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Measuring Career Preparedness Among Adolescents: Development and Validation of the Career Resources Questionnaire – Adolescent Version

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Abstract

Adolescents need to develop career preparedness to successfully transition from school to work. Many factors represent career preparedness, which are difficult to measure comprehensively and economically. We used a career resources framework to assess key aspects of career preparedness among in-school adolescents, and adapted and validated the Career Resources Questionnaire. The questionnaire assesses 12 distinct aspects of career preparedness (i.e., occupational expertise, labor market knowledge, soft skills, career involvement, career confidence, career clarity, social support from school, family, and friends, networking, career exploration, and self-exploration). We demonstrate the reliability, factor structure, and validity evidences based on internal structure and relations with other variables of the new measure among two samples ($N_1=186$; $N_2=1,004$). In sum, the study indicates that the assessment can be used by researchers and practitioners to reliably and economically assess several key indicators of career preparedness.

Keywords: career preparedness; career resources; measurement development; school-to-work

Measuring Career Preparedness Among Adolescents: Development and Validation of the Career Resources Questionnaire – Adolescent Version

As adolescents enter the final years of school, they are confronted with the key developmental task of preparing for a career (Super et al., 1996; Vondracek & Porfeli, 2003). As such, the development of career preparedness becomes an important issue, which we herein refer to as the diverse attitudes, behaviors, and competencies (ABCs) that are needed to master vocational tasks, transitions, and challenges (Savickas, 2005). Research showed that career preparedness is related to satisfaction with a career choice (Amarnani et al., 2018; Kleiman et al., 2004), well-being (e.g., Kim et al., 2016; Konstam, et al., 2015; Tak & Lee, 2003), school performance (Perry et al., 2010), and adaptive outcomes, such as social adaptation and generalized self-efficacy (Skorikov, 2007). Investigating which factors successfully prepare adolescents for a career is not only relevant for adolescents themselves, but also for schools, parents, and career counselors. All of these parties have a shared interest in knowing which factors could help adolescents make a better transition from school to work, and who is more or less prepared for this transition.

Since the mid-20th century (e.g., Super, 1957) there has been increasing interest in the topic of career preparedness, which led to the development of numerous theoretical approaches and associated constructs (e.g., career maturity, Super et al., 1996; career readiness, Phillips & Blustein, 1994). We regard career preparedness as an umbrella term that encompasses a range of more distinct and related constructs (e.g., career maturity, career readiness, preparation, preparedness; Lent, 2013; Phillips & Blustein, 1994; Skorikov, 2007; Super et al., 1996). These specific constructs are tied together by the notion that they focus on improving adolescents' career decision-making and facilitating subsequent career adjustment (Lent, 2013; Savickas, 1997).

A multitude of measures (e.g., career maturity inventory-revised; Crites & Savickas, 1996) have been developed to assess factors of career preparedness among adolescents. However, existing career preparedness measures typically assess few specific dimensions of career preparedness (e.g., career planning attitudes, knowledge of career decision-making), and omit other relevant facets (e.g., social support, Hirschi et al., 2011; Perry et al., 2010). To comprehensively assess the diverse facets of career preparedness, many different measurement scales would be needed, which imposes practical challenges for researchers, study participants, and career assessment practice on the whole. As such, most research on career preparedness tends to investigate only specific aspects of career preparedness while ignoring other relevant dimensions. This is problematic because it leads to a piecemeal assessment approach, and imposes a limit on comprehensively understanding career preparedness among adolescents.

To address this issue, the aim of the current paper is to develop and evaluate a new measurement instrument that assesses a more comprehensive range of key aspects of career preparedness, the Career Resources Questionnaire for Adolescents (CRQ-A). In a series of steps we (1) conceptually adapt the existing career resources questionnaire for adult workers (English version: Hirschi et al., 2018; German version: Hirschi et al., 2019) to be used with adolescents in school; (2) develop new items and report content-oriented evidence of the items; (3) select items based on data from a sample of adolescents; (4) confirm the internal factor structure with a new sample of adolescents; and (5) report validity evidence based on relations with other constructs and measures. Our research contributes to a better conceptual understanding of which key factors can represent career preparedness among adolescents and provides a set of validated items that can be used in future research and career counseling assessment practice to reliably and economically assess several key indicators of career preparedness.

Measuring Career Preparedness in Adolescents

As previously alluded to, research on career preparedness in adolescents has brought forth various measures that assess a wide range of factors. To begin, career maturity (Super, 1955, 1990) is often measured by assessing the competencies and attitudes needed for a transition from school to work (Crites, 1978; Crites & Savickas, 1996; Super et al., 1981). Competencies refer to knowledge of decision making, of the world of work, and of the preferred occupational group. Career maturity attitudes most commonly encompass planning and exploration. The related construct of career readiness (Peterson et al., 2002; Phillips & Blustein, 1994) is often assessed by career maturity measures. However, some researchers tend to assess the absence of readiness by measuring indecision or career decision-making difficulties, to indicate career readiness (Gati et al., 1996).

Another construct and measurement that has received considerable attention is career adaptability (Savickas, 1997; Super & Knasel, 1981), most commonly assessed as career adaptability resources (Savickas & Porfeli, 2012) and career adaptability responses (Rudolph et al., 2017). Career adaptability resources describe “an individual’s readiness and resources for coping with current and imminent vocational development tasks, occupational transitions, and personal traumas” (Savickas, 2005, p.51), which commonly encompass curiosity, concern, control, and confidence (Savickas & Porfeli, 2012). These resources subsequently impact the resulting career adaptability responses, which describe “actual behaviors that address changing career conditions and making occupational choices” (Savickas et al., 2018, p.139). Career adaptability responses can be assessed by determining whether individuals have engaged in the activities of planning, exploring, deciding, and implementing a vocational choice (Savickas et al., 2018).

