge & Kammeyer-Mueller, 2012): They are particularly useful (a) if the theory to be tested is more context-general (e.g., the effects of proactive career management on career development); (b) if the criterion of interest is general (e.g., career success, life satisfaction), or (c) to consider general and specific measures together to evaluate the unique variance of the specific measure beyond a more general construct (e.g., the unique effects of networking on promotions above the general engagement in different career behaviors). However, there is a lack of validated measures that directly assess exhibited career behaviors on a general level, which hinders the empirical evaluation of career development theories and makes existing research in this domain difficult to compare. Moreover, existing career management scales are mostly only suitable for employees and are less applicable for students. However, proactive career management also plays a pivotal role in emerging adulthood among university students to prepare for the transition to work—a critical career stage in career development theories and for many career counselor practitioners (Super, 1990).

To address the need for a reliable general measure of proactive career behaviors, this article describes the development and validation of a brief self-report scale that directly measures the general degree of engagement in self-directed career management behaviors, herein named “career engagement”, among university students and working professionals. Specifically, we present six studies with six distinct samples that (1) describe the development and initial validation of the factor structure of the scale, (2) provide an in-depth analysis of the factor structure and measurement invariance across gender among university students, (3) investigate time invariance of the measure over six months among students, (4) confirm the factor structure and assess the degree of measurement invariance among working professionals, (5) provide evidence for convergent and incremental validity among students and professionals, and (6) establish the scale’s incremental predictive validity in the transition from university to work.

The article extends existing research in several ways. First, the article theoretically distinguishes career engagement from similar constructs in the career literature. Second, the article presents a short, reliable, and valid measure for assessing career engagement for use in research. Moreover, the scale also promises to be useful in career development practice. Finally, the analyses of the criterion-related validity provide new insights into the relationships between career

engagement and important career attitudes as well as the incremental predictive effect of career engagement during the university-to-work transition on later job and career satisfaction.

Career Engagement in Relation to Existing Constructs

We define career engagement as the degree to which somebody is proactively developing his or her career as expressed by diverse career behaviors. Due to its focus on exhibited career behaviors, career engagement is conceptually distinct from other similar or similar-sounding constructs such as work engagement (Schaufeli, Salanova, González-romá, & Bakker, 2002), career commitment (Carson & Bedeian, 1994), career adaptability (Savickas, 1997), or career motivation (London, 1983) that focus on a state of mind, identity, readiness, or attitudes. Career engagement is also distinct from measures assessing specific career behaviors such as career planning (Gould, 1979), career exploration (Stumpf, Colarelli, & Hartman, 1983), or networking (Wolff et al., 2011) or from related measures of career management such as “career self-management” (Kossek, Roberts, Fisher, & Demarr, 1998; Noe, 1996; Sturges, Guest, Conway, & Davey, 2002), “career management strategies” (Gould & Penley, 1984), or “proactive career behaviors” (Claes & Ruiz-Quintanilla, 1998), which consist of two or more separate subscales measuring distinct components of career management such as feedback seeking, networking, or career exploration. In contrast to those measures, career engagement refers to and directly measures the general degree of being engaged in different career management behaviors.

Our newly developed measure is also distinct from existing one-dimensional measures of career management. The Self-Directed Career Management scale developed by Briscoe, Hall, and DeMuth (2006) assesses people’s attitude of assuming an independent role in managing their vocational behavior. In contrast, career engagement refers not to attitudes but to the specific career behaviors somebody exhibits to enhance his or her career development. The Career Initiative scale by Tharenou and Terry (1998) measures desired and enacted managerial career aspirations. Conversely, our notion of career engagement does not encompass desired aspirations and is not restricted to career behaviors that aim at advancing one’s career in terms of promotions within one organization. Raabe, Frese, and Beehr’s (2007) Career Self-Management Behaviors scale measures the extent to which somebody has exhibited self-management behaviors from an action–theoretical perspective. In contrast, career engagement does not directly refer to self-management strategies and behaviors but instead addresses overt career behaviors more generally. In sum, the notion of career engagement addresses the current interest in proactive career behaviors to describe contemporary career development. While it is conceptually related to several existing concepts and measures of career management, our notion of career engagement offers a distinct perspective on the phenomenon that merits the development and validation of a respective scale that can be used in career research and counseling practice.

Study I: Scale Development and Initial Validation of Factor Structure

Material and Method

To develop the items that assess career engagement, we followed a number of guidelines for item generation and scale development (cf., Hinkin, 1995). First, we reviewed the literature of self-directed career management by searching for relevant keywords such as “career management”, “career self-management”, “self-directed career management”, and “career competencies” in the PsycINFO and Web of Science databases. After categorizing the existing theoretical concepts and measures, we identified six specific career behaviors that are well established and that we deemed would adequately represent different manifestations of the general degree to which

somebody is proactively engaged in developing his or her career: (1) career planning, (2) career self-exploration, (3) environmental career exploration, (4) networking, (5) voluntary human capital/skill development, and (6) positioning behavior. It is important to note that we did not attempt to measure career engagement as a higher-order construct, represented by several subdimensions of specific career behaviors. Such higher-order reflective measures are often questionable in terms of theoretical clarity and measurement model specification (MacKenzie, Podsakoff, & Jarvis, 2005). Instead, we conceptualized our scale as a simple direct-effects indicator model where career engagement is represented by specific items that directly measure the construct of interest.

