


# Career Planning and Self-Efficacy as Predictors of Students' Career-Related Worry: Direct and Mediated Pathways

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## Abstract

The current study seeks to shed light on social-cognitive resources that mitigate master students' experience of dysfunctional career-related worry before graduation. Based on the career self-management model (CSM; [Lent & Brown, 2013](#)), we investigate concurrent and time-lagged direct and mediated relationships between career planning, career-related self-efficacy, and career-related worry among a sample of 482 students shortly before graduation. Using data collected at three time points, a negative relationship was found between career planning (T1) and career-related worry (T3) via career-related self-efficacy (T2). Our findings shed light on the role of career planning and career-related self-efficacy as malleable social-cognitive resources that diminish dysfunctional thinking before graduation in sequential order. These findings imply that career planning and career-related self-efficacy are relevant predictors of affective states and can be incorporated into the CSM.

## Keywords

career-related worry, career-related self-efficacy, career planning, master's students

The time right before graduation is an eventful period that is characterized by a high influx of career-related information that may influence students' evaluation of their career-developmental abilities and the perceived likelihood of obtaining the jobs they aspire to (e.g., [Wendlandt & Rochlen, 2008](#)). During the final years and months at university, students gather information on possible career paths and evaluate the obtained information with regard to its relevance for their job prospects in the desired area (e.g., [Praskova et al., 2015](#)). An unfavorable evaluation of the ability to secure employment after graduation may manifest itself in dysfunctional career-related

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worry about one's competence in successfully dealing with career-developmental tasks and obtaining suitable employment (Ebner et al., 2021). Dysfunctional career-related worry may tie up cognitive resources and thwart cognitive switch-off, which can lead to sleep deprivation and symptoms of anxiety (Pereira et al., 2013; Ryum et al., 2017). In addition to the negative consequences that career-related worry may have on students' health, it may also remove the cognitive resources needed for performing career-developmental tasks and lead to premature disengagement from pursuing career goals (Schwarzer, 1996). Although some insight has been accumulated on factors that promote students' emotional well-being *after* they have entered the labor market (e.g., Arnold, 1994), we still lack an understanding of the processes that predict an adaptive cognitive-emotional development right before graduation as a key phase of career preparation (Wendlandt & Rochlen, 2008).

According to the model of career self-management (CSM, Lent & Brown, 2013), learning experiences and past performance act as predictors of career-related self-efficacy, which, in turn, influences career-related outcomes. Drawing from the CSM model, the current study investigates career planning—defined as setting clear career goals and developing strategies to achieve them (Gould, 1979)—as source of career-related self-efficacy, which, in turn, is proposed to diminish students' dysfunctional career-related worry.

The current research contributes to career development theory, research, and practice in four critical ways. First, we investigate social-cognitive predictors of students' career-related worry, thus supplementing previous research that focused on the role of social-cognitive variables as resources of career success (Hirschi et al., 2018). Second, the present study addresses a gap in the CSM research pertaining to the role of career-related self-efficacy as an underlying mechanism between career planning and career-related worry during the pre-graduation phase. Third, previous research has found career planning to be negatively related to career-related worry in a cross-sectional study (Hayden & Osborn, 2020). By investigating the proposed effects using data collected at multiple time points, the current study sheds light on the time-lagged sequential effects of career planning and career-related self-efficacy on dysfunctional career-related worry. Finally, the study results may have relevant practical implications for the development of effective career development interventions that promote an emotionally healthy preparation for the transition from university to work.

## **Career Planning as a Predictor of Career-Related Worry**

Worry refers to negative affective thoughts and mental images that are perceived as being relatively uncontrollable. It represents a form of mental preoccupation with expected or feared negative outcomes (Borkovec et al., 1983). Worry is related to, but distinct from, rumination (Nolen-Hoeksema et al., 2008). While worry is future-oriented, meaning that the cognitive focus lies on situations that have not yet occurred, rumination commonly involves repetitive thinking about past events (Nolen-Hoeksema et al., 2008). Self-doubts represent a specific form of worry characterized by a proneness to self-preoccupation and harmful thoughts about one's ability to cope with challenging demands (e.g., Schwarzer, 1996). In the current study, we focus on career-related worry in terms of self-doubts regarding the ability to achieve relevant career-related outcomes, such as finding suitable employment.

