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Relationships between Professional Skills Growth
Mindset, Career Adaptability, Career Exploration,
and Supervisor Support: A Moderated Mediation
Model

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Master Thesis - Work, Organizational, and Personnel Psychology

s5035228

February 2023

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Abstract

The aim of this study was to (1) study the relationship between professional skills growth mindset and career exploration, with a focus on the mediating role of career adaptability, and (2) examine the moderating role of supervisor support for its impact on the relationship between professional skills growth mindset and career adaptability. A non-probability convenience sample of 166 employed adults in both supervisory and staff-level positions participated in this cross-sectional study. The participants were asked to complete a series of questionnaires measuring professional skills growth mindset, career adaptability, career exploration, and supervisor support. A moderated mediation analysis was conducted to test the hypothesis. The results showed that (1) career adaptability mediated the relationship between professional skills growth mindset and career exploration, however (2) supervisor support did not moderate the mediation model, suggesting that workers with a professional skills growth mindset displayed higher levels of career adaptability, which in turn, made them more inclined to engage in career exploration regardless of the level of supervisor support. The limitations, as well as theoretical and practical implications, are discussed below.

Keywords: professional skills growth mindset, career adaptability, career exploration, supervisor support, career construction theory

Relationships between Professional Skills Growth Mindset, Career Adaptability, Career Exploration, and Supervisor Support: A Moderated Mediation Model

Today's world of work is undergoing rapid changes, which are largely a consequence of technological developments and advancements in terms of digitization and automation, changing work processes, and loosening employment relations (De Bruyne & Gerritse, 2018; Savickas, 2005). As a consequence of these changes, the requirements placed on today's workers are also changing (De Bruyne & Gerritse, 2018). To meet these requirements, workers are expected to proactively take ownership of their careers by accumulating the necessary skills and competencies, for example, through continuous learning, which will keep them relevant and employable now and in the future (Tien & Wang, 2017; van der Horst & Klehe, 2019). Facing these changes, workers are required to be able to deal with vocational changes and adapt to constantly changing occupational demands (Hirschi et al., 2015; Rudolph et al., 2017; Savickas, 1997). Meanwhile, many employers have also begun to recognize the need to support their workers as they navigate through the changing world of work (Ahmed et al., 2019).

These changes in the world of work call for workers who are able to adapt or display adaptability (Johnston, 2018). Career adaptability, which is a fundamental concept in the career construction theory (Savickas, 1997, 2012), is defined as a psychological resource used to deal with expected and unexpected vocational transitions, and adapt to changing vocational conditions. Consistent with this definition, highly adaptable workers possess more adaptability resources that enable them to successfully cope with work-related changes and transitions (Savickas, 1997), as well as engage in self-directed career management behaviors, such as career exploration, networking, reskilling, or upskilling, and career planning (Hirschi, 2012). According to career construction theory (Hirschi et al., 2015; Savickas, 1997, 2005), career adaptability is affected by the basic assumptions or mindset people hold about the

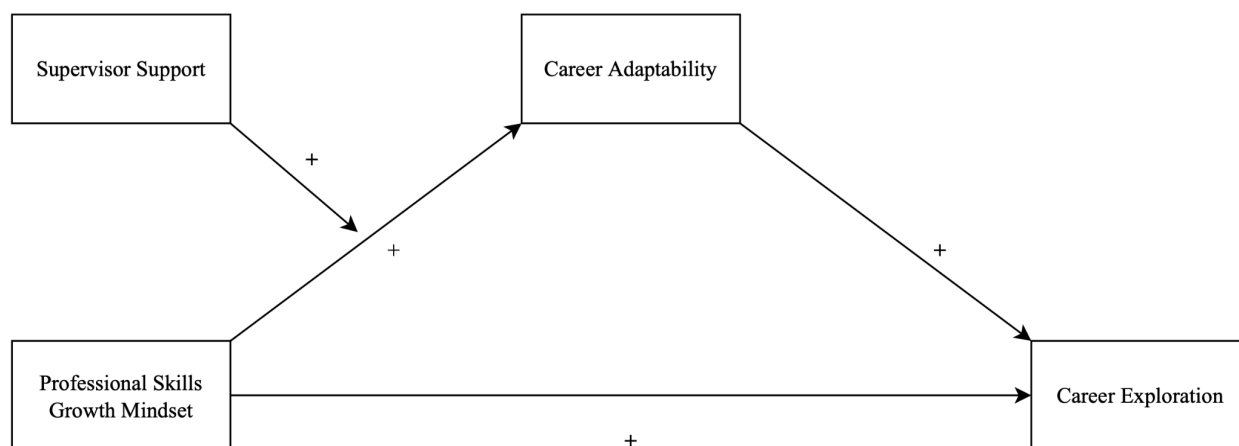
malleability of their work-related capabilities (Schmitt & Scheibe, 2022). Recently, Schmitt and Scheibe (2022) applied the mindset concept to the domain of professional skills and abilities and defined professional skills growth mindset as a worker's belief that their work-related skills and abilities can be cultivated and grown through effort, determination, hard work, and support. They further found that workers with a professional skills growth mindset are more likely to cultivate their adaptability resources by engaging in career management behaviors with regard to learning and proactive career engagement (Schmitt & Scheibe, 2022). This study aims to add to the limited research on professional skills growth mindset (for an exception, see Schmitt & Scheibe, 2022; Siebring, 2022) by focusing on one important yet understudied relationship, specifically the mediating role of career adaptability between professional skills growth mindset and career exploration. By combining assumptions from the career construction theory (Savickas, 1997, 2002, 2005) with recent theorizing by Schmitt and Scheibe (2022), I argue that workers, who think of their professional skills and capabilities as malleable, may be more inclined to cultivate and nurture their adaptability resources by exploring a variety of vocational possibilities and opportunities in the workplace. Therefore, this study is guided by the following research question: To what extent does workers' professional skills growth mindset influence their career exploration, and is this relationship mediated by career adaptability?

One way to address the requirements of today's workers is through a better understanding of work conditions that would support workers as they navigate through the changing world of work. Understanding the work conditions that benefit workers as they deal with changing work and career conditions is important for employers who wish to equip their workers with the right skills, competencies, and resources to manage their career successfully. However, up to now, this has attracted scant attention. To address this gap, this study will examine a boundary condition under which workers with a professional skills growth mindset

may be more likely to employ their vast repertoire of adaptability resources to explore vocational possibilities and opportunities in the workplace. Drawing on the career construction theory (Savickas, 2002, 2005), the job demands-resource model (Bakker & Demerouti, 2007; Demerouti et al., 2001), and the career resource model (Hirschi, 2012), I argue that while workers with a professional skills growth mindset may be more willing to employ their adaptability resources to engage vocational tasks and challenges, such as career exploration (Schmitt & Scheibe, 2022), this propensity for exploration may depend on the extent to which their supervisors support their desire. Thus, this study is guided by another research question: Is the relationship between professional skills growth mindset and career adaptability moderated by supervisor support? The model is depicted in Figure 1, and its variables and underlying propositions will be explained in the following sections.

