



Assessing Key Predictors of Career Success: Development and Validation of the Career Resources Questionnaire

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Abstract

Identifying predictors of career success is one of the most considered topics in career research and practice. However, the existing literature suggests a vast array of potential predictors that cannot be economically measured. This significantly limits research and practice. To address this issue, we have integrated theoretical and meta-analytic research to propose an integrative framework of career resources, including human capital, environmental, motivational, and career management behavior resources represented by 13 distinct factors. In a multi-step process, we have developed the Career Resources Questionnaire (CRQ) to assess these factors in workers and college students. In two studies encompassing 873 workers and 691 students, we have confirmed reliability and factor structure, convergent validity with existing scales, and criterion validity with indicators of subjective and objective career success. The developed measure can provide researchers and practitioners with a reliable, concise, and comprehensive measure to assess key predictors of career success.

Keywords: career success; career resources; measurement development; career management

Introduction

Vocational and organizational career research has a long-standing interest in identifying factors that allow people to achieve career success (e.g., Schein, 1978). Career success refers to both *objective success*, that can be externally verified and is usually assessed in terms of salary and promotions (e.g., Ng, Eby, Sorensen, & Feldman, 2005) as well as to *subjective success*, referring to the subjective evaluation about career progress according to one's own criteria (Ng & Feldman, 2014b). Apart from research, identifying factors that contribute to success is also of pivotal interest to career counselors and organizations as well as to individual workers and students. All these stakeholders share an interest in such factors in order to promote one's own career or those of clients and employees.

The large interest in this topic has resulted in a wealth of theoretical models, measures, and empirical studies that aim to identify the predictors of career success. In a recent meta-analysis, Ng and Feldman (2014a) considered as many as 64 potential correlates of objective career success in terms of salary. These authors confirmed a significant correlation with salary for 48 of the assessed factors, ranging from socio-demographic aspects such as gender to work environment factors such as unfavorable job conditions. Similarly, another meta-analysis considered 56 different factors as potential correlates of career satisfaction, finding significant correlations for 40 factors (Ng & Feldman, 2014b).

In addition to the hundreds of single studies that contributed to these meta-analytic findings, several attempts have been made to develop measures that assess specific components deemed critical to master career development tasks and achieve career success. These scales assess a range of factors pertaining to career competencies (e.g., Francis-Smythe, Haase, Thomas, & Steele, 2013), career adaptability (e.g., Rottinghaus, Buelow, Matyja, & Schneider, 2012; Savickas & Porfeli, 2012), employability (e.g., Fugate & Kinicki, 2008; Heijde & Van Der Heijden, 2006), career motivation (e.g., Day & Allen, 2004), or self-directed career management (e.g., Kossek, Roberts, Fisher, & Demarr, 1998a; Sturges, Conway, Guest, & Liefoghe, 2005). The current career literature thus offers vast array of sometimes unique and other times largely redundant concepts and variables as correlates and predictors of career success.

Given this state of affairs, we assert that, at this point, there is little value in adding new constructs and factors to the list. Instead, we see more value in trying to develop models and measures that aim to provide a more concise and integrative view on key predictors of career success. In an attempt to provide an integrative model of key factors for career success, Hirschi (2012) proposed the career resources framework. Integrating diverse theoretical models and empirical findings, the career resources model distinguishes four general types of career resources: (a) human capital resources which refer to knowledge, skills, abilities and other characteristics that are important to meet performance expectation for a given occupation; (b) social capital resources, referring to resources external to the individual in terms of developmental networks, mentors, and available social support; (c) psychological resources, that include different positive psychological traits and states; and (d) career identity resources which include the conscious awareness of oneself as a worker and the subjective meanings linked with the work role. These resources are in turn connected by behaviors of proactive career management (e.g., networking, positioning) that develop and

activate these resources. Building upon this model, we describe predictors of career success as *career resources*. In accordance with the general definition of resources by Halbesleben, Neveu, Paustian-Underdahl, and Westman (2014), we define a career resource as anything that helps an individual attain his or her career goals. If the most theoretically and empirically established career resources could be identified and reliably measured, this would provide a valuable source for researchers and practitioners who aim to assess individual differences in key predictors of career success.

To make a contribution in this direction, in this paper we integrate insights from different theoretical models and meta-analyses to identify a concise yet diverse and representative list of factors that are theoretically and empirically well-established as predictors of career success. Across four samples and two studies including workers and students, we developed and validated a new career resources questionnaire (CRQ) to assess these predictors. Study 1 reports the development, item selection, and validation of the factor structure of the new measure. Study 2 then confirms the factor structure with different samples and provides evidence for convergent and criterion-related validity.

Theory and Research Findings on Predictors of Career Success

Meta-Analytic Findings and General Theories

In the most recent meta-analysis on correlates of salary attainment, Ng and Feldman (2014a) theoretically categorized correlates of career success into socio-demographic (e.g., gender, having children), trait-related (e.g., cognitive ability, extraversion), motivational (e.g., ambition, job involvement), skill-related (e.g., education level, geographic relocations in the career), social environment (e.g., leader-member exchange quality, networking behavior), and work environment factors (e.g., career-related organizational support, job control). Their analyses confirmed that variables from all six categories significantly correlated with salary.

Similarly, in another meta-analysis, Ng and Feldman (2014b), examined correlates of subjective career success and theoretically categorized them into background-related (e.g., gender), trait-related, motivational, skill-related, social network, and organizational and job factors. The results showed that background-related and skill-related factors were generally not significantly related while aspects belonging to the trait-related, motivational, social network, and organizational and job categories showed significant correlations with career satisfaction.

While there are thus a large range of factors related to objective and subjective career success, past research frequently theoretically explained the attainment of career success by one or a combination of three theoretical perspectives: human capital, social capital, and motivational factors. Human capital theory (Sweetland, 1996) implies that career success depends on the level of education, knowledge, skills, and competencies of a person that allows him or her to obtain jobs and perform adequately in them. In contrast, social capital theory (Adler & Kwon, 2002; Kwon & Adler, 2014; Seibert, Kraimer, & Liden, 2001) posits that the goodwill available in social ties allows people to obtain jobs and competitive career outcomes, such as a high salary or a promotion. Finally, motivational theories of career success see the source of success in individual's own efforts to advance their career (London, 1983). In addition to these three perspectives, the

recent career literature has placed a strong emphasis on career self-management and the proactive role that individuals must take in order to develop their careers (Hall, 2002). In contrast to the related notion of motivational factors, self-directed career management focuses not on attitudes but on the proactive behaviors that individuals show in order to achieve their career goals and optimize their person-environment fit (Thomas, Whitman, & Viswesvaran, 2010).