Career planning, defined as the certainty one has achieved regarding career goals and the strategies to reach them (Gould, 1979), may curtail the experience of career-related worry (Arnold, 1989). According to the CSM model, setting and pursuing career goals represents one of the key elements of career self-management (Lent & Brown, 2013). Clear career goals may provide students with a sense of direction and purpose regarding their career development, thus diminishing anxious preoccupation regarding their future career. Indeed, clear career goals have

been shown to promote positive future-oriented cognitive-affective states, such as career optimism, thus likely counteracting the emergence of career-related worry (Ebner, 2021). The final months at university are an eventful period in master's students' lives during which their career outlook may change relatively quickly based on the information they obtain and the decisions they make regarding their career development. For example, doubts about making the right career choices have been shown to fluctuate on a weekly basis in a student sample (S. Hu et al., 2018a). Drawing from the CSM model and previous research findings, we propose that career planning co-occurs with lower levels of career-related worry at one point in time and limits the emergence of career-related worry at a later stage in anticipation of the graduation:

**Hypothesis 1:** Career planning negatively predicts (a) concurrent, and (b) time-lagged career-related worry.

### Career-Related Self-Efficacy as a Mediator

According to the CSM model, career-related self-efficacy acts as a mediator between learning experiences as sources of career-related self-efficacy and career outcomes (Lent & Brown, 2013). During their last months at university, students get confronted with deciding on the career goals they want to pursue after graduation and developing initial strategies to obtain them. The societal pressure to decide on a specific career path becomes particularly prevalent as graduation gets closer (Arnold, 1989). In this sense, having developed clear career goals and strategies to achieve them represents a mastery experience that boosts students' career-related self-efficacy as it signals the fulfillment of a relevant developmental task and is instrumental to the achievement of career success (Bandura, 1997; Lent et al., 2002). Indeed, career planning has been linked to career-related self-efficacy cross-sectionally (e.g., Monteiro et al., 2021). Additionally, career planning has been shown to predict job search self-efficacy among employed and unemployed job seekers over time (Saks et al., 2015). Accordingly, we suggest that career planning acts as a source of career-related self-efficacy in terms of the CSM model (Lent & Brown, 2013).

Career-related self-efficacy, in turn, may diminish levels of dysfunctional career-related worry. Individuals who trust in their abilities to master difficult situations are more likely to experience stressful situations as challenging rather than threatening, and thus are better able to regulate affective responses to stressors (Jerusalem & Mittag, 1995; Lent, 2004; Lent & Brown, 2013). In addition, people who believe they can successfully perform challenging tasks are protected from dwelling on disturbing thoughts about their lack of abilities in the respective domain (Bandura, 2000). According to the CSM model, career-related self-efficacy influences career outcomes, such as diminished career distress, both directly and indirectly, through active career development (e.g., career exploration). In the current research, we focus on career-related self-efficacy as a predictor of well-being in terms of career-related worry. Career self-efficacy was shown to influence career stress one week later in a student sample (S. Hu et al., 2018b). To account for the fluctuating attitudinal and emotional processes during the pre-graduation phase, we employed a time lag of two weeks between the assessments of T1 career planning, T2 career-related self-efficacy, and T3 career-related worry to capture relevant effects in a fast-changing context, such as the pre-transition period. Accordingly, we propose the following hypothesis:

**Hypothesis 2:** The time-lagged effect of T1 career planning on T3 career-related worry is mediated by T2 career-related self-efficacy.