Figure 1

The hypothesized moderated mediation model for the relationships between professional skills growth mindset, career adaptability, career exploration, and supervisor support



Career Adaptability

Guided by the career construction theory (Savickas, 2002, 2005), the career construction model of adaptation (Savickas, 2005, 2013; Savickas & Porfeli, 2012; see also Hirschi et al., 2015; Rudolph et al., 2017) posits that peoples' willingness and readiness to

adapt to career changes (i.e., adaptivity or adaptive readiness) enhances their psychological resources to cope with these changes (i.e., adaptability resources or career adaptability), which, in turn, enables them to act in ways that cope with these changing conditions (i.e., adapting responses). Career adaptability, which is a fundamental concept in the career construction theory (Savickas, 1997), is defined as the “readiness to cope with the predictable tasks of preparing for and participating in the work role and with the unpredictable adjustments prompted by changes in work and working conditions” (p. 254). Consistent with this definition, Savickas and Porfeli (2012) argued that career adaptability is rooted in self-regulatory processes which are expected to help workers deal with expected as well as unexpected vocational changes and transitions. They further explained that career adaptability comprises four psychological resources, also known as adapt-abilities (4 C’s) (Savickas, 1997; Savickas & Porfeli, 2012). *Career concern* refers to the degree to which workers are concerned about their future career, and consider, plan, and prepare for prospective vocational possibilities and opportunities. *Career control* refers to the extent to which workers take ownership of their career through deliberate and careful decision-making, self-discipline, effort, determination, and action. *Career curiosity* refers to the extent to which workers explore potential vocational roles, tasks, possibilities, and opportunities. *Career confidence* relates to workers’ self-efficacy beliefs about their ability to accomplish vocational goals and aspirations, cope with vocational problems, and overcome hindrances along the career path (Johnston, 2018; Rudolph et al., 2017; Savickas, 1997). Moreover, Savickas and colleagues (1997, 2012) explained that highly adaptable workers utilize these self-regulatory adaptability resources to devise strategies and solutions for adapting to vocational situations, such as when coping with present and anticipated challenges, transitions, and obstacles. They further argued that highly adaptable workers, who are proficient at employing their self-regulatory adaptability resources, tend to engage in more self-directed career management behaviors,

such as career exploration, networking, reskilling or upskilling, and career planning (Hirschi et al., 2015; Savickas & Porfeli, 2012; Rudolph et al., 2017).

Professional Skills Growth Mindset as a Predictor of Career Adaptability

The career construction theory of adaptation suggests that career adaptability is affected by the basic assumptions or mindset people hold about the malleability of their work-related capabilities (Hirschi et al., 2015; Savickas, 2005; Schmitt & Scheibe, 2022). As stated in Dweck's mindset theory, people endorse different basic assumptions or mindsets about the malleability of human traits, attributes, and abilities, such as intelligence and personality (Dweck, 1999; Dweck & Leggett, 1988; Molden & Dweck, 2006). In line with this theory, Dweck and colleagues (1988, 1999, 2017) initiated the concept of growth mindset and defined it as a way of thinking that traits and attributes are malleable and that abilities and skills can be modified, grown, and stretched with effort, persistence, hard work, and help-seeking. It is this growth mindset which leads people to think of their learning capacities as unlimited, which, in turn, leads them to look for more challenging learning opportunities, put in effort and persevere, and ultimately perform better on complicated tasks and challenges (Cook & Artino, 2016; Dweck, 2000; Molden & Dweck, 2006; Yeager & Dweck, 2012). Importantly, Cutumiso and Lou (2020) argued that people do not endorse generic mindsets (i.e., beliefs about general ability). Instead, they endorse domain- and situation-specific mindsets (i.e., beliefs about domain- or situation-specific abilities). In other words, people tend to endorse different mindsets across a broad range of domains and situations that are not always related, such as intelligence (Dweck, 1999), willpower (Job et al., 2010), and academic performance (Cutumisu & Lou, 2020). Recently, Schmitt and Scheibe (2022) applied the mindset concept to the domain of professional skills and abilities and defined professional skills growth mindset as a worker's belief that their vocational skills and abilities can be cultivated and grown through hard work, determination, and support. Consistent with

this definition, Schmitt and Scheibe (2022) argued that professional skills growth mindset is an antecedent of career adaptability, which reflects itself in workers' belief that their professional skills and abilities are malleable, which, in turn, can facilitate the career adaptation process. They further argued that because these beliefs predispose workers to think about their professional skills and capabilities as malleable, workers with a professional skills growth mindset should be more likely to take ownership of their careers by coming up with strategies to accomplish vocational goals and aspirations, as well as seeking vocational possibilities and opportunities which cause them to grow (Schmitt & Scheibe, 2022).

Hypothesis 1: A professional growth mindset is positively related to career adaptability.

Career Exploration as an Outcome of Career Adaptability

Career exploration is defined as a lifelong goal-oriented process comprising a reflection on goals and the gathering of information on vocational goals as well as ways to accomplish them (Blustein, 1997; Jordaan, 1963; Savickas, 1997; Stumpf et al., 1983). The career exploration process entails workers' seeking out vocational information to make well-informed decisions, (re-)formulating career aspirations, as well as appraising the degree of fit between various opportunities and possibilities (Blustein, 1992; Super & Hall, 1978; Zikic & Hall, 2009). By searching for, processing, and engaging with vocational information, workers are more likely to become familiar with their own goals and aspirations, interests, strengths, and weaknesses (Zikic & Hall, 2009). Consequently, career exploration shapes the way workers think about their own career identity in relation to their work-related roles, interests, and competencies (Zikic & Hall, 2009), as well as the way workers think about their workplace and more generally, the world of work (Jordaan, 1963). Drawing on the career construction theory of adaptation (Savickas, 2005), I argue that career adaptability may be part of the essential repertoire of resources that equips workers with a professional skills

growth mindset to engage in career development behaviors, such as career exploration. Specifically, I argue that workers with a professional skills growth mindset, who are proficient at employing these adaptability resources, may be keener on expanding and nurturing their resources by proactively exploring various vocational opportunities and possibilities, for example, through training and workshops.

Hypothesis 2: A professional skills growth mindset is indirectly and positively related to career exploration through career adaptability.

The Moderating Role of Supervisor Support

Workers' ability to adapt to and cope with vocational demands, stresses, and challenges depends on their personal resources (e.g., self-efficacy, optimism; Hobfoll et al., 2003;), as well as various job resources (e.g., task feedback; Bakker & Demerouti, 2007). There are several theories explaining why job resources are likely to result in increased career adaptability. In this study, the focus is on supervisor support as a specific type of job resource. Therefore two theories will be predominantly drawn upon, the job demands-resource model (Bakker & Demerouti, 2007; Demerouti et al., 2001) and the career resource model (Hirschi, 2012).

The Job Demands-Resource model (Bakker & Demerouti, 2007; Demerouti et al., 2001) postulates that work-related stress is the result of an imbalance between the job demands a worker is exposed to and the job resources which are at a worker's disposal to manage these job demands. *Job demands* refer to those "physical, psychological, or organizational aspects of the job that require sustained physical and psychological effort and are therefore associated with certain physiological and psychological costs" (Demerouti et al., 2001, p.501). Examples of job demands include, among others, high work pressure, irregular working hours, and task interruptions (e.g., Bakker et al., 2003). *Job resources* refer to those "physical, psychological, social, or organizational aspects of the job, that may do any of the

following: (a) be functional in achieving work goals; (b) reduce job demands at the associated physiological and psychological costs, (c) stimulate personal growth and development” (Demerouti et al., 2001, p. 501). Examples of job resources include, among others, work social support from supervisors and coworkers, mentoring, and feedback (e.g., Broek et al., 2008; de Lange et al., 2008; Schaufeli & Taris, 2013). Hakanen et al. (2008) further argued that workers, who are equipped with a vast repertoire of job resources, display higher levels of work engagement.