Human Capital, Environment, Motivation, and Career Management Behaviors as Key Career Resources

In order to develop a comprehensive and concise measure of key factors for career success, we have based our conceptualization on the career resources framework (Hirschi, 2012). A focus on resources fits well with contemporary theorizing in the vocational literature regarding promoters of meaningful careers (Savickas & Porfeli, 2012), the organizational literature on the importance of resources for job performance and well-being (Halbesleben et al., 2014), as well as with current conceptualizations on predictors of career success specifically (Ng & Feldman, 2014a, 2014b).

For our purposes, we specifically wanted to focus on career resources that are malleable in principle and not on relatively fixed traits (e.g., cognitive ability, extraversion, proactive personality) or socio-demographics (e.g., gender, marital status). Even though such factors can also represent career resources according to the herein proposed definition, their assessment promises less actionable insights for test takers (e.g., employees, career counselors), and would thus limit the practical usefulness of the new questionnaire. We thus slightly adapted the model by Hirschi (2012) by combining the psychological resources domain with the career identity resources domain to represent *motivational career resources*. This was done because we were interested in developing a measure that assesses more specifically career-related psychological factors (e.g., career confidence) instead of more general personality states and traits (e.g., generalized self-efficacy, neuroticism, hope) as was the idea behind the psychological career resources dimension by Hirschi (2012). Moreover, combining these two types of career resources under a common frame can be justified by meta-analytic research that established a close connection between psychological resources, such as emotional stability, and identity resources, such as career decidedness (Brown & Rector, 2008). In addition, we conceptualized social resources more broadly than in the model by Hirschi (2012) as environmental resources, which encompass, but are not limited to, social resources. For example, we wanted to account for the fact that organizations and other institutions can also represent career resources. Thus, by integrating insights from diverse existing models and adapting the career resources model by Hirschi (2012), we have identified four key areas of predictors of career success to be assessed in our measure: (1) human capital resources, (2) environmental resources, (3) motivational resources, and (4) career management behaviors. Table 1 gives an overview of the general areas and specific factors included in our model, as well as their empirical and theoretical foundation.

Study 1: Scale Development

Phase 1: Item Development

After having identified the four broad areas (i.e., human capital career resources, environmental career resources, motivational career resources, and career management behaviors) that should be assessed in our new measure, we aimed to define specific constructs that would represent some of the most important factors of each domain. Several considerations guided the selection of these constructs. Each construct should (a) have a solid theoretical foundation in the career literature; (b) show strong content validity as a defining component of one of the four identified broad domains; (c) correspond to the herein used definition of a career resource and hence represent a means to attain career goals, meaning that it should have a strong theoretical foundation as an *antecedent* for career success – not be a mere correlate (e.g., job satisfaction, work engagement, organizational commitment, general job conditions); (d) be possible to develop and not represent a relatively fixed trait (e.g., self-esteem) or socio-demographic (e.g., marital status); (e) show significant and high correlations with objective and/or subjective career success outcomes according meta-analytic research whenever such data are available; and (f) avoid redundancies with other considered constructs in the final model.

In a first step, we reviewed existing meta-analyses on objective and subjective career success (Ng et al., 2005; Ng & Feldman, 2014a, 2014b) to identify factors that corresponded to the criteria listed above. In a next step, we reviewed theoretical models and measures for additional factors that were not considered in the meta-analyses but still fulfilled all of the remaining criteria. In cases where several closely related constructs were identified, we aimed to specify a construct that would best represent the common core of different constructs. For example, constructs such as job involvement, work centrality, or career motivation were subsumed under the construct of career involvement. A first list of constructs was derived according to these steps by the first author and subsequently discussed with the coauthors. Adaptations to this list were based on mutual consent, resulting in a final list of 13 constructs that corresponded to the criteria outlined above (Table 1).

For item development, we followed a recommended multi-step procedure to ensure high item content validity (Hinkin, 1998). First, we identified 46 existing scales, for example assessing employability (Fugate & Kinicki, 2008), job-related skills (Eby, Butts, & Lockwood, 2003), self-efficacy and agency (Rigotti, Schyns, & Mohr, 2008; Rottinghaus et al., 2012), career sponsorship (Ng et al., 2005), or networking (Ng, Feldman, & Lam, 2010), that assess the same or very closely related constructs as the 13 identified factors in the previous step (the complete list is available from the authors upon request). We then used an deductive item generation strategy (Hinkin, 1998) by either creating new items or adapting items from existing scales. Four of the authors developed four items per person for each of the 13 constructs/factors. Next, all generated items underwent an internal content validity review where each of the four authors evaluated each item on a scale from 1 (*does not fit at all to this factor*) to 5 (*excellent fit to this factor*) and provided comments for each item if necessary. We then evaluated the comments, mean scores, standard deviations, and minimum and maximum value from the ratings for each item. Items with the highest ratings per factor were chosen,

resulting in 9 to 13 items per factor to be evaluated in the next step. Some of these items were also rephrased based on the comments. In a third step, to further assess content and discriminant validity for each item, five post-graduate student assistants received random sets of four to five factors with their respective items. For each factor (e.g., career confidence) the respective definition was presented. In addition, all items of all the presented factors were shown in random order and the raters had to indicate for each item to which factor it belongs or assign it to a "none of the above" category. We then analyzed these responses and deleted four items from further consideration that were not assigned to the correct factor by at least four of the five raters. In addition, nine items were rephrased in order to make their fit with their respective factor clearer. This process resulted in a set of 133 items, between 7 and 12 per factor, to be evaluated in the next step.

