Flexible Goal Tasking: The Moderating Role of Cognitive Flexibility in the Link Between Unfinished Tasks and Affective Rumination

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Abstract

Unfinished tasks have been identified as a work-related stressor that is linked to *affective rumination* – persistent and intruding occurrences of repetitive, work-related thoughts that are consistently accompanied by negative affective experiences. Although research on the link between unfinished tasks and affective rumination has accumulated, empirical evidence on the contingencies underlying this association remains limited. In this study, we set out to address this gap and examine the role of *cognitive flexibility*. Cognitive flexibility refers to alternative thinking and adaptive behavior when confronted with stressors. Unfinished tasks may be perceived as an aversive goal discrepancy, which individuals with higher cognitive flexibility may manage more adaptively, thereby diminishing AR. We conducted a cross-sectional online survey of 98 working adults from diverse nationalities and professions with validated measurement scales. Using multiple regression analysis, we replicated the positive association between unfinished tasks and affective rumination. However, we did not obtain evidence that cognitive flexibility moderates the relationship. An exploratory analysis indicated that cognitive flexibility weakened the association for respondents in English and strengthened it for respondents in Dutch. We contributed to the literature by establishing the association between unfinished tasks and affective rumination in a more demographically diverse sample than in previous studies and by being one of the first to examine the role of cognitive flexibility in relation to job stressors.

Keywords: unfinished tasks, affective rumination, cognitive flexibility

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Declining birthrates and changing societal norms are contributing to a growing shortage of skilled workers across occupations in Europe, potentially increasing the workload for existing employees (Börschlein et al., 2024; European Labour Authority, 2024; Open University, 2022). Given that individual capacities are limited, a growing number of employees are likely to finish their workday with important tasks remaining incomplete (Smit, 2016). Recent surveys show a steady increase in experienced work strain, driven by psychological demands, which is a cause for concern (Myers et al., 2019; Rigó et al., 2020). *Unfinished tasks* (UT) may cause work to remain mentally present in employees' leisure time, disrupting the recovery processes necessary to successfully unwind from one's work, thereby negatively affecting employees' recharging of mental resources and well-being (Sonnentag & Fritz, 2015; Wendsche et al., 2021).

Indeed, several studies have established UT as a significant work stressor affecting employees even for several days after having left work (Syrek et al., 2017; Weigelt et al., 2019). UT are defined as "tasks that employees aimed to finish (or make certain progress), but which were left undone (or left in an unsatisfactory state) when the employee stopped working" (Syrek et al., 2017, pp. 7-8). As such, they were found to be negatively linked to sleep quality (Syrek & Antoni, 2014; Syrek et al., 2017), affective well-being (Gabriel et al., 2011; Peifer et al., 2019) and positively to work-related rumination (Syrek et al., 2017; Weigelt & Syrek, 2017; Weigelt et al., 2019).

There is a common theme that UT are associated with problems switching off from work. An outcome that has attracted considerable research attention is *affective rumination* (AR). AR constitutes a negative well-being outcome characterized by persistent and intruding occurrences of repetitive, work-related thoughts that are consistently accompanied by

negative affective experiences (Cropley & Zijlstra, 2011). Frequent AR may lead to severe downstream negative well-being outcomes for employees (e.g., Pauli et al., 2023; Weigelt et al., 2023). Notably, research has shown a robust association between UT and AR at both the within- and between-person levels of analysis (Syrek et al., 2017; Uhlig et al., 2023; Weigelt et al., 2019; Weiher et al., 2022).

Whereas the relationship between UT and AR is well-established, the exploration of potential moderators remains rare. However, searching for moderators is a necessary endeavor to lay the scientific groundwork for the development of interventions. *Cognitive flexibility* (CF) may be a promising moderator of the association between UT and AR. CF is characterized by alternative thinking and adaptive behavior in confrontation with difficult situations (Dennis & Vander Wal, 2010). According to the goal-progress theory of rumination, AR results from a perceived discrepancy between an individual's goal and the progress towards achieving it (Martin & Tesser, 1996). Individuals high in cognitive flexibility may be better equipped to manage this discrepancy adaptively when confronted with UT, thereby weakening the association between UT and AR.

Drawing on this rationale, we examined the role of CF in the link between UT and AR empirically with a cross-sectional survey of working adults. The current study aims to contribute to the literature in two ways. Firstly, we aim to replicate the association between UT and AR. Secondly, amid the limited research on boundary conditions in the association between UT and AR, we assess CF as an individual difference variable that may weaken the link between UT and AR.

The link between unfinished tasks and affective rumination

Rumination is defined as "a class of conscious thoughts that revolve around a common instrumental theme and that recur in the absence of immediate environmental demands requiring the thoughts" (Martin & Tesser, 1996, p. 7). As such, rumination was

linked in clinical psychology to depression, anxiety and substance abuse disorders as well as negative affect (Nolen-Hoeksema et al., 2008; Mor & Daches, 2015; Olatunji et al., 2013).

More recently, the concept of rumination has been adapted to the context of work. Cropley and Zijlstra (2011, p. 6) define work-related rumination as "thoughts directed to issues relating to work, that is/are repetitive in nature". They differentiate between three types of work-related rumination, which are detachment, problem-solving pondering and AR. While detachment may be reflected by the absence of work-related thoughts and activity (Sonnentag, 2012), problem solving pondering describes the active cognitive and solution- or improvement-oriented engagement with a work-related problem (Cropley & Zijlstra, 2011). However, the most detrimental form of work-related rumination may be AR, which is characterized by continuous, intruding and repetitive thoughts that, contrary to detachment and problem-solving pondering, are of clear and continuous negative valence (Cropley & Zijlstra, 2011; Pauli et al., 2023; Weigelt et al., 2019). Given the prolonged, negative affective experience inherent to AR, it constitutes a negative well-being outcome in its own right. However, AR may also disrupt employees' recovery processes in their off-job time, potentially leading to negative downstream well-being outcomes (Blanco-Encomienda et al., 2020; Sonnentag & Fritz, 2015). For instance, Weigelt et al. (2023) have shown strong correlations between AR and both burnout symptoms and psychosomatic complaints.

An early explanation for the link between UT and AR has been the Zeigarnik effect (Zeigarnik, 1927, 1938). The Zeigarnik effect states that UT create mental tension that causes the UT and associated information in memory to be more accessible for the individual compared to a finished task (Zeigarnik, 1927, 1938). More recently, Martin and Tesser (1996, 2006) developed the goal-progress theory of rumination which has previously been used in the literature to illuminate the process underlying the association between UT and AR (e.g., Noja et al., 2025; Syrek et al., 2017; Weiher et al., 2022). The theory states that rumination

stems from unattained, individual goals or unanticipated lack of progress towards them. Rumination serves to keep the goal and related information mentally accessible, that is, to steer an individual towards further goal progress (Martin & Tesser, 1996, 2006). Specifically, employees may be naturally motivated to finish their tasks at work. UT may be experienced as an aversive goal discrepancy, causing employees to engage in AR about this discrepancy.