To derive the items that would measure career engagement, we used a deductive item-generation strategy and reviewed existing scales measuring the six identified prominent specific career behaviors including career exploration (Hirschi, 2009; Rowold & Staufienbiel, 2010; Stumpf et al., 1983; Super, Thompson, Lindeman, Jordaan, & Myers, 1981), career planning (Gould, 1979; Super et al., 1981), networking (Forret & Dougherty, 2001; Wolff & Moser, 2009), career strategies, including positioning and expertise development (Gould & Penley, 1984). In addition, we reviewed several scales measuring different career behaviors in a more diverse way (Claes & Ruiz-Quintanilla, 1998; Kossek et al., 1998; Noe, 1996; Raabe, Frese, & Beehr, 2007; Sturges, Conway, Guest, & Liefoghe, 2005; Sturges et al., 2002). Because lengthy scales can result in carelessness among respondents and can cause practical problems in research and field settings due to concerns of overburdening respondents, we aimed to parsimoniously develop a small number of items that would adequately capture the construct of interest.

In a first step, we created three items for each of the six identified specific career behaviors. Content validity of the items was assured by creating items that closely resembled existing items from established scales. The items were then presented to a group of 24 university students in a career development workshop (64% female, age $M = 22.5$, standard deviation $[SD] = 2.3$). Incorporating the feedback we received in the workshop, we next selected one item for each content domain. Due to the large amount of different career behaviors proposed in the literature, we could not represent every possible career behavior by a specific effect indicator. In order to arrive at a widely generalizable measure across diverse career behaviors, we additionally derived three general items that assess engagement in career behaviors more generally (Items no. 1–3). This process resulted in nine items and is reported in Table 1. We used a 5-point Likert-type scale response format to indicate the extent to which someone has been engaged in this task during the last six months ranging from 1 (*almost never*) to 5 (*very often*). These nine items were administered to a unique sample of 146 German university students (42% female, age $M = 23.48$, $SD = 3.32$) who participated in a class on research methods, using an online questionnaire. Based on the data, we examined the factor structure and reliability to establish the scale's unidimensionality.

Results and Discussion

We applied an exploratory factor analysis using principal axis factors extraction with Promax rotation. Based on the scree test and factor eigenvalues, a clear single-factor solution emerged with the first factor having an eigenvalue of 4.45 and explaining 49.4% of the total variance and the second factor having only an eigenvalue of 0.95 explaining 10.5% of the variance. Factor loadings on the first factor ranged from .37 to .85 and further confirmed that the 3 general and the 6 specific items represent one common factor. Cronbach's α for the scale was .89, and corrected item-total correlations ranged from .35 to .77. In sum, the results show the adequateness of the developed items for capturing a one-dimensional construct of career engagement, and we consequently retained all the items for use in subsequent studies.

Table 1. Factor Loadings (Standardized), Item Intercepts, Corrected Item-Total Correlations, and Skew and Kurtosis for the 9 Career Engagement Items.

Item	To what extent have you in the past 6 months ... <i>Inwiefern haben Sie in den vergangenen sechs Monaten ...</i>	Factor Loading	Item Intercept	Item-Total Correlation	Skew	Kurtosis
1	Actively sought to design your professional future <i>sich aktiv um die Gestaltung Ihrer beruflichen Zukunft bemüht</i>	.85	3.23	.77	-0.31	-0.77
2	Undertook things to achieve your career goals <i>Dinge unternommen, um Ihre beruflichen Ziele zu verwirklichen</i>	.82	3.23	.75	-0.34	-0.66
3	Cared for the development of your career <i>sich um die Weiterentwicklung Ihrer Karriere gekümmert</i>	.83	3.16	.76	-0.32	-0.79
4	Developed plans and goals for your future career <i>Pläne und Ziele für Ihre berufliche Zukunft erarbeitet</i>	.71	3.20	.66	-0.34	-0.69
5	Sincerely thought about personal values, interests, abilities, and weaknesses <i>aufrichtig über persönliche Werte, Interessen, Fähigkeiten und Schwächen nachgedacht</i>	.41	3.64	.40	-0.63	-0.16
6	Collected information about employers, professional development opportunities, or the job market in your desired area <i>Informationen über Arbeitgeber, berufliche Entwicklungsmöglichkeiten oder den Arbeitsmarkt in Ihrem Wunschbereich gesammelt</i>	.64	2.81	.61	0.04	-1.04
7	Established or maintained contacts with people who can help you professionally <i>Kontakte zu Personen, die Ihnen beruflich weiterhelfen können, aufgenommen oder gepflegt</i>	.66	2.92	.64	-0.08	-0.97
8	Voluntarily participated in further education, training, or other events to support your career <i>freiwillig an Weiterbildungen, Trainings oder anderen Veranstaltungen zur Förderung Ihrer Karriere teilgenommen</i>	.53	2.46	.52	0.31	-1.07
9	Assumed duties or positions that will help you progress professionally <i>Aufgaben oder Positionen übernommen, die Sie beruflich weiterbringen</i>	.61	3.03	.59	-0.17	-1.05

Note. Study 2, $N = 2,027$. Answers are provided on a 5-point Likert-type scale; English: (1) *not much*; (2) *little*; (3) *somewhat*; (4) *much*; (5) *a great deal*. Original German: (1) *wenig*; (2) *ein bisschen*; (3) *mittelmäßig*; (4) *ziemlich viel*; (5) *sehr viel*.

Study 2: Confirmation of the Factor Structure and Measurement Invariance Across Gender Among University Students

Study 2 aimed at testing the one-factorial structure and adequateness of the selected items with an independent and larger student sample using confirmatory factor analysis (CFA). In addition, we aimed at establishing measurement invariance across gender. Establishing measurement invariance is an important prerequisite for a scale to be useful to assess the construct in different groups and to make substantive comparisons between groups. Thus, demonstrating gender invariance is

particularly relevant because career research is frequently interested in assessing gender differences (Ng, Eby, Sorensen, & Feldman, 2005) and it appears important to investigate whether gender differences in career engagement exist.