Apart from a questionnaire to be used by working adults, we also wanted to create a questionnaire that can assess the same career resources among university students. We hence created a student version of each item. Most items needed no changes (e.g., "I have a good knowledge of the job market"; "I am capable of successfully managing my career"). For other items, we changed item components to fit for students. For example, "my organization" was changed to "my university/college" (e.g., "My university/college actively supports my career development") and "work" was changed to "my studies" (e.g., "My studies are the most important part of my life").

Phase 2: Item Selection

In order to empirically evaluate which items best describe each factor and select a parsimonious and efficient number of final items for each factor, we collected data from a worker as well as a university student sample.

Method

Sample and procedure. Participants were recruited through a US-American online-access research panel company with over 1,200,000 registered respondents. The respondents received an incentive for a successfully completed questionnaire. To ensure data quality, participants complete on average one questionnaire per month.

In the *worker sample*, recruited participants had to be aged between 18-65 years and employed in at least 50% of a fulltime position. We conducted extensive data quality checks concerning streamlining, carelessness, and speeding. Based on these checks, 13.5% of the participants were excluded, resulting in a final sample of $N = 436$, 37.2% men. Respondents were aged between 19 to 65 years ($M = 40.73$, $SD = 11.56$), came from a large variety of industry sectors and worked on average 40.23 ($SD = 6.06$) hours per week. Respondents' educational level was representative of the working population in the USA and ranged from vocational training (12.5%) to doctoral graduates (4.0%). The majority of participants had completed an undergraduate program as their highest education (43.1%), whereas 20.2% of the participants held a masters degree. The majority of participants were Caucasian (76.1%), 9.4% Hispanic, 6.7% African American, 5.9% Asian, and 1.9% indicated another race.

The *student sample* had to be enrolled at a university or a 4-year college. Based on data quality checks 13.3% of the participants were excluded, resulting in a final sample of $N = 288$, 16.7% men. Respondents were aged between 16 to 30 years ($M=22.30$, $SD=3.58$), from a broad variety of study fields. The majority of participants were completing their undergraduate degree (76%), and 52.3% were Caucasian, 17.9% African American, 11.6% Asian, 11.4% Hispanic, and 6.8% indicated another race.

Measures. The worker sample participants completed all 133 items. The student sample did not receive the eight organizational career opportunities items (125 items total) because we deemed this as not relevant for this population. All items were answered on a 5-point Likert scale ranging from 1 (*not true at all*) to 5 (*completely true*).

Results

Based on best-practice recommendations in scale development (Hinkin, 1998), we set an aim of four to six items per scale but were willing to considering as few as three items per scale if they would still sufficiently represent the content domain and show adequate reliability. For each factor, we conducted a single-factor confirmatory factor analyses (CFA) with the worker and the student sample and identified the six items per scale that showed the highest average factor loadings across the two samples. Three of the authors independently reviewed these items for content overlap and indicated which items were to be remained for the final version, considering factor loadings, construct representativeness, and avoiding content overlap among selected items. The three raters had a high inter-rater consistency across the 133 items with $ICC(2,3) = .75$. Together with a fourth author, the team then jointly decided which items to keep for the final version, resulting in 41 items in total for the worker group and 38 items for the student group, with 3 to 4 items per scale (see Table 2 for an overview).

Phase 3: Confirming the Factor Structure

To confirm dimensionality and structure of the selected items, we conducted confirmatory factor analyses (CFA) in the worker and student sample with maximum likelihood estimation with robust standard errors. We compared four structurally different models in each sample. The first model (M1) reflected the hypothesized structure of 13 (worker sample) and 12 (student sample) distinct factors that were allowed to freely correlate with each other. The second model (M2) reflected a hierarchical structure, with each of the 13, respectively 12, factors (e.g., career confidence) indicated by their respective items and each factor loading onto its appropriate higher order dimension (e.g., motivational career resource), with the four higher-order dimensions allowed to freely correlate. The third model (M3) tested a four-factor model with all items directly loading onto their respective higher-order domain (e.g., human capital resources; motivational career resources). The fourth model (M4) represented a one-factor model where all items loaded onto a single factor. Acceptable model fit is defined by the following criteria: above .90 for CFI and TLI (Kline, 2015) and an RMSEA value of .05 or less, with values less than .08 also considered as acceptable (Cheung & Rensvold, 2002; Vandenberg & Lance, 2000). For model comparisons, the scaled chi-square difference test was used.

In both samples, Model 1 was the best fitting model; workers $\chi^2(710) = 112.84, p < .001$, RMSEA = .037, CFI = .961, TLI = .955; students $\chi^2(599) = 891.38, p < .001$, RMSEA = .041, CFI = .954, TLI = .946. For workers, the model fit for Model 2, $\chi^2(760) = 1754.12, p < .001$, RMSEA = .055, CFI = .910; TLI = .902, Model 3, $\chi^2(773) = 3516.30, p < .001$, RMSEA = .090, CFI = .751, TLI = .735, and Model 4, $\chi^2(779) = 4459.89, p < .001$, RMSEA = .104, CFI = .665, TLI = .658, were worse than that of Model 1. All model comparisons in the worker sample showed Δ CFI greater than .002 and the $\Delta\chi^2$'s were significant (all $p < .001$), again favoring Model 1. Similarly, for students, Model 2, $\chi^2(647) = 1088.52, p < .001$, RMSEA = .049, CFI = .931, TLI = .925, Model 3, $\chi^2(659) = 1697.50, p < .001$, RMSEA = .074, CFI = .838, TLI = .827 and Model 4, $\chi^2(665) = 2352.99, p < .001$, RMSEA = .094, CFI = .736, TLI = .721, showed poorer model fit than Model 1. All model comparisons showed Δ CFI greater than .002 and all $\Delta\chi^2$'s were significant with $p < .001$.

These results support our hypothesized structure and favor the 13 factor (and 12 factor model) over other models. However, the hierarchical 4-factor Model 2 also showed acceptable fit. This suggests that in addition to 13, or 12 respectively, individual factors, the CRQ can also be used to represent four broader higher-order constructs of different career resources. Construct validity of the factors was further supported by high standardized factor loadings for each scale, ranging between .72 and .92 in the 13 factor model (worker sample), and between .70 and .91 in the 12 factor model (student sample). Reliability estimates for each factor in each sample were also high, ranging from .85 to .94 (Table 2).