Notably, there is robust empirical evidence for the association between UT and AR at the between- and within-level of analysis (Syrek et al., 2017; Uhlig et al., 2023; Weigelt et al., 2019; Weiher et al., 2022). Moreover, AR was shown to mediate negative effects of UT on sleep (Syrek et al., 2017) and vitality (Weiher et al., 2022). Considering the clearly negative consequences associated with AR and its well-established relationship with UT, we focus on AR as our focal outcome variable. Given the previously laid out theoretical arguments and empirical evidence we propose the following hypothesis:

Hypothesis 1: Unfinished tasks are positively related to affective rumination.

The moderating role of cognitive flexibility

According to Martin and Tesser (1996, 2006), AR would cease if the goal was attained, abandoned or substituted by alternative means. However, resuming progress towards UT in one's off-job time may naturally not be desirable for employees that want to detach from work in their free time. Consequently, employees would have to either abandon their goal of completing their UT or temporarily disengage from it to pursue alternative goals that could serve as substitutes to diminish AR or prevent it from arising (Martin & Tesser, 1996, 2006). CF – the ability to change one's cognitive set in adaptation to the environment - may facilitate both ways of responding to UT (Dennis & Vander Wal, 2010).

The literature has used CF synonymously with constructs such as attentional set-shifting and task switching (Dajani & Uddin, 2015). However, there is currently no consensus about a unified definition or approach to measure the construct (Dennis & Vander Wal, 2010;

Ionescu, 2012). In the past, CF was investigated by time-consuming neurocognitive tests such as the Stroop Color Test (Jaén et al., 2024). However, recently developed self-report measures, such as the Cognitive Flexibility Inventory (CFI), provide more time-efficient administration, making them suitable for applied research with larger sample sizes (Dennis & Vander Wal, 2010). Dennis and Vander Wal (2010) developed the CFI to assess the elements of cognitive flexibility that facilitate adaptive thinking in the face of stressful life events, with the scores showing some intra individual, trait like stability. The CFI consists of the two facets “alternatives” and “control”. The “alternatives” subscale describes the inclination to find multiple explanations for life occurrences as well as the capability to conceive multiple alternative solutions to problems. The “control” subscale describes the propensity to regard challenging situations as manageable and under one’s control. These two facets are thought to work in tandem, yielding a total CF score. Specifically, considering alternatives may foster novel ideas and response generation on how to deal with an environmental stressor effectively. However, a sense of control may be necessary to engage in alternative thinking and for implementing the conceived alternative responses (Dennis & Vander Wal, 2010). In sum, both facets of CF are conceived to work together, enabling cognitive flexible individuals, evidenced by higher scores on the CFI, to consider alternative solutions and subsequently manage stressors more adaptively (Dennis & Vander Wal, 2010; Jaén et al., 2024).

In confrontation with UT, AR may constitute employees’ natural response. However, employees that score high on CF may be more likely to consider alternative explanations and ways of responding to UT (Dennis & Vander Wal, 2010; Friedman & Robbins, 2021). They may develop a more realistic and effective appraisal of the situation and how to deal with the work-related stressor (Dennis & Vander Wal, 2010). Specifically, employees high in CF may conclude that the UT are not achievable today or this week and therefore decide to either

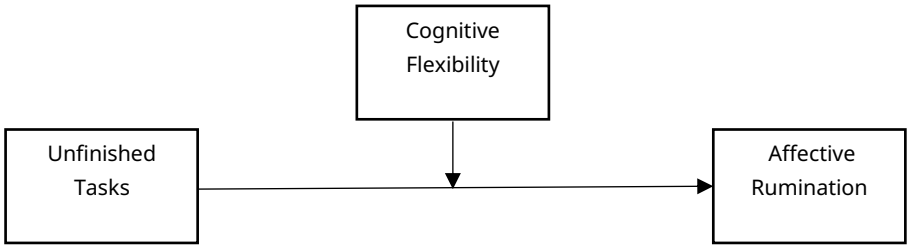
abandon or temporarily disengage from their goal of completing them. A high CF may further aid in effectively abandoning or temporarily disengaging the goal, given that CF is characterized by an enhanced ability to shift one's cognitive set and attention (Dennis & Vander Wal, 2010; Friedman & Robbins, 2021; Goldin et al., 2025).

Abandoning the goal of completing one's UT should prevent or eliminate AR, depending on the point of time the goal is dropped (Martin & Tesser, 1996). However, temporary disengagement from UT, for instance by means of distraction, may only provide short-term relief, as the underlying goal discrepancy remains unresolved (Martin & Tesser, 1996). Nonetheless, momentary disengagement from UT may free one's cognitive capacities for pursuing alternative, meaningful goals. For instance, employees high in CF may focus on fulfilling family responsibilities in their off-job environment. Accomplishing this may subsequently substitute for the goal discrepancy in relation to their UT, thereby attenuating AR (Martin & Tesser, 1996). Previously, Weigelt et al. (2019) have shown that progressing towards goals (proactive work behavior) other than the focal goal (UT) served as a substitute for the perceived goal discrepancy, thereby diminishing the link of UT to work-related rumination. Given our previously laid out theoretical arguments and the existing empirical evidence for CF we propose the following hypothesis (see Figure 1):

> *Hypothesis 2*: Cognitive flexibility will moderate the relationship between unfinished tasks and affective rumination. The relationship becomes weaker for individuals with higher cognitive flexibility.

Figure 1

Research Model of the Hypothesized Moderation Effect



Method

Procedure

The study was part of a broader Bachelor thesis project investigating the effects of UT and related interaction effects. A cross-sectional survey was employed given its suitability for testing moderation effects (Spector, 2019). This study examined whether UT are positively related to AR and tested if CF moderates this relationship with all variables measured at the same point in time. The survey was available through Qualtrics in English, German and Dutch. Information was provided that the study explores how employees deal with UT and manage to switch off during their free time, aiming to identify potential strategies for improving their well-being. Participants were informed about the anonymous nature of the survey and their right to withdraw from the study at any time without penalty. All participants provided voluntary informed consent prior to participation. The survey comprised four parts and took between 7-12 minutes to complete. First, participants were asked to provide diverse demographic information. Afterwards, participants indicated experiences related to work. The next section contained questions about general behaviors and beliefs of the participants. Lastly, participants answered questions about spending and experiencing time after work (see Table 1A, Appendix A for all assessed variables). At the conclusion of the survey,

participants were given the opportunity to reach out to the researchers via e-mail to address questions and concerns or to receive a summary of the aggregate findings. The present study was exempt from formal examination by the Ethics Committee of the University of Groningen and conducted in accordance with the Declaration of Helsinki (World Medical Association, 2013).

