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Development and Initial Validation of the Job-Search Self-Regulation Scale: Expanding the Career Adaptation Model of Job Search

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Given the pressing issues of unemployment during the coronavirus disease (COVID-19) pandemic and the underrecognized role of job-search self-regulation (JSSR) in general within career construction theory (CCT), it is socially and theoretically important to expand the career adaption model of job search by examining the role of JSSR in predicting job-search outcomes. However, a psychometrically sound measure of JSSR is lacking. Study 1 used a sample of U.S. unemployed individuals ($n = 300$) to develop and explore the factor structure of a measure of JSSR. Study 2 tracked a sample of U.S. unemployed individuals ($n = 399$) to validate the JSSR by examining its structural, concurrent, and predictive validities. Study 2 also examined the mediation of the JSSR subscales in the links from career adaptability to subsequent employment status and job-search progress (JSP). The results supported the psychometric soundness of the newly developed JSSR and demonstrated that JSSR behaviors mediated the positive predictions of career adaptability resources for subsequent employment status and JSP. Therefore, the present study offers a measure of JSSR for future research and practice and highlights JSSR as an important adapting response.

Public Significance Statement
The present study develops and initially validates a measure of job-search self-regulation (JSSR) and supports the mediation of JSSR in positive predictions of adaptability resources for subsequent employment status and job-search progress (JSP). Thus, the study offers a sound measurement tool of JSSR and extends job-search research within the framework of career construction theory.

Keywords: job search, self-regulation, career construction, career adaptability, COVID-19 pandemic

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Work is clearly one of the most important life tasks because it brings financial resources and satisfies important psychosocial needs (Fouad, 2007). In contrast, the lack of paid work or unemployment has been widely acknowledged as a risk factor for individuals' physical and psychological well-being (Paul & Moser, 2009; Wanberg, 2012). Extensive evidence has supported the detrimental effects of unemployment. For example, Paul and Moser (2009) reported a meta-analysis of cross-sectional studies that showed unemployed individuals had lower levels of psychological health than did employed individuals. They also summarized longitudinal studies and showed that unemployment increased distress and reemployment decreased distress. Furthermore, research has shown that unemployment associates with decline in physical health indicated by subjective reports or biomedical measures (Wanberg, 2012). Thus, helping unemployed individuals seek jobs is clearly a psychologically and socially important task, one that needs to be better understood scientifically. This need is particularly pressing during the coronavirus disease (COVID-19) pandemic because the current public health and economic crisis exacerbates the problems of unemployment.

Although facilitators of job search in general have been studied (Brouwer et al., 2015; Saks, 2005; Wanberg et al., 2002), one could argue that job search, which can involve socioeconomic uncertainty and trauma, should be particularly conceptualized from the career adaptation model of career construction theory (CCT; Savickas, 2019, 1995). CCT applies constructionist epistemology to career development and counseling by emphasizing the central importance of self-agency for subjective construction of career. The CCT adaptation model provides a robust theoretical framework for understanding the process and outcomes of job search by describing relationships among adaptive readiness (i.e., personality traits denoting flexibility and wiliness to change), adaptability resources (i.e., psychosocial resources that empower adaptation), adapting responses (i.e., coping behaviors in adaptation), and adaptation results (i.e., adaptation progress and outcomes). Job search (particularly during the pandemic) clearly represents an adaptation scenario.

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Previous job-search research framed by CCT has concentrated on the relations of adaptability resources to job-search results mediated by job-search self-efficacy and information collection strategies (Guan et al., 2013; Koen et al., 2010). However, researchers have not sufficiently investigated the role of a key adapting response, namely, job-search self-regulation (JSSR), and no measure that broadly captures JSSR exists in the field. In general, self-regulation involves phases of foresight, performance, and reflection. In particular, JSSR refers to a feedback loop individuals follow to achieve (re)employment, which involves four components: setting goals, preparing and planning, executing activities and problem solving, and evaluating progress (Lord et al., 2010; Wanberg et al., 2010). Note that according to CCT, JSSR aligns with the strategic behaviors involved in adapting responses rather than the conative beliefs of job-search self-efficacy (Savickas, 2021) and consequently relates more directly and strongly to job-search outcomes. Therefore, to advance CCT-oriented research and practice on adapting responses in job search, more research on JSSR is imperative. Lying at the heart of this agenda is the development of a psychologically sound measure of JSSR, which was the focus of the present study.

Job Search From the Perspective of CCT

The CTT's adaptation model of job-search positions career adaptability as a key psychosocial resource that facilitates the process and outcomes of job search. Adaptability as a self-regulation "capacity" or "ability" increases the degree to which human behavior is flexible and able to adapt (Baumeister & Vohs, 2007). Career adaptability denotes self-regulation resources for coping with unfamiliar, complex, and ill-defined problems presented by current and anticipated vocational development tasks, occupational transitions, and work troubles that, to some degree large or small, alter an individual's social integration (Savickas, 2013). From this perspective, self-regulation is not a personality disposition at the core of an individual, rather it is a psychosocial strength that resides at the intersection of person-in-environment. Thus, adaptability refers to competencies that develop through interactions between the inner and outer worlds of a person. In this sense, adaptability resources are a form of human capital, defined as accumulated transactional competencies and knowledge gained through education and experience (O'sullivan & Sheffrin, 2003). In CCT, adaptability resources shape adapting responses, in the present study defined as self-regulating strategies and behaviors. In turn, the adapting responses produce adaptation results.

CCT conceptualizes career adaptability resources as a self-regulation system with a multidimensional and hierarchical structure. Specifically, CCT operationally defines career adaptability as four self-regulation resources for coping with career tasks, occupational transitions, and work troubles (Savickas & Porfeli, 2012). The four adaptabilities are (a) *concern* about the future, (b) *control* in taking responsibility for building a career, (c) *curiosity* about possible selves and vocational roles, and (d) *confidence* for making realistic choices and moving toward goals. More than 260 studies have examined and supported the role of career adaptabilities in a wide range of adaptation process and outcome variables (Hirschi et al., 2015; Rudolph et al., 2017; Savickas, 2021; Xu, 2020a).