Study 2: Confirming Factor Structure, Convergent, and Criterion Validity

The first aim of the second study was to confirm the factor structure and content validity (i.e., factor loadings with theoretically assigned factors) of the selected items in Study 1 with new samples of workers and students. We expected that the results from Study 1 would be replicated and that a model that postulates 13 and 12 different factors among workers and students, respectively, would fit the data well.

The second aim was to assess the convergent validity of the newly developed scale. As it was the goal of the CRQ to comprehensively and economically assess established predictors for career success, the CRQ factors should show high correlations with existing scales that measure closely related constructs. Some factors of the CRQ assess constructs that are very similar to those assessed by existing (and mostly longer) scales (i.e., occupational expertise, job market knowledge, career confidence, organizational support for development, available career opportunities, networking, and career exploration). Other CRQ factors assess constructs that are related to similar constructs assessed by existing scales. Specifically, the CRQ factor *soft skills* should show a significant correlation with occupational self-efficacy (Rigotti et al., 2008), CRQ-*career involvement* with job involvement (Kanungo, 1982) and work role commitment (Amatea, Cross, Clark, & Bobby, 1986), CRQ-*career clarity* with career planning (Gould, 1979), CRQ-*job challenges* with the job characteristic of skill variety (Morgeson & Humphrey, 2006), CRQ-*social support* with the job characteristic of social support at work (Morgeson & Humphrey, 2006), and CRQ-*learning* with job crafting in terms of enhancing structural resources at work (Tims, Bakker, & Derks, 2012). In sum, we expect:

Hypothesis 1: Among workers and students, the CRQ factors show moderate to high correlations with existing scales that assess closely related constructs.

The final goal of Study 2 was to establish criterion-related validity of the CRQ factors. Because the CRQ aims to assess key factors that predict career success, the CRQ factors should show significant correlations with the most commonly established indicators of subjective and objective career success. Specifically, we investigated the relationship of the CRQ factors with career satisfaction, representing the most commonly used indicator of subjective career success (Ng et al., 2005; Ng & Feldman, 2014b). In addition, we examined job satisfaction because subjective evaluation of one's current job is also frequently used to assess subjective career success (Ng & Feldman, 2014b). In addition, we included salary and promotions as two of the most established factors representing objective career success (Ng et al., 2005; Ng & Feldman, 2014a). Because these career success indicators are only useful to assess among workers, we evaluated criterion validity only among the worker sample. We expected:

Hypothesis 2: The CRQ factors show significant positive correlations with indicators of subjective (i.e., career satisfaction; job satisfaction) and objective (i.e., salary; promotions) career success.

Method

Sample and procedure

We recruited two new samples of participants with the same panel provider and procedure as outlined in Study 1. In the *worker sample*, we retained a final sample of $N = 437$, 34.2% men, based on data quality checks concerning streamlining, carelessness, and speeding 11.8% of the participants were excluded. The respondents were aged between 20 to 65 years ($M = 41.76$, $SD = 10.79$), came from a large variety of industry sectors and worked on average 39.92 ($SD = 5.26$) hours per week. Respondents' educational level was representative of the worker population in the USA and ranged from vocational training (8.4%) to doctoral graduates (4.3%). The majority of participants had completed an undergraduate program as their highest education (41.1%), whereas 19.6% of the participants held a masters degree. The majority of participants were Caucasian (75.8%), 13.5% Hispanic, 3.4% African American, 3.2% Asian, or indicated another race (4.1%).

In the *student sample*, we had a final sample of $N = 403$, 27.4% men, from a broad variety of study fields after excluding 15.5% of the participants based on quality checks. Age ranged between 16 and 30 years ($M=22.65$, $SD=3.57$). The majority of participants were completing their undergraduate degree (74.6%) and were of Caucasian ethnicity (59.4%), 14.0% of Hispanic, 11.2% of African American, 8.5% of Asian ethnicity and 6.9% indicated another race.

Measures

All measures were completed by the worker and the student samples, except of *job involvement* and *organizational career opportunities* that were only assessed among the worker sample while only the student sample completed the *work role salience* measure. The *career resource questionnaire* was administered with the 41 items in the worker sample and the 38 items in the student sample, as selected in

Study 1 and indicated in Table 2. Reliability estimates for all factors are presented in Table 2. All other measures are shown in Table 3. Mirroring the procedure used for developing the CRQ items, we adapted the items of existing scales for the student sample where necessary. For example, "work" was replaced with "studies" and "organization" with "college/university".

Results and Discussion

Confirmatory factor analysis

To reconfirm dimensionality and structure of the selected items in the new samples, we repeated the series of CFAs in the worker and student sample as described in Study 1. Replicating the findings from Study 1, in both samples Model 1, distinguishing 13 and 12 factors, respectively, was the best fitting model. However, as in Study 1, the hierarchical 4-factor model also showed acceptable fit (complete results are available from the authors upon request). Confirming the construct validity, standardized factor loadings ranged between .72 and .93 in the worker sample, and between .71 and .87 in the student sample. As seen in Table 2, all factors also showed high reliability, ranging from $\alpha = .80$ to $\alpha = .93$ in the worker sample and from $\alpha = .78$ to $\alpha = .90$ in the student sample. Overall, the results confirm the construct validity and proposed factor structure of the selected CRQ items. The bivariate correlations among the CRQ factors ranged between .42 (organizational career support and career exploration) and .83 (organizational career opportunities and organizational career support) in the worker sample and between .36 (job market knowledge and career involvement) and .77 (job market knowledge and career exploration) in the student sample (full correlation tables are available from the authors upon request).

Convergent validity

To assess convergent validity, the CRQ factors were correlated with existing scales measuring closely related constructs (Table 4; full correlation table is available from the authors upon request). All correlations were highly significant and moderate to high in size, supporting Hypothesis 2. As expected, some correlations (e.g., for job market knowledge, career opportunities, networking) were high ($r > .70$), indicating that some CRQ factors assess constructs that are close to those assessed in existing scales. Other correlations (e.g., skill variety, job crafting) were moderate to high ($r = .38$ to $.70$) confirming that some CRQ factors assess related constructs to existing scales. Overall, these results confirmed the convergent validity of the newly developed scales.