Sample

The collection of data took place between April 27, 2025, and May 12, 2025. A convenience sample of working adults was drawn, utilizing researchers' personal networks and advertising on social media. As an incentive, participants were given the opportunity to reach out to the researchers to receive a summary of the aggregate findings upon the termination of the study. Participants were required to be at least 18 years old, employed either full- or part-time and have sufficient proficiency in English, German, or Dutch. We collected a total of 135 responses, of which 37 participants were excluded. Specifically, 19 participants stopped filling out the questionnaire after consenting, 12 participants provided demographic details only, 5 participants missed at least one answer in the focal variables and 1 respondent showed clear indications of insufficient effort responding. After cleaning the data, the final sample consisted of 98 working adults with an equal number of men (50%) and women (50%). The mean age was 42.1 (SD = 15.3), ranging from 21 to 68 years of age. Our participants came from a variety of nationalities, with mostly German (32.7%), Dutch (26.5%) and Indian (18.4%) respondents (see Table 2A, Appendix A for a complete list of nationalities). There were diverse occupational backgrounds such as healthcare, teaching and architecture. Regarding the highest level of education, most participants had completed a master's degree (39.8%) followed by a bachelor's degree (30.6%), vocational training (14.5%), high school (12.4%), and a Ph.D. (2.0%). Participants had a mean number of 18 working years (SD = 14.2), ranging from 0 to 45 years. Most participants worked 31-40 hours

a week (38.8%), followed by more than 40 hours (30.6%), 0-10 hours (13.3%), 11-20 hours (11.2%) and 21-30 hours (6.1%). The questionnaire was completed by 48 respondents in English (49%), 29 in German (29.6%) and 21 in Dutch (21.4%)

Measures

In the present study, we drew on validated rating scales from prior research. The translations of the scales to German and Dutch were conducted by two student researchers each, according to the reconciliation method (Epstein et al., 2015). Specifically, after the initial translation by one student researcher, a second student researcher reviewed the translation for accuracy. Disagreements were discussed and resolved.

Unfinished tasks

We applied six items of prior research by Syrek et al. (2017) to assess UT. We asked participants to consider a typical work week when reflecting on UT. An example item was "*I have not finished important tasks that I had planned to do this week*". Respondents answered on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) with higher scores indicating more UT. Cronbach's alpha was previously established as excellent with .93 (Syrek et al., 2017).

Affective rumination

We applied five items of the Work-Related Rumination Questionnaire (Cropley et al., 2012) to assess AR. We asked participants to consider thoughts during their off-job time, including evenings after work, weekends and vacations. An example item was "*Are you troubled by work-related issues when not at work*". Respondents answered on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) with higher scores indicating more AR. Cronbach's alpha was previously established as excellent with .91 (Syrek et al., 2017).

Cognitive flexibility

We applied 10 out of 20 items of the CFI (Dennis & Vander Wal, 2010) to assess CF. Selection was made according to the highest factor loadings. We asked participants to consider thoughts and perceptions about themselves, not specifically related to work. Six items were taken from the "*alternative*" subscale. An example item was "*I consider multiple options before making a decision*". Four items were taken from the "*control*" subscale. An example item was "*When I encounter difficult situations, I feel like I am losing control*". Respondents answered on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) with higher scores indicating more CF. Cronbach's alpha was previously established as excellent, ranging from .90 to .91 (Dennis & Vander Wal, 2010; Johnco et al., 2014).

Analytical strategy

To test our hypothesis we employed a multiple linear regression model using IBM SPSS Statistics (Version 28.0.1.1). As a preliminary step we investigated the reliability of our scales using Cronbach's alpha and subsequently created mean composite scores for each variable. Afterwards, we plotted the descriptive statistics of our data for an initial impression. We looked for outliers through inspection of scatter plots, standardized residuals and cook's distance. In preparation of the main analysis, the relevant assumptions were verified by establishing sufficient linearity and homoscedasticity using a residual plot and sufficient normality by means of a P-P plot. Additionally, multicollinearity was investigated by looking at the variance inflation factor (VIF). We mean centered the predictor variables and entered them into the multiple regression model, predicting AR through UT and CF together with the interaction term of UT and CF, using the linear regression function for SPSS. Finally, we examined the correlations to investigate the main effect (Hypothesis 1) and moderation effect (Hypothesis 2). The threshold for determining statistical significance was set at the commonly accepted $p = 0.05$ mark.

Results

Preliminary analysis

Cronbach's Alpha (α) was determined as adequate for all scales used in our study: UT (α = .83), AR (α = .88), CF (α = .81). This indicates our measurements were consistent in assessing the respective constructs across participants. An additional principal component analysis, using Varimax rotation, confirmed the two-factor structure of CF with all items loading on their designated factor (see Table 1B and 2B, Appendix B). Given our previously laid out theoretical arguments we proceeded to not separate the facets of CF in the main analysis.

Table 1 displays the descriptive statistics of and bivariate correlations between the variables of UT, AR and CF. UT are positively related to AR ($r(96) = .29$, $p = .004$). Moreover, AR shows a significant negative association with CF ($r(96) = -.22$, $p = .029$). The association between CF and UT is nonsignificant ($r(96) = -.17$, $p = .093$).

Table 1

Descriptive Statistics and Bivariate Correlation Coefficients

	M	*SD*	1	2	3	4	5	6
1. Unfinished tasks	2.4	0.7	(.83)[c]					
2. Affective rumination	2.8	0.9	.29**	(.88)				
3. Cognitive flexibility	3.9	0.6	-.17	-.22*	(.81)			
4. Alternative[a]	4.0	0.6	-.07	.02	.82**	(.85)		
5. Control[b]	3.7	0.8	-.21*	-.40**	.76**	.26*	(.80)	
6. Age	42.1	15.3	.11	-.29**	0.3	-.15	.22*	-

Note. $N = 98$; *$p < .05$; **$p < .01$.

[a.] Alternative subscale of cognitive flexibility.

[b.] Control subscale of cognitive flexibility.

[c.] Along the diagonal in parentheses are the Cronbach's alphas of a given scale.

In preparation of our main analysis, we examined if the assumptions of a multiple regression model are sufficiently met. An inspection of a residual plot (see Figure 1B, Appendix B) shows sufficient random scatter, indicating that the assumptions of linearity and homoscedasticity are met. Moreover, our Q-Q plots (see Figure 2B, 3B, and 4B, Appendix B) show no systematic deviations, indicating that the assumption of normality are met. Additionally, we looked at the VIF, indicating that multicollinearity is of no concern to us.

Lastly, we centered all predictors around their means before entering them into multiple regression model.