Material and Method

Participants and Procedure

Students from a German university were invited to participate in the study via announcements on a university list server providing a short description of the study and a link to an online questionnaire hosted on a secure website. Approximately 6,000 students were subscribed to the list server, and 2,091 students completed the questionnaire. Because it is important to have a relatively homogeneous sample regarding aspects that might distort the answers to the measure, we restricted our sample according to age and study semesters: Students older than age 30 ($n = 90$) and/or studying in a semester higher than the 12th ($n = 24$) were excluded. These delimitations resulted in a final sample with the following characteristics: size of $N = 2,027$, 63.8% female, age $M = 23.74$, $SD = 2.39$, study semester $M = 4.29$ and $SD = 2.32$. These students represented 41 different majors, with the largest groups stemming from management and entrepreneurship (16%), business administration (13%), and business psychology (10%).

Measure

The same 9 items with the 5-point Likert-type scale assessing career engagement as in Study 1 (see Table 1) were administered. The Engagement scale indicated good internal consistency (Cronbach's α) for the total sample (.88) and for the two subsamples (female group: .89; male group: .88). The average scale scores (item means) were 3.08 ($SD = 0.86$) for the total sample, 3.09 ($SD = 0.87$) for the female group, and 3.04 ($SD = 0.85$) for the male group.

Results and Discussion

We first conducted a CFA to confirm the measurement model of the Engagement scale for the total sample. We used a robust maximum likelihood estimator because data deviated from a multivariate normal distribution. For the assessment of the model fit, we used (1) the Satorra–Bentler (SB) χ^2 statistic, (2) the comparative fit index (CFI), (3) the Tucker–Lewis index (TLI), (4) the root mean square error of approximation (RMSEA), and (5) the standardized root mean square residual (SRMR). CFI and TLI values greater than .90 and RMSEA and SRMR values less than .08 can be considered indicators of good model fit (Browne & Cudeck, 1992). Model comparisons were made based on the SB-corrected χ^2 difference test (Satorra & Bentler, 2001).

For the model with 9 items, the model fit was satisfactory: $SB-\chi^2 = 324.79$, $df = 27$, $p < .01$; CFI = .96; TLI = .94; RMSEA = .07 (90% confidence interval [CI] = [.07, .08]); and SRMR = .04. This result indicates that the one-factor solution found in Study 1 can be confirmed with data obtained from an independent sample. Table 1 shows factor loadings, intercepts, corrected item-total correlations, and skew and kurtosis for all 9 items based on the total sample. We also evaluated whether a two-factor solution distinguishing a factor represented by the three general items from a factor represented by the six specific indicators would provide a better fit to the data than a one-factor model. We obtained only marginal changes in fit indices, $\Delta CFI = -.008$; $\Delta RMSEA = .005$, and a very high correlation (.94) between the two factors suggesting the two factors are not distinct. These results support the more parsimonious one-factor model.

Next, we assessed the measurement invariance for gender. In doing so, we fitted a sequence of nested CFA models where we imposed increasing restrictions on the equalities of the model

parameters (cf. Vandenberg & Lance, 2000). The baseline model (Model 1) specified a one-factor solution for the subgroups under study. In this model, there were no further restrictions on any parameters beyond the number of factors (held constant at 1). Model 2 featured equal factor loadings across groups, which can be interpreted as each item having the same discrimination parameters for female and male participants. Model 3 additionally assumed equal intercepts, which corresponds to the same difficulty parameters for each item across the groups. While the assumption of equal factor loadings could be upheld for the gender group comparison, restricting the item intercepts to be equal across gender proved to be too strong. Here, the intercepts for one item (Item 4) had to be set free in each group, leading to partial intercept invariance. Next, we specified equal residual variances for the items (Model 5), followed by equal factor variances (Model 6), and equal factor means (Model 7). All these assumptions could be upheld, confirming substantial measurement invariance across gender. Table 2 details the model fit statistics for these seven measurement invariance analysis models. The results not only address the psychometric issue of measurement equivalence but also provide answers regarding substantive questions about career engagement. With regard to the scale's psychometric properties, our findings confirm that the scale measures the same construct for men and women and demonstrate the absence of a gender bias. Substantively, the nonsignificant result obtained in the comparison between Models 6 and 7 indicates that there were no significant gender differences in the degree of career engagement.

Study 3: Establishing Time Invariance of the Measure Among University Students

The goals of Study 3 were to (a) establish the measurement invariance of our measure across time and (b) assess whether the degree of career engagement changes during university. The Career Engagement scale assesses the extent to which proactive career behaviors are exhibited. Hence, unlike a personality trait, career engagement is likely to show some change over time and intraindividual differences in this variation across time. This can particularly be expected during the university years when getting closer to a developmental deadline (Heckhausen & Tomasik, 2002) in terms of graduation is likely to increase career engagement. Because career research is by nature concerned with development over time, it is important to establish time invariance of the measure to support its applicability in longitudinal research (Horn & McArdle, 1992). We assessed measurement invariance across an interval of six months, which represents one semester at university and a period of time where meaningful changes in career behaviors might be observed. Other career research often uses the same time lag (e.g., Kossek et al., 1998; Strauss et al., 2012). We expected the measure to show measurement invariance across time, which would demonstrate that the measure assesses the same construct across time, despite possible changes in magnitude.

