

Supplementary Information

Understanding resilience in medical interns through ecological momentary assessments, predictive modelling, and topic analysis

Laura E. Meine^{1,2,*}, Ella B. A. McPherson^{1,2,*}, Jan B. Schmutz³, Christian C. Ruff⁴, Lorenzo Käser⁵, HMZ STRESS Consortium, Birgit Kleim^{1,2}

¹Experimental Psychopathology and Psychotherapy, Department of Psychology, University of Zurich, Zurich, Switzerland

²Department of Adult Psychiatry and Psychotherapy, Psychiatric University Clinic Zurich, Zurich, Switzerland

³Applied Team Research Lab, Department of Psychology, University of Zurich, Zurich, Switzerland

⁴Zurich Center for Neuroeconomics, Department of Economics, University of Zurich, Zurich, Switzerland

⁵University Hospital Zurich, Zurich, Switzerland

*These authors contributed equally.

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Supplementary Methods

Deviations from preregistration

The analyses presented deviated from the preregistration in the following ways.

Following recommendations in the literature¹ and from one of the reviewers, the three subscales of burnout were considered separately rather than as a mean score. Apart from this, the multiple regression analyses were as specified. The elastic net regressions included an expanded predictor set from that used for the multiple regression analyses since these models are able to account for a large number of, sometimes correlated, predictors. These kinds of models are by nature data-driven and exploratory, so we included the entire predictor set to reduce bias.

In the preregistration, we set out multiple regression models to test the association of the experience and prediction errors (experienced minus expected) of support, stressful situations, and responsibility and contribution with burnout and well-being at T2. However, for the sake of conciseness and given the prediction errors were highly correlated with the experiences, we instead chose to include the experiences and prediction errors in the predictor sets for the elastic net models. This reduces the number of models tested and accounts for correlations between variables.

For the analyses involving ecological momentary assessment data, burst (T0, T1 or T2) was entered as a covariate in the models given that negative and positive affect can change across bursts, due to the internship or other factors. We found this to improve model fit (Supplementary Table 2). The random slopes (NA_slope and PA_slope) from the model in Supplementary Table 3 were related to work dissatisfaction in separate models due to their high correlation instead of the same model (Supplementary Table 4). NA_slope and PA_slope were added to the elastic net regressions to predict the outcome variables since these models are able to separate the individual contributions of correlated variables.

In addition, the random effects structure was improved in the model investigating the interaction between being on/off duty and feeling comfortable in company (Table 3) by including the interaction term as a random effect, rather than just on/off duty, as is recommended². This model had significantly better model fit than the preregistered model (see Supplementary Table 5 for model comparison). Further to the preregistration, we added an exploratory mediation analysis (Supplementary Figure 3).