Main analysis

Hypothesis 1 states that UT are positively related to AR. The results of our multiple regression model support this hypothesis. As shown in Table 2 there is a significant positive association between UT and AR (b_1 = 0.34, t(94) = 2.66, p = .009, CI [0.09, 0.59]). Specifically, one unit increase (above the mean) in UT is associated with a 0.34 increase in AR.

Table 2

Multiple Regression Analysis Coefficients Table

	b	*SE*	*t*	*p*	VIF
Constant	2.84	0.09	30.70	<.001	-
UT	0.34	0.13	2.66	.009	1.030
CF	-0.30	0.17	-1.79	.077	1.030
UT*CF	0.09	0.24	0.38	.708	1.030

Note. The outcome variable was affective rumination. UT*CF stands for the interaction term of unfinished tasks and cognitive flexibility.

Hypothesis 2 states that CF moderates the relationship between UT and AR, as such that the relationship becomes weaker for individuals with higher CF. As shown in Table 2 the results of our multiple regression analysis do not support this hypothesis. There is a nonsignificant effect of the interaction term between UT and CF on AR (b_3 = 0.09, t(95) = 0.38, p = .708, CI = [-0.39, 0.57]).

As can be seen in Table 3 our overall regression model explains 12% of the variance in AR (R^2 = .12, F(3, 94) = 4.15, p = .008) with UT uniquely accounting for 7% of the variance in AR (part r^2 = .07). UT explain 9% of the variance in AR when entered as a single

predictor ($\Delta R^2 = .09$). The change is significant ($F(1, 96) = 8.96$, $p = .004$). Entering CF as a predictor to the model containing UT increases the explained variance by 3% ($\Delta R^2 = .03$). The change is not significant ($F(1, 95) = 3.25$, $p = .075$). Entering the interaction term of UT and CF as a predictor to the model containing UT and CF increases the explained variance by 0% ($\Delta R^2 = .00$). The change is not significant ($F(1, 94) = 0.14$, $p = .708$). The results indicate UT explain a small amount of variance in AR, while CF and the interaction term of CF and UT do not contribute significantly.

Table 3

Model Summary

				Change statistics				
Model	*R*	R^2	Std. error	R^2 change	*F* change	*df*1	*df*2	*p*
1[a]	.29	.09	0.91	.09	8.96	1	96	.004
2[b]	.34	.12	0.90	.03	3.25	1	95	.075
3[c]	.34	.12	0.90	.00	0.14	1	94	.708

a. Predictors: Constant, unfinished tasks.

b. Predictors: Constant, unfinished tasks, cognitive flexibility.

c. Predictors: Constant, unfinished tasks, cognitive flexibility, interaction term.

Additional analysis

In additional analysis, we examined if the language of response in the questionnaire moderated the two-way interaction of CF and UT in predicting AR. We entered the variables into a moderated moderation model using Model 3 of the PROCESS macro (Version 4.2) for SPSS. All continuous predictors were centered around their mean.

The overall model is significant ($F(11, 86) = 5.42$, $p = <.001$, $R^2 = .41$) with a significant three-way interaction between UT, CF and response language in predicting AR ($F(2, 86) = 7.21$, $p = .001$). The conditional effects are displayed in Table 4. For English

respondents CF moderates the positive association between UT and AR ($F(1, 86) = 6.44$, $p = .013$). Specifically, the positive relationship between UT and AR weakens as cognitive flexibility increases. In line with Hypothesis 2, the association is significant at low levels of CF ($b = 1.20$, $t(86) = 3.86$, $p < .001$), smaller but significant at mean levels of CF ($b = 0.18$, $t(86) = 3.77$, $p < .001$) and becomes nonsignificant at high levels of CF ($b = 0.22$, $t(86) = 1.08$, $p = .282$, see Table 3B, Appendix B for a complete list of simple slopes).

Table 4

Conditional Interaction for Different Response Languages

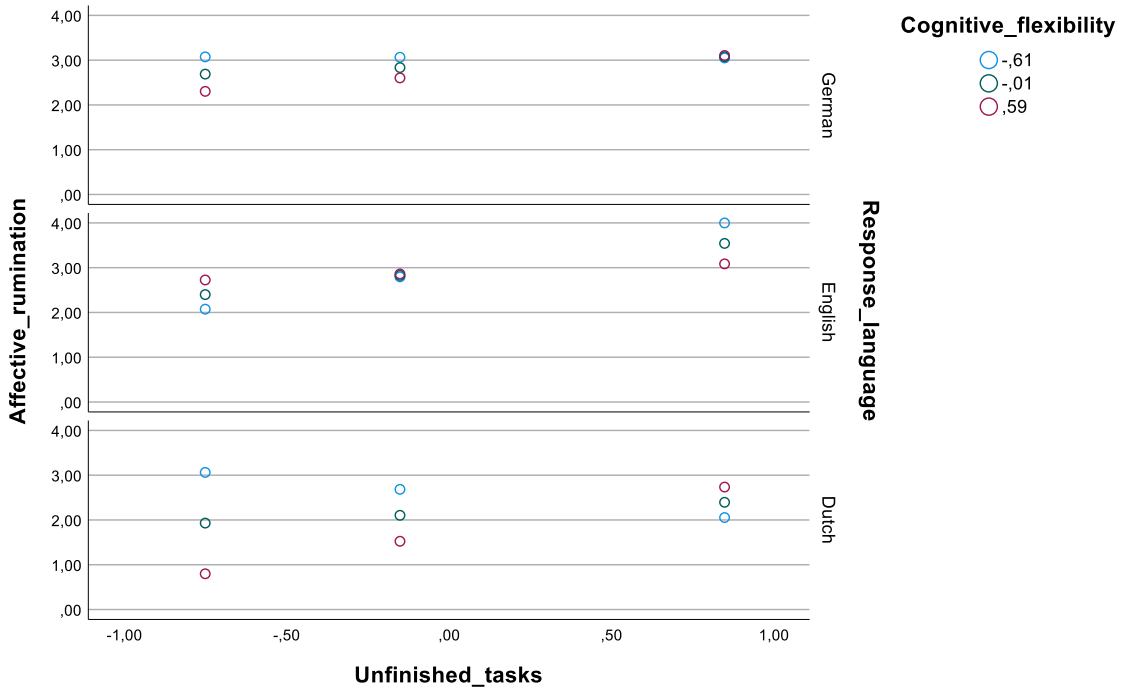
Language	*b*	*F*	*df*1	*df*2	*p*
German	0.43	0.73	1	86	.397
English	-0.82	6.44	1	86	.013
Dutch	1.53	7.38	1	86	.008

Note. The table displays the conditional effect for the interaction term of unfinished tasks and cognitive flexibility on affective rumination for different response languages.