## Method

### *Procedure and Participants*

We commissioned a professional research-focused panel company, Prolific, to recruit a sample of master's students. Research has shown that data obtained from Prolific are of high quality compared to data collected from other panel companies (e.g., MTurk) and university subject pools (Peer et al., 2017; see also Palan & Schitter, 2018). The study participants were reimbursed 1.50 GBP per 10 minutes of completing the questionnaires. The study was approved by the ethical committee of the University of Groningen (Faculty of Behavioural and Social Sciences). The data for the three waves were collected in June and in July 2020, with a time lag of 2 weeks between the waves. Before participating in the T1 assessment, the participants filled in a baseline questionnaire that asked them about their graduation intention and demographic information. To ensure that all the master's students who participated in the survey were about to graduate soon, we only invited students to take the T1 questionnaire who indicated that they intended to graduate the same year the assessment took place to complete the T1 questionnaire. Because the intention to graduate the same year may not always be a direct indicator of the actual graduation date, we additionally asked students to state the probability of graduating the same year. We invited students who estimated their probabilities of graduating the same year to be larger than 60% to take the T1 survey. Overall, 490 participants provided data at T1. Of those, 470 took part at T2 (response rate = 95.9%), and 458 took part at T3 (response rate = 93.5%). Careless responding in panel studies may cause severe reliability and validity issues. Thus, we followed recent recommendations to detect and remove careless responses from the sample (Dunn et al., 2018; Goldammer et al., 2020; Ward & Meade, 2018). First, we calculated the intra-individual response variability (IRV) index as the standard deviation of a set of consecutive item responses for an individual. A low IRV index indicates low variability in the given responses—an indicator of careless responding. Past research points out the high validity of the IRV index as an indicator of careless responding compared to other measures, such as bogus questions (Dunn et al., 2018). We removed two records from T1, four from T2, and three from T3 with an IRV index smaller than two standard deviations below the mean IRV (Dunn et al., 2018). Second, we excluded one participant from T1, five from T2, and 14 from T3 with response times below 2 seconds per item (Goldammer et al., 2020; Ward & Meade, 2018). Finally, we excluded five multivariate outliers from T1, nine from T2, and 12 from T3 ( $p < .001$  for Mahalanobis  $D^2$ ). The final sample is comprised of 482 participants at T1, 452 at T2, and 429 at T3. Since the hypotheses test results did not change with careless responders included, we exclusively report findings for a sample with careless responses removed.

Students came from multiple countries, with most living in the United Kingdom ( $n = 154$ , 32.0%), the United States ( $n = 56$ , 11.6%), Portugal ( $n = 55$ , 11.4%), and Italy ( $n = 48$ , 10.0%). Most participants were female ( $n = 266$ , 55.2%), 214 were male (44.4%), and two participants indicated to be otherwise defined (0.4%). Sample mean age was 25.6 years ( $SD = 5.4$ ). We found no significant mean differences with regard to career-related self-efficacy and career-related worry between the students included in our main analyses and those who stopped participating in later waves. However, those included in the analyses scored significantly higher on career planning than non-responders ( $t(40.99) = 2.86$ ,  $p = .007$ ).

### *Measures*

**Career Planning.** We used six items developed by Gould (1979) to measure career planning at T1 and T3. The scale assesses whether students have clear career plans and strategies to achieve them (e.g., "I have a plan for my career"). The scale has repeatedly been used to measure the

achievement of clear career goals in student samples (e.g., [Renn et al., 2014](#)). The results of two meta-analyses suggest career planning, as measured with [Gould's \(1979\)](#) scale, to be positively related to career satisfaction ([Ng et al., 2005](#)) and protean career orientation ([Wiernik & Kostal, 2019](#)). The respondents indicated how much they agreed with each statement on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Cronbach's alpha was 0.87 (T1 and T3).

*Career-Related Self-Efficacy.* We used [Hirschi et al.'s \(2018\)](#) career confidence scale to measure career-related self-efficacy at T2. Career confidence captures the belief that one is capable of successfully developing one's career. One example item is "When I set goals for my career, I am confident that I can achieve them." The scale has been shown to possess good internal consistency, and high convergent and criterion validity. For example, it was shown to correlate moderately with more general assessments of career self-efficacy, such as references to learning on the job, advancement in the current company, or career self-reliance, and it was shown to be highly related to career satisfaction ([Hirschi et al., 2018](#)). The response categories range from 1 (not true at all) to 5 (completely true). Cronbach's alpha was 0.90.

*Career-Related Worry.* We adapted three items of Penn State Worry Domains Questionnaire (WDQ, [Tallis et al., 1992](#)) to measure students' career-related worry at T1 and T3. We chose three items that have been shown to load on the Aimless Future subscale ([van Rijsoort et al., 1999](#)). The Aimless Future items of the WDQ have been shown to explain more variance in students' life satisfaction than the other WDQ subscales ([Paolini et al., 2006](#)). The three chosen items were adapted to represent students' mental preoccupation with expected or feared negative outcomes concerning their future careers. Because we were interested in how students' career-related worry developed over the 2 weeks following their assessment of career planning and career-related self-efficacy, we introduced the scale with "Over the course of the past 2 weeks, I worried that...". The three items are "my future job prospects are not good," "I will never achieve my occupational ambitions," and "I do not work hard enough to find a job." Answers were given on a four-point scale ranging from 1 (not at all) to 4 (very much). Cronbach's alphas were 0.72 (T1) and 0.75 (T3).