Criterion validity

To test criterion validity, we correlated all CRQ factors with the assessed career success variables (Table 5). All CRQ factors correlated significantly and positively with career satisfaction, job satisfaction, salary, and promotions. However, salary generally showed lower correlations with the CRQ factors. Multiple regression analyses showed that the 13 CRQ factors explained 55% variance in career satisfaction ($p < .001$), 55% ($p < .001$) in job satisfaction, 4% ($p < .001$) in salary, and 14% ($p < .001$) in promotions. These results

support the criterion-related validity of the CRQ as stated in Hypotheses 3 and suggest that the factors assessed in the CRQ are useful predictors of career success.

General Discussion

We set out to develop an integrative framework of key factors that promote career success, so called career resources. Based on this framework, we have developed the CRQ to assess the theoretically identified career resources among workers and college students. In two studies encompassing 873 workers and 691 students in four distinct samples, we have established and confirmed the factor structure of the instrument, as well as its convergent and criterion-related validity. As such, our paper makes several theoretical and empirical contributions to the literature and should provide an important source for future research and practice in career development.

The CRQ as a Comprehensive Framework of Predictors of Career Success

From a theoretical view, based on existing models and theories of career success, we have identified four main areas of key predictors for objective and subjective career success and specified 13 aspects within these four areas that are empirically and theoretically well established in the international career literature as predictors of career success, are not redundant, and do not represent relatively fixed traits or socio-demographics. This developed framework makes a theoretical contribution to the career literature because it synthesizes the vast literature on correlates and predictors of career success into a model that is both comprehensive and manageable.

Following best-practice guidelines in questionnaire development (Hinkin, 1998) and a multi-step procedure, we have developed and validated in parallel a version for workers as well as college students. By developing and validating two versions in parallel, we can avoid the pitfall that future studies use a questionnaire among students that was developed and validated only among workers without a proper evaluation process. Instead, future research and practice can rely on two versions of the same questionnaire that have been developed and validated specifically for different populations.

By building upon a theoretically derived model of key predictors of career success, the CRQ represents a comprehensive assessment of key career resources. Existing scales that assess constructs such as career adapt-ability (Savickas & Porfeli, 2012), employability (Fugate & Kinicki, 2008; Heijde & Van Der Heijden, 2006), or career competencies (Akkermans, Brenninkmeijer, Huibers, & Blonk, 2012; Francis-Smythe et al., 2013; Kuijpers & Scheerens, 2006) mostly focus on a limited range of attitudinal or behavioral constructs. In contrast, the CRQ covers a much broader area, encompassing human capital resources, environmental resources, motivational resources, and career management behaviors. This makes it to our knowledge the most comprehensive single assessment of key predictors of career success available.

An important advantage of the CRQ compared to existing measures is not only the relatively comprehensive coverage of key predictors of career success but also its shortness. By applying a rigorous scale development process, we were able to derive three to four items for each factor that reliably measure each construct. Our newly developed measure should thus be welcomed by researchers who are looking for

a short survey due to concerns about lower participation rates, increased inattentiveness and fatigue in responding, and higher attrition rates in longitudinal studies due to lengthy questionnaires.

The CRQ in Relation to Existing Measures and Career Success

Our results not only established the factor structure and reliability of the assessed factors but also their convergent validity. Study 2 showed moderate to high correlations between the CRQ factors with existing measures that assess related constructs. Although there were some differences in the magnitude of the correlations between the worker and the student sample, in several instances (i.e., job market knowledge, career opportunities, networking, career exploration) the correlations were above .7 in both groups. This indicates that some CRQ factors measure a highly similar construct when compared to existing scales. Because it was the goal of the CRQ to assess well-established factors for career success, and not some “new” predictors, such overlaps can be expected. It is, however, notable that the herein developed scales are much shorter than most existing scales without suffering in reliability or content validity. Hence, even if some CRQ factors assess a highly similar construct compared to existing scales, the shortness of the CRQ scales and the existence of validated worker and student versions make a useful contribution to the literature beyond existing measures.

The herein developed questionnaire also refined the assessment of key predictors of career success beyond existing scales, as indicated by more moderate correlations to some existing measures. For example, the CRQ factor of *career confidence* is only moderately related to the existing measure of career self-efficacy by Kossek et al. (1998a). A closer inspection of the content of the items reveals that the Kossek et al. scale contains items referring to learning on the job, advancement in the current company, or career self-reliance. In contrast, the herein developed career confidence scale taps more directly and specifically into the confidence to successfully managing one’s career. In other instances, we have developed scales for constructs which showed only modest overlap with existing measures of similar constructs, such as for possession of soft-skills that can be used in many jobs, job challenges that help to utilize and develop personal valued skills, or executed learning activities of work-related knowledge and skills.

To establish criterion validity, Study 2 showed that all CRQ-factors were significantly correlated with indicators of subjective (i.e., career satisfaction, job satisfaction) as well as objective career success (i.e., salary, promotions). These results support the view that the CRQ factors measure career resources that are important to attain career success. Notably, the CRQ factors were generally more strongly correlated with the indicators of subjective career success compared to objective success, particularly in terms of salary. This is in line with meta-analytic findings that motivational, social, and organizational/work environment factors generally show higher correlations with subjective career success than with salary (Ng & Feldman, 2014a, 2014b).

Limitations and Future Research

Although the selected 13 career resources factors are all well-established in the literature, no such model can claim to be exhaustive. Other factors not included in this framework might be considered for each

category (e.g., ability to adapt quickly to new environments or exhibiting influence behaviors). However, in order for a model to be practically useful, a selection of constructs needs to be made and all the factors included in our framework represent well-established key factors for career success, even if other factors might also be important.