Among these studies, scholars have taken the CCT perspective on job-search research to examine the relation of career adaptability to job-search outcomes through adapting responses. For example, Koen et al. (2010) reported that among unemployed individuals, career adaptability positively predicted reemployment quality through job-search strategies that focus on information collection. Guan et al. (2013) reported that career adaptability positively predicted employment status and person–environment fit through job-search self-efficacy among college students. Notably, CCT-inspired job-search research commonly treated information collection strategies and job-search self-efficacy as two adapting responses in job search. However, while these two constructs are related to adapting responses in job search, we argue that they have limitations in representing CCT's concept of adapting responses in job search (Savickas, 2021). CCT specifies five sets of behaviors that foster adaptation to tasks and transitions, consisting of orienting, exploring, deciding, planning, and problem-solving (Savickas, 2021). Notably, job-search self-efficacy focuses on conative beliefs as opposed to behaviors, rendering it only remotely related to CCT's definition of adapting responses, whereas information collection strategies focus only on exploring. Thus, although research on these constructs provide initial evidence for the CCT adaptation model of job search, identifying an adapting response that can more fully capture the dynamic array of orienting, exploring, deciding, planning, and problem-solving will be necessary for advancing CCT-oriented research and practice on job search. The present study focused on such an adapting response, JSSR, and aimed to develop and initially validate a measure of JSSR to facilitate research and practice on this important construct.

JSSR as a Key Adapting Response

JSSR was broadly defined in the present study as psychological and behavioral activities individuals coherently conduct based on a feedback loop to achieve (re)employment (Lord et al., 2010; Wanberg et al., 2010). As Lord et al. (2010) explained, self-regulation essentially involves a negative feedback loop that aims to resolve the discrepancy between the current status and desired goals. In the specific case of job search, individuals likely need to set/adjust goals, develop readiness and plans, execute job search, and monitor progress and solve problems (Lord et al., 2010; Wanberg et al., 2010). Notably, JSSR embraces all behaviors that CCT deems beneficial for adaptation (Savickas, 2021). However, JSSR remains an understudied construct in the CCT literature, which is in no small part attributable to the lack of a measure that broadly assesses this construct.

The knowledge gap on JSSR within CCT presents an important theoretical and practical limitation. Theoretically, although career adaptability always has been conceptualized as a self-regulation resource, no study has directly examined its relation to self-regulated adapting behaviors. Thus, examining the role of self-regulated behaviors within the CCT-oriented conceptualization of job search can elaborate CCT and shed light on the self-regulatory nature of career adaptation. Practically, effective self-regulation behaviors likely constitute a key foundation for successful job search. Lord et al. (2010) have generally argued that self-regulation theory applies to vocational behaviors because most vocational behaviors essentially aim to achieve desired goals through regulated behaviors. Although the construct of JSSR itself

has never been examined with the CCT framework, the self-regulation framework of job search has been the dominant process-oriented model of job search and has received empirical support (Wanberg, 2012; Wanberg et al., 2010). For example, Wanberg et al. (2010) longitudinally found that perceived job-search process (in reference to monitoring progress) positively predicted subsequent reemployment efficacy (in reference to developing readiness and plans), which then positively predicted subsequent job-search intensity (in reference to executing job search). One could further argue that JSSR is particularly important for job search during the pandemic because the pandemic plausibly requires job seekers to adjust their goals and regulate their job-search process more diligently and mindfully in order to cope with elevated socioeconomic uncertainty and disruptions on work and hiring (Fouad, 2020; Xu, 2021a). In other words, the pandemic likely created new job seeking and working norms that do not align with job seekers' existing knowledge and require job seekers to adapt to.

Drawing on the CCT adaptation model (Savickas, 2013; Savickas & Porfeli, 2012) and the self-regulation framework of job search (Lord et al., 2010; Wanberg et al., 2010), we propose that JSSR relates to but differs from existing constructs that tap into the process and outcomes of job search. First, according to CCT, JSSR is a downstream construct of career adaptation in that career adaptability resources can foster JSSR. Theoretically, the psychosocial resources of career adaptability could empower JSSR in that *concern* about the future and planfulness may benefit developing readiness and planning, *control* in taking initiative and responsibility may benefit all aspects of JSSR, *curiosity* in terms of inquisitiveness and openness may benefit setting/adjusting goals and monitoring progress, and *confidence* in task performance and problem solving may benefit developing plans and executing job-search activities. In other words, based on the CCT adaptation model, JSSR implements the four aspects of adaptability in the goal pursing cycle of job search, and its measure should reflect the use of the four aspects.

Second, job-search metacognition (JSM), which denotes monitoring and controlling thought processes, represents a construct that conceptually overlaps with JSSR yet still falls short of capturing all four domains of self-regulatory behaviors in job-search adaptation. Specifically, Turban et al.'s (2009) popular six-item scale of JSM involves items for setting/adjusting goals ("set personal goals to guide job search activities"), developing readiness and plans (e.g., "developed a coherent plan to guide my job search"), and monitoring the progress (e.g., "monitored my progress toward finding a job"), but no items for executing a job search. However, as noted earlier, from the perspective of CCT, JSSR involves more than planning and evaluation and additionally includes performance and problem-solving. Thus, according to the CCT adaptation model, a measure of JSSR is expected to offer incremental utility in predicting job-search outcomes over JSM.

Last, enhanced JSSR could lead to desirable employment status and job-search progress (JSP) because mindfully executing job search based on job-search goals and progress could enhance the intentionality of job search and continuously improve job-search performance. We focused on two key job-search outcomes during the pandemic: employment status and JSP. While employment status denotes a dichotomous and objective outcome of job search (i.e., whether unemployed individuals find a job), JSP denotes a continuous and subjective evaluation of JSP (i.e., the extent to which job search is progressing). Thus, together they present a more complete picture of an individual's JSP. Notably, JSP captures the summative progress of job search instead of specific behaviors conducted in job search and thus differs from JSSR. Research obviously has not examined the prediction of JSSR for job-search outcomes but has supported the role of JSM in predicting job-search outcomes, such as the number of interviews and offers and reemployment speed and quality (Koen et al., 2016; Turban et al., 2009; Wanberg et al., 2020). Although JSM has a narrower content coverage than JSSR, its research offers preliminary support for JSSR being an important adapting response.