*Control Variables.* We controlled for students' age and gender because they have been shown to relate to feelings of worry, we controlled for students' age and gender (e.g., [Brown et al., 2006](#); [McCann et al., 1991](#)). In addition, the COVID-19 crisis may have had an impact on the worries of students shortly before graduation (e.g., [Dhar et al., 2020](#)). Accordingly, we controlled for the perceived influence of the current COVID-19 crisis on students' future job prospects. Specifically, we asked them: "To what extent are your future job prospects affected by the consequences of the Corona crisis?". Answers were given on a slider rating scale ranging from 1 to 100. Last, as master's students' level of career-related worry may be influenced by their success in securing employment after graduation, we controlled for job status measured at T1 (i.e., "Have you already found employment for the time after your graduation?").

## Data Analysis

All data analyses were conducted with *R* ([R Core Team, 2019](#)), using the *lavaan* package ([Rosseel, 2012](#)). We used maximum likelihood estimation with robust standard errors to estimate the structural equation models. To handle missing data, the parameters were estimated using full information maximum likelihood (FIML). First, we conducted confirmatory factor analysis to examine the appropriateness of the measurement model. Model fit was accepted as good for comparative fit index (CFI) values close to or exceeding 0.95, root mean square error of approximation (RMSEA) values close to 0.06 or below, and standardized root mean square residual

(SRMR) values close to 0.08 or below (L. Hu & Bentler, 1999; Little, 2013). Next, we examined measurement invariance of career planning and career-related worry. We tested configural (i.e., same factorial structure over time), weak (i.e., factor loadings constrained to be equal over time), and strong (i.e., factor loadings and intercepts constrained to be equal) measurement invariance of our focal variables (Little, 2013). If strong factorial invariance holds, career planning and career-related worry are comparable across the two measurement occasions (Little, 2013). We considered changes  $<0.010$  in CFI,  $<0.015$  in RMSEA, and  $<0.030$  in SRMR ( $<0.010$  for the test of strong factorial invariance) as indicators of a negligible deviations from perfect invariance (Chen, 2007). We used structural equation modeling to examine the concurrent and lagged effects of career planning on career-related worry. Previous research has proposed career-related worry to complicate information processing and to increase planning decision-making confusion and commitment anxiety (Hayden & Osborn, 2020), suggesting negative effects of career-related worry on career planning (rather than vice versa). Accordingly, we conducted our analyses of lagged effects in multiple steps to clarify directionality. First, we included only paths from T1 career planning and T1 career-related worry to their corresponding variable at T3. This model only estimates the stability of the constructs over time (i.e., auto-regressive effects). Second, we tested our theoretical model with paths from T1 career planning leading to T3 career-related worry. Third, we tested a reciprocal model by adding paths from T1 career-related worry to T3 career planning. We compared the nested model using the chi-squared difference test. The measurement error of each item at T1 was allowed to covary with the corresponding item measurement error at T3 (Cole & Maxwell, 2003). Fourth, we tested the proposed mediation model of the effect of T1 career planning on T3 career-related worry mediated through T2 career-related self-efficacy. Following recommendations by Podsakoff et al. (2003), 10,000 bootstrap samples were created to calculate the estimate for the indirect effect and its 95% confidence interval.

## Results

Table 1 shows means, standard deviations, and zero-order correlations among the study variables.

**Table 1.** Means, Standard Deviations, and Correlations Among Model Variables.

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. T1 Planning	3.36	0.83								
2. T1 Worry	2.27	0.82	−0.38							
3. T2 CRSE	3.89	0.74	0.46	−0.41						
4. T3 Planning	3.45	0.80	0.78	−0.36	0.51					
5. T3 Worry	2.20	0.78	−0.40	0.55	−0.44	−0.45				
6. Age	25.57	5.43	0.03	−0.07	0.02	0.01	−0.01			
7. Gender	1.55	0.51	0.06	0.10	−0.04	0.03	0.08	−0.05		
8. Covid influence	56.57	28.52	−0.10	0.35	−0.14	−0.12	0.27	0.03	0.08	
9. Job status	1.27	0.44	0.17	−0.37	0.22	0.16	−0.24	0.20	−0.06	−0.33

Note. *N* = 401–482 (pairwise deletion). CRSE = career-related self-efficacy; Covid influence = perceived influence of Covid-19 crisis on job prospects. Categories for gender: 1 = male, 2 = female; Categories for job status: 1 = no job found yet, 2 = job found.