An empirical limitation of the presented studies is that no long term predictive utility was established. For future evaluation of the measure it would be important to examine to what extent the assessed CRQ factors predict career success over time. This is especially true for the student population. Here, no criterion validity was established and future longitudinal research needs to investigate to what extent the CRQ factors among students predict career success after graduation. Also, the CRQ assesses human capital and environmental career resources only by self-report. Future studies could aim to establish to what extent such self-assessments are related to more objective indicators of these factors. Future research should also assess the incremental utility beyond existing measures that aim to assess facilitators for career development, for example employability (Fugate & Kinicki, 2008; Heijde & Van Der Heijden, 2006), career competencies (Akkermans et al., 2012; Francis-Smythe et al., 2013; Kuijpers & Scheerens, 2006), or career adaptability (Rottinghaus, Day, & Borgen, 2005; Savickas & Porfeli, 2012). Future studies could assess the specific strength and weaknesses of all these measures in their ability to predict different career outcomes.

Related to this point is the limitation that we did not assess to what extent the CRQ factors differ across diverse populations (e.g., according to gender, race/ethnicity, age, or education). It is possible that systematic differences in career resources among such groups exist. Moreover, it is possible that different career resources have different effects on career outcomes for different populations. For example, it might be that in smaller organizations career opportunities and organizational support might not be as important as in larger organizations; or that in highly knowledge intense occupations (e.g., lawyers, engineers) occupational expertise might be a more important factors than in more manual occupations (e.g., construction worker, cleaning staff). Future research could investigate the generalizability of the CRQ across different samples and employment contexts and increase the understanding of differential effects of career resources on career outcomes.

Finally, the results in Study 2 showed that some CRQ factors were highly correlated, specifically career clarity and career confidence, and organizational career opportunities and organizational career support in the worker sample. We argue that it makes sense to measure these constructs with separate scales because they are conceptually not identical. The CFA conducted among the four independent samples also confirmed the good fit of proposed model to the data. However, future research is needed to empirically establish to what extent different CRQ factors might have different predictors, correlates, and consequences, and might imply different approaches in career development practice to further establish the discriminant validity of the CRQ factors.

For future research, the herein developed questionnaire can be useful in several ways. First, it would now be interesting to examine how career resources can predict closely related constructs to career success, such as psychological well-being, work-family balance, or work stress would provide important insights into how career-related resources can affect a range of work and nonwork outcomes. A second important line of

inquiry would be to assess how the career resources develop over time and how they affect each other to form resource gain or loss spirals (Hobfoll, 1989). Related to this point is the question of timing of resources that deserves further attention: Is there a natural or preferable sequence regarding how career resources are developed? Do some career resources become more or less important at specific points in time, for example among younger employees when compared to older workers, or among employees with family obligations when compared to people without childcare or eldercare responsibilities? Moreover, the investigation of resource caravans would be instructive (Halbesleben et al., 2014), that is the patterns of how career resources typically occur in combination and what type of resource combination leads to which outcomes. Finally, intervention research that assesses by what means and to what extent different career resources can be systematically promoted and to what effect would be important.

Implications for Practice and Conclusions

The herein developed and validated CRQ could be a highly useful tool for career counseling, university career service, and human resources development practice in several ways. First, it can provide practitioners in these areas with an integrative framework of some of the most established key predictors of career success. The CRQ framework can thereby help practitioners making sense of the vast academic literature on career success because the framework shows in a comprehensive yet concise way what career resources are critical for career success based on the best available knowledge to date. Second, the CRQ can be used as an economic way to assess key areas of strength and weaknesses among clients regarding the availability of resources that can help people to achieve their career goals. Based on such an assessment, practitioners could more specifically target their interventions to specific career resources that seem most fruitful to capitalize on or are in need of more development. Third, the CRQ can be used in quality control and assessment of effectiveness of career interventions. If the CRQ is completed before and after an intervention, practitioners could then assess to what extent their intervention has been successful in increasing key career resources among their client(s), and which career resources are more or less affected by the intervention. Such insights could then be used to document the effectiveness of the intervention to important stakeholders (clients, organization, government agencies) as well as to improve the intervention. Finally, apart from the use by career professionals, the CRQ could also be a useful tool for self-assessment among workers and students. Based on the CRQ results, individuals could get a better understanding of their existing career resources that could be important for career planning and to promote active engagement in self-directed career management.

To conclude, we have developed a framework of critical career resources that integrates existing empirical and theoretical work on which factors help individuals achieve objective and subjective career success. Based on this framework we have developed and validated a concise measurement that can assess a range of important career resources among workers and students. We believe that the CRQ will be a useful tool for researchers interested in career development generally and predictors of career success more specifically. Moreover, we assume that the CRQ will be a useful instrument among practitioners in career counseling, university career service centers, and human resource managers to help client in their career

development as well as individuals for self-assessment in order to promote successful self-directed career management.

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Table 1**Overview of the Four Key Career Resource Dimensions and the 13 Specific Career Resources Assessed in the Career Resource Questionnaire**

Career resource	Definition	Main theoretical and empirical reasons for selection
<i>Human capital career resources</i>		
Occupational expertise	The degree of possessed occupation specific knowledge and competencies.	Part of models of employability (McQuaid & Lindsay, 2005) and career competencies (e.g., Eby et al., 2003).
Job market knowledge	The degree of possessed general knowledge about the job market and employment trends.	Part of models of employability (McQuaid & Lindsay, 2005) and career adaptability (Rottinghaus et al., 2012; Rottinghaus et al., 2005).
Soft skills	The degree of possessed skills and competencies that are relevant for a broad range of occupations.	Part of models of employability (McQuaid & Lindsay, 2005). Significantly related to employment (vs. unemployment) and wages in OECD countries (OECD, 2013).
<i>Environmental career resources</i>		
Career opportunities	The extent to which personally interesting career advancement opportunities exist within one's current organization.	Related to promotions (Ng et al., 2005), salary (Ng et al., 2005), career satisfaction (Ng et al., 2005; Ng & Feldman, 2014b) in meta-analyses.
Organizational career support	The extent to which one's current organization provides support for one's career development.	Related to salary (Ng et al., 2005; Ng & Feldman, 2014a), promotions (Ng et al., 2005), and career satisfaction (Ng et al., 2005; Ng & Feldman, 2014b) in meta-analyses.
Job challenge	The extent to which one's current job allows to utilize and develop personally valued skills.	Related to salary (Ng & Feldman, 2014a), and career satisfaction (Ng & Feldman, 2014b) in meta-analyses.