Summary of the Present Research

Given the importance of JSSR in the CCT adaptation model of job search (Savickas, 2021) and the lack of measurement tools for JSSR, Study 1 developed the JSSR *Scale* (JSSR) and examined its factor structure. To broaden the utility of the new measure, we focused on self-regulatory behaviors that are important for (not necessarily specific to) job search during the pandemic. Following Study 1, Study 2 aimed to cross-validate the structure of the JSSR and examined its concurrent validity (career adaptability and JSM as criteria) and predictive validity (subsequent employment status and JSP as criteria). Additionally, given that JSSR is more closely tied to the CCT adaptation model and more broadly covers self-regulatory behaviors than JSM, we comparatively examined the links of career adaptability to the JSSR and the JSM and examined the incremental predictions of the JSSR for subsequent employment status and JSP over and beyond the JSM.

Study 1. Development of the JSSR

Study 1 developed the JSSR. Although we developed the JSSR items based on an a priori four-domain conceptualization, it was still possible that other models might empirically outperform the four-factor structure. This prospect was plausible particularly given the unidimensional nature of a similar measure, the JSM. Thus, to examine the best factor structure of the JSSR and retain the best items, we conducted an exploratory factor analysis (EFA) in Study 1 and did not propose formal hypotheses.

Method

Participants

The study participants consisted of 300 unemployed individuals (in October 2020) from the United States with a mean age of 36.53 years (SD = 12.02) and an intent to seek employment. Of the participants, 44.7% (n = 134) identified as male, 54.7% (n = 164) identified as female, and .7% (n = 2) identified as transgender. In terms of race/ethnicity, 67.3% (n = 202) identified as White/European American/Caucasian, 11.0% (n = 33) identified as African/African American/Black, 7.0% (n = 21) identified as Hispanic/Latinx American, 9.3% (n = 28) identified as Asian/Asian American, 1.0% (n = 3) identified as Native Hawaiian/Other Pacific Islander, .7% (n = 2) identified as American Indian/Native American, .7% (n = 2) identified as Arab American/Middle Eastern/North African, and 2.7% (n = 8) identified as Multiracial. In terms of socioeconomic status (SES), 10.7% (n = 22) identified as living in poverty, 33.0% (n = 99) identified as working class, 45.0%

(n = 135) identified as middle class, 9.3% (n = 28) identified as upper-middle class, and 1.0% (n = 3) identified as upper class.

Measure

JSSR. Following Worthington & Whittaker's (2006) guidance, we developed initial items of the JSSR. Based on a review of relevant literature on career adaptability, job search and reemployment, and self-regulation, we wrote items to measure the four processual self-regulation elements in job search. Because the JSSR is positioned as a downstream construct of career adaptability within the CCT adaptation model, we also made sure that the initial items reflect the use of the four adaptability resources in JSSR. Example items include "Reflecting on what I need to do to achieve employment" and "Being honest about my job search progress." After we developed the initial items, we contacted a senior scholar in vocational psychology in general and CCT in particular for feedback about the clarity and theoretical representativeness of the initial items and revised the items accordingly. The final version of the initial item pool consisted of 62 items, with 14 items for setting/adjusting goals, 16 items for developing readiness and plans, 17 items for executing job search, and 15 items for monitoring the progress. The JSSR instructed participants to indicate the extent to which they have performed listed adapting responses on a 5-point Likert scale, ranging from 1 (*little*) to 5 (*a great deal*). The JSSR behavioral response scale differs from the CAAS response scale which directs participants to indicate how well they have developed psychosocial resources, the difference being strength of capacities versus performance of behaviors.

Procedure

After obtaining institutional review board approval, we recruited participants from Amazon Mechanical Turk (MTurk). MTurk has become an increasingly popular platform for data collection in social science because it offers affordable access to diverse populations and shows comparable data quality in reference to convenient college samples (Buhrmester et al., 2011; Casler et al., 2013; Paolacci & Chandler, 2014; Ramsey et al., 2016). MTurk has also been used in research on vocational psychology and career development in recent years (e.g., (Dahling et al., 2013; Xu, 2020b).

We followed a protocol from previous research and invited voluntary participants to respond to the online survey that included demographic questions and the research questionnaire in exchange for monetary compensation. All participants' responses were anonymous. To further enhance the data validity, we invited only participants who had a 95% or higher approval rate history and used two validity items (e.g., "please choose 'Strongly agree'") throughout the survey to screen out careless participants. Out of 306 total responses, 300 were retained because they followed the instructions for both validity items.

Analysis

We first conducted EFA with principal-axis factoring and a parallel analysis to determine the optimal factor structure and name each dimension (Kahn, 2006; Worthington & Whittaker, 2006). Then, based on the conceptual meaning of each dimension, we retained the six to eight best items, which were defined as items holding maximum primary loadings and minimum cross-loadings (Kahn, 2006; Worthington & Whittaker, 2006). The data set revealed a small rate of missingness across all variables (<5%), and we used the default method of SPSS (i.e., list-wise deletion) to handle missing values in EFA.

Results

We first examined the Kaiser–Meyer–Olkin (KMO) and Bartlett's test of sphericity, and the result revealed a KMO value of .97 and a significant Bartlett's test ($p < .05$), allowing us to move forward with factor analysis (Kahn, 2006; Worthington & Whittaker, 2006). Because of the medium-large item communalities (around .60–.70) of the current sample, the current sample size was adequate for EFA (MacCallum et al., 1999).

In EFA, the results of principal-axis factoring (with eigenvalues > 1 as the criterion) suggested a six-factor solution, but only the first two factors were above the elbow of the scree plot. Additionally, a parallel analysis (Horn, 1965) based on random data sets (with 1,000 replications and 95% as the cutoff) suggested that two factors meaningfully captured the covariance of the data. Therefore, we selected a two-factor solution as the best structural model and found that the two factors accounted for 53.9% of the total variance. After oblique rotation by direct oblimin, we examined items loaded on each factor and concluded that the first factor focused on self-regulatory activities and the second factor focused on seeking input from other people. Therefore, we named the first and second factors adapting self-regulation and external referencing, respectively. The two factors were correlated at .64.