All correlations  $\geq |.09|$  were significant at  $p < .05$ .



## Measurement Model and Measurement Invariance

Confirmatory factor analyses were conducted to demonstrate that the study variables differ from each other across all measurement occasions. A three-factor-model (with career planning, career-related self-efficacy, and career-related worry) yielded a slightly unsatisfactory fit to the T1 data ( $\chi^2 = 283.10$ ,  $df = 62$ ,  $p < .001$ , CFI = 0.926, RMSEA = 0.086, and SRMR = 0.050). The modification indices suggested that model fit would be improved if error terms of the reverse-coded items of the career planning scale were allowed to correlate. As indicated by Zhang et al. (2016), negatively worded items may distort overall model fit without representing a separate factor. After including correlations between the three negatively worded items of the career planning scale, the measurement model fitted the data well at T1 ( $\chi^2 = 128.91$ ,  $df = 59$ ,  $p < .001$ , CFI = 0.977, RMSEA = 0.050, and SRMR = 0.039), T2 ( $\chi^2 = 114.99$ ,  $df = 59$ ,  $p < .001$ , CFI = 0.984, RMSEA = 0.046, and SRMR = 0.044), and T3 ( $\chi^2 = 103.78$ ,  $df = 59$ ,  $p < .001$ , CFI = 0.985, RMSEA = 0.043, and SRMR = 0.034). The model fitted the data better than other more parsimonious ones, such as those with career planning and career-related self-efficacy loading on one factor (at T1:  $\chi^2 = 626.23$ ,  $df = 61$ ,  $p < .001$ , CFI = 0.810, RMSEA = 0.139, and SRMR = 0.086) or career-related self-efficacy and career-related worry loading on one factor (at T1:  $\chi^2 = 318.30$ ,  $df = 61$ ,  $p < .001$ , CFI = 0.914, RMSEA = 0.094, and SRMR = 0.061). This shows that the variables included in our analyses are empirically distinct from each other. The results of measurement invariance tests for career planning and career-related worry across T1 and T3 are shown in Table 2. Change in fit measures was  $<0.003$  for CFI,  $<0.003$  for RMSEA, and  $<0.003$  for SRMR. Accordingly, we conclude that the measurements of career planning and career-related worry were invariant over time.

## Hypotheses Tests

*Career Planning as a Predictor of Concurrent and Time-Lagged Career-Related Worry.* The structural equation analysis models performed to test the proposed model of career planning predicting career-related worry revealed a good fit for the prediction of T1 career-related worry ( $\chi^2 = 160.40$ ,  $df = 55$ ,  $p < .001$ , CFI = 0.949, RMSEA = 0.063, SRMR = 0.063) and T3 career-related worry ( $\chi^2 = 433.489$ ,  $df = 187$ ,  $p < .001$ , CFI = 0.947, RMSEA = 0.052, SRMR = 0.059). The model with a cross-lagged path leading from T1 career planning to T3 career-related worry fitted the data better than a mere stability model ( $\chi^2 = 449.289$ ,  $df = 188$ ,  $p < .001$ , CFI = .943, RMSEA = 0.054, SRMR = 0.067;  $\Delta\chi^2(\Delta df) = 17.198(1)$ ,  $p < .001$ ). Finally, we added reciprocal paths leading from T1 career-related worry to T3 career planning. The model with reciprocal paths did not reveal a better fit to the data than the theorized unidirectional path model ( $\chi^2 = 433.112$ ,  $df = 186$ ,  $p < .001$ , CFI = 0.947, RMSEA = 0.053, SRMR = 0.058;  $\Delta\chi^2(\Delta df) = 0.339(1)$ ,  $p = 0.561$ ). Accordingly, we