Hirschi (2012) proposed the career resource model, which posits four career resources that are necessary for successful career management: (1) human capital resources, (2) social resources, (3) identity resources, and (4) psychological resources. *Human capital resources* can be defined as a worker’s ability to use their work-related knowledge, skills, and abilities, which they acquired, for example, through education, training, or work experience, in order to fulfill performance expectations in a specific occupation. *Social resources* (otherwise known as social capital) refer to social networks, such as organizational, coworker, and supervisor support or a mentor, that are at a worker’s disposal. *Identity resources* refer to a worker’s conscious perception of their role as a worker, including their vocational interests and preferences, abilities and competencies, goals and aspirations, as well as the importance and meaning they attach to their role as a worker. *Psychological resources* relate to a worker’s positive psychological traits and states, such as their attitudes, cognitions, motivations, and affect, that they can draw upon and utilize in a variety of different work situations and contexts (Hirschi, 2012). Hirschi (2012) further explained that workers, who can draw upon a broad set of career management resources, can utilize and apply these when finding solutions to occupational problems, when coping with career- and work-related tasks and challenges, when making career-related decisions and when managing their careers, for example, for the purpose of career exploration, career planning, and networking.

As mentioned before, the purpose of this study is to look at the moderating role of supervisor support for its impact on the relationship between professional skills growth mindset and career adaptability. Supervisors, as extensions of the company, play a key role in supporting their workers as they deal with varying occupational demands, such as managing work schedules (Swanberg et al., 2011) or obtaining career-related information (Creed et al., 2009). By combining the insights from the career construction theory (Savickas, 2005), with the insights from the job demands-resources model (Bakker & Demerouti, 2007; Demerouti et al., 2001), and the career resource model (Hirschi, 2012), I argue that supervisor support might function as a specific type of social resource that empowers workers with a professional skills growth mindset to cope with various vocational tasks, demands, and challenges, such as career exploration processes. In support of this assumption, Guan et al. (2015b) and Ito and Brotheridge (2005) argued that workers, who receive enough social support from supervisors and coworkers in the workplace, are more likely to make use of their vast repertoire of adaptability resource in order to deal with problems and challenges in their career development. Similarly, Karatepe and Olugbade (2016) explained that when workers, who are skillful at employing their self-regulatory adaptability resources, in addition obtain support from their supervisors, then these workers are better able to explore their vocational possibilities in the workplace.

Hypothesis 3: The relationship between workers' professional growth mindset and career adaptability is moderated by supervisor support, such that the positive relationship is stronger when workers receive high levels of support from the supervisor as compared to when they receive low levels of support.

Hypothesis 4: Supervisor support moderates the indirect relationship between professional skills growth mindset and career exploration via career adaptability, such that the

indirect positive relationship is stronger when supervisor support is high as compared to when supervisor support is low.

Methods

Procedure and Participants

The present study was part of an existing two-wave study. In total, there were two surveys with a four-week time lag in-between. The first survey could be completed in approximately 12 to 15 minutes. The second survey was shorter and could be completed within approximately 7 minutes. Of note, this study only used data from the first survey (i.e., first time point), as the response rate of the second survey (i.e., second time point) was too low (yielding a response rate of 19.53%). Participants were recruited through personal and work-related networks (e.g., Facebook and LinkedIn) of the three researchers, who were involved in the data collection process, as well as through the survey-sharing website SurveySwap¹ and accepted responses from June 2022 to October 2022. Importantly, participants who signed up within the participant pool of SurveySwap could obtain SurveySwap credits. In contrast, participants, who signed up outside of the SurveySwap participant pool, received a feedback report containing information on the main findings, including the practical implications. All surveys were conducted online through the survey administration application Qualtrics and could be completed in German and English. Participation in both surveys was voluntary. Furthermore, all participants were assured that their data would be securely stored on a cloud-based system of the university of Groningen. In addition, all participants were assured that their data would not be accessible to anyone except the researcher(s). The present research was authorized by the Ethical Committee of Psychology of the University of Groningen.

¹ SurveySwap is an online platform that helps researchers find survey participants by connecting researchers with each other, so they can fill in each other's surveys. In essence, exchanging favors between researchers (SurveySwap | Find Survey Participants Today, n.d.) .

First, participants were informed that this survey aimed to study their thoughts and attitudes about their professional skills and how these are linked to their career-related behaviors and work experiences. After obtaining informed consent, participants were asked to complete questionnaires measuring their professional skills growth mindset, career adaptability, career exploration, supervisor support, and demographic information. Lastly, participants were asked to provide their email address to re-approach them for the second survey (providing the email address to participate in the second survey was voluntary) and to send participants the feedback report. This report was emailed to the participants once the study was completed.

Using the time-lag technique, 256 participants filled in the first survey at the first point in time. After excluding cases with missing values in the main variables, participants comprising a non-probability convenience sample of 162 (57 male; 101 female; 4 otherwise defined) employed adults remained in the sample. The sample consisted of participants mostly in their early adulthood life stage (25 to 40 years) ($M = 31.59$, $SD = 10.20$, Range = 18-60). The sample was predominantly made up of German participants (47.60%, $n = 79$), followed by Dutch (15.70%, $n = 26$), British (9.00%, $n = 15$), and other participants (25.30%, $n = 42$). In regard to the highest level of education, 9.60% ($n = 16$) of the participants had obtained a secondary school diploma, 11.40% ($n = 19$) had obtained a technical secondary school diploma, 66.90% ($n = 111$) had obtained a university degree, 6.00% ($n = 10$) had obtained a doctorate degree, and 3.60% ($n = 6$) had obtained a different degree. The participants worked for a variety of business sectors, such as the financial industry (18.10%), health and social welfare (11.40%), industry production (10.80%), education and instruction (9.60%), and public administration (5.40%), among others. 75.30% ($n = 125$) of participants held staff-level positions, and 22.30% ($n = 37$) of the participants held a supervisor position. 67.50% ($n = 112$) of the participants had a permanent contract, and 30.10% ($n = 50$) of the participants had

a temporary contract. On average, participants were employed for 5.89 years in their company and typically worked 36.30 hours per week.

Power Analysis

Preliminary to the statistical analysis, an a priori power analysis was conducted using G*Power 3.1 (Faul et al., 2007; 2009) to test the adequacy of the sample size. To calculate the sample size, F-tests were selected from the test family, and linear multiple regression: Fixed model R² deviation from zero was selected from the drop-down menu of statistical tests, as proposed by Faul et al. (2009). The number of predictors was set to 3. The default parameters were used, comprising a medium effect size of 0.15, a Cronbach's α of .05, and a high power of 0.95. The results of the a priori power analysis showed that a total of 119 participants would be necessary, which is lower than this study's sample size. Thereafter, a post hoc analysis was conducted with the same parameters to compute the power of the final sample size (n = 166). The results of the post hoc analysis showed that the power was 0.99, which was greater than the recommended cut-off score of 0.80 (Cohen, 1992). Based on the a priori and post hoc power analysis, the sample size for testing the proposed model was sufficient.