Additional constructs include career preparation (Hartung et al., 2005; Skorikov, 2007) and career preparedness (Lent, 2013). Here, researchers use various measures which can relate to

adolescents' attitudes (e.g., decidedness, Osipow, 1987; Osipow et al., 1976), behaviors (e.g., planning, Skorikov, 2007), or knowledge and competencies (e.g., knowledge about specific jobs, Walker et al., 2010).

This brief summary makes clear that researchers can draw on a breadth of measures that assess various aspects of career preparedness, which gives little incentive to adding more factors to the list. However, this multitude of measures indicates four issues: (1) many existing constructs overlap, which creates conceptual confusion within the field of career preparedness; (2) many constructs can be assessed with a variety of measures, which indicates a lack of consensus regarding how constructs should be operationalized; (3) many measures only assess very targeted dimensions of career preparedness (e.g., only attitudes) and omit other relevant facets (e.g., behaviors); and (4) no single measure captures a sufficiently broad set of career preparedness that tap into attitudes, competencies, behaviors, and contextual supports. As a result many measures would be needed in practice to assess a broad range of aspects of career preparedness, which can be a nuisance to both researchers, study participants, or counseling clients.

Career Resources as Indicators of Career Preparedness

Due to changes in the world of work, individuals need to take increasingly control of their own career development. This affects all ages, including adolescents who need to choose a career (Savickas, 2012). As a consequence, individuals need to develop, maintain, and apply different resources to promote their career development in an active and adaptable way throughout the life course by engaging in different proactive career behaviors (e.g., learning, networking; Hall, 2001). Resources can be broadly understood as all factors which help individuals attain or preserve valued states or goals (Hobfoll, 1989).

Based on the career resources model of (Hirschi, 2012) and an extensive literature review, Hirschi, Nagy, Baumeler, Johnston, and Spurk (2018) identified four categories of resources relevant for successful career development: (1) knowledge and skills resources, which comprise occupational expertise, job market knowledge, and soft skills; (2) environmental career resources, which encompass external supports, such as network, mentors, and available social support; (3) motivational career resources, which include involvement, confidence, and clarity about one's career; and (4) career management activities, which comprise behaviors such as networking, career information gathering, and continuous learning. All of these resources can be actively developed, and are closely related to subjective and objective career success among employees (Hirschi et al., 2019; Hirschi, et al., 2018). To assess these resources and behaviors, Hirschi et al. (2018; 2019) developed and validated the Career Resources Questionnaire (CRQ) among US and German employees and university students. The CRQ framework and respective measurement were originally developed for adults in reference to attaining objective and subjective career success. However, we argue that the career resources framework is also relevant for conceptualizing and integrating key aspects of career preparedness among adolescents. Career preparedness needs to be actively developed throughout adolescence, and therefore a resource perspective may be an appropriate integrative approach.

Indeed, all four types of resources identified in the career resources framework have been investigated and used in research on career preparedness for adolescents in some form. Knowledge and skills resources, such as knowledge of the world of work (e.g., Creed et al., 2002; Jawarneh, 2016; Savickas et al., 2002), are commonly assessed in many career maturity measures, such as the career development inventory (CDI; Super et al., 1981) and the career factors inventory (CFI; Chartrand et al., 1990). There is also a substantial amount of research that has investigated the role of environmental resources, such as social, parental, and school support

(e.g., Amarnani et al., 2018; Hirschi et al., 2011) in adolescents. Next, motivational resources, such as career decision-making, self-efficacy (e.g., Koivisto et al., 2011; Punch et al., 2005), attitudes toward planning (e.g., Creed et al., 2002; Hirschi et al., 2011) and exploration (e.g., Rogers et al., 2008; Savickas et al., 2002), or confidence in mastering work challenges (Hirschi & Herrmann, 2013; Jaensch et al., 2016), have been a focus of career preparedness research. Indeed, measures based on constructs of career maturity, career readiness, or career adaptability all share a strong focus on assessing motivational facets of career preparedness. Lastly, research has further found that career management behaviors, such as actively seeking advice from advisors and faculty (St Clair et al., 2017), actively exploring careers and professional options (Rogers et al., 2008; Wong et al., 2016), or self-exploration (Hirschi et al., 2015; Li et al., 2015), are important aspects of career preparedness.

To summarize, the dimensions represented in the career resources model and assessed in the CRQ in terms of knowledge and skills resources, environmental resources, motivational resources, and career management behaviors are all well-established as pivotal aspects in career preparedness research. The career resources framework and CRQ could therefore be a useful basis to comprehensively yet economically measuring some of the most important aspects of career preparedness in adolescents. Hence, by drawing on a the CRQ resources framework, we adopted the career resources questionnaire (CRQ; Hirschi et al., 2019; Hirschi et al., 2018) for an adolescent population to integratively assesses key aspects of career preparedness in an economic and reliable way.