**Table 2.** Results of Measurement Invariance Tests for Career Planning and Career-Related Worry Across T1 and T3.

Invariance Test	$\chi^2$ (df)	CFI	RMSEA (90% CI)	SRMR	$\Delta\chi^2$	$\Delta$ CFI	$\Delta$ RMSEA	$\Delta$ SRMR
Configural	284.624 (112)	0.961	0.057 (0.048–0.065)	0.060	—	—	—	—
Weak	294.398 (119)	0.961	0.055 (0.047–0.063)	0.062	9.774 (7)	0.000	0.002	0.002
Strong	306.137 (126)	0.960	0.054 (0.047–0.062)	0.063	11.739 (7)	0.001	0.001	0.001

Note.  $N = 482$ . CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual;  $\Delta$  = change in.

selected the unidirectional model as the best fitting and most parsimonious model. An overview of the parameter estimates is shown in Table 3. Comparisons of models without control variables did not yield substantially different results—the theorized unidirectional model remained the best fitting model. All effects were in the expected direction. As can be seen from Table 3, T1 career planning negatively predicted both concurrent and time-lagged levels of career-related worry, after controlling for T1 career-related worry and control variables, supporting Hypothesis 1a and 1b.

**T2 Career-Related Self-Efficacy as a Mediator of the Effect of T1 Career Planning on T3 Career-Related Worry.** As none of the control variables predicted T3 career-related worry in the model examining lagged effects and the results did not differ substantially from a model with control variables included, we report the mediation model results without control variables added. The structural equation analysis specified to test the mediation model fitted the data well ( $\chi^2 = 175.402$ ,  $df = 98$ ,  $p < .001$ , CFI = 0.979, RMSEA = 0.040, SRMR = 0.060). An overview of the parameter estimates of the mediation model is shown in Table 4. T1 worry predicted T3 worry ( $\beta = .52$ ,  $p < .001$ ). Moreover, the path between T1 career planning and T2 career-related self-efficacy was significant ( $\beta = 0.55$ ,  $p < .001$ ), as was the path between T2 career-related self-efficacy and T3 career-related worry ( $\beta = -0.25$ ,  $p < .001$ ). The indirect effect was computed using 10,000 bootstrapped samples. The 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped unstandardized indirect effect was  $-0.14$  (95% CI  $[-0.21, -0.07]$ ). Accordingly, we conclude that the effect of T1 career planning on T3 career-related worry was mediated by T2 career-related self-efficacy, supporting Hypothesis 2.<sup>1</sup>

## Discussion

The goal of the current research was to examine the role of career planning, in terms of having set clear goals and strategies to achieve them, as a predictor of concurrent and time-lagged career-related worry. Additionally, based on the CSM model (Lent & Brown, 2013), we examined the role of career-related self-efficacy as a mediating mechanism in the lagged relationship. To be able

**Table 3.** Parameter Estimates of the Direct Effect of T1 Career Planning on T1 and T3 career-related worry.

Predictor	B	SE	p	95% CI [LL; UL]	$\beta$
Outcome variable: T1 career-related worry					
T1 Planning	−0.41	0.06	<0.001	[−0.516; −0.296]	−0.35
Age	0.01	0.01	0.622	[−0.016; 0.010]	−0.02
Gender	0.15	0.07	0.048	[0.002; 0.291]	0.09
Covid infl.	0.01	<0.01	<0.001	[0.006; 0.012]	0.32
Job status	−0.44	0.09	<0.001	[−0.623; −0.261]	−0.24
Outcome variable: T3 career-related worry					
T1 Worry	0.50	0.07	<0.001	[0.366; 0.642]	0.52
T1 Planning	−0.23	0.06	<0.001	[−0.359; −0.110]	−0.22
Age	0.00	0.01	0.906	[−0.011; 0.010]	−0.01
Gender	0.04	0.06	0.517	[−0.079; 0.156]	0.03
Covid infl.	<0.01	<0.01	0.236	[−0.001; 0.004]	0.06
Job status	−0.03	0.09	0.749	[−0.203; 0.146]	−0.02

Note.  $N = 482$ .  $B$  = unstandardized estimate;  $SE$  = standard error;  $CI$  = confidence interval;  $LL$  = lower limit;  $UL$  = upper limit;  $\beta$  = standardized estimate; Covid infl. = perceived influence of Covid-19 crisis on job prospects. Categories for gender: 1 = male, 2 = female; Categories for job status: 1 = no job found yet, 2 = job found.