Social career support	The extent to which one receives career-related support from other people.	Part of models of career competencies (Eby et al., 2003). Related to salary (Ng & Feldman, 2014a), promotions (Ng et al., 2005), and career satisfaction (Ng & Feldman, 2014b) in meta-analyses.
Motivational career resources		
Career involvement	The degree of affective attachment to the working role.	Several specific forms of work commitment show significant correlations with salary and career satisfaction in meta-analyses (Brown, 1996; Cooper-Hakim & Viswesvaran, 2005; Lee, Carswell, & Allen, 2000; Ng & Feldman, 2014a, 2014b). Part of models of career adaptability (Savickas & Porfeli, 2012), career motivation (Day & Allen, 2004), and employability (Fugate, Kinicki, & Ashforth, 2004).
Career confidence	The believe that one is capable of successfully developing one's career.	Significantly related to salary in meta-analysis (Ng & Feldman, 2014a). Part of models of career adaptability (Rottinghaus et al., 2012; Savickas & Porfeli, 2012), employability (De Cuyper, Bernhard-Oettel, Berntson, De Witte, & Alarco, 2008), and career motivation (Day & Allen, 2004).
Career clarity	The clarity and self-determination of career goals.	Career planning is related to salary (Ng et al., 2005; Ng & Feldman, 2014a) and career satisfaction (Ng et al., 2005) in meta-analyses. Part of models of career adaptability (Rottinghaus et al., 2012; Savickas & Porfeli, 2012), employability (Fugate et al., 2004), career motivation (e.g., Day & Allen, 2004), and career competencies (e.g., Francis-Smythe et al., 2013).
Career management behaviors		
Networking	The extent to which social contacts are built, maintained, and utilized to promote one's career development.	Related to salary (Ng & Feldman, 2014a), and career satisfaction (Ng & Feldman, 2014b) in meta-analyses. Part of models of career competencies (e.g., Akkermans et al., 2012), and career self-management (e.g., Sturges et al., 2005).
Career exploration	The extent to which information about career options is collected.	Part of models of career adaptability (Savickas & Porfeli, 2012), career competencies (e.g., Akkermans et al., 2012), and career self-management (Noe, 1996).
Learning	The extent to which work relevant knowledge and skills are enlarged and updated.	Part of models of career motivation (Day & Allen, 2004), career competencies (Kuijpers & Scheerens, 2006), and career self-management (Noe, 1996). Participation in training and development activities is significantly related to salary (Ng & Feldman, 2014a) and career satisfaction (Ng & Feldman, 2014b) in meta-analysis.

Table 2**Final Items and Cronbach's Alpha Reliability Estimates for the CRQ Factors among Workers and Students in Study 1 and Study 2**

CRQ factor	Items (workers / students)	Cronbach's alpha - worker samples		Cronbach's alpha - student samples	
		Study 1 (N = 436)	Study 2 (N = 437)	Study 1 (N = 288)	Study 2 (N = 403)
Occupational expertise	1. Others see me as an expert in my occupation. / Others see me as an expert in my desired occupation.				
	2. I possess profound knowledge in my occupation. / I possess profound knowledge for my desired occupation.	.85	.80	.86	.80
	3. I have a very high level of expertise and skill in my occupation. / I have a very high level of expertise and skill for my desired occupation.				
Job market knowledge	1. I have a good knowledge of the job market. / (same)				
	2. I have a lot of knowledge about the current labor market. / (same)	.92	.91	.91	.90
	3. I have a good overview of employment trends in the labor market. / (same)				
Soft skills	1. I have many skills that I could use in a range of different occupations. / (same)				
	2. I possess many competencies that are also helpful in various other occupations. / (same)	.88	.83	.87	.82
	3. Besides pure expert knowledge, I possess many skills and competencies that are important in different jobs. / (same)				
Career opportunities	1. My organization offers interesting career opportunities for me. / -				
	2. My organization holds many interesting positions for my future career. / -	.94	.93	-	-
	3. My current employer offers interesting career advancement opportunities for me. / -				
Organizational career support	1. My organization actively supports my career development. / My university/college actively supports my career development.	.92	.91	.89	.88

	2. My current employer supports my intended career. / My current university/college supports my intended career.				
	3. I feel fully supported in my career development by my current employer. / I feel fully supported in my career development by my current university/college.				
Job challenge	1. My work allows me to fully utilize my professional skills. / My studies allow me to fully utilize my academic skills.				
	2. My current job fully challenges my skills. / My current studies fully challenge my skills.	.92	.84	.89	.78
	3. My work helps me to increase my skills. / My studies help me to increase my skills.				
Social career support	1. I know many people who support me in my career development. / (same)				
	2. My friends support me in my career development. / (same)				
	3. I receive a high level of career support from my social environment. / (same)	.88	.88	.88	.83
	4. My co-workers support me in my career development. / My fellow students support me in my career development.				
Career involvement	1. My work is a central part of my identity. / My studies are a central part of my identity.				
	2. Work is an essential part of my life. / My studies are an essential part of my life.	.90	.85	.90	.82
	3. I feel strongly attached to my work. / I feel strongly attached to my studies.				
Career confidence	1. I am capable of successfully managing my career. / (same)				
	2. When I set goals for my career, I am confident that I can achieve them. / (same)	.92	.86	.92	.88
	3. I believe that I can successfully manage career-related challenges. / (same)				
	4. I can successfully develop my career. / (same)				
Career clarity	1. I have a clear understanding of what I want to achieve in my career. / (same)				
	2. I have clear career goals that reflect my personal interests and values. / (same)	.92	.88	.93	.85
	3. I have clear career goals. / (same)				
Networking	1. I always try to be well connected in my professional field. / I always try to be well-connected in my aspired professional field.	.93	.88	.92	.84

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	2. I frequently build contacts with other people who are important for my career development. / (same)				
	3. I frequently utilize contacts with other people to advance in my career. / (same)				
Career exploration	1. I regularly collect information about career opportunities. (same)				
	2. I constantly stay up-to-date about employment opportunities in the labor market. / (same)	.92	.88	.93	.87
	3. I regularly stay up-to-date about possible job opportunities. / (same)				
Learning	1. I use every opportunity to expand my professional knowledge. / (same)				
	2. I continuously develop my work-related abilities. / (same)	.92	.85	.89	.81
	3. I make sure that my work-related abilities and knowledge are up-to-date. / (same)				