Study 1: Item Development and Selection

The Present Study Context

We conducted our studies in Switzerland, where adolescents after finishing compulsory school at the end of ninth grade (at around age of 16), continue to either pursue vocational

education and training (VET), or general high school, which prepares for later university studies. In 2017, 62.9% of all adolescents completed vocational educational training (SERI, 2018), where they were training for a specific vocation (e.g., car mechanic). The remaining 37.1% of adolescents received a high school diploma, which grants them access to higher education (e.g., university). Starting from ninth grade, students need to apply for a desired apprenticeship positions with companies, which means that starting from eighth grade, adolescents need to actively engage in career preparation. The Swiss context thus makes career preparedness a pivotal concern for most adolescents, which presents an optimal setting for our studies.

Step 1: Conceptual Adaptation of CRQ Subdimensions

Based on the career preparedness literature, we adapted several subdimensions of the original CRQ (Hirschi et al., 2019; Hirschi et al., 2018) to make them more meaningful for adolescents who are still in school. For the knowledge and skills resource, we changed “job market knowledge” to “labor market knowledge” because this is more relevant in our context. The biggest change occurred with the subdimensions assessing environment resources because the original CRQ assesses organization support and job challenge, which are not relevant for adolescents who are still in school. Instead, we focused on the existing CRQ factor of social support because research broadly supports its relevance for adolescent career preparedness (e.g., Hirschi et al., 2011; Rogers et al., 2008). To assess social support more comprehensively, we differentiated between support from peers, parents, and the school because these groups have been shown to be the main sources of social support during adolescence (Camara et al., 2017). In the course of adolescence, relations with peers become a more central source of social support, and perceived support from parents either remains constant or decreases (Smetana et al., 2006). Furthermore, the social context (i.e., school) in which the students are embedded plays a critical role in supporting for positive development (Bokhorst et al., 2010). Research has demonstrated

that in this context, not only the teacher but also classmates, supportive classrooms, or counselors can be important (e.g., Cipriano et al., 2019).

Lastly, we also made a change in the CRQ factors assessing career management behaviors. Specifically, we changed “continuous work-related learning” to “self-exploration” because work-related learning is not relevant for our target population. Conversely, self-exploration is broadly recognized as an important element of career preparedness, for example, as the self-exploration component of career exploration (Blustein et al., 1989; Kracke, 1997; Stumpf et al., 1983). Furthermore, it is commonly established in different career decision-making models as a key behavior to make good career decisions (e.g., Gati et al., 1995; Peterson et al., 1996) and is also stressed in career development theories (e.g., the exploration phase of career maturity; Super et al., 1996). We thus argue that to make well-informed career choices, self- and occupational exploration is needed (Savickas, 2002). Table 1 summarizes the four general dimensions of career preparedness that we aimed to assess in the new CRQ-A, as well as the 12 specific subdimensions within these dimensions.

Step 2: Item Development and Content-Oriented Evidence Evaluation

For the creation of the item pool, we followed the recommended multi-step procedure to ensure high item content-oriented validity (Hinkin, 1998). We used a deductive item generation strategy (Hinkin, 1998) by either creating new items or adapting the existing items for employees and students from the original CRQ questionnaire (Hirschi et al., 2019; Hirschi et al., 2018). Two authors independently generated six to eight items for each of the twelve dimensions¹. Second, both authors then discussed which of the items should be included in a preliminary item pool by evaluating item overlap, as well as content-oriented evidence. The resulting item pool consisted

¹ The authors made sure that items related to VET can easily be changed to more general statements about the world of work, in case the questionnaire would be used in a different setting.

of 78 items. Third, these items were given to two career counselors who had a master's degree in psychology and were currently working in career counselling with adolescents. The counselors independently evaluated each item on its content-oriented validity and readability. After incorporating the feedback of the career counselors, the research team rephrased some items, but no item was deleted, resulting in a preliminary item pool of 78 items for the CRQ-A.

Step 3: Item Selection

To empirically evaluate which items best describe each factor of the CRQ-A, and to select an economical yet parsimonious number of final items for each factor, we conducted a data collection with adolescents currently in school.

Method

Participants and Procedure. We recruited a sample of students (subsequently: Sample 1) through teachers who administered an online questionnaire during regular class hours, with a final sample of $N = 186$ (47.3% female) students, mean age of 14.9 years ($SD = .54$).

Measures. Students completed the derived 78-items on a 5-point Likert-type scale, ranging from 1 (*not true at all*) to 5 (*completely true*).

Results and Discussion

Item Selection and Confirmatory Factor Analysis. For the item selection we conducted single-factor factor analyses (CFA) with diagonally weighted least squares (DWLS) to account for the ordered categorical data. For the analysis we used the statistics program R version 3.6.2 (R Core Team, 2019) and conducted confirmatory factor analyses with the package lavaan version 0.6-5 (Rosseel, 2012). To select the best fitting items, the authors investigated the standardized factor loadings, as well as the item contents. The goal was to establish three items per subdimension, to capture enough information per subdimension, and to keep the questionnaire economical. We attentively selected a set of items for each subdimension that

provided good construct coverage, as well selecting items with high standardized factor loadings. To ensure good construct coverage, we excluded items with content overlap, even if they may have offered higher standardized loadings. Instead, we decided to select items that provided high construct representativeness while still considering the standardized factor loadings. This process resulted in three items per factor (36 items total, see Table 4).

