The title

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Abstract

One or two sentences providing a **basic introduction** to the field, comprehensible to a scientist in any discipline. Two to three sentences of **more detailed background**, comprehensible to scientists in related disciplines. One sentence clearly stating the **general problem** being addressed by this particular study. One sentence summarizing the main result (with the words "**here we show**" or their equivalent). Two or three sentences explaining what the **main result** reveals in direct comparison to what was thought to be the case previously, or how the main result adds to previous knowledge. One or two sentences to put the results into a more **general context**. Two or three sentences to provide a **broader perspective**, readily comprehensible to a scientist in any discipline.

Keywords: keywords

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Introduction

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The present study

Methods

Internal consistency was assessed for all scales using the α Cronbach indicator (**cronbach1951?**), and an initial descriptive analysis was conducted to assess the univariate normality assumptions for the scalar variables. The Mardia indicator (**Mardia-1970?**) was computed to assess multivariate normality and correlation matrix with means ans standard deviations was reported. For hypothesis testing, a path mediation model was used and the parameters were estimated using MLM (Mean adjusted Maximum Likelihood) robust method. Satorra-Bentler correction, was used for global fit testing because the assumption of multivariate normality was not fulfilled. The failure to fulfill the assumptions of univariate and multivariate normality will lead to the use of Spearman's ρ correlation matrix and some robust techniques to analyze the model.

We used R (Version 4.4.0; R Core Team, 2024) and the R-packages *dplyr* (Version 1.1.4; Wickham et al., 2023), *expss* (Version 0.11.6; Demin, 2023), *foreign* (Version 0.8.86; R Core Team, 2023), *Hmisc* (Version 5.1.2; Harrell Jr, 2024), *kableExtra* (Version 1.4.0; Zhu, 2024), *lavaan* (Version 0.6.16; Rosseel, 2012), *maditr* (Version 0.8.4; Demin, 2024), *mvtnorm* (Version 1.2.4; Genz & Bretz, 2009), *papaja* (Version 0.1.2; Aust & Barth, 2023), *psych* (Version 2.4.3; William Revelle, 2024), *rstatix* (Version 0.7.2; Kassambara, 2023), *sasLM* (Version 0.10.3; Bae, 2024), and *tinylabels* (Version 0.2.4; Barth, 2023) for all our analyses.

Participants and Procedure

The study was approved by the institutional Research Ethics Committee. Participants were recruited by undergraduate Psychology students in exchange for extra credit in the Work

Psychology course. They completed the measures twice, approximately 10 weeks apart, using a secure online platform. Initially, 305 employees agreed to participate in the study. Out of them, 246 (80.66%) also completed the measures two and a half months later and were included in the final sample. Participants were aged between 20 and 73 years (M = 36.89, SD = 11.37). They had an average tenure of 7.60 years in their current organizations (SD = 7.63) and worked in various fields (education, healthcare, IT, hospitality etc.). Other characteristics of the participants are summarized in Table ....

Measures

For all measures used in this study, items were scored on 7-point scale (1 = completely disagree, 7 = completely agree). The internal consistency coefficients for all the scales are displayed in Table 1.

Please Insert Table 1 around here

Trait Gratitude. Gratitude was measured using the Gratitude Questionnaire (McCullough et al., 2002). The six items of the questionnaire measure the frequency, intensity and density of gratitude in one's life (e.g., "If I had to list everything that I felt grateful for, it would be a very long list."). On our data, Cronbach's α was α=0.72, 95% CI [0.66, 0.77].

Work Motivation. Employees' motivation was evaluated with The Multidimensional Work Motivation Scale (Gagné et al., 2015). The questionnaire has 19 items and assesses five types of work motivation: amotivation, extrinsic regulation, introjected regulation, identified regulation, and intrinsic motivation (e.g., "I don't know why I'm doing this job, it's pointless work."). Each subscale comprises 3 items, except for extrinsic regulation (6 items) and introjected regulation (4 items), and on our data, Cronbach's α was α=0.75, 95% CI [0.69, 0.8] for amotivation, α=0.83, 95% CI [0.8, 0.86] for extrinsic regulation, α=0.72, 95% CI [0.66, 0.77] for introjected regulation, α=0.74, 95% CI [0.67, 0.79] for identified regulation, and α=0.89, 95% CI [0.87, 0.91] for intrinsic motivation.