Finally, we selected the best items for each factor based on their factor loading, cross-loadings, and content representation. We retained eight items for self-regulation adapting behavior, all of which exhibited main loadings greater than .70 and cross-loadings less than .32. In fact, seven of them showed the highest main loadings for adapting self-regulation, and we included the eighth item to make sure all four self-regulation domains have at least two items. Note that the main loading of .70 may be more stringent than the cut off main loadings recommended by Kahn (2006); However, as Worthington and Whittaker (2006) mentioned, the criterion of main loadings is a researcher preference as long as it is above the minimum limit. In fact, they recommend that to the degree possible, researchers should set the criteria as high as possible to pursue an approximately simple factor structure. The factor-analytic results on adapting self-regulation fit this situation in that there were enough items loading strongly on this factor and covering the four self-regulation domains. For external referencing, we retained six items, all of which exhibited main loadings greater than .60 and cross-loadings less than .32. Other items were not retained because they either showed cross-loadings above .32 or thin conceptual connection to external referencing. Notably, while the initial items of external referencing cover the four self-regulation domains, the six items representing external referencing cover only three self-regulation domains (except setting/adjusting goals). Table 1 presents the items of the final JSSR (see Supplemental Material for all the items of the initial JSSR).

Notably, Study 1 supported a two-factor structure rather than the theoretically anticipated four-factor structure when modeling the interconnections of job-search self-regulatory behaviors. Although the items were selected empirically, the items on the adapting

Table 1
Pattern Factor Loading for Final Items From Exploratory Factor Analysis on the Original Item Pool

Items	Factor I	Factor II
Assuming responsibility for initiating job search	**0.94**	−0.30
Deciding on jobs to pursue	**0.89**	−0.25
Becoming curious about potential employment	**0.84**	−0.16
Keeping open minded about other employment opportunities	**0.83**	−0.19
Solving problems when they arise in my job search	**0.81**	−0.02
Reflecting on what I need to do to achieve employment	**0.80**	−0.04
Being honest about my job-search progress	**0.80**	−0.10
Accepting my responsibility for setting a job-search goal	**0.77**	−0.05
Being curious about other people's perspective of my job-search process	−0.03	**0.77**
Seeking feedback about my job-search process	0.08	**0.73**
Investigating other people's job-search strategies	0.01	**0.71**
Looking for successful stories of job search	0.01	**0.67**
Consulting with others about my job-search strategy	0.08	**0.62**
Thinking about how to negotiate the job contract	0.19	**0.61**

Note. Factor I = adapting self-regulation; Factor II = external referencing. Participants indicated the extent to which they have performed listed adapting responses as they seek employment. Values in bold indicate loadings on the corresponding factor.

self-regulation and external referencing factors showed conceptual links to the career adaptabilities, which is theoretically desirable. In reviewing the adapting self-regulation factor items, we concluded that one item seemed to relate to the concern adaptability (i.e., Reflecting on what I need to do to achieve employment), three items related to the control adaptability (e.g., Assuming responsibility for initiating job search), two items related to the curiosity adaptability (e.g., Keeping open minded about other employment opportunities), and two items related to the confidence adaptability (e.g., Solving problems when they arise in my job search). In reviewing the external referencing factor items, while the initial items seemed to relate to all four areas of career adaptability, the final items of external referencing lacked a clear connection to the control adaptability. Although external referencing emerged unexpectedly and showed somewhat limited content coverage in its current form, we retained this subscale as a developing subscale so that research can continue to study this potentially underrecognized self-regulation factor.

Study 2. Validation of the JSSR

Study 2 examined the structural, concurrent, predictive, and incremental validities of the JSSR. Given its EFA results and conceptual differences from career adaptability and JSM, we hypothesized that the JSSR is best represented by a two-factor oblique structure and is structurally distinct from career adaptability and JSM. Given the role of JSSR in the CCT adaptation model of job search, we hypothesized that the JSSR subscales are positively associated with career adaptability, JSM, subsequent JSP, and subsequent employment status. Additionally, given the broader content coverage of the JSSR relative to the JSM, we hypothesized that the JSSR subscales positively predict subsequent JSP and employment status over and beyond the JSM.

Method

Participants

We tracked a group of unemployed individuals ($n = 399$ at Time 1; $n = 252$ at Time 2) in the United States ($M_{age} = 27.68$, $SD = 9.07$) from October 2020 to February 2021. They reported an intent to seek employment. Of the sample, 50.4% ($n = 201$) identified as male, 44.4% ($n = 177$) identified as female, 2.0% ($n = 8$) identified as transgender, and 3.0% ($n = 12$) identified as gender nonbinary. In terms of race/ethnicity, 56.9% ($n = 227$) identified as White/European American/Caucasian, 10.8% ($n = 43$) identified as African/African American/Black, 6.8% ($n = 27$) identified as Hispanic/Latinx American, 18.5% ($n = 74$) identified as Asian/Asian American, .3% ($n = 1$) identified as Native Hawaiian/Other Pacific Islander, .3% ($n = 1$) identified as American Indian/Native American, .3% ($n = 1$) identified as Arab American/Middle Eastern/North African, and 6.3% ($n = 25$) identified as multiracial. In terms of SES, 13.5% ($n = 54$) identified as living in poverty, 38.8% ($n = 155$) identified as working class, 38.1% ($n = 152$) identified as middle class, 8.0% ($n = 32$) identified as upper-middle class, and .3% ($n = 1$) identified as upper class.

Measures

At time 1, participants responded to the JSSR and two measures that served as concurrent validity indicators, namely, the *Job-Search Metacognition Scale* and the *Career Adapt-Abilities Scale-Short Form*. They additionally reported JSP at time 1. At time 2, the participants responded to the *JSP scale* and an item asking about employment status.