Study 2: Confirming the Factor Structure and Further Validity Evidences

As the factor structure of the original CRQ has been established across different target groups (Hirschi et al., 2019; Hirschi et al., 2018), we elected to confirm the factor structure of the new measure with confirmatory factor analysis (CFA). CFA is an appropriate approach when aiming to validate a theoretically presumed factorial structure, as is the case here, where we expect two different models. Firstly, we expect that the previously selected 36 items represent 12 distinct subdimensions. Secondly and leaning on the career resources model (Hirschi, 2012; Hirschi, et al., 2018), we expected that these 12 distinct subdimensions represent four higher-order dimensions, namely (1) knowledge and skills, (2) motivation, (3) environment, and (4) activities. However, the three subdimensions that comprise each higher order dimension are not interchangeable, and therefore a CFA testing only these four higher order factors should not provide acceptable fit. Lastly, we included a CFA testing whether all 36 items can represent one single factor. Here, our goal was to demonstrate that the CRQ-A is not a one-dimensional indicator of career preparedness.

In the last step, we aimed to provide construct-validity evidence of the new questionnaire in terms of relations with other constructs and measures. We expected that the CRQ-A should show moderate to high, and positive correlations with existing scales that measure closely related constructs. Specifically, the knowledge and skills dimensions that measure perceived career-related knowledge, skills, and abilities should show strong positive associations with

occupational self-efficacy (Rigotti et al., 2008). For the motivational dimensions of career involvement, confidence, and clarity, we predicted moderate to high positive correlations with measures of work role importance (Amatea et al., 1986), career decision-making self-efficacy (Lent et al., 2016), and vocational identity (Holland et al., 1980), respectively. We expected the environmental dimensions perceived school, family, and friends' support to correlate moderately and positively with general perceived social support (Hirschi & Freund, 2014). Finally, the assessed career management behaviors of networking, career exploration, and self-exploration should strongly and positively correlate with other measures that assess the same career exploration behaviors (Hirschi, 2009).

Method

Participants and Procedure

To confirm the factors structure we recruited participants through teachers in German-speaking schools in Switzerland, and questionnaire were administered online during regular class hours with a sample of $N = 1,068$. After performing data quality checks, we removed 6% of the participants from the sample because they showed clear signs of careless responding (e.g., flatliners, speeders), resulting in a final sample (hereafter: Sample 2) of $N = 1004$ students (50.1% female), mean age 13.57 years ($SD = .63$). We subsequently refer to this sample as Sample 2.

To examine the validity of the new scale in relation to other constructs, we used the same Sample 1 as in Step 3.

Measures

Means, standard deviations, and reliability coefficients for all subsequent measures are reported in the Appendix.

CRQ-A. We used the newly derived 36-item CRQ-A with a 5-point Likert scale ranging from 1 (*not true at all*) to 5 (*completely true*).

Vocational Identity. We used the German-language version of the vocational identity scale (Holland et al., 1980; Jörin et al., 2003). The scale consists of seven inversely coded items (e.g., “I’m not sure yet which occupations I could perform successfully”), which are scored on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Social Support. To measure the degree of perceived social support, we used the German Social Support scale developed by (Hirschi & Freund, 2014), which is based on the University of California, Los Angeles, Social Support Inventory (Schwarzer et al., 1994). The scale consists of four items, where participants could indicate their answer on a five-point Likert scale ranging from 1 (*never*) to 5 (*very often*) pertaining to how often people provided emotional (showing understanding, listening, encouragement), informational, and tangible support.

Occupational Self-Efficacy. We used the short version of the German-language occupational self-efficacy scale developed by Rigotti, Schyns, and Mohr (2008). The scale consists of six items (e.g., “Whatever comes my way in my job, I can usually handle it”) and participants could indicate their answer on a six-point Likert scale ranging from 1 (*not at all true*) to 5 (*completely true*).

Career Decision Self-Efficacy. To assess career decision self-efficacy, we used the Brief Decisional Self-Efficacy Factor (CEDSE-BD) developed by Lent and colleagues (2016). The original items were independently translated into a German version by two psychologists. Discrepancies between the translations were discussed and a preliminary common translation was derived. This translation was then reviewed by one of the authors and a final translation was established. The scale consists of eight items (e.g., “figure out which career options could provide a good fit for your personality”), in which respondents indicate their confidence on a ten-point Likert scale ranging from 1 (*no confidence*) to 10 (*absolute confidence*).

Career Exploration. Career exploration was assessed by using the German version of Career Exploration Scale developed in German by Hirschi (2009). Six items measure environmental exploration (e.g., “gathering information about interesting career paths”), and four items measure self-exploration behaviors (e.g., “reflection about personal interests”). Participants could indicate their answer on a five-point likert scale ranging from 1 (*few*) to 5 (*a lot*).

Work role importance. We assessed work role importance with the five item occupation role reward value scale from the Life Role Salience Scale by Amatea, Cross, Clark, and Bobby (1986). The original items were translated with the same process as described above for the career decision self-efficacy scale. Respondents indicated their answer to the items (e.g., “I value being involved in a career and expect to devote the time and effort needed to develop it.”) on a five-point Likert scale ranging from 1 (*disagree*) to 5 (*agree*).