Measures

Professional Skills Growth Mindset

Schmitt and Scheibe (2022) established a six-item professional skills and abilities mindset scale comprising two subscales - growth and fixed mindset - which demonstrated satisfactory psychometric properties and convergent validity. As Schmitt and Scheibe's (2022) professional skills and abilities mindset scale is a new scale, an exploratory factor analysis (EFA) in the form of a principal component analysis using varimax rotation was conducted to examine their proposed two-factor item structure in a new data set. Bartlett's test of sphericity was significant ($\chi^2(28) = 484.824, p < .001$), and the Kaiser-Meyer-Olkin (KMO) measure was adequate with an index of .78, confirming that the data were suitable to proceed with the

exploratory factor analysis (Kaiser, 1974). On the basis of the scree plot and eigenvalues greater than 1, two factors were retained, which combined explained 61.28% of the total variance. The professional skills fixed mindset factor accounted for 43.22% of the total variance, while the professional skills growth mindset factor accounted for 18.06% of the total variance. In line with Schmitt and Scheibe (2022), the results of this analysis showed that professional skills growth mindset and professional skills fixed mindset are two separate but negatively related constructs ($r = -.39, p < .01$). The structure matrix showed that the correlations between the items and their corresponding factors varied between .71 and .78. The lowest correlation was found for item 8 “All people can develop their professional abilities and skills further no matter their current level” (.48). Unlike Schmitt and Scheibe (2022), who decided to drop one item each from the growth and fixed mindset subscale due to low correlations with the corresponding factors (i.e., thus opting for a six-item solution), all eight items could be retained in this study. In the present research, the professional skills and abilities growth mindset subscale was used (Schmitt & Scheibe, 2022). Participants responded to all four items on a 5-point Likert scale (anchored at 1 = strongly disagree, 0 = neither agree nor disagree, and 5 = strongly agree). Examples of items are as follows: “No matter what job people hold, they can always change their professional skills and abilities”, and “To be honest, people’s professional skills and abilities are something about them that they can’t change very much”. In this study, Guttman's lambda of the entire scale was adequate ($\lambda^2 .65$). That said, the reliability of this scale could not be increased by excluding any of the items.

Career Adaptability

Career adaptability was measured using the Career Adapt-Abilities Scale–Short Form (CAAS-SF; Maggiori et al., 2017). The scale comprises four subscales, with three items each to measure career concern, career control, career curiosity, and career confidence. Thus, in total, 12 items were used. The participants first read the following instruction: “Different

people use different strengths to build their careers. No one is good at everything, each of us emphasizes some strengths more than others.” Then, participants responded to the items on a 5-point Likert scale (anchored at 1 = not strong to 5 = strongest). Example items for each of the four dimensions are as follows: “Thinking about what my future will be like” (career concern, Cronbach’s α .74), “Taking responsibility for my actions” (career control, Cronbach’s α .71), “Looking for opportunities to grow as a person” (career curiosity, Cronbach’s α .61), and “Taking care to do things well” (career confidence, Cronbach’s α .60). The Cronbach’s alpha of the entire scale was good (α .81).

Career Exploration

Career exploration was measured using the Career Information Gathering subscale of Hirschi et al.’s (2017) Career Resource Questionnaire (CRQ). The Career Information Gathering subscale consists of three items resulting in a total score that indicates the extent to which information about career options is gathered by a participant. Participants responded to all items on a 5-point Likert scale (anchored at 1 = strongly disagree, 0 = neither agree nor disagree, and 5 = strongly agree). The items were “I regularly collect information about career opportunities”, “I constantly stay up-to-date about employment opportunities in the labor market”, and “I regularly stay up-to-date about possible job opportunities”. In addition, a filler item, “Please click agree here”, was presented as an attention probe to draw the participants’ attention back to the questionnaire. The internal consistency of the items was good (Cronbach’s α .84).

Supervisor Support

Supervisor support was measured using the supervisor support subscale of Maurer et al. (2003). This scale consisted of 11 statements (e.g., “My supervisor is supportive of my efforts to improve my work skills”, and “My supervisor has tried to make me believe that I am capable of learning and improving at work”) to which the participants could indicate to

what extent they agreed using a 5-point Likert scale (anchored at 1 = strongly disagree, 0 = neither agree nor disagree, and 5 = strongly agree). The scale had an excellent internal consistency (Cronbach's α .85).

Demographic Covariates

Age, gender, and level of education were examined as potential demographic covariates in the analysis because research suggests that these variables are associated with career exploration (Farmer, 1995; Ketterson & Blustein, 1997; Kleine et al., 2021; Lazarides et al., 2016; Torraco, 2018).

Data analysis

The data were transferred to IBM SPSS Statistics 28 to perform a moderated mediation analysis examining the moderation of social support on the mediated relationship between professional skills growth mindset, career adaptability, and career exploration. Before the analysis, all negatively-worded items were reverse-scored, and a single mean score was calculated for all the variables. Then, two² simple linear regression analyses were conducted to check the assumptions of linear regression for the hierarchical regression analysis and the moderated mediation analysis. For both analyses, all assumptions were met (see Appendix A). Further, a hierarchical regression analysis was conducted to determine whether professional skills growth mindset and career adaptability had a unique contribution to the prediction of career exploration while statistically controlling for potential covariates. Finally, moderated mediation analysis was conducted using the SPSS PROCESS macro suggested by Hayes (2013). Model 7 was specified in the SPSS PROCESS Macro. Bootstrapping was applied with 5,000 samples to test this index and to produce 95%

² An additional simple linear regression analysis was performed to check the assumptions of linear regression for the hierarchical regression analysis because four participants had to be excluded from the analysis because they had missing values for the gender variable. As gender was not included as a variable in the moderated mediation analysis, these participants did not have to be excluded from this analysis (see Appendix A).

bias-corrected confidence intervals. Because PROCESS requires data to be complete, 90 cases with missing data in any of the main variables were excluded from the analysis. A cut-off point of $p \leq 0.05$ was set to interpret the significance of the findings.

Results

Descriptive Statistics

Table 1 presents the means, standard deviations, and correlations between professional skills growth mindset, career adaptability, career exploration, supervisor support, age, gender, and level of education. The results showed significant positive correlations of professional skills growth mindset with career adaptability, professional skills growth mindset with supervisor support, career adaptability with career exploration, career adaptability with supervisor support, age with gender, and level of education with career exploration. Further, the results showed significant negative correlations of age with career exploration and supervisor support.

Hypothesis Testing

A three-stage hierarchical regression was conducted to determine whether professional skills growth mindset and career adaptability had a unique contribution to the prediction of career exploration while statistically controlling for potential covariates. The predictors were entered into different blocks representing different classes of processes. In step 1, the effects of the participant's characteristics were controlled for using the following variables as covariates: age, gender, and level of education. In step 2, professional skills growth mindset was entered, while career adaptability was entered in step 3. Table 3 and 4 shows the results of the hierarchical regression analysis. It appears that age ($b = -0.02$, $SE = .01$, $t = -3.12$, $p < .01$) and level of education ($b = 0.34$, $SE = .08$, $t = 4.11$, $p < .01$) together explained 42.10% of the variance in career exploration. However, gender had no unique significant contribution to the prediction of career exploration ($b = -0.24$, $SE = .15$, $t = -1.61$, $p = .11$). Further, the results

showed that professional skills growth mindset added 0.60%, although the contribution to the prediction of career exploration was not significant ($b = 0.02$, $SE = .14$, $t = 0.15$, $p = .88$).