JSSR. We used the JSSR developed in the first study to measure JSSR. Participants rated each item on a 5-point Liker scale ranging from 1 (*little*) to 5 (*a great deal*). High scores indicated greater extent of JSSR. In the present study, the JSSR had α coefficients of .87 and .83 for adapting self-regulation and external referencing, respectively.

JSM. We used Turban et al. (2009) 6-item scale of job-search metacognitive activities (JSM) to measure job-search metacognitive thoughts. The JSM is currently the most popular scale for measuring job-search metacognitive activities. Two sample items were "set personal goals to guide job search activities" and "developed a coherent plan to guide my job search." Participants rated each item on a 5-point Likert scale ranging from 1 (*I never did or thought this*) to 5 (*I did or thought this all the time).* Higher scores indicated a greater extent to which individuals engaged in metacognitions. Turban et al. (2009) reported an α coefficient of .82 for the JSM and found support for its validity in its positive relation to number of interviews and final offers. In the present study, the JSM had α coefficient of .87.

Career Adaptability. We used the 12-item Career Adapt-Abilities Scale-Short Form (CAAS-SF; Maggiori et al., 2017) to measure career adaptability, which includes the four dimensions of concern, control, curiosity, and confidence. For each dimension, the CAAS-SF uses the three items in the original CAAS (Porfeli & Savickas, 2012) that exhibited the highest loadings. Sample items included "Preparing for the future" and "Learning new skills." Participants rated each item on a 5-point Likert scale ranging

from 1 (*not strong*) to 5 (*strongest*). Researchers typically used total scores to indicate career adaptability (Savickas & Porfeli, 2012; Xu, 2020a), and higher total scores indicated stronger career adaptability. Maggiori et al. (2017) reported an α coefficient of .90 for the total scale of the CAAS-SF and demonstrated that the short version and the full version associated highly ($r > .90$). In the present study, the CAAS-SF had an α coefficient of .88.

Employment Status. At Time 2, participants indicated their employment status as unemployed (1) or employed (2).

JSP. At Time 2, we used the 6-item JSP scale developed in Wanberg et al. (2010) study to measure perceived JSP. Sample items included "I have been productive in terms of my job search" and "I moved forward with my job search." Participants were asked to rate each item on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores indicated greater perceived JSP. Wanberg et al. (2010) reported an average α coefficient of .93 for the JSP across multiple waves of administration. Their study also supported the construct validity of the JSP through satisfactory factor-analytic results and positive associations of the JSP total score with positive affectivity, reemployment efficacy, and time spent in job search. In the present study, the JSP had an α coefficient of .94.

Control Variable. Perhaps one of the most important confounding variables for the present study is JSP at Time 1 because of its obvious prediction for JSP at Time 2. Although age, gender, SES, and working experience theoretically could also affect JSP, they did not empirically relate to the two indictors of job-search outcomes in this study. Thus, we added JSP at Time 1 as a control variable in the analysis.

Procedure

After obtaining institutional review board approval, we recruited participants from Prolific, a cloud-sourcing platform. Similar to MTurk, Prolific has been acknowledged as an affordable and reliable platform for data collection in social science (Palan & Schitter, 2018). It is particularly reputable in safeguarding data quality. Participants' time and effort was compensated with monetary rewards. All participants' responses remained anonymous throughout the study. To further enhance the data validity, we used four validity screening items (e.g., "please choose 'totally confident'") throughout the survey. Out of 405 total responses in the first wave of recruitment, 399 were retained as valid because they followed the exact instructions of all four validity items. In the second wave, we reinvited the participants and were able to receive responses from 252 of them. We used participants' anonymous Prolific ID to link participants' responses in the first and second waves.

Analysis

We first conducted confirmatory factor analysis (CFA) to cross-validate the factor structure of the JSSR. We comparatively examined four competing models, consisting of a one-factor model (adapting self-regulation and external referencing combined), a two-factor oblique model (adapting self-regulation and external referencing correlated as two related factors), a two-factor orthogonal model (adapting self-regulation and external referencing as two uncorrelated factors), and a four-factor oblique model (the four self-regulatory domains as four separate but correlated factors). We used the JSSR items as the indicators of latent factors. Additionally, to ensure the distinctiveness of career adaptability, JSSR, and JSM, we compared three competing models, consisting of a one-factor model (the CAAS-SF, JSSR, JSM combined), a two-factor oblique model (the JSSR and JSM combined), and a four-factor oblique model (adaptability, adapting self-regulation, external referencing, and JSM as four separate but correlated factors). We used the CAAS-SF subscales and the JSSR and JSM items as the indicators of corresponding latent factors. Based on the suggestions of Hu and Bentler (1999) and Kline (2015), we used several criteria to holistically evaluate the model-data fit: the robust Chi-square, comparative fit index (CFI; >.90, adequate; >.95, good), Akaike information criterion (AIC; smaller the better), root mean square error of approximation (RMSEA; <.08, adequate; <.06, good) and standardized root mean square residual (SRMR; <.08, adequate; <.06, good). To render the results of the present study robust to potential nonnormality, we adopted the robust maximum likelihood parameter estimation in Mplus 8.

To further validate the JSSR, we examined the correlations of the two JSSR subscales with the JSM and the CAAS-SF for concurrent validity and the predictions of the two JSSR subscales for subsequent employment status and JSP for predictive validity. Using Fisher's z test, we additionally compared the correlations of the CAAS-SF with the JSSR and the JSM to examine whether the JSSR is more closely connected to the CCT adaptation model than the JSM. Last, we conducted hierarchical multiple regression to examine the incremental predictions of the JSSR for subsequent employment status and JSP over and beyond the JSM. For binary employment status, we employed logistic regression. For continuous JSP, we employed linear regression. We tested a strong version of incremental validity by using not only the JSM but also JSP at Time 1 as the baseline predictors, which allowed us to address whether JSSR facilitates within-person changes in job-search outcomes. The data set revealed negligible missingness (<.5%) at Time 1. We conducted Little's (1988) test to examine data attrition from Time 1 to Time 2 and found that $\chi^2(13, n = 399) = 6.37, p > .05$, indicating a missing completely at random (MCAR) pattern. Thus, we used the full information maximum likelihood estimation (FIML) and the default method of SPSS (i.e., list-wise deletion) to handle missing values in CFA and regression, respectively (Schlomer et al., 2010).