Results and Discussion

Confirmation of Factor Structure

To confirm the factor structure of the CRQ-A, we conducted confirmatory factor analyses with diagonally weighted least squares (DWLS). With the selected 36 items, we ran CFAs to assess four distinct models. The first model (M1) reflected the twelve hypothesized subdimensions of the CRQ-A, where each item loaded on the respective subdimension that were allowed to freely correlate. The second model (M2) represented a hierarchical structure, where each of the twelve subdimensions loaded onto its appropriate higher order dimension, with the four higher order dimensions allowed to freely correlate. The third model (M3) represented a four-factor model, with all items loading onto their respective higher order dimensions. The fourth model (M4) reflected a one-factor model, where all items loaded on one factor. The literature (Hooper et al., 2008) has defined an acceptable model fit as: above .95 for comparative fit index (CFI), less than .05 for well-fitting models for the standardized root mean square

residual (SRMR) but .08 has been also been deemed acceptable (Hu & Bentler, 1999), and a root-mean-square error of approximation (RMSEA) value of .05 or less, with values less than .08 also considered as acceptable (Cheung & Rensvold, 2002; Vandenberg & Lance, 2000). The first model (M1) and the second model (M2) had demonstrated acceptable fit criteria (see Table 3). The four higher order dimensions (M3) by themselves do not show an acceptable fit. The fourth model (M4) also showed no acceptable fit, which indicates that the CRQ-A is not a one-dimensional indicator of career preparedness. Lastly the results showed evidence of internal structure by high, averaged standardized factor loadings of 0.77 for each scale, ranging between .49 and .89 (see Table 4). In sum, these results show that the CRQ-A measures 12 distinct, but related factors. These factors can be combined to represent four broader higher-order dimensions of career preparedness as postulated by the career resources model (Hirschi, 2012; Hirschi, et al., 2018).

Evidence Based on Relations to Other Variables

We correlated the CRQ-A subdimensions with the theoretically expected closely-related scales. Almost all of the correlations were positively significant, and small to large in size (Table 2). In the Appendix we report the full correlation table for all constructs assessed as latent factors, together with Cronbach's alpha and McDonald's omega estimates.

We found the CRQ-A subdimensions of occupational expertise and soft skills to strongly, positively and significantly correlate with occupational self-efficacy. The motivational CRQ-A factors were all significantly, positively, and strongly correlated with their respective closely related construct. Environmental CRQ-A factors significantly, positively and moderately correlated with the social support scale. The CRQ-A career management scales showed significant and positive correlations with the environmental and self-career exploration. In sum,

the results provide construct-validity evidence by confirming significant relations with related existing measures.

General Discussion

We set out to validate an adaptation of the CRQ for adolescents, to comprehensively and economically assess different indicators of career preparedness. We successfully identified 36 items for 12 distinct subdimensions (i.e., occupational expertise, labor market knowledge, soft skills, career involvement, career confidence, career clarity, social support from school, family, and friends, networking, career exploration, and self-exploration) and confirmed the factor structure of the CRQ-A. We established that both a model with 12 distinct subdimensions and a second-order model, where 12 distinct subdimensions represent four higher order dimensions, provide good fit criteria. Finally, we demonstrated the relations of each subdimension to existing scales that measure closely related constructs.

The results enrich the career preparedness literature by confirming four main dimensions of career preparedness in adolescents, namely knowledge and skills, motivation, environmental support, and career management behaviors. Within these four main areas, we confirmed 12 distinct and reliable subdimensions. Therefore, the CRQ-A makes a theoretical contribution to the career preparedness literature because it organizes prominent indicators of career preparedness into a model that is meaningful, comprehensive, and economical. As such, the CRQ-A provides a relatively comprehensive perspective on career preparedness in adolescents. The CRQ-A should thus be a useful framework and measurement in career research and practice.

Limitations and Future Research

There are several limitations of the paper that need be addressed, as well as suggestions for future research. First, although we present a comprehensive model of 12 subdimensions of career preparedness which have been well-established in the literature, we cannot claim that the

CRQ-A is an exhaustive measure. Other factors might be considered to also be important indicators of career preparedness (e.g., willingness to compromise, Gati et al., 2010; career locus of control, Millar & Shevlin, 2007). Yet, for the CRQ-A to be practically useful, we necessarily needed to restrict the selection of assessed dimensions. Research could thus combine the CRQ-A with other measures that capture additional components of career preparedness. Second, we noticed somewhat lower scale score reliabilities for the *career involvement* subdimension (see Table 1). However, as the subdimension exhibited good construct validity evidence with positive moderate to strong correlations with many other relevant constructs (see Appendix), we decided to keep the subdimension. Third, we were not able to assess the evidence of the relation of test scores of the CRQ-A to a relevant criterion. Theoretical outcomes of career preparedness can be a successful transition from school to work, subsequent job satisfaction, high job performance, and lower turnover intentions (Savickas, 1997; Savickas & Porfeli, 2012). Therefore, to determine test-criterion relationships, a longitudinal investigation is needed to assess whether the CRQ-A is able to predict criterion-related outcomes once adolescents have transitioned from school to work. Here, it would be further noteworthy to inspect whether certain CRQ-A subdimensions (e.g., career involvement) are particularly good predictors of certain outcomes (e.g., turnover intentions). Fourth, the CRQ-A is purely based on self-evaluations, and it might be possible that adolescents are either over- or underestimating their own career preparedness. As such, it would be interesting to compare self-rated CRQ-A assessments with expert opinions from career counselors or school teachers. Finally, the CRQ-A was developed and assessed in the Swiss context. In a different cultural context, adolescents might develop certain subdimensions of career preparedness at different rates, or might show different profiles of career preparedness. Therefore, future research should investigate how career preparedness in adolescents develops within different cultural and socioeconomic contexts.

Practical Implications and Conclusions

The findings of the conducted studies have several practical implications. First, the CRQ-A provides practitioners with a simple, comprehensive, and understandable framework for career preparedness in adolescents that can inform their various career development interventions. Moreover, the CRQ-A may be used in career counseling as a screening instrument to diagnose career preparedness in adolescents quickly and reliably regarding the strengths and weaknesses of a single adolescent or groups (e.g., classes). Using this knowledge, practitioners could specifically tailor interventions to the identified career development needs. Second, the CRQ-A could be used to evaluate career preparedness interventions' effectiveness with pre- and post-intervention tests.