Supplementary Tables

Supplementary Table 1. Correlation matrix of numeric variables.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
(1) Skills Improvement T2																								
(2) Experienced Responsibility and Contribution T2	0.58***																							
(3) Responsibility and Contribution PE	0.46***	0.64***																						
(4) Experienced Stressful Situations T2	0.13	0.23*	0.19																					
(5) Stressful Situations PE	0.07	0.19	0.24*	0.87***																				
(6) Experienced Support T2	0.40***	0.44***	0.16	0.20*	0.18																			
(7) Support PE	0.24*	0.21*	0.35***	0.15	0.27**	0.58***																		
(8) Psychological Safety T1 (imputed)	0.31**	0.20*	0.05	0.05	0.05	0.34***	0.09																	
(9) Psychological Safety T2	0.29**	0.31**	0.12	0.05	0.04	0.47***	0.24*	0.28**																
(10) Depersonalisation T1	-0.12	-0.07	-0.03	-0.10	-0.04	-0.10	0.14	-0.16	0.00															
(11) Depersonalisation T2	-0.13	-0.09	-0.07	-0.25*	-0.15	-0.13	-0.02	-0.13	-0.06	0.49***														
(12) Personal Accomplishment T1	0.21	0.23*	0.14	0.10	0.16	0.03	-0.07	0.20	0.07	0.11	0.21													
(13) Personal Accomplishment T2	0.25*	0.16	0.26*	0.02	0.05	0.02	-0.05	0.19	0.13	-0.11	0.15	0.48***												
(14) Emotional Exhaustion T1	-0.15	-0.19	-0.10	0.11	0.10	-0.27*	-0.15	-0.31**	-0.10	0.33**	0.04	0.03	-0.12											
(15) Emotional Exhaustion T2	-0.01	-0.18	-0.11	0.02	0.01	-0.21	-0.14	-0.24*	-0.18	0.20	0.32**	0.08	-0.02	0.56***										
(16) Average Practical Involvement (T1+T2)	0.57***	0.65***	0.49***	0.09	0.07	0.32**	0.19	0.15	0.23*	-0.18	0.01	0.26*	0.34**	-0.10	-0.04									
(17) Well-Being T0	0.23*	0.19	0.10	-0.09	-0.13	0.15	0.07	0.26**	0.32**	-0.18	-0.05	0.10	0.28*	-0.30**	-0.25*	0.30**								
(18) Well-Being T1	0.19	0.26*	0.25*	0.05	0.10	0.13	0.11	0.42***	0.09	-0.13	-0.02	0.19	0.35**	-0.42***	-0.35**	0.24*	0.50***							
(19) Well-Being T2	0.37***	0.30**	0.21*	-0.09	-0.06	0.35***	0.30**	0.30**	0.37***	-0.09	-0.15	0.16	0.40***	-0.50***	-0.51***	0.26**	0.46***	0.58***						
(20) Internship Events T1 (imputed)	-0.03	0.07	-0.01	-0.01	-0.03	-0.12	-0.03	-0.14	-0.08	0.07	0.14	0.20	0.25*	0.03	0.16	0.11	-0.07	-0.05	-0.07					
(21) Internship Events T2	0.19	0.28**	0.11	0.33**	0.24*	0.15	0.15	0.00	0.05	-0.05	-0.06	0.13	0.11	-0.04	0.08	0.23*	0.21*	0.12	0.07	0.33***				
(22) Work Dissatisfaction T1	-0.41***	-0.41***	-0.31**	-0.08	-0.13	-0.34***	-0.23*	-0.47***	-0.28**	0.23*	0.08	-0.29**	-0.32**	0.31**	0.28*	-0.46***	-0.41***	-0.66***	-0.48***	0.08	-0.13			
(23) Work Dissatisfaction T2	-0.41***	-0.23*	-0.22*	0.00	0.02	-0.32**	-0.15	-0.41***	-0.39***	0.18	0.19	-0.17	-0.23*	0.35**	0.37***	-0.23*	-0.24*	-0.23*	-0.43***	0.17	0.10	0.50***		
(24) Self-Efficacy T0	0.33***	0.50***	0.21*	-0.01	0.05	0.33***	0.19	0.22*	0.25*	0.04	0.13	0.18	0.37***	-0.14	-0.07	0.47***	0.20*	0.36***	0.34***	0.04	0.20	-0.47***	-0.28**	

(25) Stress Reactivity T0 -0.22* -0.36*** -0.22* 0.13 0.07 -0.23* -0.19 -0.12 -0.23* -0.30** -0.27* -0.09 -0.26* 0.19 0.16 -0.39*** -0.22* -0.23* -0.28** -0.10 -0.12 0.31** 0.26** -0.57***

Note. Spearman rank correlation was performed on possible pairs, r_s values presented with *** denoting $p < .001$, ** denoting $p < .01$, and * denoting $p < .05$.

Supplementary Table 2. ANOVA model comparison when adding burst as a covariate to affect models.

NA Model	npar	AIC	BIC	logLik	deviance	Chisq	Df	Pr(>Chisq)
Preregistered model	8	3575.03	3633.29	-1779.52	3559.03	NA	NA	NA
Adding burst	10	3469.49	3542.32	-1724.75	3449.49	109.54	2	<0.001
PA Model	npar	AIC	BIC	logLik	deviance	Chisq	Df	Pr(>Chisq)
Preregistered model	8	28340.17	28398.43	-14162.09	28324.17	NA	NA	NA
Adding burst	10	28284.33	28357.16	-14132.17	28264.33	59.84	2	<0.001

Adding burst as a covariate to the preregistered multilevel models predicting negative and positive affect significantly improved model fit. *P*-values below 0.05 are bolded.