Results

Structural Validity of the JSSR

We first examined the fit indices for all four competing models for the JSSR items. As shown by the values of χ^2/df (419.40/77), RMSEA (.106), SRMR (.08), AIC (15803.37), and CFI (.83), the one-factor model fit the data poorly. The values of χ^2/df (282.99/77), RMSEA (.082), SRMR (.19), AIC (15667.30), and CFI (.90) for the two-factor orthogonal model indicated that this model did not fit the data either. The values of χ^2/df (146.64/76), RMSEA (.048), SRMR (.05), AIC (15532.94), and CFI (.97) for the two-factor oblique model indicated that this model was an adequate representation of the data. Additionally, we examined modification indices and did not detect important substantive links that were omitted. Last, as showed by the values of χ^2/df (410.57/71), RMSEA (.110),

SRMR (.08), AIC (15806.85), and CFI (.83), the four-factor oblique model did not fit the data. Therefore, the results cross-validated the two-factor structure revealed in Study 1.

We then examined the fit indices for all three competing models for the interrelations among the CAAS-SF, JSSR, and JSM. As shown by the values of χ^2/df (1062.16/230), RMSEA (.095), SRMR (.08), AIC (25074.85), and CFI (.76), the one-factor model fit the data poorly. Similarly, the values of χ^2/df (856.34/229), RMSEA (.083), SRMR (.07), AIC (24842.62), and CFI (.82) for the two-factor orthogonal model indicated that this model was not an adequate representation of the data either. However, the values of χ^2/df (443.92/224), RMSEA (.050), SRMR (.05), AIC (24369.77), and CFI (.94) for the four-factor oblique model indicated that this model fit the data relatively well. Thus, the distinctiveness of the career adaptability, JSSR, and JSM was supported.

Concurrent, Predictive, and Incremental Validities of the JSSR

Table 2 presents the means, standard deviations, and correlations of adapting self-regulation, external referencing, JSM, career adaptability, employment status, and JSP. Results supported the concurrent validity of the JSSR in that adapting self-regulation and external referencing were positively correlated to JSM (rs = .56 and .45, respectively; ps < .05) and career adaptability (rs = .61 and .33, respectively; ps < .05). Additionally, adapting self-regulation positively predicted subsequent employment status ($r = .17$, $p < .05$) and JSP ($r = .26$, $p < .05$), while external referencing only predicted JSP (r = .22, p < .05). Therefore, results generally supported the concurrent validity and the predictive validity of the JSSR scores.

When comparing the correlations of career adaptability with adapting self-regulation (r = .61) and JSM (r = .43), Fisher's test revealed that z = 4.71, p < .05, indicating adapting self-regulation was more strongly associated with career adaptability than JSM. However, when comparing the correlations of career adaptability with external referencing (r = .33) and JSM (r = .43), Fisher's test revealed that $z = -2.10$, p < .05, indicating JSM was more strongly associated with career adaptability than external referencing. Notably, external referencing showed a weaker predictive power and a thinner connection to career adaptability than adapting self-regulation.

Last, we examined the incremental validity of the JSSR in predicting job-search outcomes over and beyond the JSM (see Tables 3 and 4). Because adapting self-regulation and external referencing address two related but distinct aspects of JSSR, we examined their incremental validity separately. Results showed that adapting self-regulation did not additively predict employment status at Time 2, $\chi^2(1) = 1.80$, $p > .05$, and external referencing did not additively predict employment status at Time 2, $\chi^2(1) = .01$, $p > .05$. However, results showed that adapting self-regulation additively predicted JSP at Time 2, $\Delta F(1, 245) = 5.14$, $p < .05$, and external referencing failed to add unique predictions, $\Delta F(1, 244) = 3.11$, $p > .05$. Thus, in terms of measuring JSSR, adapting self-regulation (not necessarily external referencing) not only exhibited better content representatives than the JSM in conceptual analysis but also showed incremental predictions for JSP over and beyond the JSM in empirical results.

Table 2
Means, Standard Deviations, and Correlations of Variables in Study 2

Variable	*M*	*SD*	Adapting self-regulation	External referencing	Job-search metacognition	Career adaptability	Job-search progress (control)	Employment status
Time 1								
Adapting self-regulation	3.68	.80	1.00					
External referencing	2.59	.97	.56**	1.00				
Job-search metacognition	2.94	.96	.56**	.45**	1.00			
Career adaptability	3.34	.74	.61**	.33**	.43**	1.00		
Job-search progress (control)	2.29	.68	.36**	.28**	.54**	.32**	1.00	
Time 2								
Employment status	1.28	.45	.17**	.07	.18**	.14*	.14*	1.00
Job-search progress	2.80	1.23	.26**	.22**	.24**	.25**	.31**	.55**

* $p < .05$. ** $p < .01$.

Table 3
Hierarchical Logistic Regression on Employment Status in Study 2

Step	Variable	*B*	*SE*	*OR*	R^2	χ^2
Baseline					0.05	8.86*
	Job-search progress (Time 1)	0.19	0.25	1.21		
	Job-search metacognition	0.36	0.18	1.43*		
Baseline + Adaptive self-regulation					0.06	1.80
	Job-search progress (Time 1)	0.18	0.26	1.20		
	Job-search metacognition	0.24	0.20	1.27		
	Adaptive self-regulation	0.32	0.24	1.37		
Baseline + External referencing					0.05	0.01
	Job-search progress (Time 1)	0.19	0.25	1.21		
	Job-search metacognition	0.37	0.19	1.44		
	External referencing	−0.01	0.16	0.99		

* $p < .05$.