CF moderates the relationship between UT and AR also for the Dutch respondents ($F(1, 86) = 7.38$, $p = .008$). Specifically, the positive relationship becomes stronger as cognitive flexibility increases. Contrary to Hypothesis 2, the association is significant at low levels of CF ($b = -0.63$, $t(86) = -2.03$, $p = .045$), becomes nonsignificant at mean levels of CF ($b = 0.29$, $t(86) = 1.04$, $p = .303$) and is significant again at high CF ($b = 1.21$, $t(86) = 2.25$, $p = .027$). There are no such effects for German respondents ($F(1, 86) = 0.73$, $p = .397$). The visualized interaction effects for English and Dutch respondents are shown in Figure 2.

Figure 2

Interaction Plot



Note. The graph shows values of affective rumination depending on low, mean and high levels of unfinished tasks and cognitive flexibility for different response languages.

To investigate potential issues with our translations, we compared the internal consistency (Cronbach's alpha) of our scales for each response language. While there are differences between the groups of language respondents, there is no consistent trend, and all values are in an adequate range (see Table 4B, Appendix B).

Furthermore, we conducted Chi-square tests and one-way analysis of variance (ANOVA) to investigate whether there were systematic differences in demographic variables. The results indicate systematic differences between the groups in age ($F(2, 95) = 3.25$, $p = .043$), highest level of formal education ($\chi^2 (8, 97) = 21.20$, $p = .007$) and professional working years ($F(2, 95) = 3.39$, $p = .038$). We entered these variables separately as covariates into the moderated moderation model, which did not significantly affect the moderated

moderation effect of response language (see Table 5B, 6B, and 7B, Appendix B). This indicates our findings may not be attributable to these group differences.

Discussion

The aim of this study was to replicate the well-established association between UT and AR (Hypothesis 1). Beyond mere replication, we investigated if CF moderates this relationship, hypothesizing that high CF would weaken the association between UT and AR (Hypothesis 2). In support of Hypothesis 1, our results indicate that UT are positively related to AR. However, contrary to Hypothesis 2, we found no evidence that CF buffers the association between UT and AR.

In an additional analysis we examined this finding further and found an interaction effect of CF and UT present for respondents in English and Dutch. Specifically, the association between UT and AR was buffered by CF for English respondents, but strengthened for Dutch respondents, while there was no such effect for respondents in German.

Theoretical implications

In line with our predictions, we found that UT are positively related to AR. The findings corroborate the results of previous empirical studies (Syrek et al., 2017; Uhlig et al., 2023; Weigelt et al., 2019). However, unlike previous studies, which usually recruited German-speaking university students, our sample consisted of a more diverse set of nationalities and full-time employees. Hence, our results testify to the robustness of the association between UT and AR across more diverse demographics. The results can be explained by the goal-progress theory of rumination. UT may be perceived as an aversive goal discrepancy leading employees to engage in AR about this discrepancy (Martin & Tesser, 1996). Although we obtained a significant result, the effect was relatively small, with UT uniquely explaining 7% of the variance in AR inside the multiple regression model. This

suggests additional factors may have contributed to AR in employees. Perhaps high amounts of UT are indicative of negative working environments characterized by high demands and lack of organizational support (Blanco-Encomienda et al., 2020; Firoozabadi et al., 2018). Multiple work stressors may work together causing several goal discrepancies that elicit AR in employees (Martin & Tesser, 1996; Pauli et al., 2023).

Contrary to our predictions we did not obtain evidence that CF buffers the association between UT and AR. Several explanations may account for the nonsignificant finding in the overall dataset. Firstly, our bivariate correlations showed a significant negative association between CF and AR. This corresponds to previous findings, showing a bivariate negative relationship between CF and work-related rumination (Cropley et al., 2016; Cropley et al., 2020). Specifically, employees low in cognitive flexibility may generally be more prone to ruminative thoughts in response to work-stressors. They are more rigid and inflexible in their thinking, which may make it more difficult to shift the cognitive set away from a given work stressor and associated ruminative thoughts about it (Cropley et al., 2020; Davis & Nolen-Hoeksema, 2000; Dennis & Vander Wal, 2012). Following this line of reasoning, there may be a more direct association between CF and AR. Murphy (2021) pointed out that the obtainment of a moderation effect is unlikely if a relevant predictor (CF) shows a direct association with the outcomes variable (AR).

Another possibility is that with increasing CF there may be a turning point at which the beneficial effects of CF reverse in the opposite direction. Considering too many alternatives may lead to the aversive state of choice overload (Iyengar & Lepper, 2000). Specifically, conceiving too many alternative ways of responding may overwhelm an employee, leading to indecisiveness and failure to take action on the goal discrepancy. Similarly, considering a lot of alternative solutions and perspectives may make the goal discrepancy even more mentally salient, which in turn may intensify AR (Martin & Tesser,

1996). Both possibilities would suggest a curvilinear relationship, in which very high levels of CF would have canceled the effects of more moderate levels of CF out in our data set. There were no indications of such a curvilinear relationship. However, it is possible that our dataset suffered from restriction of range, given the moderate sample size with most participants indicating a high degree of CF.

Alternatively, in line with previous research, we have treated CF as a sufficiently stable individual difference variable (Ionescu, 2012; Jaén et al., 2024). However, there is some evidence that CF can vary within individuals over time in response to changing contextual and environmental factors (e.g., Kubicek et al., 2022; Uhlig et al., 2023). Our cross-sectional design may not have been able to capture such a dynamic, potentially concealing an employee's typical level of CF. In consequence, random noise may have attenuated the moderation effect, obscuring the real effect of CF in the association between UT and AR.

Finally, the moderating role of CF may be contingent on additional factors. Noja et al. (2025) have shown that CF moderated the beneficial direct effect of job autonomy on negative-affective involvement, which is conceptually similar to AR. This indicates employees experiencing high CF may benefit more from job autonomy. However, it is equally conceivable that the beneficial effects of CF may just unfold for employees if they have enough autonomy in when and how they complete their tasks. For instance, an employee receiving strict deadlines for completing their tasks by a supervisor may feel little control over the process. The strict external demands would perhaps make it more difficult or possibly override any attempt at idiosyncratic alternative appraisals and effective disengagement from the goal of completing UT, regardless of the level of CF.

Contrary to our main findings, an additional analysis yielded a significant moderation effect in the hypothesized direction of CF for English respondents, and in the opposite

direction for Dutch respondents. Importantly, however, the findings may reflect Type 1 errors, given that the number of participants in each respondent language group was small. Similarly, given the low numbers of participants in each group, our analysis may have suffered from restriction of range, failing to capture the whole range of possible values for each group. For instance, the Dutch respondent group consisted of only 21 participants, yet it showed a substantial moderation effect of CF.