Job Performance. Job performance was measured using a self-report version of the Job Performance Scale (Goodman and Svyantek, 1999). The scale assesses task performance (9 items; e.g., "I perform well in the overall job by carrying out tasks as expected") and contextual performance (7 items; e.g. "I assist my colleagues with their duties"). On our data, Cronbach's α was $\alpha=0.88$, 95% CI [0.86, 0.9] for task performance and $\alpha=0.83$, 95% CI [0.79, 0.86] for contextual performance.

Results

Preliminary analysis

Some moderated outliers were observed on all variables, without extreme values, and the assumption of univariate normality was not met (see Table 2). The multivariate normality assumption based on Mardia coefficient (**Mardia-1970?**) was not met and a statistically significant multivariate positively skewed (Mardia = 43.92, Skewness = 1,800.85, p< 0.001) and a large multivariate leptokurtic distribution (Mardia = 312.12, Kurtosis = 19.84, p< 0.001) were observed.

Please Insert Table 2 around here

Please Insert Table 3 around here

Most of the Spearman's ρ correlations were statistically significant (see Table 3), with values between -0.63 and 0.76, and the correlation matrix was positively defined. At both measurement times, gratitude was positively related to task and contextual performance, introjected and identified regulation, as well as intrinsic motivation. Gratitude was also negatively related to amotivation and extrinsic regulation. Both task and contextual performance were negatively related to amotivation and positively linked to introjected and identified regulations and intrinsic motivation. Contextual performance was unrelated to extrinsic regulation. Task performance and extrinsic regulation were negatively related at T1, but not at T2.

Model analysis

The convergence was acquired after 150 iterations, estimating 78 parameters, based on 246 cases, resulting an over identified model with marginal fit indices (χ^2=120.149, df=42, p < 0.001, CFI=0.941, SRMR=0.084, RMSEA= 0.087, p < 0.001, 90% CI [0.07, 0.104]).

Please Insert Figures 1 and **??** *around here*

Two positive and marginally significant indirect effects were identified, from the initial measurement of *gratitude* to the final measurement of *contextual performance*, mediated by the final measurement of *intrinsic motivation* (B=0.03, z=1.77, p=0.08, β=0.02), and from the initial measurement of *gratitude* to the final measurement of *task performance*, mediated by the final measurement of *identified regulation* (B=0.03, z=1.83, p=0.07, β=0.03). The initial measurements for *gratitude* were positively and marginally significantly associated with the final measurements for *intrinsic motivation* (B=0.08, z=1.95, p=0.05, β=0.10), and the final measurements of *intrinsic motivation* were positively and statistically significantly associated with the final measurements of *contextual performance* (B=0.44, z=3.21, p=0.00, β=0.21). The initial measurements for *gratitude* were also positively and statistically significantly associated with *identified regulation*, and the final measurements for *identified regulation* were positively and statistically significantly associated with *task performance* (B=0.32, z=2.32, p=0.02, β=0.15), therefore both mediated effects were marginally significant and positive.

No other indirect association were observer, however our data suggested a positive and statistically significant association between the final measurements for *intrinsic motivation* and the final measurements for *task performance* (B=0.21, z=1.65, p=0.10, β=0.12). Statistically significant positive associations were also observed between the initial measurements of *gratitude* and final measurements of *identified regulation* (B=0.47, z=10.81, p=0, β=0.51), and *intrinsic motivation* (B=0.08, z=1.95, p=0.05, β=0.10), whereas negative associations were observed with the final measurements of *amotivation* (B=-0.07, z=-2.02, p=0.04, β=-0.12), and *introjected regulation* (B=0.49, z=10.65, p=0, β=0.49). All longitudinal associations

between the same variables measured at the initial and final moments were statistically significant and no other associations were observed.