In sum, this paper reported the development and validation of a new measurement scale to comprehensively, reliably, and economically assess a range of pivotal factors of adolescent career preparedness, according to an integrative theoretical framework. We also provided substantive theoretical insights into the nature of career preparedness by showing that conceptually very different facets of career preparedness seem to typically co-occur among adolescents, and that personality resources predict such preparedness profiles. We thus hope that this paper provides a useful reference for adolescent career development research more generally, and career assessment practice more specifically.

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Table 1

Dimensions and Subdimensions of the CRQ-A; Including Cronbach's Alpha and McDonald's Omega per Subdimension for Samples 1 and 2

General career preparedness dimension	Subdimension	Description	α and ω –	α and ω –
			Sample 1	Sample 2
Knowledge and skills	Occupational expertise	Perceived occupational-specific knowledge and abilities.	.79/.79	.76/.76
	Labor market knowledge	Perceived general knowledge about the VET market and its development.	.84/.84	.87/.88
	Soft skills	Perceived abilities and competencies that are applicable to range of occupations.	.79/.79	.82/.82
Motivation	Career involvement	Emotional attachment to and identification with the work role.	.69/.69	.69/.71
	Career confidence	The belief that one can successfully manage career challenges.	.76/.76	.77/.77
	Career clarity	The clarity of one's career goals.	.82/.83	.85/.85
Environment	Social support from school	Perceived career support received by school.	.81/.81	.81/.82
	Social support from family	Perceived career support received by family.	.87/.87	.85/.85
	Social support from peers	Perceived career support received by peers.	.90/.90	.88/.88
Activities	Networking	The extent to which someone builds, maintains, and utilizes social contacts to promote one's career.	.80/.81	.84/.84
	Career exploration	The degree to which one is actively collecting information about various occupations.	.78/.78	.80/.80
	Self-exploration	The degree to which one actively reflects about career-related interests, strengths, and preferences.	.76/.76	.76/.76

Table 2

Correlations of CRQ-A Factors and the Proposed Convergent Measures, Study 1 (N=186)

CRQ-A factor	Related Construct	Correlation
Occupational expertise	Occupational Self-Efficacy (Rigotti et al., 2008)	.59**
Labor market knowledge	-	-
Soft skills	Occupational Self-Efficacy (Rigotti et al., 2008)	.60**
Career involvement	Work Role Importance (Amatea et al., 1986)	.37**
Career confidence	Brief Decisional Self-Efficacy Factor (CEDSE-BD; Lent et al. 2016)	.59**
Career clarity	Vocational Identity (Holland et al., 1980; Jörin et al., 2004)	.62**
Social support from school	Social Support (Hirschi & Freund, 2014)	.18*
Social support from family	Social Support (Hirschi & Freund, 2014)	.43**
Social support from peers	Social Support (Hirschi & Freund, 2014)	.21**
Networking	Career environment exploration (Hirschi, 2009)	.55**
Career exploration	Career environment exploration, (Hirschi, 2009)	.57**
Self-exploration	Career self-exploration (Hirschi, 2009)	.55**

Table 3

Model Fit Statistics of the Final 36-Item CRQ-A with Sample 2 (N=1,004)

Sample 2 (N= 1004)	χ^2	df	p	RMSEA	CFI	SRMR
Model 1 (12 factors)	328	528	<.01	<.001	1	.026
Model 2 (hierarchical)	1161	576	<.01	.032	.985	.049
Model 3 (4 factors)	2815	588	<.01	.062	.944	.080
Model 4 (1 factor)	4122	594	<.01	.078	.911	.099

Note. χ^2 = chi-square test statistic; df = degrees of freedom; RMSEA = root-mean-square error of approximation; CFI = comparative fit index; SRMR = standardized root mean square residual.

Table 4

Items of the CRQ-A with Loadings, Means and Standard Deviations with Sample 2 (N=1,004)

Item (English / German)	Standardized factor loading	<i>M</i>	<i>SD</i>
Occupational expertise / Berufliche Fähigkeiten			
I am certain that I have the necessary knowledge and skills for my desired occupation. / Ich bin mir sicher, dass ich das notwendige Wissen und die Fähigkeiten für meinen angestrebten Beruf habe. /	0.718	3.93	.80
I have the necessary knowledge and skills to successfully enter into my desired occupation. / Ich habe das notwendige Wissen und Können, um in eine Lehre in meinen angestrebten Beruf erfolgreich einsteigen zu können.	0.670	3.86	.83
I can do many things that are important for my desired occupation. / Ich kann viele Dinge, die in meinem gewünschten Beruf wichtig sind.	0.750	4.08	.77
Labor market knowledge / Wissen über Lehrstellenmarkt			
I am well-informed about the current labour market trends and developments. / Ich bin über die aktuellen Trends und Entwicklungen auf dem Lehrstellenmarkt gut informiert.	0.806	3.10	.97
I have a good knowledge of the (VET) job market. / Ich kenne den Lehrstellenmarkt gut.	0.853	3.00	.98
I have a lot of knowledge about the current (VET) labour market. / Ich habe viel Wissen über den derzeitigen Lehrstellenmarkt.	0.851	3.00	.96
Soft skills / Allgemeine Fähigkeiten			
I have many skills that I could apply to different occupational fields. / Ich habe viele Fähigkeiten, die ich in verschiedenen Arbeitsbereichen anwenden könnte.	0.756	3.89	.78
I have many skills that would be useful in various occupations. / Ich habe viele Qualitäten, die in verschiedenen Berufen hilfreich sein werden.	0.769	3.84	.78
I can do many things that are useful in many occupations. / Ich kann viele Dinge, welche in vielen Berufen hilfreich sind.	0.804	3.87	.79
Career involvement / Wichtigkeit der Arbeit			
It is important for me to get training to have an occupation. / Mir ist es wichtig, dass ich einen Beruf erlerne.	0.491	4.63	.71
I view work as a very important part of life. / Arbeit sehe ich als einen sehr wichtigen Teil des Lebens.	0.721	4.43	.76