Alternatively, the findings could reflect issues with the adaptation of the scales from English to Dutch and German. While we translated the scales with diligence, none of us were trained translators. It is well recognized that the translation of measurement items and cultural contexts can change the meaning of the items (e.g., Van de Vijver & Hambleton, 1996). While the scales for each respondent group were all of adequate internal consistency, Cronbach's alpha may not adequately capture subtle sources of error variance introduced through translation that may have obscured the results of the Dutch and German respondents. Similarly, there is the possibility that CF exhibits differential effects in the association between UT and AR for different cultures.

Finally, a third variable may account for the differences between each response language group. We assessed the groups for differences in several demographic variables and found systematic differences in age, professional working years, and level of formal education. However, including them as covariates did not significantly change the moderated moderation effect of response language. Nonetheless, our assessed demographics were by no means exhaustive, and the groups may have differed in other respective factors.

Practical implications

The link between UT and AR seems robust, with CF not accounting for variability in the strength of the association. Hence, addressing the root cause of AR seems to be important in practical settings. For instance, supervisors should be attentive to their employees' UT as

they are likely to elicit AR, thereby negatively affecting their employees' off-job time and well-being (Pauli et al., 2023). If UT and AR persist over time, they may have severe long-term consequences, including burnout (Weigelt et al., 2023). Given the potential costs associated with AR and low employee well-being, organizations are advised to take measures early and closely monitor the accumulation of UT among employees (Cooper & Bevan, 2014). Moreover, supervisors could be instructed to critically evaluate the number of tasks they give to their employees, given that a high workload may exceed individual capacities on a given workday, resulting in UT being carried over into non-work hours (Smit, 2016).

While we found no clear evidence that CF buffers the association between UT and AR, we still found a negative bivariate correlation between CF and AR. This suggests promoting CF may be beneficial to reduce AR that does not result from UT. Cognitive behavioral therapy (CBT) identifies negative thinking patterns and aims to replace them with more positive thinking, leading to more adaptive cognitions and behavior when dealing with stressors (Kazantzis et al., 2018; Tement et al., 2020). Notably, CBT may work to increase one's CF (Dennis & Vander Wal, 2010). Similarly, Querstret et al., 2016 have shown that employees that took part in CBT workshop exhibited long-term reductions in AR. Organizations could provide workshops or access to educational online materials to educate their employees about CBT techniques.

Strength and weaknesses

Our study had some notable strengths. The use of validated rating scales strengthens our confidence in the findings. Moreover, given the availability of our questionnaire in three languages and our broad recruitment approach, we were able to assemble a more diverse set of nationalities and workers than in previous studies (e.g., Syrek et al., 2017). Furthermore, our study contributes to a growing literature that applies CF in the context of occupational

health research and job stressors (e.g., Kubicek et al., 2022; Noja et al., 2025; Uhlig et al., 2023). Nonetheless, several limitations should be noted.

While our sample was more diverse than in previous studies, most participants were still from Western, educated, industrialized, rich, and democratic (WEIRD) countries. Similarly, our sample was well educated, with only 26% who did not attain at least a bachelor's degree. Moreover, as participants were recruited through personal networks and social media, they may be more similar to the researchers than to the general population. All these shortcomings question the generalizability of our findings to the general working population and non-WEIRD cultures.

Cross-sectional designs are generally well-suited for moderation analysis, but there are also difficulties associated with them (Spector, 2019). First, cross-sectional designs cannot tell us about the direction of effects. While theoretically plausible, we cannot conclude that UT cause AR. Moreover, capturing the dynamic nature of variables is not possible. For instance, if CF varied intra-individually more than we assumed, this may have led us to miss out on important information or in the worst case to obtain invalid results. Finally, cross-sectional surveys can be susceptible to common-method variance, which may have inflated the correlations between our variables (Spector, 2019).

Lastly, we theorized that people high in CF would be more likely to abandon their goal of completing UT or temporarily disengage from it to substitute the goal discrepancy with alternative goals. However, we did not assess these specific behaviors and thus had no data available about these processes. Perhaps such data would have yielded important information about why we failed to find a moderating role of CF and why Dutch and English respondents exhibited strong moderation effects in opposing directions.

Avenues for future research

There are several avenues for future research. First, given the robust association between UT and AR future research should continue examining potential moderators that may serve as a basis for intervention development. Moreover, the relationship should be tested in samples that are more representative of the general population. It should be explored if the relationship holds or differs across more diverse occupations and educational levels. Similarly, it would be interesting to see whether the effect is observed across non-WEIRD cultures. Moreover, future research could utilize longitudinal or experience sampling methods to assess if there are notable within-person variations in CF, and how that would affect a possible moderating role in the association between UT and AR. It may also be promising to assess whether job autonomy moderates the interaction between CF and UT on AR, as the beneficial effects of CF may be contingent on having sufficient job autonomy for enacting alternative responses (Noja et al., 2024).

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Appendix A

Table 1A

Complete Set of Variables in Order of Assessment in the Questionnaire

Questionnaire part	Variable
Part 1	Gender
	Age
	Nationality
	Highest attained educational level
	Occupation or job title
	Amount of professional working years
Part 2	Performance expectations
	Unfinished tasks
	Taking charge
	Professional self-efficacy
	Work competence need satisfaction
Part 3	Stress mindset
	Regulatory focus
	Executive functioning
	Cognitive flexibility
Part 4	Affective rumination
	Problem solving pondering
	Positive affective work prospection
	Detachment
	Sleep impairment
	Recovery activities
	Relaxation

Table 2A

Nationalities of Participants in Order of Frequency

Nationality	Frequency	Percent
German	32	32.7
Dutch	26	26.5
Indian	18	18.4
USA	6	6.1
British	2	2
Dutch and French	2	2
Austrian	1	1
Canadian	1	1
Cypriot	1	1
Dutch, French and USA	1	1
Egyptian	1	1
Kenyan	1	1
Norwegian	1	1
Polish	1	1
Romanian	1	1
Singaporean	1	1
Turkish	1	1
Total	98	100

Appendix B

Table 1B

Eigenvalues, Percentage of Explained Variance and Cumulative Variance of the 10 CFI Items

	Eigenvalues		
Factor	Total	% of variance	Cumulative variance
1	3.93	39.35	39.35
2	2.16	21.64	60.99
3	0.99	9.94	70.95
4	0.76	7.63	78.57
5	0.62	6.19	84.77
6	0.54	5.44	90.20
7	0.39	3.93	94.14
8	0.25	2.53	96.67
9	0.19	1.93	98.60
10	0.14	1.40	100