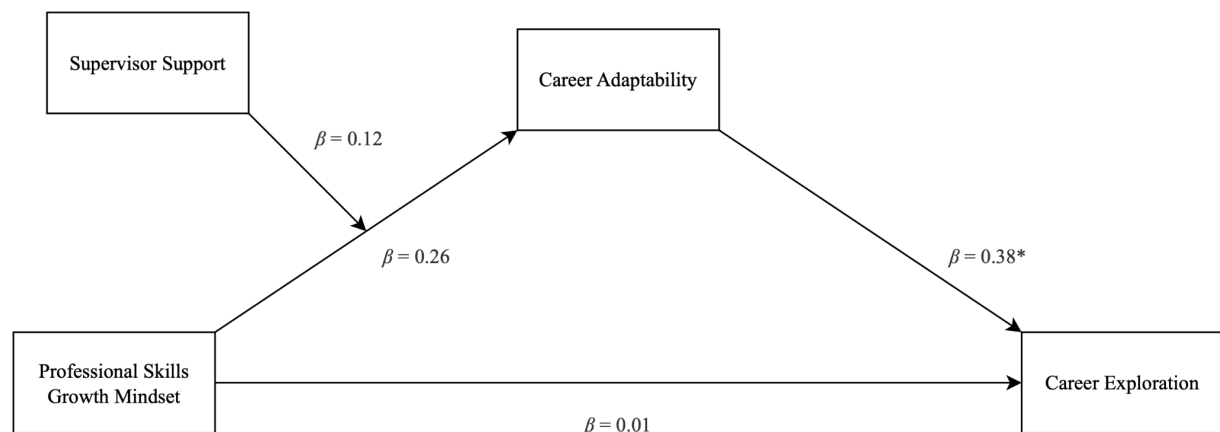
However, career adaptability, which was added afterwards, had a unique significant contribution of 4.70% to the prediction of career exploration ($b = 0.41$, $SE = .14$, $t = 3.04$, $p < .01$). Together, all variables explained 48.00% of the variance in career exploration.

Furthermore, to examine the moderated mediation effect, a bootstrap analysis using PROCESS Model 7 (i.e., moderation of X → M effect by W; Hayes, 2013) was carried out, setting the sample times at 5000 and the confidence intervals at 95%. The results showed that there is no direct effect of professional skills growth mindset on career exploration ($b = 0.01$, $SE = .14$, $t = -.12$, $p = .91$, 95% CI = [(-.26, .29)]. Thus, Hypothesis 1 was not supported. However, the results indicated that there is a direct effect of career adaptability on career exploration ($b = 0.38$, $SE = .14$, $t = 2.79$, $p < .01$, 95% CI = [(0.11, .64)]. In addition, the results indicated that there is a positive direct effect of age ($b = -0.02$, $SE = .01$, $t = -3.57$, $p < .05$, 95% CI = [(-.04, -.01)]) and a negative direct effect of level of education ($b = 0.35$, $SE = .08$, $t = 4.28$, $p < .05$, 95% CI = [(0.19, .51)]) on career exploration. To test Hypothesis 2, the indirect effect was probed showing that professional skills growth mindset is positively associated with career exploration via career adaptability ($M = [2.64, 3.91]$, 95% CI = [[0.01, 0.03], [0.21, 0.23]]). Thus, Hypothesis 2 was supported. Furthermore, the results showed that there is no direct effect of professional skills growth mindset ($b = 0.26$, $SE = .40$, $t = 0.66$, $p = .51$, 95% CI = [(-.52, 1.05)]) and supervisor support ($b = 0.12$, $SE = .49$, $t = 0.24$, $p = .81$, 95% CI = [(-.85, 1.09)]) on career adaptability. The results also indicated that there is no direct effect of age ($b = 0.00$, $SE = .00$, $t = 0.82$, $p = .41$, 95% CI = [(-.00, .01)]) and level of education ($b = 0.05$, $SE = .05$, $t = 0.95$, $p = .35$, 95% CI = [(-.05, .14)]) on career adaptability. In addition to that, the results showed that there is no interaction effect of supervisor support on the relationship between professional skills growth mindset and career adaptability ($b = 0.01$, SE

= .12, $t = .07$, $p = .95$, 95% CI = [(-.23, .24)]. In other words, there is no moderation effect. Thus, Hypothesis 3 was not supported. To test Hypothesis 4, the conditional indirect effect was probed showing that professional skills growth mindset is positively associated with career exploration via career adaptability regardless of the level of supervisor support ($M - 1SD = 2.64$, 95% CI = [0.01, 0.23]; $M = 3.36$, 95% CI = [0.03, 0.21]; $M + 1SD = 3.91$, 95% CI = [0.02, 0.23]); the direction of the indirect effect was in the hypothesized direction. Thus, Hypothesis 4 was not supported. The total variance of career exploration explained by the moderated mediation model reached statistical significance ($R = 0.461$, $R^2 = 0.212$, $F(4, 157) = 10.57$, $p < .05$). However, the results showed that the moderated mediation model was not supported with an index of moderated mediation of .00 (95% CI = [-.09, .09]). The moderated mediation model was presented in Figure 4.

Figure 4

Moderated mediation model for the relationships between professional skills growth mindset, career adaptability, career exploration, and supervisor support



Note. * significant.

Discussion

The aim of this study was to (1) examine the relationship between professional skills growth mindset and career exploration, with a focus on the mediating role of career adaptability, and (2) study the moderating role of supervisor support for its impact on the

relationship between professional skills growth mindset and career adaptability. The findings of this study support the hypothesized mediation model, demonstrating that professional skills growth mindset influences career exploration through career adaptability. However, the findings indicated there was no direct effect of professional skills growth mindset on career exploration, but they were related to each other through indirect relationships. Thus, in accordance with the career construction theory (Rudolph et al., 2017; Savickas, 2005) and recent theorizing by Schmitt and Scheibe (2022), career adaptability functions as an underlying mechanism through which professional skills growth mindset influences career exploration. However, contrary to assumptions, the findings of this study did not support the hypothesized moderated mediation model indicating that professional skills growth mindset influences career exploration through career adaptability regardless of the level of supervisor support. Beyond that, additional analysis showed that gender and age were negatively related to career exploration, and level of education was positively related to career exploration.

Theoretical Implications

The present study showed that workers with a professional skills growth mindset are adept at using their adaptability resources, which, in turn, makes them keener on cultivating these resources by exploring possible vocational possibilities and opportunities in the workplace. These findings support research by Schmitt and Scheibe (2022) by showing that professional skills growth mindset is a predictor of workers' career adaptability and, through this path, fosters career exploration; there was no direct effect of professional skills growth mindset on career exploration. These findings further extend the standpoint rooted in the career construction theory (Rudolph et al., 2017; Savickas, 2005) and recent theorizing by Schmitt and Scheibe (2022) that career adaptability may be part of the essential repertoire of resources that equips workers with a professional skills growth mindset to deal with vocational tasks and challenges, such as career exploration.

Next, this study examined a boundary condition under which workers with a professional skills growth mindset are more likely to employ their vast repertoire of adaptability resources to explore vocational possibilities and opportunities within a moderated mediation framework. Drawing on the career construction theory (Savickas, 2005), the job demands-resource model (Bakker & Demerouti, 2007), and the career resource model (Hirschi, 2012), it was expected that while workers with a professional skills growth mindset may be more willing to employ their adaptability resources to proactively engage in career management behaviors, such as career exploration (Schmitt & Scheibe, 2022), this propensity for exploration may depend on the extent to which their supervisors support their desire. Contrary to predictions, the findings of this study showed that while career adaptability mediated the relationship between professional skills growth mindset and career exploration, this relationship did not depend on the level of supervisor support. However, the direction of the indirect effect was in the hypothesized direction. It follows that irrespective of the level of supervisor support, workers with a professional skills growth mindset are more likely to explore vocational possibilities and opportunities as a result of their adaptability resources.