Discussion

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Table 1

Cronbach's alpha coefficients and confidence intervals

	Cronbac's alpha	95% CI Lower	95% CI Upper
Gratitude	0.72	0.66	0.77
Amotivation	0.75	0.69	0.8
Extrinsic regulation	0.83	0.8	0.86
Introjected regulation	0.72	0.66	0.77
Identified regulation	0.74	0.67	0.79
Intrinsic motivation	0.89	0.87	0.91
Task performance	0.88	0.86	0.9
Contextual performance	0.83	0.79	0.86

Table 2

Descriptive statistics for the primary variables

Variables	N	Mean	SD	Median	Min	Max	Skew (SE)	Kurt (SE)
Amotivation (T1)	246	5.59	3.45	4	3	18	1.53 (0.16)	1.83 (0.31)
Amotivation (T2)	246	5.92	3.52	5	3	18	1.21 (0.16)	0.6 (0.31)
Extrinsic regulation (T1)	246	21.24	8.71	21	6	42	0.3 (0.16)	-0.62 (0.31)
Extrinsic regulation (T2)	246	21.81	8.68	22.5	6	42	0.22 (0.16)	-0.7 (0.31)
Introjected regulation (T1)	246	21.36	5.09	22	4	28	-0.92 (0.16)	0.72 (0.31)
Introjected regulation (T2)	246	21.54	5.47	23	4	28	-0.88 (0.16)	0.26 (0.31)
Identified regulation (T1)	246	16.99	3.79	18	4	21	-1.03 (0.16)	0.79 (0.31)
Identified regulation (T2)	246	16.99	3.76	18	6	21	-1.02 (0.16)	0.5 (0.31)
Intrinsic motivation (T1)	246	16.51	4.34	18	3	21	-0.97 (0.16)	0.27 (0.31)
Intrinsic motivation (T2)	246	16.22	4.41	17	3	21	-0.9 (0.16)	0.09 (0.31)
Task performance (T1)	246	53.3	7.88	55	23	63	-1 (0.16)	0.79 (0.31)
Task performance (T2)	246	53.5	7.77	54.5	23	63	-1.14 (0.16)	1.29 (0.31)
Contextual performance (T1)	246	37.95	7.75	39	10	49	-0.67 (0.16)	0.26 (0.31)
Contextual performance (T2)	246	37.26	8.75	39	7	49	-0.94 (0.16)	0.68 (0.31)