Supplementary Table 3. Multilevel model predicting momentary negative and positive affect, and mean momentary stress.

<i>Predictors</i>	(Log) Negative Affect						Positive Affect						(Sqrt) Mean Momentary Stress					
	<i>beta</i>	<i>SE</i>	<i>95% CI</i>	<i>T</i>	<i>p</i>	<i>df</i>	<i>beta</i>	<i>SE</i>	<i>95% CI</i>	<i>T</i>	<i>p</i>	<i>df</i>	<i>beta</i>	<i>SE</i>	<i>95% CI</i>	<i>T</i>	<i>p</i>	<i>df</i>
Intercept	0.59	0.03	0.52 – 0.66	17.22	<0.001	100.30	4.01	0.09	3.83 – 4.18	46.49	<0.001	102.85	1.47	0.03	1.40 – 1.53	43.64	<0.001	137.17
On Duty [Yes]	0.04	0.01	0.02 – 0.06	4.09	<0.001	93.02	0.07	0.03	0.00 – 0.13	2.07	0.041	95.83	0.06	0.02	0.03 – 0.10	4.01	<0.001	464.64
Burst [T1]	0.05	0.01	0.04 – 0.06	7.57	<0.001	10657.72	-0.13	0.02	-0.17 – -0.09	-6.26	<0.001	10670.17	0.01	0.02	-0.03 – 0.04	0.29	0.772	471.10
Burst [T2]	0.07	0.01	0.05 – 0.08	9.89	<0.001	10657.33	-0.15	0.02	-0.19 – -0.10	-6.88	<0.001	10668.30	-0.00	0.02	-0.04 – 0.04	-0.13	0.894	472.07
Gender (Male)	0.07	0.06	-0.06 – 0.20	1.07	0.287	98.77	-0.10	0.16	-0.42 – 0.22	-0.60	0.551	100.85	0.01	0.06	-0.10 – 0.13	0.25	0.801	98.84
Gender (Unknown)	-0.26	0.29	-0.84 – 0.32	-0.90	0.373	94.32	-1.08	0.73	-2.53 – 0.37	-1.48	0.142	97.08	-0.38	0.26	-0.91 – 0.14	-1.45	0.151	96.49
Random Effects																		
σ^2	0.08						0.78						0.04					
T00	0.08 id						0.52 id						0.06 id					
T11	0.01 id.in_internship[Yes]						0.06 id.in_internship[Yes]											
ρ_{01}	0.16 id						0.03 id											
ICC	0.53						0.41						0.63					
N	103 id						103 id						103 id					
Observations	10745						10745						571					
Marginal R ² / Conditional R ²	0.020 / 0.542						0.020 / 0.421						0.026 / 0.643					
Deviance	3449.544						28264.383						-37.336					

Multilevel models predicting (log-transformed) negative (left) and positive (middle) affect by whether the student was currently working in the internship or not. On/off duty was included as a random slope. Momentary stress (right) was aggregated across bursts and across on/off duty factor levels first

and then square-root-transformed in order to meet model assumptions, therefore only random intercepts were included. Note that momentary stress was included as an item to calculate negative affect. Degrees of freedom were calculated using Satterthwaite approximation. *P*-values below 0.05 are bolded.

Supplementary Table 4. Multiple linear regression predicting average work dissatisfaction from PA and NA slope estimates.