One conceptual explanation for this finding emerges by bringing together insights from mindset theory (Dweck, 2000) with insights from self-determination theory (SDT; Ryan & Deci, 2000). In light of these theories, it can be argued that people possess a natural tendency for growth and self-actualization (e.g., growth mindset), which is promoted or thwarted by the extent to which their basic psychological needs for autonomy (de Charms, 1968), competence (White, 1959), and relatedness (Baumeister & Leary, 1995) are satisfied (Dweck, 2000; Ryan & Deci, 2017). The need for autonomy is supported by offering opportunities to choose, respecting feelings, not passing judgment, and promoting responsibility for actions, whereas the need for autonomy is thwarted by offering rewards, punishments, expectations, or any other type of controlling behavior (Cook & Artino, 2016;

Ryan & Deci, 2000). The need for competence is supported by providing optimal challenges, as well as constructive feedback that boosts confidence in one's abilities (Cook & Artino, 2016; Ryan & Deci, 2000). By combining insights from these two theories (Dweck, 2000; Ryan & Deci, 2017) with assumptions from the job demands-resource model (Bakker & Demerouti, 2007) the career resource model (Hirschi, 2012), and recent theorizing by Schmitt and Scheibe (2022), I speculate that workers with a professional skills growth mindset, who possess the capacity to be self-initiating and autonomous, may experience a high level of supervisor support (more job resources) as need-thwarting. This may be because supervisors, who impose tasks, training, or workshops, may not grant workers sufficient freedom to proactively take ownership of their career, thereby acting against their needs for autonomy and competence. By contrast, workers with a professional skills growth mindset may experience a lower level of supervisor support (fewer job resources) as need-supportive. This may be because supervisors, who grant them sufficient freedom to proactively take ownership of their career, may promote their needs for autonomy and competence. Thus, this finding hints at the possibility that although job resources are generally good and valuable for workers (Parker & Wall, 1998), for workers with a professional skills growth mindset, supervisor support may be not be wanted or needed (e.g., too much of a good thing; see Van Veldhoven et al., 2020) to proactively engage in self-directed career management behaviors. Instead, these workers may benefit from other job resources, such as support from mentors (Hirschi, 2012) or coworkers (Guan et al., 2015b; Karatepe & Olugbade, 2017).

Furthermore, one methodology explanation for this finding is the cross-sectional study design used to examine participants' psychological experiences at work. A weak point of cross-sectional study designs is that it addresses general instead of specific work features, asking participants to summarize and judge their vocational behaviors and experiences (Alliger & Williams, 1993). Thus, future researchers may profit from considering other data

collection methods, such as experience sampling methods (ESM, Alliger & Williams, 1993), to gain deeper insight into specific features of work that may be related to or are indicators of the outcome variable.

Demographic Variations

Concerning demographic differences, this study found that although career exploration is negatively related to gender, the hierarchical regression analysis indicated that gender does not explain any variance in career exploration beyond that explicable by other variables. This finding is in accordance with a few studies which found no gender differences in relation to career exploration (Cai et al., 2015; Okay-Somerville & Scholarios, 2017), but differs from other studies which found no gender difference with respect to career exploration (Farmer, 1995; Oakley, 2000). Moreover, the findings of this study suggest that career exploration is negatively related to age. This finding supports prior research, which found that in comparison to younger workers, older workers are less interested in training and career development activities, such as career exploration (Ng & Feldman, 2012). Further, the present study found that career exploration is positively related to level of education. This finding is consistent with previous research, which found that compared to more educated workers, less educated workers are less likely to be exposed to an adequate range of career options and opportunities, thus leading to less career exploration (Torraco, 2018).

Validation of the Professional Skills and Abilities Mindset Scale

One of the additional contributions of this study was to examine the proposed two-item-factor structure of Schmitt and Scheibe's (2022) professional skills and abilities mindset scale in a new data set. In line with Schmitt and Scheibe (2022), the present study found that the professional skills and abilities mindset is a two-dimensional concept. This means that workers can endorse both professional skills growth and fixed mindsets at the same time. Moreover, the present study found a moderate negative bivariate correlation

between the two dimensions ($r = -.39$), which implies that workers are prone to endorsing one of the two mindsets. This finding is consistent with prior research, which found correlations between $-.02$ and $-.78$ (Kunz et al., 2020; Lüftenegger & Chen, 2017; Schmitt & Scheibe, 2022; Tempelaar et al., 2015) and more recent conceptualization of mindsets as a two-dimensional construct (Lüftenegger & Chen, 2017; Schmitt & Scheibe, 2022; Murphy & Reeves, 2019), but is different from prior conceptualizations of mindset as a one-dimensional construct (Burnette et al., 2013; Dweck et al., 1995).

Limitations

The present study should also be seen in light of its limitations. First, the present study was part of an existing time-lagged two-wave study but only used data from the first survey as the response rate of the second survey was too low (19.53%). Thus, no inferences can be made about any causal relations in the absence of longitudinal data (Zapf et al., 1996). Because low response rates for time-lagged studies are common (see Siebring, 2022), future researchers may benefit from considering other data collection methods to make up for the data loss, thereby enhancing their chances of generating replicable results across longitudinal samples. For example, Beach et al., (1999) argued that shorter time lags between each data collection moment might decrease any issues regarding the recruitment and attrition of participants.

Further, because it was not possible to test the causal relationships proposed in the theoretical model (Figure 1), it is also important to note that the relationship between career adaptability and career exploration may be bi-directional and thus different from the one hypothesized in this study. That is, while some researchers argued that career adaptability is an antecedent to career exploration (Li et al., 2015; Rudolph et al., 2017), other researchers proposed that career exploration is an antecedent to career adaptability instead of its outcome (Guan et al., 2015a). Therefore, future researchers may benefit from using a longitudinal

research design to better understand the relationship between career adaptability and career exploration.

Third, this study used a single-source, single-method methodology, which carries the risk of common method bias (Podsakoff et al., 2003). A common method bias occurs when a single source of information (e.g., worker) and method (e.g., self-report questionnaire) are used, which, in turn, can bias the estimated relationships between the variables of interest (Podsakoff et al., 2003). To control for common method bias, future researchers could employ a multiple-source approach collecting data from various sources within the same company (e.g., other workers, supervisors; Podsakoff et al., 2003), which, however, was beyond the scope of this study. By doing so, the risk of other biases (e.g., social desirability, or lenient tendencies) could also be decreased (Podsakoff et al., 2003. p. 882). Despite these limitations, this study offers many practical implications for practitioners.

Practical Implications

The findings of the present study carry important practical implications. To summarize, this study showed that irrespective of the level of supervisor support, workers with a professional skill growth mindset are adept at employing their adaptability resources, which, in turn, makes them keener on cultivating their resources by exploring possible vocational possibilities and opportunities in the workplace. The first practical implication which follows is that companies may profit from taking workers' mindsets into consideration when recruiting, hiring, and promoting them into job positions (Özduran & Tanova, 2017). Specifically, companies should seek out workers who are not only equipped with necessary knowledge, expertise, skills, and experiences but also endorse a professional skills growth mindset, as these workers are more likely to proactively engage in career development activities (Özduran & Tanova, 2017; Schmitt & Scheibe, 2022). Still, many workers, who endorse a professional skills fixed mindset, may already be employed at companies (i.e., the

belief that professional skills and abilities are fixed and cannot be cultivated or grown; Schmitt & Scheibe, 2022). As workers can endorse both a growth and fixed mindset about their professional skills and abilities at the same time (Schmitt & Scheibe, 2022), companies should encourage workers to shift to a professional skills growth mindset. For example, companies can facilitate this shift by offering coaching, training, workshops, and mentoring programs (Dweck, 2006; Heslin et al., 2005; 2006; Murphy & Reeves, 2019).