Table 3

Spearman zero-order correlation matrix

|	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
(1) Gratitude (T1)	0.72														
(2) Amotivation (T1)	-0.457	0.75													
(3) Amotivation (T2)	-0.326	0.64	0.75												
(4) Extrinsic regulation (T1)	-0.214	0.188	0.269	0.83											
(5) Extrinsic regulation (T2)	-0.128	0.155	0.215	0.678	0.83										
(6) Introjected regulation (T1)	0.177	-0.295	-0.194	0.277	0.254	0.72									
(7) Introjected regulation (T2)	0.283	-0.348	-0.407	0.074	0.268	0.597	0.72								
(8) Identified regulation (T1)	0.311	-0.545	-0.47	-0.017	0.001	0.68	0.557	0.74							
(9) Identified regulation (T2)	0.316	-0.492	-0.582	-0.062	0.022	0.484	0.758	0.652	0.74						
(10) Intrinsic motivation (T1)	0.355	-0.626	-0.527	-0.073	-0.111	0.47	0.379	0.728	0.561	0.89					
(11) Intrinsic motivation (T2)	0.318	-0.551	-0.633	-0.098	-0.027	0.379	0.573	0.597	0.75	0.74	0.89				
(12) Task performance (T1)	0.232	-0.342	-0.315	-0.133	-0.092	0.301	0.296	0.412	0.333	0.411	0.324	0.88			
(13) Task performance (T2)	0.245	-0.309	-0.39	-0.14	-0.055	0.274	0.4	0.317	0.468	0.347	0.457	0.703	0.88		
(14) Contextual performance (T1)	0.311	-0.39	-0.344	-0.07	-0.002	0.334	0.33	0.459	0.41	0.485	0.4	0.551	0.402	0.83	
(15) Contextual performance (T2)	0.278	-0.38	-0.444	-0.107	-0.014	0.262	0.419	0.375	0.51	0.467	0.567	0.421	0.58	0.681	0.83
Means	33.825	5.593	5.923	21.24	21.813	21.362	21.545	16.988	16.988	16.508	16.224	53.297	53.496	37.947	37.26
Standard deviations	5.514	3.451	3.523	8.71	8.68	5.088	5.468	3.788	3.763	4.341	4.408	7.881	7.771	7.748	8.754
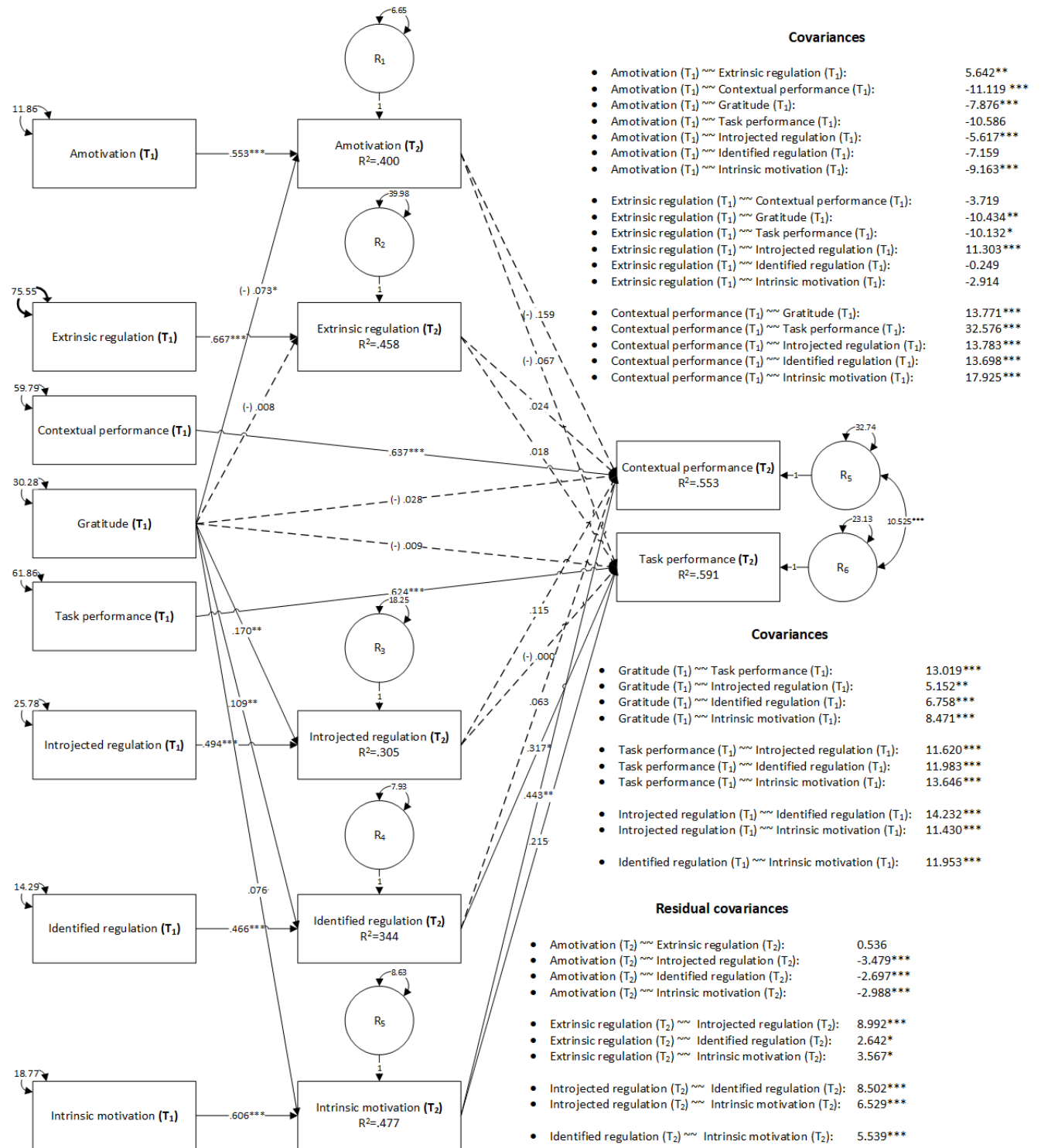
Figure 1

Mediation model. Unstandardized coefficients