**Table 4.** Parameter estimates of the effect of T1 career planning on T3 career-related worry, mediated through T2 career-related self-efficacy.

Paths	B	SE	p	95% Boot-CI [LL; UL]	$\beta$
<b>Direct effects</b>					
T1 Worry → T3 Worry	0.49	0.06	<.001	[0.374; 0.607]	0.52
T1 Planning → T2 CRSE	0.51	0.06	<.001	[0.404; 0.619]	0.55
T2 CRSE → T3 Worry	−0.27	0.07	<.001	[−0.403; −0.145]	−0.25
T1 Planning → T3 Worry	−0.11	0.06	.076	[−0.237; 0.012]	−0.11
<b>Indirect effect</b>					
T1 Planning → T2 CRSE → T3 Worry	−0.14	0.04	<.001	[−0.211; −0.069]	−0.14
<b>Total effect</b>	−0.25	0.06	<.001	[−0.369; −0.136]	−0.25

Note.  $N = 482$ . B = unstandardized estimate; SE = standard error; Boot-CI = bootstrap confidence interval (10,000 samples); LL = lower limit; UL = upper limit;  $\beta$  = standardized estimate; CRSE = career-related self-efficacy.

to derive implications regarding the predictors of students' worry shortly before the transition from university to work, master's students who indicated an intention to graduate over the next six to 7 months were invited to participate in the study. The results of the main effects of career planning on both concurrent and time-lagged career-related worry suggest that students who have a fixed plan for their careers at one point in time engage less in dysfunctional worry about their future occupation at the same time point and 4 weeks later in anticipation of their graduations. A test of reciprocal effects (i.e., worry as a time-lagged predictor of career planning) did not yield a better model fit than the more parsimonious hypothesized model, lending support for the suggested direction of effects over time (cf. [Hayden & Osborn, 2020](#)). Finally, the results of our path model show that the time-lagged effect of career planning on career-related worry was mediated through career-related self-efficacy.

### Theoretical Implications

The findings of the current research align with yet offer opportunities to extend the CSM. According to the CSM model, career-related self-efficacy represents a relevant mediator between learning experiences as sources of career-related self-efficacy and career outcomes ([Lent & Brown, 2013](#)). In line with CSM, we found support for the role of career-related self-efficacy as a mediator between career planning as a source of career-related self-efficacy and career-related worry as a relevant career outcome. However, while learning or mastery experiences are considered as sources of career-related self-efficacy, the role of career planning as a predictor of career-related self-efficacy has not been formally included in the CSM model ([Lent & Brown, 2013](#)). The findings of the current research align with previous empirical results showing that career planning may predict job search self-efficacy among employed and unemployed job seekers over time ([Saks et al., 2015](#)). Accordingly, we suggest adding career planning and career-related self-efficacy as sequentially operating predictors of career-related affective states to the CSM model.

The CSM model and related research put a strong focus on career decidedness and decision-making difficulties as career outcome variables (see [Kleine et al., 2021](#); [Lent & Brown, 2013](#)), resulting in a neglect of career-related well-being in the CSM model. In contrast, the unifying theoretical perspective on career-specific well-being ([Lent, 2004](#)) emphasizes the role of career-related self-efficacy as a predictor of domain-specific (i.e., career-related) well-being. Career-related worry is not necessarily related to the decision-making process. Instead, it represents an

overall pessimistic attitude toward one's occupational future that may inhibit relevant career-preparatory actions and diminish students' emotional health (e.g., [Brosschot & Thayer, 2004](#); [Ryum et al., 2017](#); [Schwarzer, 1996](#)). Our findings resonate with the predictions of the domain-specific well-being model ([Lent, 2004](#)) and suggest considering career-related worry as an outcome of career-related social-cognitive processes in the CSM model.