<i>Predictors</i>	Average Work Dissatisfaction (T1+T2)						Average Work Dissatisfaction (T1+T2)					
	<i>beta</i>	<i>SE</i>	<i>std. Beta</i>	<i>95% CI</i>	<i>T</i>	<i>p</i>	<i>beta</i>	<i>SE</i>	<i>std. Beta</i>	<i>95% CI</i>	<i>T</i>	<i>p</i>
Intercept	2.29	0.05	0.05	2.19 – 2.40	43.04	<0.001	2.14	0.06	0.02	2.01 – 2.26	33.88	<0.001
PA Slope Estimate	-0.76	0.24	-0.30	-1.24 – -0.28	-3.12	0.002						
Gender (Unknown)	-0.30	0.44	-0.68	-1.17 – 0.56	-0.69	0.490	-0.09	0.44	-0.20	-0.95 – 0.78	-0.20	0.840
Gender (Male)	-0.07	0.10	-0.15	-0.26 – 0.12	-0.71	0.478	-0.03	0.10	-0.06	-0.22 – 0.16	-0.29	0.770
NA Slope Estimate							2.40	0.84	0.28	0.74 – 4.07	2.86	0.005
Observations	101						101					
R ² / R ² adjusted	0.095 / 0.067						0.082 / 0.053					

The slope estimates of negative and positive affect were significantly related to work dissatisfaction (averaged between T1 and T2 reports) when entered into separate multiple linear regression models. *P*-values below 0.05 are bolded.

Supplementary Table 5. ANOVA model comparison when adding burst as a covariate and the interaction term in the random effect structure.

NA Model	npar	AIC	BIC	logLik	deviance	Chisq	Df	Pr(>Chisq)
Preregistered	10	1594.93	1662.84	-787.47	1574.93	NA	NA	NA
Adding burst	12	1560.78	1642.28	-768.39	1536.78	38.15	2	<0.001
Only interaction random slope	15	1450.07	1551.94	-710.04	1420.07	116.71	3	<0.001
PA Model	npar	AIC	BIC	logLik	deviance	Chisq	Df	Pr(>Chisq)
Preregistered	10	16608.64	16676.55	-8294.32	16588.64	NA	NA	NA
Adding burst	12	16592.15	16673.64	-8284.07	16568.15	20.49	2	<0.001
Only interaction random slope	15	16577.00	16678.87	-8273.50	16547.00	21.14	3	<0.001

We conducted an ANOVA to compare the preregistered models to those where burst was added as a covariate and the slope of the interaction term `on/off_duty:comfortable_in_company` was included in the random effects structure. Both significantly improved model fit and justified the adaptation of the model from what was preregistered where a less comprehensive random effects structure (only `on/off_duty`) was included and burst was omitted. *P*-values below 0.05 are bolded.

Supplementary Table 6. Multiple linear regression predicting skills improvement at T2.

Skills Improvement T2						
<i>Predictors</i>	<i>beta</i>	<i>SE</i>	<i>std. Beta</i>	<i>95% CI</i>	<i>T</i>	<i>p</i>
Intercept	2.08	0.36	0.04	1.37 – 2.80	5.83	<0.001
Average Practical Involvement (T1+T2)	0.47	0.07	0.55	0.32 – 0.62	6.40	<0.001
Average Psychological Safety (T1+T2)	0.02	0.01	0.21	0.00 – 0.03	2.30	0.024
Prior Experience T0 (Linear)	0.07	0.09	0.14	-0.11 – 0.24	0.76	0.449
Prior Experience T0 (Quadratic)	0.09	0.09	0.19	-0.09 – 0.26	1.01	0.314
Prior Experience T0 (Cubic)	0.10	0.10	0.20	-0.10 – 0.29	0.96	0.339
Prior Experience T0 (Quartic)	-0.16	0.10	-0.33	-0.35 – 0.03	-1.62	0.108
Gender (Male)	-0.05	0.09	-0.11	-0.23 – 0.13	-0.58	0.566
Gender (Unknown)	-0.05	0.39	-0.10	-0.83 – 0.74	-0.12	0.905
Observations	97					
R ² / R ² adjusted	0.427 / 0.375					

We conducted a multiple linear regression on reported skills improvement at T2. The model explained a significant proportion of variance ($R^2 = 0.43$, adj. $R^2 = 0.38$, $F(8, 88) = 8.19$, $p < .001$). Average practical involvement across T1 and T2 was positively associated with skills improvement, as was average psychological safety. *P*-values below 0.05 are bolded.

Supplementary Table 7. Multiple linear regression predicting the burnout subscales depersonalisation, emotional exhaustion, and personal accomplishment at T1.