Moreover, companies may benefit from establishing a growth mindset-oriented organizational culture grounded in the belief that workers' professional skills and abilities are malleable and can be cultivated with effort, persistence, hard work, and help-seeking (Özduran & Tanova, 2017; Schmitt & Scheibe, 2022). In a growth mindset-oriented organizational culture, companies may profit from granting workers the freedom to proactively take ownership of their career, for example, by allowing them to choose which vocational possibilities and opportunities they would like to explore in the workplace (Schmitt & Scheibe, 2022). In turn, this may lead workers with a professional skills growth mindset to experience greater work satisfaction, work commitment, and performance. Subsequently, this may result in better organizational performance, ultimately increasing the company's success.

Conclusion

The purpose of this study was to gain a better understanding under what conditions workers with a professional skills growth mindset employ their adaptability resource to engage in career exploration. This study showed that workers with a professional skills growth mindset are equipped with a vast repertoire of adaptability resources, which, in turn, makes them keener on nurturing these resources by exploring vocational possibilities and opportunities in the workplace. Further, this study showed that the effect of professional skills growth mindset on career exploration through career adaptability did not depend on the boundary condition of supervisor support. Specifically, irrespective of the level of supervisor

support, workers with a professional skills growth mindset may come to work feeling eager to stretch and grow their adaptability resources by exploring vocational options and opportunities in the workplace. Thus, one important takeaway from this study is that not all workers may attach the same importance to job resources (e.g., supervisor support), and accordingly, researchers and practitioners may need to rethink the ‘more is better assumption’ rooted within the job demands-resource model (Bakker & Demerouti, 2007) and the career resource model (Hirschi, 2012).

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Tables

Table 1

Descriptive statistics and correlations among the main study variables and control variables (N = 162)

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. Professional skills growth mindset	4.05	0.51	-						
2. Career adaptability	3.58	0.53	0.31**	-					
3. Career exploration	3.17	0.96	0.08	0.24**	-				
4. Supervisor support	3.31	0.68	0.14	0.22**	0.14	-			
5. Age	31.59	10.20	0.01	0.02	-0.25**	-0.25*	-		
6. Gender	1.40	0.54	0.02	0.08	-0.13	-0.09	0.16*	-	
7. Level of education	3.82	0.83	0.04	0.11	-0.33**	0.15	0.01	-0.05	-

Note. Mean, standard deviation, and Pearson's R correlation between all variables. * $p < 0.05$, ** $p < 0.01$. Gender was coded 1 = female, 2 = male, 3

= otherwise defined. Educational degree was coded 1 = primary school, 2 = secondary school, 3 = (technical) secondary diploma, 4 = university degree, 5 = doctorate degree, 6 = otherwise defined.

Appendix A

Assumption Checks for the Hierarchical Regression (N = 158)

To check the assumptions for the hierarchical regression, an analysis of standard residuals was carried out, which showed that the data contained no outliers (Std. Residual Min = -2.44, Std. Residual Max = 1.89). Furthermore, the data met the assumption of collinearity, indicating that multicollinearity was not a problem (professional skills growth mindset, Tolerance = .95, VIF = 1.06; career adaptability, Tolerance = .88, VIF = 1.14; supervisor support, Tolerance = .95, VIF = 1.06). A detailed collinearity diagnostic showing the Eigenvalue and condition index was reported in Table 2.

Table 2

Collinearity Diagnostics

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(constant)	Professional Skills Growth Mindset	Career Adaptability	Supervisor Support
1	1	3.949	1.000	.00	.00	.00	.00
	2	.030	11.463	.02	.06	.06	.96
	3	.014	16.921	.05	.32	.88	.00

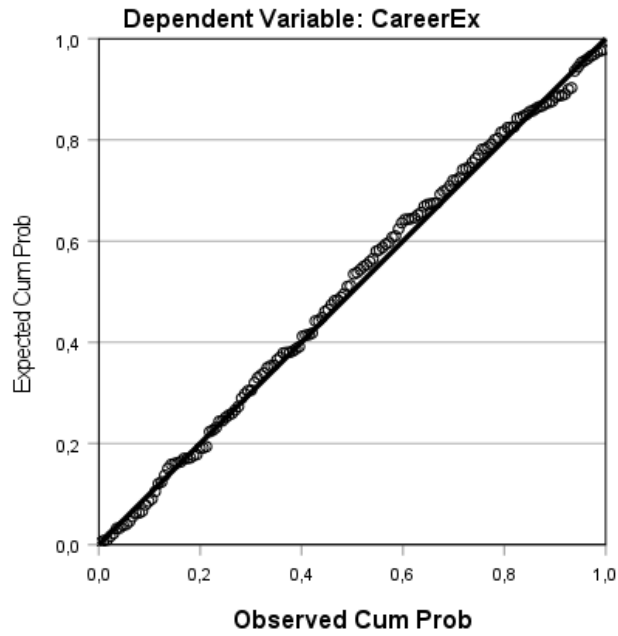
			Variance Proportions			
4	.007	23.006	.94	.62	.06	.04

a. Dependent Variable: Career Exploration

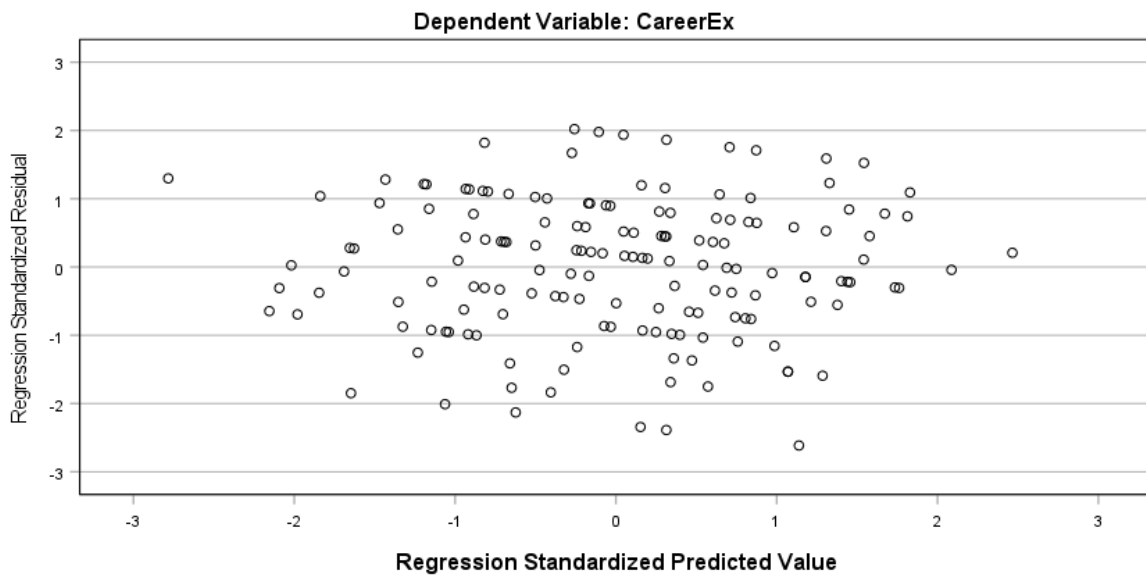
Besides that, the data met the assumption of independent errors (Durbin-Watson value = 2.11). The histogram of standardized residuals showed that the data contained approximately normally distributed errors, along with the normal P-P plot of standardized residuals, which showed points that were reasonably close to the main line (see Figure 2). Furthermore, the scatterplot of standardized predicted values showed that the data met the assumptions of homogeneity of variance and linearity (see Figure 3). Taken together, it can be concluded that all important assumptions were satisfied to perform a hierarchical regression analysis.