Table 2B

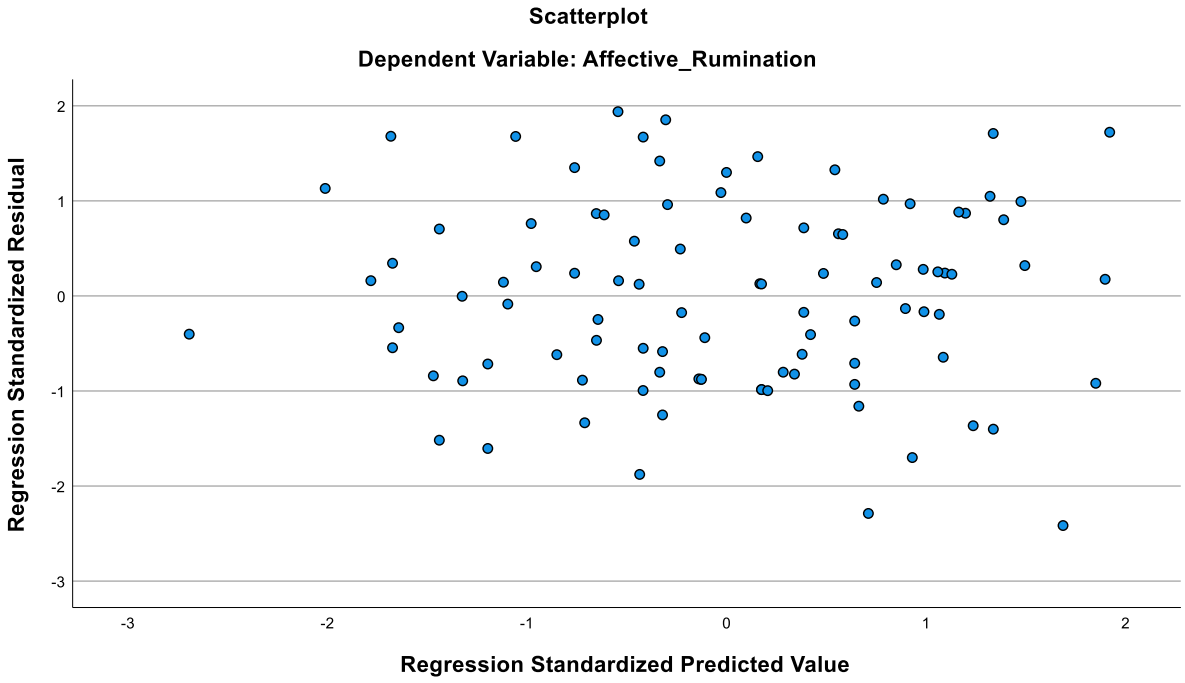
Rotated Component Matrix With Factor Loadings

Item	Component	
	1	2
Alternative 1	.800	-.152
Alternative 2	.776	.002
Alternative 3	.780	.205
Alternative 4	.768	.170
Alternative 5	.819	.235
Alternative 6	.571	.130
Control 1	.006	.680
Control 2	.127	.807
Control 3	.175	.830
Control 4	.097	.798

Note. On the left are our 10 items of the CFI together with their designated subscale. Under components is shown which factor they were loading on in our data set.

Figure 1B

Residual Plot for the Multiple Regression Analysis



Note. The multiple regression model included affective rumination as outcome variable and unfinished tasks, cognitive flexibility and the interaction term of both as predictors.