<i>Predictors</i>	Depersonalisation T1						Emotional Exhaustion T1						Personal Accomplishment T1					
	<i>beta</i>	<i>SE</i>	<i>std. Beta</i>	<i>95% CI</i>	<i>T</i>	<i>p</i>	<i>beta</i>	<i>SE</i>	<i>std. Beta</i>	<i>95% CI</i>	<i>T</i>	<i>p</i>	<i>beta</i>	<i>SE</i>	<i>std. Beta</i>	<i>95% CI</i>	<i>T</i>	<i>p</i>
Intercept	1.04	3.30	-0.10	-5.55 – 7.63	0.32	0.753	-0.95	3.41	-0.06	-7.76 – 5.86	-0.28	0.782	2.77	2.41	-0.06	-2.03 – 7.57	1.15	0.253
Internship Events T1 (imputed)	0.00	0.04	0.01	-0.07 – 0.08	0.09	0.925	0.01	0.04	0.04	-0.07 – 0.09	0.34	0.734	0.04	0.03	0.15	-0.02 – 0.09	1.28	0.205
Psychological Safety T1 (imputed)	0.02	0.03	0.09	-0.04 – 0.07	0.59	0.559	-0.03	0.03	-0.15	-0.08 – 0.03	-0.96	0.339	0.01	0.02	0.10	-0.03 – 0.05	0.68	0.500
Work Dissatisfaction T1	0.78	0.33	0.33	0.11 – 1.45	2.32	0.023	0.44	0.35	0.19	-0.25 – 1.13	1.27	0.208	-0.31	0.24	-0.19	-0.80 – 0.17	-1.28	0.204
Stress Reactivity T0	-0.03	0.02	-0.19	-0.08 – 0.02	-1.31	0.194	0.04	0.02	0.23	-0.01 – 0.09	1.53	0.131	0.01	0.02	0.08	-0.03 – 0.04	0.51	0.614
Self-Efficacy T0	-0.00	0.05	-0.01	-0.10 – 0.09	-0.07	0.946	0.05	0.05	0.15	-0.05 – 0.14	1.03	0.309	0.03	0.03	0.15	-0.03 – 0.10	1.02	0.310
Prior Experience T0 (Linear)	0.16	0.30	0.13	-0.45 – 0.77	0.52	0.601	-0.50	0.31	-0.42	-1.13 – 0.13	-1.59	0.116	0.05	0.22	0.05	-0.40 – 0.49	0.20	0.839
Prior Experience T0 (Quadratic)	-0.10	0.30	-0.08	-0.70 – 0.51	-0.32	0.750	0.10	0.31	0.08	-0.53 – 0.72	0.31	0.754	0.03	0.22	0.03	-0.41 – 0.47	0.13	0.899
Prior Experience T0 (Cubic)	0.41	0.34	0.35	-0.26 – 1.09	1.22	0.226	0.14	0.35	0.12	-0.56 – 0.84	0.41	0.684	0.14	0.25	0.16	-0.36 – 0.63	0.55	0.586
Prior Experience T0 (Quartic)	-0.40	0.32	-0.33	-1.03 – 0.23	-1.26	0.212	-0.02	0.33	-0.01	-0.67 – 0.64	-0.05	0.959	-0.31	0.23	-0.36	-0.77 – 0.15	-1.33	0.187
Gender (Male)	0.56	0.36	0.46	-0.16 – 1.27	1.55	0.126	0.11	0.37	0.09	-0.63 – 0.85	0.28	0.777	0.21	0.26	0.24	-0.31 – 0.73	0.80	0.429
Gender (Unknown)	-1.77	1.19	-1.47	-4.15 – 0.61	-1.48	0.143	0.93	1.23	0.78	-1.53 – 3.39	0.76	0.452	0.41	0.87	0.48	-1.32 – 2.14	0.47	0.638
Observations	79						79						79					
R ² / R ² adjusted	0.232 / 0.106						0.164 / 0.027						0.190 / 0.057					

Results of multiple linear regression models predicting burnout subscales at T1. Work dissatisfaction was the only predictor that showed an association, positively predicting depersonalisation. None of the models explained a significant portion of variance (Depersonalisation: $R^2 = 0.23$, adj. $R^2 = 0.11$, $F(11, 67) = 1.84$, $p = .064$; Emotional Exhaustion: $R^2 = 0.16$, adj. $R^2 = 0.03$, $F(11, 67) = 1.20$, $p = .305$; Personal Accomplishment: $R^2 = 0.19$, adj. $R^2 = 0.06$, $F(11, 67) = 1.42$, $p = .183$). *P*-values below 0.05 are bolded.