Method

Participants and Procedure

All participants in Study 2 were asked if they were willing to participate again in a second survey and provide their e-mail address for this purpose. Among the 2,091 participants, 1,942 provided contact information and were contacted directly per e-mail six months later, inviting participation in the follow-up survey containing again the Career Engagement scale with a response rate of $n = 951$ (45%); 65.5% female, age $M = 23.70$, $SD = 2.93$, study semester $M = 4.24$, and $SD = 2.38$. Post hoc tests showed that participants who had completed the measure again did not differ regarding career engagement, age, study semester, or gender distribution from the students who participated only in T1.

Table 2. Fit Indices for Measurement Invariance Model Comparisons Across Gender for Study 2.

Model	Model Equalities	df	SB- χ^2	Compare		CFI	TLI	RMSEA [90% CI]	SRMR
				With Model	Δ SBc χ^2 ^a				
1	Number of factors	54	351.87	—	—	.96	.94	.07 [.07, .08]	.04
2	NF; factor loadings	62	367.97	1	3.98	.95	.95	.07 [.06, .08]	.04
3	NF; FL; intercepts	70	389.06	2	16.78*	.95	.95	.07 [.06, .07]	.04
4	NF; FL; partial intercepts	69	381.61	2	8.92	.95	.95	.07 [.06, .07]	.04
5	NF; FL; PI; residual variances	78	396.05	4	9.27	.95	.96	.06 [.06, .07]	.04
6	NF; FL; PI; RV; factor variance	79	398.57	5	1.19	.95	.96	.06 [.06, .07]	.04
7	NF; FL; PI; RV; FV; factor mean	80	399.55	6	0.33	.95	.96	.06 [.06, .07]	.04

Note. NF = number of factors; FL = IC = intercepts; RV = residual variances; FV = factor variance; CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; CI = confidence interval. $N = 1,294$ women and 733 men. Δ SBc χ^2 = Satorra–Bentler-corrected χ^2 difference test.

^aThe Satorra–Bentler-corrected χ^2 difference test was computed using the maximum likelihood chi-square, the degrees of freedom, and the scaling correction factor of the two nested models (Satorra & Bentler, 2001).

* $p < .05$.

Measure

The same measure for career engagement as described in Study 1 was used.

Results and Discussion

To assess the measurement equivalence over time (Vandenberg & Lance, 2000), we conducted a similar procedure of fitting a series of nested CFA models as in Study 2. To test longitudinal invariance, equality constraints were applied to model parameters across the two time points. The baseline model (Model 1) specified a two-factor solution, each factor representing one point in time. Model 2 constrained the factor loadings to be equal across time points. Model 3 tested for the same difficulty parameters across time. In Model 4, equal residual variances for the items were specified, testing equivalent item reliability over time. This procedure was followed by testing for equal factor variances (Model 5) and equal factor means (Model 6). A summary of the results of Study 3 is provided in Table 3. All but the last equality constraint yielded nonsignificant results, thus confirming measurement invariance across time. Restricting the factor means to be equal led to a significant decrease in model fit for Model 6 compared to Model 5. This result indicates that the mean degree of career engagement changed significantly from T1 to T2. A higher mean for the construct was observed in T2.

The findings confirm the suitability of the Career Engagement scale for longitudinal research: The scale showed measurement invariance across time to assure that the same construct is measured across time. We could also show that the measure is sensitive to detect changes in career behaviors exhibited across different time points. As shown, the level of career engagement in the sample increases over the course of 6 months, which can be explained by the effect of getting closer to the developmental deadline of graduation (Heckhausen & Tomasik, 2002).

Study 4: Investigation of Psychometric Scale Properties Among Working Professionals

Study 4 aimed at demonstrating the appropriateness of the one-factorial structure, previously established in student samples, among a sample of working professionals. This finding is relevant

Table 3. Fit Indices for MI Model Comparisons Across Times for Study 3 ($N = 951$).

Model	Model Equalities	df	SB- χ^2	Compare		CFI	TLI	RMSEA [90% CI]	SRMR
				With Model	Δ SBc χ^2 ^a				
1	Number of factors	125	459.75	—	—	.95	.94	.05 [.05, .06]	.04
2	NF; factor loadings	133	478.45	1	10.23	.96	.95	.05 [.05, .06]	.04
3	NF; FL; intercepts	141	497.06	2	15.55	.95	.95	.05 [.05, .06]	.04
4	NF; FL; IC; residual variances	150	511.63	3	4.17	.95	.95	.05 [.05, .06]	.05
5	NF; FL; IC; RV; factor variance	151	512.97	4	0.55	.95	.95	.05 [.05, .06]	.05
6	NF; FL; PI; RV; FV; factor mean	152	524.92	5	14.25*	.95	.95	.05 [.05, .06]	.05

Note. NF = number of factors; FL = factor loadings; IC = intercepts; RV = residual variances; FV = factor variance; CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; CI = confidence interval. Δ SBc χ^2 = Satorra–Bentler-corrected χ^2 difference test.

^aThe Satorra–Bentler-corrected χ^2 difference test was computed using the maximum likelihood chi-square, the degrees of freedom, and the scaling correction factor of the two nested models (Satorra & Bentler, 2001).

* $p < .05$.

because we intended to develop a scale that is applicable for students and working adults. We also assessed the degree of measurement invariance between these two groups. We did not assume complete measurement invariance between students and working professionals because we expected the latter group to display generally higher levels of career engagement due to being in a working context where it is reasonable to assume that career management activities might be more expected and needed than at university, in turn facilitating possibilities to show the associated behavior. Instead, we aimed at establishing partial measurement invariance across the two groups, expecting to find the factor structure and factor loadings but not the item intercepts to be invariant across both groups. An equal factor structure and equal factor loadings support the assumption that both respondent groups applied the same conceptual frame of reference when completing the items, which is desirable because it provides evidence of the scale's invariant construct validity across both groups. In contrast, obtaining theoretically expected differences in item intercepts and factor means between both groups would provide further evidence of the construct validity of the new scale (Hinkin, 1995).