Figure 2B

Q-Q Plot of Unfinished Tasks

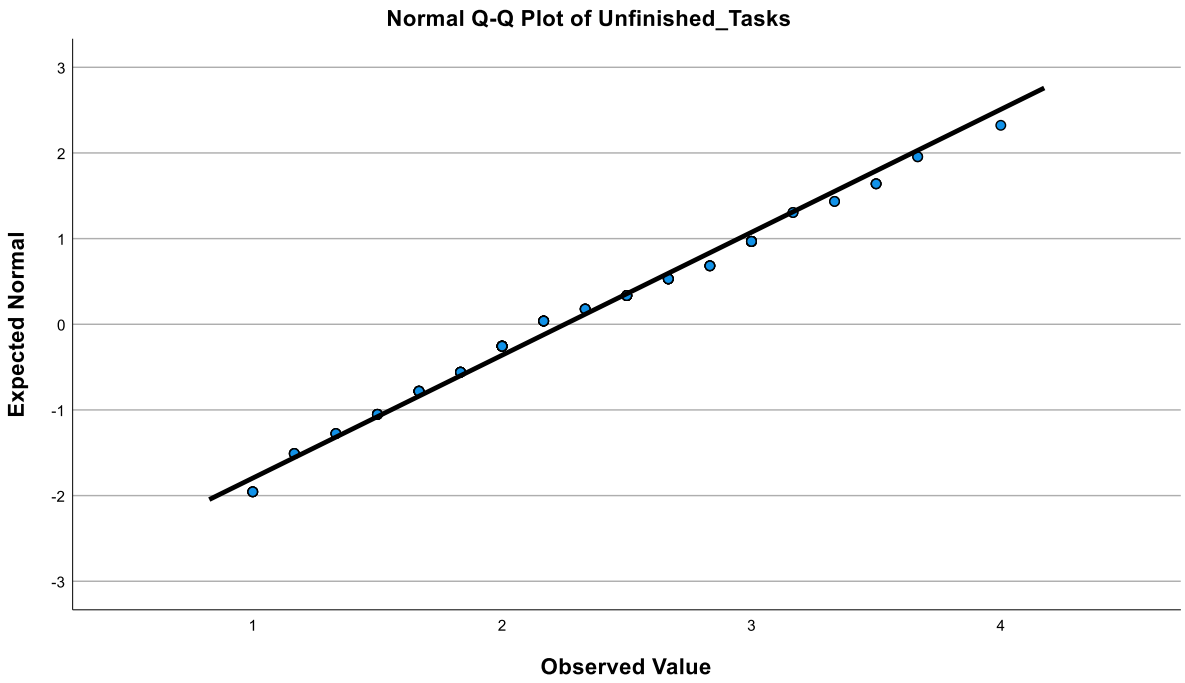


Figure 3B

Q-Q Plot of Affective Rumination

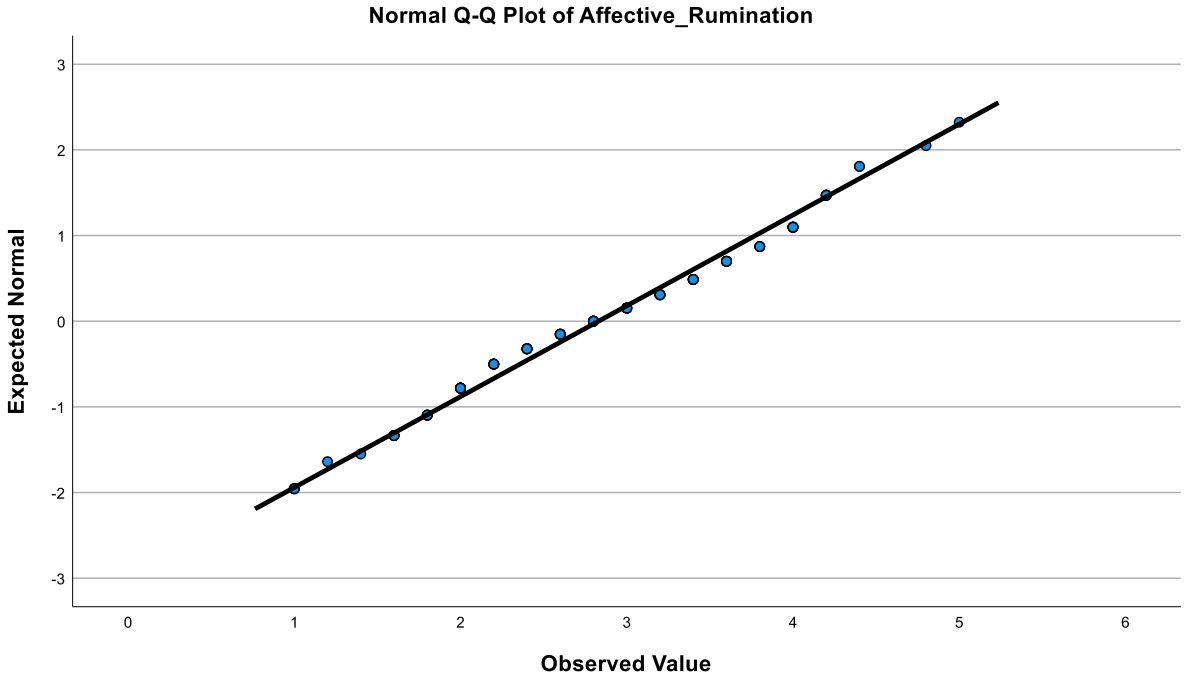
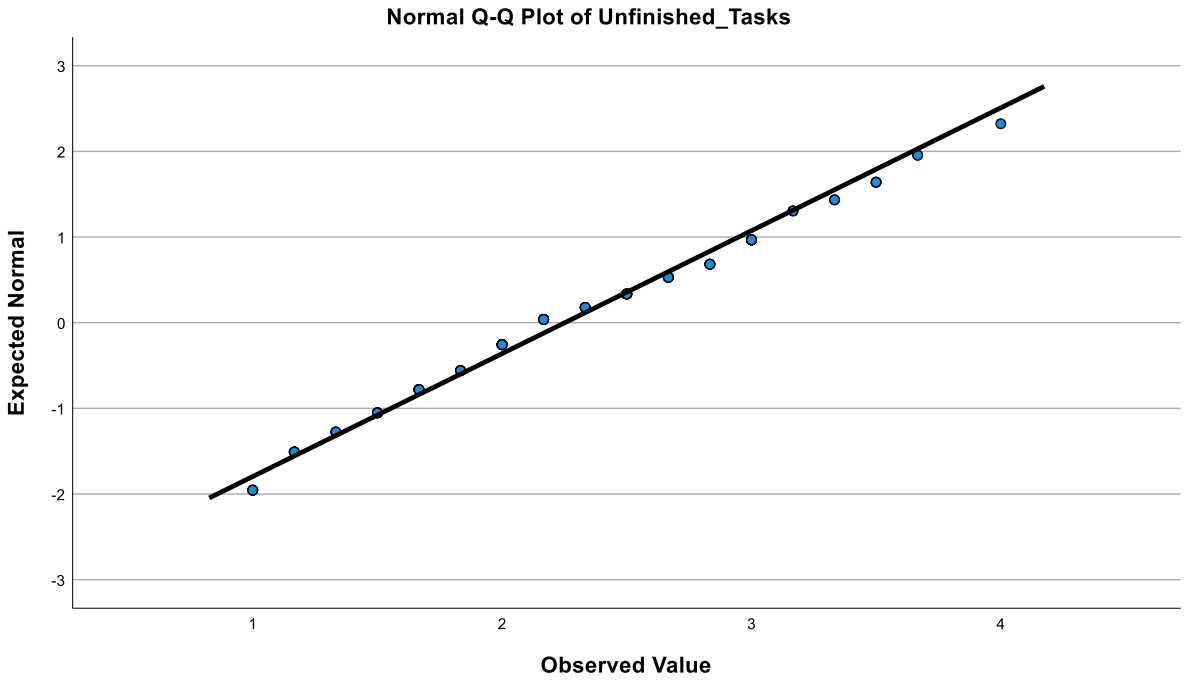


Figure 4B

Q-Q Plot of Cognitive Flexibility



Tabel 3B

Conditional Effects of the Focal Predictors at Values of the Moderator(s)

Cognitive flexibility	Respondent language	*b*	*SE*	*t*	*p*
-0.61	German	-0.02	0.35	-0.04	.966
-0.61	English	1.20	0.31	3.86	<.001
-0.61	Dutch	-0.63	0.31	-2.03	.045
-0.01	German	0.24	0.21	1.15	.252
-0.01	English	0.71	0.18	3.93	<.001
-0.01	Dutch	0.29	0.28	1.04	.303
0.59	German	0.50	0.39	1.30	.198
0.59	English	0.23	0.21	1.08	.282
0.59	Dutch	1.21	0.54	0.03	.027

Note. Conditional effects of unfinished tasks on affective rumination at low, mean, and high levels of cognitive flexibility depending on the response language.

Table 4B

Cronbach's Alphas Conditional on Response Language

	Unfinished tasks	Affective rumination	Cognitive flexibility
German	.81	.70	.75
English	.78	.90	.83
Dutch	.87	.93	.80

Note. The table displays Cronbach's alpha for the scales unfinished tasks, affective rumination and cognitive flexibility depending on the response language.

Tabel 5B

Conditional Interaction for Different Response Languages

Language	*b*	*F*	*df*1	*df*2	*p*
German	0.47	0.92	1	85	.340
English	-0.70	4.88	1	85	.030
Dutch	1.37	6.09	1	85	.016

Note. The table displays the conditional effect for the interaction term of unfinished tasks and cognitive flexibility on affective rumination for different response languages when age is included as a covariate.

Table 6B

Conditional Interaction for Different Response Languages

Language	*b*	*F*	*df*1	*df*2	*p*
German	0.387	0.572	1	84	.452
English	-0.857	6.803	1	84	.011
Dutch	1.534	7.252	1	84	.009

Note. The table displays the conditional effect for the interaction term of unfinished tasks and cognitive flexibility on affective rumination for different response languages when highest level of formal education is included as a covariate.

Table 7B

Conditional Interaction for Different Response Languages

Language	*b*	*F*	*df*1	*df*2	*p*
German	0.530	1.18	1	85	.281
English	-0.676	4.62	1	85	.035
Dutch	1.495	7.50	1	85	.008

Note. The table displays the conditional effect for the interaction term of unfinished tasks and cognitive flexibility on affective rumination for different response languages when professional working years is included as a covariate.