Work has a very important meaning for me. / Arbeit hat für mich eine grosse Bedeutung.	0.749	4.26	.80
Career confidence / Zutrauen			
I am confident that I will achieve my occupational goals. / Ich bin zuversichtlich, dass ich meine beruflichen Ziele erreiche.	0.672	4.19	.77
I am capable of successfully shaping my intended career. / Ich bin fähig, meine angestrebte berufliche Laufbahn erfolgreich zu gestalten.	0.775	3.99	.77
I believe that I can successfully overcome challenges in my future career. / Ich glaube daran, dass ich Herausforderungen in meiner zukünftigen beruflichen Laufbahn erfolgreich meistern kann.	0.710	4.09	.72
Career clarity / Klarheit			
I know which occupational field I am intending to pursue. / Ich weiss, welches Berufsfeld ich anstrebe.	0.809	3.98	1.01
I have clear career goals that match my personal interests and skills / Ich habe klare Berufsziele, die zu meinen persönlichen Interessen und Fähigkeiten passen.	0.899	3.92	.97
I know exactly which occupation I would like to pursue. / Ich weiss genau, was ich beruflich machen möchte.	0.732	3.60	1.16
Social support – school / Soziale Unterstützung - Schule			
I can rely on the support of my school to overcome difficulties and challenges in my career development. / Ich kann mich bei Schwierigkeiten und Herausforderungen in der Berufswahl auf die Unterstützung meiner Schule verlassen.	0.852	4.05	.82
My school provides support in answering my career questions. / Meine Schule ist bei Fragen zu beruflichen Anliegen für mich da.	0.723	4.27	.79
My school offers support in my career development. / Meine Schule bietet mir Unterstützung in der Berufswahl und Lehrstellensuche.	0.742	4.29	.76
Social support – family / Soziale Unterstützung - Familie			
I can rely on the support of my family to overcome difficulties and challenges in my career development. / Ich kann mich bei Schwierigkeiten und Herausforderungen in der Berufswahl auf die Unterstützung meiner Familie verlassen.	0.781	4.58	.75
My family provides support in answering my career questions. / Meine Familie ist bei Fragen zu beruflichen Anliegen für mich da.	0.772	4.66	.68
In choosing an occupation, I receive substantial support from my family. / Ich erhalte viel Unterstützung in meiner Berufswahl und Lehrstellensuche durch meine Familie.	0.876	4.46	.80

Social support – friends / Soziale Unterstützung - Freunde

My friends support me in my career development. / Meine Freunde unterstützen mich in meiner Berufswahl.	0.886	3.30	1.16
I can rely on the support of my friends to overcome difficulties and challenges in my career development. / Ich erhalte viel Unterstützung in meiner Berufswahl und Lehrstellensuche durch meine Freunde.	0.813	3.57	1.11
My friends help me in my career development. / Meine Freunde helfen mir in meiner Berufswahl und Lehrstellensuche.	0.823	3.03	1.16

Networking / Netzwerken

I have actively cultivated contacts to people who could help my career development. / Ich habe aktiv Kontakte zu Personen gepflegt, die mir in meiner beruflichen Entwicklung helfen könnten.	0.815	3.33	1.09
I have consciously used my contacts with people to help my career development. / Ich habe bewusst Kontakte zu Personen genutzt, die mir in meiner beruflichen Entwicklung helfen könnten.	0.815	3.35	1.11
I have frequently established contacts with people who could be important for my career development. / Ich habe häufig Kontakte zu anderen Personen geknüpft, die für meine Berufswahl und Lehrstellensuche wichtig sein könnten.	0.768	3.20	1.08

Career exploration / Informieren über Möglichkeiten

I have informed myself about the job market in my desired occupational fields. / Ich habe mich über den Lehrstellenmarkt in meinen Wunschgebieten informiert.	0.728	3.44	1.12
I have collected information about occupations and jobs. / Ich habe mich gut über Berufe und Lehrstellen informiert.	0.807	3.62	.92
I have informed myself about the job market opportunities. / Ich habe mich über Möglichkeiten auf dem Lehrstellenmarkt informiert.	0.721	3.31	1.08

Self-exploration / Selbstreflexion

I have given a lot of thought to what my career interests are. / Ich habe mir viele Gedanken darüber gemacht, was meine beruflichen Interessen sind.	0.724	4.28	.78
I have often thought about what is important to me in an occupation. / Ich habe mir oft überlegt, was mir an einem Beruf wichtig ist.	0.741	4.19	.83
I have thought a lot about which occupations are suitable for me. / Ich habe mir viele Gedanken darüber gemacht, welche Berufe zu mir passen.	0.640	4.28	.81

Appendix

Means, standard deviations, and correlations of the latent variables in Sample 1 (N=186), including Cronbach's Alpha and McDonald's Omega values