Method

Participants and Procedure

The sample consisted of university alumni from two universities in northern Germany, who had provided their e-mail addresses and consent to being contacted again for research purposes in a previous online questionnaire conducted by the career services of the their universities. Participants were contacted directly via e-mail ($N = 543$) and were invited to complete the online questionnaire, resulting in a response rate of 53% ($n = 290$). The characteristics of the respondents were as follows: 56% female; age $M = 29.61$; $SD = 6.06$; 32% had a bachelor's degree, 63% had a master's degree, 1% had a PhD, and the others indicated other degrees or provided no answer; and they worked in a diverse range of industries, the largest being business management (18%), education (15%), and engineering (11%).

Measure

The same measure for career engagement as described in Study 1 was used.

Results and Discussion

We first conducted a CFA to confirm the measurement model of the Engagement scale for the sample of working professionals. The model fit was satisfactory: $SB-\chi^2 = 54.91$, $df = 27$, $p < .01$; CFI = .97; TLI = .95; RMSEA = .06 (90% CI = [.04, .08]); and SRMR = .04. This result indicates that the one-factor solution found among students in Studies 1 and 2 was confirmed with an independent sample of working professionals. Next, we assessed measurement invariance between the student (sample from Study 2) and the working groups. We expected to find measurement invariance regarding the one-factor solution (Model 1) and factor loadings (Model 2) but not necessarily regarding intercepts (Model 3; partial intercepts: Model 4) or residual variances (Model 5). The same procedure as described in Study 2 was applied. The results showed that the assumption of equal factor loadings could be upheld (Model 1: $SB-\chi^2 = 377.63$, $df = 54$, $p < .01$; CFI = .96; TLI = .94; RMSEA = .07 (90% CI = [.07, .08]); SRMR = .04; Model 2: $SB-\chi^2 = 399.03$, $df = 62$, $p < .01$; CFI = .95; TLI = .95; RMSEA = .07 (90% CI = [.06, .08]); SRMR = .04; $\Delta SB-\chi^2 = 14.17$, $df = 8$, $p > .05$). However, neither intercept invariance nor partial intercept invariance could be obtained because the intercepts for all items were significantly higher in the employees group (Model 3: $SB-\chi^2 = 450.82$, $df = 70$, $p < .01$; CFI = .95; TLI = .95; RMSEA = .07 (90% CI = [.06, .08]); SRMR = .05; Model 4: $SB-\chi^2 = 410.50$, $df = 65$ (intercepts for Items 1, 2, 3, 8, and 9 were set free in both groups), $p < .01$; CFI = .95; TLI = .95; RMSEA = .07 (90% CI = [.06, .07]); SRMR = .04; both models fitted significantly poorer than Model 2). Observing this consistent pattern of higher intercepts for working professionals does not indicate measurement bias but supports our assumption of higher levels of career engagement across this group of respondents. Furthermore, the consistently higher intercepts provide evidence of the validity of the Engagement scale because theoretically expected differences in the construct between the groups of respondents are indeed found when applying the measure (Vandenberg & Lance, 2000).

In sum, the results support the applicability of the scale for working professionals by supporting its factor structure. The results also indicate the utility of the scale in detecting differences in career engagement between samples of students and working professionals because the items were found to be consistently more difficult for students. This result provides further evidence of the construct validity of the measure.

Study 5: Establishing Concurrent, Discriminant, and Incremental Validity

Study 5, first, aimed at supporting the concurrent validity of the Career Engagement scale by investigating its relations to established measures of career management behaviors, specifically career planning, career self-exploration, environmental career exploration, and networking. Because career engagement is conceptualized as the general degree to which somebody is engaged in different career behaviors, we expected significant and high correlations with those specific career behavior measures.

Hypothesis 1: Career engagement is significantly and positively related to (a) career planning, (b) career self-exploration, (c) environmental career exploration, and (d) networking.

Second, Study 5 was designed to ascertain discriminant validity by establishing that our new measure is distinct from prominent career constructs that assess career attitudes, specifically, career self-efficacy beliefs and vocational identity clarity. Theoretically, career self-efficacy is important for exercising human agency in career development and should be positively related to exhibiting career behaviors (Betz, 2007). Likewise, a clear vocational identity should be positively related

to proactive career behaviors because it can encourage goal-directed behaviors and is in turn affected by career behaviors such as exploration or planning (Skorikov & Vondracek, 2007). However, because self-efficacy and identity are attitudinal career constructs, we expected only modest correlations to our behaviorally oriented Career Engagement scale.

Hypothesis 2: Career engagement shows modest positive correlations with (a) career self-efficacy beliefs and (b) vocational identity clarity.

Third, we wanted to establish the new scale's incremental validity, by showing that it is not redundant with existing measures of specific career behaviors. Specifically, we aimed at demonstrating that the Career Engagement scale captures variance in criterion-related constructs beyond single measures of specific career behaviors. For the student group, we chose career self-efficacy beliefs and vocational identity clarity as criterion variables. For the working sample, we chose job satisfaction and career satisfaction as criterion variables. Because proactive behaviors are supposed to enhance career success and result in better person-environment fit (Thomas et al., 2010), we expected a positive relation between job and career satisfaction with proactive career behaviors. Empirical studies confirmed this assumption with different career behaviors (e.g., De Vos et al., 2009; Wolff & Moser, 2009). To establish incremental validity, we predicted:

Hypothesis 3: Career engagement explains variance in (a) career self-efficacy beliefs and (b) vocational identity clarity beyond measures of career planning, self-exploration, environmental exploration, and networking.