Table 3**Additional Measures used in Study 2**

Measure (citation)	Response format	No. items	Sample item	α	
				W	S
Occupational Expertise (Heijde & Van Der Heijden, 2006)	1 (<i>not at all</i>) to 6 (<i>extremely</i>)	6	"I consider myself competent to be of practical assistance to colleagues with questions about the approach to work"	.89	.89
Occupational awareness (CFI; Rottinghaus et al., 2012)	1 (<i>disagree strongly</i>) to 5 (<i>agree strongly</i>)	6	"I keep current with job market trends"	.85	.86
Occupational self-efficacy (Rigotti et al., 2008)	1 (<i>disagree strongly</i>) to 5 (<i>agree strongly</i>)	6	"Whatever comes my way in my job, I can usually handle it"	.90	.91
Job involvement (Kanungo, 1982)	1 (<i>disagree strongly</i>) to 6 (<i>agree strongly</i>)	10	"Most of my interests are centered around my job"	.89	/
Work role salience-commitment (Amatea et al., 1986)	1 (<i>strongly disagree</i>) to 5 (<i>strongly agree</i>)	5	"I expect to devote whatever time and energy it takes to move up in my career field"	/	.71
Career self-efficacy Kossek (Kossek, Roberts, Fisher, & Demarr, 1998b)	1 (<i>strongly disagree</i>) to 5 (<i>strongly agree</i>)	11	"When I make plans for my career, I am confident I can make them work"	.80	.85
Career planning (Gould, 1979)	1 (<i>not true at all</i>) to 5 (<i>completely true</i>)	6	"I have a strategy for achieving my career goals"	.72	.79
Career opportunities (Kraimer, Seibert, Wayne, Liden, & Bravo, 2011)	1 (<i>disagree strongly</i>) to 7 (<i>agree strongly</i>)	3	"There are career opportunities within my company that are attractive to me"	.95	/
Organizational support for development (Kraimer et al., 2011)	1 (<i>disagree strongly</i>) to 7 (<i>agree strongly</i>)	6	"My organization has programs and policies that help employees to reach higher managerial levels"	.97	.95
Skill variety (WDQ; Morgeson & Humphrey, 2006)	1 (<i>disagree strongly</i>) to 5 (<i>agree strongly</i>)	4	"My job requires a variety of skills"	.90	.88
Social support (WDQ; Morgeson & Humphrey, 2006)	1 (<i>disagree strongly</i>) to 5 (<i>agree strongly</i>)	6	"People I work with are friendly"	.87	.86

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Internal networking (Ng et al., 2010)	1 (<i>not true at all</i>) to 5 (<i>completely true</i>)	6	"I spend a lot of time and effort networking with others within my organization"	.95	.95
Career exploration (Hirschi, 2009)	1 (<i>rarely</i>) to 5 (<i>a great deal</i>)	10	"How often in the last three months have you informed yourself about career possibilities?"	.95	.92
Job crafting (Tims et al., 2012)	1 (<i>never</i>) to 5 (<i>often</i>)	5	"I try to develop my capabilities"	.87	.86
<i>Criterion variables (worker sample only)</i>					
Career satisfaction (Greenhaus, Parasuraman, & Wormley, 1990)	1 (<i>not true at all</i>) to 5 (<i>completely true</i>)	5	"I am satisfied with the success I have achieved in my career"	.96	-
Job satisfaction (Rafferty & Griffin, 2006)	1 (<i>strongly disagree</i>) to 7 (<i>strongly agree</i>)	3	"All in all I am satisfied with my work"	.92	-
Salary	1 (<500 dollars) to 21 (>10,000 dollars)		Salary measured as gross income in the last month	-	-
Promotions (Ng et al., 2005)	Free entry		Participants indicate how many times he or she had been promoted in his or her career	-	-

Note. α = Cronbach's Alpha, W = workers, S = students; to account for the skewed distribution of salary measures, the scale was log transformed for the analyses.

Table 4**Correlations of CRQ Factors with Similar Existing Measures (Study 2)**

CRQ Factor	Existing Measure	Correlation workers	Correlation students
Occupational expertise	Occupational expertise	.55	.62
Job market knowledge	Occupational awareness	.78	.76
Soft skills	Occupational self-efficacy	.54	.39
Career involvement	Job involvement / Work role salience ¹	.78	.46
Career confidence	Career self-efficacy	.38	.49
Career clarity	Career planning	.58	.71
Career opportunities	Career opportunities	.83	/
Organizational career support	Organizational support for development	.78	.69
Job challenges	Skill variety	.52	.53
Social career support	Social support	.60	.58
Networking	Networking	.78	.75
Career exploration	Career exploration	.73	.70
Learning	Job crafting	.67	.68

Note. $N(\text{workers}) = 437$; $N(\text{students}) = 403$;

¹ Job involvement was measured only in the worker and work role salience only in the students sample; all correlations are significant at level $p < .001$.

Table 5**Correlations of Career Success Indicators with CRQ Factors in the Worker Sample (Study 2)**

CRQ factors	Career satisfaction	Job satisfaction	Salary	Promotions
Occupational expertise	.48	.37	.17	.25
Job market knowledge	.51	.38	.20	.29
Soft skills	.45	.30	.11	.25
Career involvement	.50	.50	.15	.25
Career confidence	.65	.55	.15	.26
Career clarity	.57	.42	.15	.23
Career opportunities	.64	.62	.16	.36
Organizational career support	.67	.69	.17	.32
Job challenges	.64	.61	.14	.31
Social career support	.64	.57	.16	.30
Networking	.57	.48	.19	.30
Career exploration	.40	.23	.10	.20
Learning	.61	.50	.15	.26

Note. $N = 437$; $n(\text{salary}) = 425$, $n(\text{promotions}) = 423$ (not all participants provided answers on these measures); correlations from .10 to .13 are $p < .05$; correlations from .14 to .17 are $p < .01$; all other correlations: $p < .001$.