Supplementary Model-Based Evidence

We supplementarily examined whether adapting self-regulation mediates the links from career adaptability to subsequent job-search outcomes. This step might fall outside of conventional scale development, which is essentially based on bivariate associations. However, it could offer valuable model-based evidence for the validity of the JSSR because JSSR is not only anticipated to link to adaptability resources and adaption outcomes separately but also anticipated to link adaptability resources to adaption outcomes in the CCT adaptation model. Using the robust weighted least squares estimator in Mplus 8, we conducted path analysis and examined Models 1 and 2, in which career adaptability predicted subsequent employment status and JSP through adapting self-regulation and external referencing, respectively (see Figure 1 for a combined visual demonstration). Because both models were saturated models, they fit the data perfectly. Based on Model 1, the 95% confidence intervals of bias-corrected bootstrapping mediation analysis showed that adapting self-regulation mediated the positive predictions of career adaptability for subsequent employment status (.00, .26) and JSP (.02, .23). Based on Model 2, the 95% confidence intervals of bias-corrected bootstrapping mediation analysis showed that external referencing mediated the positive predictions of career adaptability for subsequent JSP (.01, .10) but not for subsequent employment status (−.04, .08). These results further supported the validity of the JSSR (particularly adapting self-regulation) in capturing an important adapting response in the CCT adaption model.

Discussion

Given the pressing psychosocial issue of unemployment during the COVID-19 pandemic and the underdeveloped research status about JSSR in general within the CCT framework of job search, the present study developed a measure of JSSR and examined its psychometric performance among unemployed individuals during the pandemic. The newly developed JSSR generally demonstrated satisfactory structural, concurrent, and predictive validities. It consisted of two subscales, adapting self-regulation and external referencing, with adapting self-regulation as the primary subscale due to its stronger predictions of subsequent job-search outcomes. The results also supported the incremental validity of adapting self-regulation in predicting changes in JSP over and beyond JSM and its mediation in linking career adaptability to subsequent JSP and employment status. The results offer useful implications for facilitating reemployment and expanding CCT research on job search.

Psychometric Performance and Utility of the JSSR

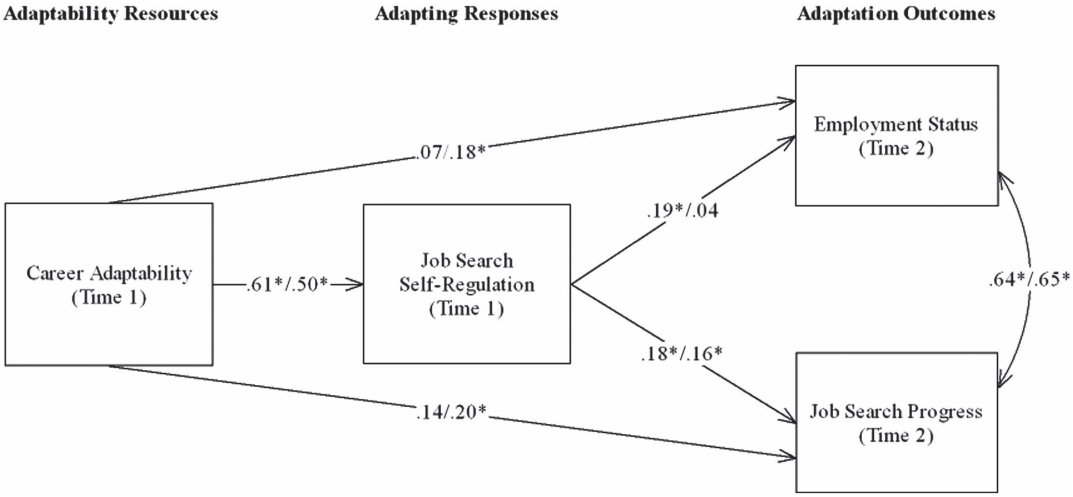
The present study revealed an interesting structural pattern about JSSR. While we anticipated a four-factor structure that corresponds to the four processual domains of self-regulation, both Studies 1 and 2

Table 4
Hierarchical Linear Regression on Job-Search Progress in Study 2

Step	Variable	*B*	*SE*	β	R^2	$\triangle F$
Baseline					0.10	14.24*
	Job-search progress (Time 1)	0.43	0.13	0.24*		
	Job-search metacognition	0.15	0.09	0.12		
Baseline + Adaptive self-regulation					0.02	5.14*
	Job-search progress (Time 1)	0.41	0.13	0.23*		
	Job-search metacognition	0.04	0.10	0.03		
	Adaptive self-regulation	0.26	0.12	0.16*		
Baseline + External referencing					0.01	3.11
	Job-search progress (Time 1)	0.42	0.13	0.24*		
	Job-search metacognition	0.09	0.10	0.07		
	External referencing	0.15	0.08	0.12		

* $p < .05$.

Figure 1
The Structural Models



Note. The figure describes standardized regression coefficients for adapting self-regulation (before slashes) and external referencing (after slashes).
* $p < .05$.

favored a two-factor model. First, this theory-data discrepancy is not particularly surprising because JSM, which captures several but not all self-regulatory domains, also exhibits a unidimensional feature (Koen et al., 2016; Turban et al., 2009; Wanberg et al., 2020). More importantly, the results potentially suggest that individuals tend to perform the whole array of job-search self-regulatory behaviors together as opposed to dividing them to four processual domains. In other words, although the items of the JSSR were developed to cover the four processual domains, the four domains might not function as four separate units in job seekers' practice. This finding resonates with the dynamic and interconnected natures of self-regulation.

While the present study revealed a two-factor structure of the JSSR, one of the factors (i.e., external referencing) still has less than ideal content representativeness, which might have compromised its predictive power in the present study. Admittedly, we did not anticipate that the external focus of information would represent a distinct factor in self-regulation; thus, we did not write as many items for this factor as for adapting self-regulation, which potentially led to limited content coverage of external referencing. Therefore, it would be interesting for future research to refine this factor by potentially including more items on setting/adjusting goals. Notably, we termed adapting self-regulation the primary factor given the psychometric performance of the two factors/subscales in the present study. However, the weaker concurrent evidence of external referencing might be attributable to the fact that external referencing emerged as an unexpected factor and we did not select criterion measures with external referencing in mind. Additionally, the weaker predictive validity of external referencing does not necessarily mean that the construct of external referencing is secondary across job-search scenarios. The importance of external referencing for job search might be more pronounced in cultural contexts (e.g., collectivistic cultures) that emphasize or normalize seeking feedback from external figures. With a refined subscale of external referencing, research in those communities will be helpful for shedding more light on the role of external referencing. It is noteworthy that external referencing might be related to the fifth factor, cooperation, in the original formulation of career adaptability resources, which was not retained in the final measure because it did not fit all 13 countries (Savickas & Porfeli, 2012). It might be interesting to explore the validity of the external referencing subscale with the cooperation adaptability as the criterion.