Finally, our research findings suggest considering the influence of contextual characteristics on the timing and sequence of effects in CSM research. We chose a relatively short time lag of 2 weeks between the measurement points because the time shortly before graduation is a dynamic context characterized by rapid change ([Perrone & Vickers, 2003](#); [Wendlandt & Rochlen, 2008](#)). The lagged effects of career planning on career-related worry through career-related self-efficacy suggest that the developmental task of deciding on a specific career path may be particularly relevant during the critical phase shortly before graduation, thus quickly unfolding its effects on career-related worry through career-related self-efficacy. Our research findings resonate with [Super's \(1980\)](#) career development model according to which certain roles and associated demands fluctuate in importance across different life stages. The future development of the CSM model may benefit from considering the effect of context on the dynamics of social-cognitive processes and their sequential effects on affective states.

### *Strengths, Limitations, and Recommendations for Future Research*

Our research has several strengths. To begin with, this is the first study that has identified career planning and self-efficacy as sequentially operating social-cognitive predictors of students' career-related worry before graduation, thus offering opportunities for the further development of the CSM model. We tested the proposed model in a sample of master's students and ensured that the processes under investigation took place shortly before graduation, allowing us to zoom in on the processes relevant to students' career-related affective states during the key phase of career preparation. Moreover, our longitudinal research design allowed us to examine mediating processes and mitigate the effects of common method bias ([Podsakoff et al., 2003](#)). Finally, we compared the fit of the theoretical model with a less restricted model that included reciprocal paths leading from career-related worry to career planning (cf. [Hayden & Osborn, 2020](#)), thus providing additional support for the proposed direction of effects.

However, the findings of our study should also be viewed in light of some limitations. First, the results of mean comparisons revealed that our sample scored higher on career planning than those individuals who dropped out. It seems like students who have obtained more clarity regarding their career goals were more likely to take follow-up questionnaires, thus possibly limiting the generalizability of our findings due to self-selection bias.

Second, the findings of our study have to be viewed against the context in which they were studied. That is, having clear career goals signals the achievement of a critical developmental task during the final period at university ([Arnold, 1989](#)). Future studies may apply the proposed research model across critical career-related contexts of the working lifespan, such as the transition from job loss to reemployment, to provide insight into the generalizability of the reported findings. Related to this, applying alternative time lags may further enhance an understanding of the temporal dynamics of the proposed effects. For example, daily diary studies may detect dynamic change occurring over shorter periods of one to several days. Such research designs are particularly fruitful when studying dynamic processes in life periods characterized by rapid change.

Finally, as pointed out by [Lent and Brown \(2020\)](#), it is doubtful whether clear career goals provide longer-term benefits if choices are based on heuristic thinking rather than active career exploration ([Lent & Brown, 2020](#)). While the CSM model suggests a direct effect of career-related self-efficacy on career outcomes, [Lent and Brown \(2013\)](#) propose active career development (e.g.,

career exploration) as an additional mediating mechanism through which careers self-efficacy unfolds its effects on career outcomes. Accordingly, future research may explore career exploration and development as potential mediating mechanisms that explain the beneficial effects of career self-efficacy on affective career outcomes, in line with the CSM model (Kleine et al., 2021; Lent & Brown, 2013).

### Practical Implications

The findings of the current study suggest that career planning affects career-related worry both at one point in time and over time. The lagged relationship is mediated through career-related self-efficacy. Accordingly, to foster mental health during the pre-graduation phase, students and career counselors should focus on increasing students' perceived career-related self-efficacy and career planning, for example, through career choice interventions (for a meta-analysis, see Whiston et al., 2017). As shown by Raabe et al. (2007), clear career plans may initiate positive career self-management processes. Our findings suggest that career choice and development interventions targeted toward enhancing students' career planning may be effective in unfolding positive effects on self-efficacy beliefs and diminish dysfunctional career-related worry shortly before graduation.

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### Supplemental Material

Supplemental material for this article is available online.

### Note

1. We conducted an additional study in which we examined the proposed paths using general self-efficacy instead of career-related self-efficacy. Because social-cognitive career theories suggest career-related self-efficacy to be adequately captured against the context in which it is studied (e.g., Betz & Hackett, 2006; Lent & Brown, 2013), we did not include the study in the manuscript. However, as the study findings may add to the understanding of the relevance of career planning and general self-efficacy for students' career-related worry, we added the study as [supplemental material](#) to the open science framework (osf), accessible via the following link: [https://osf.io/gyzrk/?view\\_only=d51c0affce4949f89022e62d60c3a597](https://osf.io/gyzrk/?view_only=d51c0affce4949f89022e62d60c3a597).

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