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. CRQ Occupational Expertise	4.00	0.58	(.79/.79)						
2. CRQ Labor Market Knowledge	3.21	0.81	.46**	(.84/.84)					
3. CRQ Soft Skills	3.87	0.60	.84**	.55**	(.79/.79)				
4. CRQ Importance of Work	4.39	0.56	.47**	.29**	.40**	(.69/.69)			
5. CRQ Career Confidence	4.00	0.60	.86**	.46**	.82**	.47**	(.76/.76)		
6. CRQ Career Clarity	3.98	0.80	.65**	.42**	.40**	.34**	.59**	(.82/.83)	
7. CRQ Social Support - School	4.19	0.63	.20*	.18*	.21*	.17*	.16	.11	(.81/.81)
8. CRQ Social Support - Family	4.40	0.72	.36**	.20*	.47**	.10	.46**	.22**	.19*
9. CRQ Social Support - Friends	3.31	1.05	.03	.38**	.13	.03	.19	.15	.13
10. CRQ Networking	3.49	0.87	.55**	.59**	.57**	.57**	.56**	.41**	.18*
11. CRQ Career Exploration	3.63	0.76	.51**	.90**	.50**	.41**	.46**	.46**	.24**
12. CRQ Self-Exploration	4.24	0.61	.49**	.46**	.52**	.60**	.51**	.38**	.33**
13. Self-Exploration	3.99	0.66	.32**	.41**	.42**	.34**	.47**	.37**	0.0
14. Environment-Exploration	3.37	0.77	.44**	.70**	.58**	.43**	.53**	.39**	.05
15. CEDSE-BD	3.94	0.51	.64**	.39**	.55**	.35**	.71**	.51**	.03
16. Occupational Self-Efficacy	3.45	0.65	.73**	.55**	.72**	.41**	.76**	.54**	.00
17. Social Support	3.92	0.64	.31**	.29**	.40**	.33**	.45**	.21*	.22*
18. Vocational Identity	3.65	0.94	.44**	.22**	.15	.18*	.35**	.71**	-.03
19. Work Role Importance	3.91	0.60	.36**	.20*	.30**	.52**	.38**	.32**	-.01

Appendix cont.

Variable	<i>M</i>	<i>SD</i>	8	9	10	11	12	14
1. CRQ Occupational Expertise	4.00	0.58						
2. CRQ Labor Market Knowledge	3.21	0.81						
3. CRQ Soft Skills	3.87	0.60						
4. CRQ Importance of Work	4.39	0.56						
5. CRQ Career Confidence	4.00	0.60						
6. CRQ Career Clarity	3.98	0.80						
7. CRQ Social Support - School	4.19	0.63						
8. CRQ Social Support - Family	4.40	0.72	(.87/.87)					
9. CRQ Social Support - Friends	3.31	1.05	.24**	(.90/.90)				
10. CRQ Networking	3.49	0.87	.23**	.39**	(.80/.81)			
11. CRQ Career Exploration	3.63	0.76	.26**	.24**	.61**	(.78/.78)		
12. CRQ Self-Exploration	4.24	0.61	.29**	.28**	.52**	.61**	(.76/.76)	
13. Self-Exploration	3.99	0.66	.26**	.32**	.44**	.53**	.71**	(.82/.82)
14. Environment-Exploration	3.37	0.77	.20**	.23**	.64**	.69**	.47**	.60**
15. CEDSE-BD	3.94	0.51	.36**	.11	.34**	.55**	.53**	.60**
16. Occupational Self-Efficacy	3.45	0.65	.37**	.10	.44**	.55**	.44**	.53**
17. Social Support	3.92	0.64	.53**	.23**	.46**	.31**	.50**	.48**
18. Vocational Identity	3.65	0.94	.07	-.01	.09	.19*	.11	.22*
19. Work Role Importance	3.91	0.60	.22*	.06	.37**	.30**	.31**	.37**

Appendix cont.

Variable	<i>M</i>	<i>SD</i>	15	16	17	18	19	20
1. CRQ Occupational Expertise	4.00	0.58						
2. CRQ Labor Market Knowledge	3.21	0.81						
3. CRQ Soft Skills	3.87	0.60						
4. CRQ Importance of Work	4.39	0.56						
5. CRQ Career Confidence	4.00	0.60						
6. CRQ Career Clarity	3.98	0.80						
7. CRQ Social Support - School	4.19	0.63						
8. CRQ Social Support - Family	4.40	0.72						
9. CRQ Social Support - Friends	3.31	1.05						
10. CRQ Networking	3.49	0.87						
11. CRQ Career Exploration	3.63	0.76						
12. CRQ Self-Exploration	4.24	0.61						
13. Self-Exploration	3.99	0.66						
14. Environment-Exploration	3.37	0.77	(.85/.85)					
15. CEDSE-BD	3.94	0.51	.48**	(.89/.89)				
16. Occupational Self-Efficacy	3.45	0.65	.56**	.75**	(.79/.79)			
17. Social Support	3.92	0.64	.34**	.37**	.35**	(.73/.73)		
18. Vocational Identity	3.65	0.94	.19*	.37**	.42**	.07	(.90/.90)	
19. Work Role Importance	3.91	0.60	.29**	.34**	.46**	.14	.18	(.82/.83)

Note. *M* and *SD* are used to represent mean and standard deviation, respectively. Values in square brackets indicate Cronbach's Alpha and McDonald's Omega values respectively. * indicates $p < .05$. ** indicates $p < .01$.