While the subscale of external referencing can be refined, the present study offers psychometric evidence for the JSSR in general and the subscale of adapting self-regulation in particular. This tool first opens a door for future research on the antecedents and outcomes of JSSR. Although the benefit of self-regulation makes intuitive sense, there are a variety of barriers to executing self-regulation (e.g., procrastination and limited resources; (Baumeister & Heatherton, 1996). It would be helpful to see future research that contextualizes JSSR in job seekers' psychosocial backgrounds and investigate how practitioners can enhance clients' JSSR through psychological and advocacy mechanisms. Second, practitioners can directly use the JSSR as an assessment tool when analyzing issues in clients' job search. Given the brevity of the JSSR, practitioners can even track clients' scores on the JSSR to monitor the progress of intervention. However, such practice still requires more evidence on the temporal stability (when no changes occur) and sensitivity (when changes occur) of the JSSR. Last, it would be a promising direction for future research to develop norms for the JSSR in different populations, based on which practitioners can use the JSSR as a screen tool to identify at-risk clients/students.

The salience of JSSR also suggests an expanded perspective regarding the roles of previously examined adapting responses in job search, such as job-search self-efficacy beliefs and information collection strategies (Guan et al., 2013; Koen et al., 2010). Although job-search self-efficacy and information collection strategies are both important, their roles should be understood in light of the whole

dynamic self-regulation cycle of job search. In other words, while the self-regulatory framework of job search acknowledges the one-way predictions of job-search self-efficacy and information collection strategies on job-search outcomes, it emphasizes a more dynamic (and even nonlinear) relationship between these elements and the JSP. For example, adapting job-search beliefs and behavioral strategies do not have to be established prior to job search, and a strictly linear mentality might ironically deter individuals from engaging in job search. Rather, practitioners can consider helping clients engage in job search first and learn from their experiences to formulate appropriate expectations and strategies.

Roles of Career Adaptability and JSSR

While the supplementary mediation analysis offers model-based evidence for the JSSR, it also joins and extends previous CCT-oriented research on job search by revealing an important behavioral mechanism of the predictions of career adaptability. The results suggest that career adaptability facilitates job search likely because these psychosocial resources could empower unemployed individuals to engage in effective self-regulatory behaviors. Simply stated, career adaptability self-regulation resources foster JSSR behaviors. Although the present study is the first in the field to develop a measure of JSSR and examine its role in job search, it echoes previous research on the positive role of JSM (Koen et al., 2016; Turban et al., 2009; Wanberg et al., 2020), supporting the applicability of the self-regulation framework for job search (Lord et al., 2010; Wanberg et al., 2010). More importantly, the present study examined JSSR in the CCT framework and is the first to portray JSSR as an important adapting response linking adaptability resources to adaptation outcomes. Thus, this finding meaningful extends CCT by shedding light on an important and process-oriented adapting response in the specific realm of job search. Related to CCT, the dual-process theory of career decision-making (DTC; Xu, 2021a, 2021b) might be able to provide another theoretical perspective regarding why JSSR is likely conducive to career transition, particularly during the pandemic. As DTC proposes, career development involves decisional uncertainty that cannot be eliminated during a given window of career decision-making, and how to manage such inevitable uncertainty (termed ambiguity by DTC) affects career outcomes. The pandemic clearly exacerbates ambiguity in career transition, rendering job-search behaviors that adapt to inevitable ambiguity particularly important. JSSR is indeed one type of such behaviors given its emphasis on a dynamic adjustment loop.

Limitations and Suggestions for Future Research

There are several limitations to be noted when interpreting the results and drawing implications. First, given the socioeconomic constraints during the COVID-19 pandemic, finding a job is likely more urgent or fits unemployed individuals' needs better than finding a good job. Therefore, we focused on reemployment status (including objective and subjective JSP) over reemployment quality (e.g., job satisfaction and improvement). However, it would be interesting for future research to examine the predictions of career adaptability and JSSR for reemployment quality when such criteria fit the needs of targeted populations better (e.g., individuals with stronger economic safety net). Second, the present study examined the incremental validity of the JSSR over a 4-month interval during the pandemic. Given the slow economic recovery of the United Stated, it is not particularly surprising that about 72% of the participants remained unemployment at Time 2. This feature, together with the dichotomous nature of employment status, limited the range of the variance of employment status, which potentially explains the nonsignificant incremental results associated with employment status. It would be interesting for future research to use longer intervals to examine the changes of job-search outcomes. Last, the present study adopted a two-wave longitudinal design to examine the mediator role JSSR plays in the links from career adaptability to subsequent employment status and JSP. Although the present study built the model according to the theoretical roles of central variables within CCT, the temporal sequence of these variables and the mediation technically cannot be fully established without three-wave data. Therefore, although previous research on CCT model of adaptation (e.g., Hirschi et al., 2015; Rudolph et al., 2017; Savickas, 2021; Xu, 2020a) generally lends us confidence for the validity of the current model, we still encourage future research to use more longitudinal waves or even experimental data to cross-validate the current model.

Conclusions

To extend research on job search, the present study developed and initially validated a measure of JSSR and examined a model involving career adaptability as adaptation resources, JSSR as an adapting response, and subsequent employment status and JSP as adaptation outcomes. The results of the present study supported the psychometric performance of the newly developed JSSR and supported the mediation of JSSR (particularly adapting self-regulation) in the links between career adaptability and subsequent employment status and JSP. Therefore, the present study offers a measurement tool for the important construct, JSSR, and suggests how JSSR could work with career adaptability in predicting important job-search outcomes. To conclude, the present study contributes to the social agenda of alleviating psychological and socioeconomic ramifications of unemployment and sheds light on an important but underrecognized adapting response within CCT.

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