Hypothesis 4: Career engagement explains variance in (a) job satisfaction and (b) career satisfaction beyond measures of career planning, self-exploration, environmental exploration, and networking.

Material and Method

Participants and Procedure

The *student sample* was a unique sample of German university students from the same university as in Studies 1 and 2. Participants were invited by sending an e-mail invitation containing a link to the online questionnaire to students across all majors in their second and third year ($N = 1,891$) with a response rate of 36% ($n = 681$), 62.3% female, age $M = 23.51$, $SD = 5.49$, study semester $M = 4.56$, $SD = 3.86$, and representing 29 different majors with the largest groups coming from management and entrepreneurship (17%), business administration (15%), cultural studies (12%), and business psychology (11%).

The *working sample* consisted of university alumni from five universities in northern Germany, who were contacted via e-mail ($N = 422$) and invited to complete the online questionnaire, resulting in a response rate of 56% ($n = 271$), 62% female; age $M = 29.07$; $SD = 5.91$; 34% held a bachelor's degree, 59% a master's degree, and 2% a PhD, 22% worked in business management, 16% in education, and 7% in engineering, computer science, and marketing, respectively.

Measures

Measures were originally in German and, unless stated otherwise, used a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Cronbach's α estimates and correlations between measures are reported in Table 4.

Table 4. Bivariate Correlations and Reliabilities of Career Engagement and the Other Assessed Constructs in Study 5.

Measure	Student Sample (N = 681)		Working Sample (N = 271)	
	career engagement	α	career engagement	α
Career engagement	—	.87	—	.87
Career planning	.46	.87	.36	.85
Self-exploration	.57	.85	.54	.87
Environmental exploration	.72	.89	.67	.90
Networking	.41	.79	.43	.77
Vocational identity	.32	.81	.22	.89
Self-efficacy	.33	.81	.21	.86
Job satisfaction	—	—	.28	.91
Career satisfaction	—	—	.25	.86

Note. All correlations $p < .001$.

Career Engagement

The same 9 items as described in Study 1 were used.

Career Planning

We assessed career planning with the 6-item scale by Abele and Wiese (2008) who reported a reliability of $\alpha = .86$ and support of the construct validity of the scale among a large group of university-educated German professionals by medium relationships with subjective and objective career success.

Career Exploration

We measured career exploration with the 4 items assessing *self-exploration* behaviors and the 6 items assessing *environmental career exploration* from the Career Exploration scale developed by Hirschi (2009). Previous research showed reliabilities of $\alpha = .76$ for self-exploration and $\alpha = .85$ for environmental exploration, as well as medium correlations for both measures with career planning (Hirschi, Niles, & Akos, 2011).

Networking

Networking activities were assessed with the 7-item *building external contacts* subscale (e.g., “I accept invitations to official functions or festivities out of professional interest”) of the Networking scale by Wolff and Moser (2006; Wolff et al., 2011) with a 4-point Likert-type scale ranging from 1 (*never/very seldom*) to 4 (*very often/always*). The scale showed a reliability of .69 to .83 in different samples and predictive utility regarding career satisfaction and annual salary in a longitudinal study with German alumni (Wolff & Moser, 2009).

Career Self-Efficacy Beliefs

Career self-efficacy was assessed with the 6-item (e.g., “Whatever comes my way in my job, I can usually handle it”) short version of the Occupational Self-Efficacy scale developed and validated by Rigotti, Schyns, and Mohr (2008) applying a 6-point Likert-type scale ranging from 1 (*not at all*) to 6 (*completely*). The authors of the scale (Rigotti, Schyns, & Mohr, 2008) reported a scale reliability of

$\alpha = .84$ and evidence of construct validity among a large group of German employees with significant relationships with job satisfaction, organizational commitment, job performance, and job insecurity.

Vocational Identity Clarity

We assessed vocational identity with the 7-item (e.g., “I’m not sure yet which occupations I could perform successfully”) German-language adaptation of the Vocational Identity scale (Holland, Dager, & Power, 1980; Jörin, Stoll, Bergmann, & Eder, 2004). The original scale is one of the most frequently used scales for vocational identity assessments with ample support for its reliability and construct validity (Holland, Johnston, & Asama, 1993). Research with the German-language version reported scale reliabilities between $\alpha = .81$ and $.89$ and positive correlations with career decidedness, career planning, and career exploration among adolescents and college students (Hirschi & Läge, 2007; Jörin et al., 2004).

Job Satisfaction

We measured job satisfaction with the brief index of affective job satisfaction developed and validated by Thompson and Phua (2012). The scale consists of four statements (e.g., “I find real enjoyment in my job”). The authors of the scale provide sound support for internal consistency reliability, temporal stability, convergent, and criterion-related validities, and cross-population invariance by nationality, job level, and job type. For example, they report α s of $.81$ to $.87$ across different samples, a 3-month retest reliability of $.57$, and significant relations to other job satisfaction measures and subjective well-being.

Career Satisfaction

We used a German translation (Abele & Spurk, 2009) of the Career Satisfaction scale by Greenhaus, Parasuraman, and Wormley (1990). The scale includes 5 items (e.g., “I am satisfied with the progress I have made towards meeting my overall career goals”). Abele and Spurk (2009) report a reliability of $.83$ and support for unidimensionality and construct validity of the scale in terms of significant correlations with salary and occupational status.