Figure 2

Normal P-P Plot of Regression Standardized Residual for Career Exploration (N = 158)

**Figure 3**

Scatterplot for Career Exploration (N = 158)



Assumption Checks for the Moderated Mediation (N = 162)

To check the assumptions for the moderated mediation, an analysis of standard residuals was carried out, which showed that the data contained no outliers (Std. Residual Min = -2.62, Std. Residual Max = 2.02). Furthermore, the data met the assumption of collinearity, indicating that multicollinearity was not a problem (professional skills growth mindset, Tolerance = .90, VIF = 1.11; career adaptability, Tolerance = .87, VIF = 1.15; supervisor support, Tolerance = .94, VIF = 1.06). A detailed collinearity diagnostic showing the Eigenvalue and condition index was reported in Table 2.

Table 3

Collinearity Diagnostics

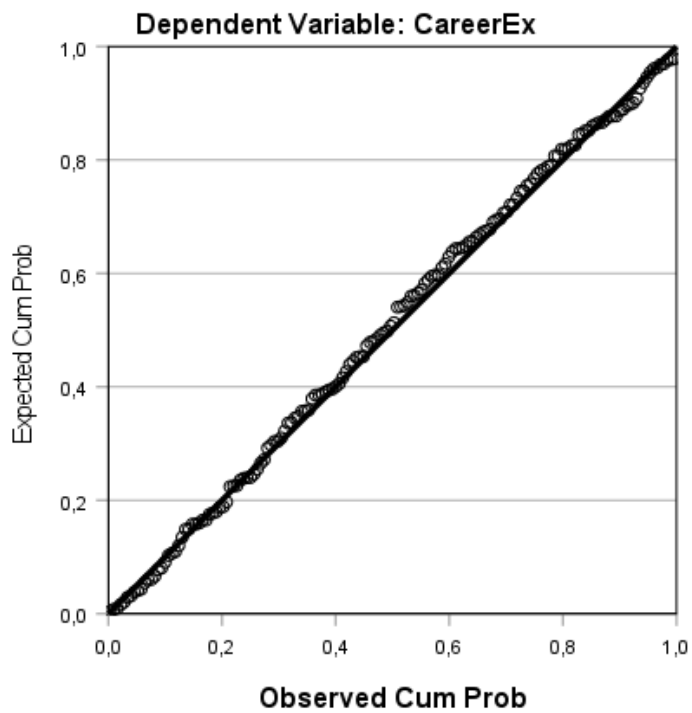
Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(constant)	Professional Skills Growth Mindset	Career Adaptability	Supervisor Support
1	1	3.950	1.000	.00	.00	.00	.00
	2	.029	11.597	.02	.06	.06	.96
	3	.013	17.107	.05	.31	.89	.00
	4	.007	23.201	.94	.63	.05	.04

b. Dependent Variable: Career Exploration

Besides that, the data met the assumption of independent errors (Durbin-Watson value = 2.07). The histogram of standardized residuals showed that the data contained approximately normally distributed errors, along with the normal P-P plot of standardized residuals, which showed points that were reasonably close to the main line (see Figure 4). Furthermore, the scatterplot of standardized predicted values showed that the data met the assumptions of homogeneity of variance and linearity (see Figure 5). Taken together, it can be concluded that all important assumptions were satisfied to perform a moderated mediation analysis.

Figure 4

Normal P-P Plot of Regression Standardized Residual for Career Exploration (N = 162)

**Figure 5**

Scatterplot for Career Exploration (N = 162)

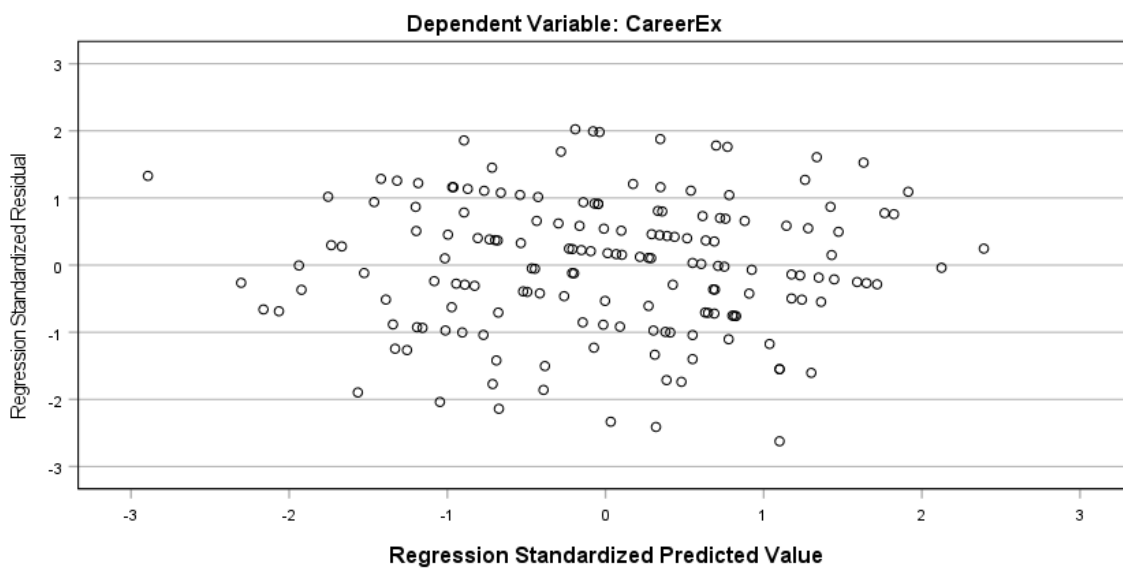


Table 4

Model summary of the three-stage hierarchical regression analysis for variables predicting career exploration (N = 158)

Step	R	R Square	Adjusted R Square	R Square Change	Std. Error of the Estimate	F(Df)
1	.421	.177	.161	.177	.88568	F(3,154) = 11.062**
2	.428	.184	.162	.006	.88518	F(1,153) = 1.172
3	.480	.230	.205	.047	.86225	F(1,152) = 9.244**

1. Predictors: (constant), age, gender, level of education

2. Predictors: (constant), age, gender, level of education, professional skills growth mindset

3. Predictors: (constant), age, gender, level of education, professional skills growth mindset, career adaptability

Note. * $p \leq .05$, ** $p \leq .001$

Table 5*Coefficient results for variables predicting career exploration (N = 158)*

Step	Predictor	B	SE	β	t
1	Constant	2.70	0.43		6.26**
	Age	-.02	.01	-.23	-3.04**
	Gender	-.19	.15	-.10	-1.28
	Level of education	.37	.08	.32	4.40**
2	Constant	2.11	0.69		3.07**
	Age	-.02	.01	-.23	-3.05**
	Gender	-.20	.15	-.19	-1.30
	Level of education	.37	.08	.32	4.36**
	Professional skills growth mindset	.15	.14	.08	1.08
3	Constant	1.31	0.72		1.86*
	Age	-.02	.01	-.23	-3.12**
	Gender	-.24	.15	-.12	-1.61

Level of education	.34	.08	.30	4.11**
Professional skills growth mindset	.02	.14	.01	0.15
Career adaptability	.41	.14	.28	3.04**

a. Dependent Variable: Career Exploration

Note. * $p \leq .05$ ** $p \leq .001$