Results and Discussion

Table 4 shows that, in both samples, career engagement demonstrates a significantly positive correlation with planning, self-exploration, environmental exploration, and networking. This result confirms career engagement’s concurrent validity, as stated in Hypotheses 1a to 1d. Supporting the scale’s discriminant validity as proposed in Hypothesis 2, vocational identity and career self-efficacy beliefs showed positive but only modest correlations to career engagement in both samples (Table 4). In order to test the incremental validity of our new measure (Hypotheses 3 and 4), we conducted hierarchical linear regression analyses. In the *student sample*, career engagement explained 1.7% additional variance in career self-efficacy, $\Delta F(1, 675) = 14.73, p < .001$, beyond the variance explained by the four measures of career planning, self-exploration, environmental exploration, and networking, $R^2 = .22, F(4, 676) = 47.33, p < .001$. Career engagement explained 0.4% additional variance in vocational identity clarity, $\Delta F(1, 675) = 5.70, p = .017$, beyond the variance explained by the four specific measures, $R^2 = .53, F(4, 676) = 192.75, p < .001$. For the *working sample*, the results showed that career engagement explained an additional 2.8% variance in job satisfaction, $\Delta F(1, 265) = 210.94, p = .001$, beyond the variance explained by the four specific measures, $R^2 = .29, F(4, 266) = 28.04, p < .001$. Finally, career engagement explained an additional

6.5% variance in career satisfaction, $\Delta F(1, 265) = 27.43, p < .001$, beyond the variance explained by the four specific measures, $R^2 = .31, F(4, 266) = 29.14, p < .001$.

In sum, the results confirm Hypotheses 2 and 3 and show that although the Career Engagement scale is significantly related to measures of specific career behaviors, it is not redundant with more specific existing measures. Specifically, the scale has incremental validity regarding important career attitudes among students (i.e., vocational identity clarity, career self-efficacy) and working professionals (i.e., job satisfaction, career satisfaction), above several measures of more specific career behaviors.

Study 6: Incremental Predictive Utility in the Transition From University to Work

Study 6 aimed at establishing the incremental predictive utility of the measure. Based on the notion that proactive career behaviors are pivotal to achieve objective and subjective career success (Thomas et al., 2010), we expected that career engagement would be important to master career transitions. Particularly, we focused on the transition from university to work which is characterized by the need for active career engagement while at university to manage this transition successfully (Haase, Heckhausen, & Silbereisen, 2012). This transition hence seems to be an ideal context in which the predictive utility of our measure can be assessed.

Previous research has established that different factors measured before or shortly after graduation predict subsequent career outcomes, for example, different behaviors of career management (Sturges et al., 2002), occupational self-efficacy beliefs and career-advancement goals (Abele & Spurk, 2009), personality characteristics (emotional stability, proactive personality; Rode, Arthaud-Day, Mooney, Near, & Baldwin, 2008), or career decidedness, self-clarity, and career choice importance (Earl & Bright, 2007). However, none of these studies investigated whether proactive career behaviors exhibited while at university would positively predict later career outcomes while working. Similar to Study 5, but with a longitudinal design in a crucial career transition, Study 6 aimed at establishing the incremental predictive validity of career engagement while at university regarding later job satisfaction and career satisfaction when controlling for more specific career behaviors during university. Specifically, we expected:

Hypothesis 5: Higher career engagement while at university will predict higher (a) job satisfaction and (b) career satisfaction several months later while working, beyond the effects of career planning, self-exploration, environmental exploration, and networking while at university.

Participants and Procedure

The sample was recruited by inviting a cohort of students ($N = 896$) across all 16 majors (ranging from business administration to engineering to social work) of a medium-sized German university in their last semester of study, approximately one month before graduation, to participate in a study on career development (T1). Two reminder e-mails were sent, each one week apart, to potential participants who had not yet responded. The final participation rate was 48% ($n = 436$), and 317 respondents (72% of 436) provided consent and contact details for a follow-up survey. Six months later, all consenting participants were contacted again and invited to participate in the second survey (T2), resulting in a response rate of 44% and $N = 141$. Career engagement, career planning, self-exploration, environmental exploration, and networking were assessed at T1. Job and career satisfaction were assessed at T2. Post hoc tests showed no significant differences in career engagement or in the four specific career behaviors in the final longitudinal sample compared to the students who participated only at T1. The final sample was 70% female, age $M = 27.17$, and $SD = 4.23$. At T2, the

respondents were working in a range of areas, including business administration (20%), education (16%), marketing (9%), engineering (7%), and human resources (7%).

Measures

We measured *career engagement* (Cronbach's $\alpha = .87$ in the current sample), *career planning* ($\alpha = .86$), *self-exploration* ($\alpha = .84$), *environmental exploration* ($\alpha = .89$), *networking* ($\alpha = .79$), *job satisfaction* ($\alpha = .91$), and *career satisfaction* ($\alpha = .84$) with the same measures as described in Study 5.

Results and Discussion

To test our hypothesis, we conducted two hierarchical linear regression analyses. Job satisfaction was significantly predicted by the four specific measures, $R^2 = .15$, $F(4, 136) = 7.37$, $p < .001$, and career engagement explained an additional 3.7% of variance beyond the other four scales in the outcome measure, $\Delta F(1, 135) = 6.40$, $p = .013$. Similarly, career satisfaction was predicted by the specific career behaviors, $R^2 = .14$, $F(4, 136) = 5.54$, $p < .001$, but career engagement explained an additional 8.1% of variance beyond the other four scales in the outcome measure, $\Delta F(1, 135) = 14.00$, $p < .001$. In sum, the results confirm Hypothesis 5 and show the incremental predictive utility of the Career Engagement scale regarding job and career satisfaction in the transition from university to work beyond more specific career behaviors.

General Discussion

The goal of the present article was to introduce and evaluate a short measure of career engagement (i.e., the general degree to which someone is engaged in different career behaviors in order to proactively develop his or her career). In contrast to existing measures that aim at assessing career attitudes or specific career behaviors, we aimed at developing a measure that directly measures the general degree of exhibited career behaviors. The six studies with six unique samples containing university students, working professionals, and university graduates show that the herein presented Career Engagement scale reliably measures a self-reported, one-factorial, general degree of engagement in proactive career behaviors among men and women and among students and employees that is significantly related to, but not redundant with, measures of specific career behaviors. Establishing the same pattern of factorial structure as well as convergent and incremental validity among two samples at different career stages (i.e., students and working professionals) provides strong support for the construct validity of our new measure. Moreover, a particular strength of our study is that we could demonstrate that the measure is sensitive to detect changes in career engagement over time while assuring measurement invariance. This result indicates that the scale can rightfully be applied in longitudinal research investigating the development and change of career engagement over time. Finally, we could establish the incremental predictive validity of our measure in a crucial career transition by showing that career engagement while at university predicts higher job and career satisfaction while working several months later and that this effect is beyond the effects of several more specific career behaviors.

In addition to developing and evaluating a new scale for measuring engagement in career development activities, the above-presented studies assert several more general theoretical contributions to the literature on self-directed career management. First, by enhancing the literature that mostly focuses on career management among employees, we could show that proactive career engagement is already relevant for university students. We encourage more research that takes a developmental

perspective on careers and investigates how proactive career management emerges during university and affects later career development.

Second, our results further demonstrate that students are on average less engaged in self-directed career management than employed graduates already in the workforce and that the items of our scale are considerably more difficult for students. This finding indicates that, while self-directed career management is already relevant during a student's time at university, it significantly gains importance after graduation during the first years at work. Our results hence empirically support theories of new careers that emphasize the importance for self-directedness and self-management in the current career environment (Hall, 2002).

Third, expanding research that investigated career management only at a given point in time, our results show that the degree of engagement in proactive career management generally increases during the university years and that career engagement is not a stable disposition.

Fourth, our results show that career engagement is significantly related to career attitudes of identity and self-efficacy among students and to job and career satisfaction among employees. These results support theoretical accounts (Hall, 2002) that emphasize that agency and a clear sense of identity are pivotal to succeed in the current career environment that is increasingly characterized by uncertainty and change. Our studies advance current research by suggesting that such attitudes might have a positive effect on career development because they encourage exhibiting proactive career management behaviors. Moreover, our results support the notion that proactive engagement in developing one's career is pivotal to achieve (subjective) career success in the current career environment (Hall, 2002).

Finally, our studies advance the literature on the university-to-work transition and the career development of graduates. Going beyond extant research that mostly investigated career development of graduates after graduation (e.g., Abele & Spurk, 2009; Earl & Bright, 2007), our study shows that career engagement while still at university predicts subjective career success in the transition to work. This result advances the literature on the importance of proactive behaviors in the current work and career context (Thomas et al., 2010) by showing that proactive career engagement is also important in the university-to-work transition.

Limitations and Conclusion

One limitation of the presented studies is that they relied on two specific groups of respondents: university students and young professionals. Hence, it appears important to investigate the applicability of the present scale among other samples such as blue-collar workers or older employees. Also, our studies were conducted in Germany, and the applicability of the scale in other countries and languages remains to be established. Moreover, in contrast to the procedure generally applied in scale development, we did not generate and empirically evaluate a large item pool. This decision can be justified by the fact that we created items that closely resembled items of existing measures with established validity. However, this procedure does not allow to present evidence as of whether the best possible items to represent career engagement were chosen. Moreover, while we assessed the relation of our new measure to several existing scales in order to establish concurrent, discriminant, and predictive validity, subsequent studies should assess the relation of our measure to a range of additional constructs, such as a self-directed career management orientation or career aspirations. Similarly, the predictive utility of the scale regarding other important career outcomes, such as work engagement or promotions, needs to be addressed. Finally, while we have provided several arguments for the utility of a general measure, including parsimony and breadth of coverage, the usefulness of general versus specific measures is not uncontested (Spector, 2012), and arguments can be made for using more specific measures to avoid obscuring potential variability among the constituent components of the general constructs and increase predictive capability for specific outcomes.

Despite these limitations, the developed scale has manifold implications for future research and practice. First, the measure appears particularly useful for career research when investigating theory regarding causes and consequences of proactive career behaviors on a more general level without focusing on more specific career behaviors. Moreover, the scale can be used together with specific measures if one wants to assess the unique contribution of a specific career behavior (e.g., networking or exploration) beyond the more general degree of career engagement. Using our measure, future research can assess what personal and environmental factors promote career engagement and to what extent career engagement is related to objective and subjective career success. Finally, the scale also appears promising for human resources and career counseling practice to assess the general level of career engagement among employees and clients. Such an assessment could be used to assign employees and clients with low levels of career engagement to specific career development interventions such as career workshops encouraging career planning, exploration, and networking. Moreover, employees with high levels of career engagement could be identified, and human resources management should ensure that those people have ample career development opportunities within their organization if they want to retain such employees. Finally, the scale can be used to evaluate interventions that aim at increasing students' and employees' proactivity regarding career management to assure the effectiveness of interventions.

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