Supplementary Table 8. Multiple linear regression predicting the burnout subscales depersonalisation, emotional exhaustion, and personal accomplishment at T2.

<i>Predictors</i>	Depersonalisation T2						Emotional Exhaustion T2						Personal Accomplishment T2					
	<i>beta</i>	<i>SE</i>	<i>std. Beta</i>	<i>95% CI</i>	<i>T</i>	<i>p</i>	<i>beta</i>	<i>SE</i>	<i>std. Beta</i>	<i>95% CI</i>	<i>T</i>	<i>p</i>	<i>beta</i>	<i>SE</i>	<i>std. Beta</i>	<i>95% CI</i>	<i>T</i>	<i>p</i>
Intercept	-0.14	2.92	-0.19	-5.98 – 5.69	-0.05	0.961	-1.91	2.66	-0.16	-7.22 – 3.40	-0.72	0.476	1.45	2.18	-0.09	-2.91 – 5.80	0.66	0.509
Internship Events T2	-0.03	0.03	-0.09	-0.09 – 0.04	-0.78	0.439	0.01	0.03	0.05	-0.05 – 0.08	0.45	0.653	0.01	0.03	0.04	-0.04 – 0.06	0.38	0.704
Psychological Safety T2	0.01	0.02	0.05	-0.04 – 0.06	0.39	0.698	-0.00	0.02	-0.02	-0.05 – 0.04	-0.18	0.854	0.01	0.02	0.04	-0.03 – 0.04	0.32	0.752
Stress Reactivity T0	-0.03	0.03	-0.14	-0.08 – 0.03	-0.98	0.333	0.03	0.02	0.21	-0.01 – 0.08	1.39	0.169	-0.00	0.02	-0.01	-0.04 – 0.04	-0.06	0.950
Work Dissatisfaction T2	0.89	0.35	0.32	0.19 – 1.59	2.53	0.014	0.87	0.32	0.35	0.23 – 1.51	2.73	0.008	-0.08	0.26	-0.04	-0.60 – 0.45	-0.29	0.776
Self-Efficacy T0	0.04	0.05	0.12	-0.05 – 0.14	0.89	0.375	0.03	0.04	0.09	-0.06 – 0.12	0.67	0.504	0.09	0.04	0.36	0.02 – 0.17	2.61	0.011
Prior Experience T0 (Linear)	-0.13	0.33	-0.10	-0.80 – 0.53	-0.40	0.688	0.15	0.30	0.12	-0.46 – 0.75	0.48	0.634	0.05	0.25	0.05	-0.45 – 0.55	0.19	0.850
Prior Experience T0 (Quadratic)	0.25	0.32	0.19	-0.40 – 0.89	0.77	0.442	0.22	0.29	0.18	-0.37 – 0.81	0.75	0.453	0.15	0.24	0.15	-0.33 – 0.63	0.62	0.538
Prior Experience T0 (Cubic)	0.29	0.39	0.21	-0.49 – 1.06	0.74	0.464	0.26	0.35	0.21	-0.45 – 0.97	0.73	0.469	0.22	0.29	0.22	-0.36 – 0.80	0.75	0.454
Prior Experience T0 (Quartic)	0.26	0.34	0.19	-0.43 – 0.95	0.75	0.456	0.40	0.31	0.33	-0.23 – 1.02	1.27	0.210	0.01	0.26	0.01	-0.50 – 0.52	0.04	0.970
Gender (Male)	0.84	0.40	0.63	0.05 – 1.63	2.13	0.037	0.56	0.36	0.47	-0.16 – 1.28	1.55	0.126	0.19	0.30	0.20	-0.40 – 0.78	0.66	0.513
Gender (Unknown)	-1.03	1.34	-0.76	-3.70 – 1.64	-0.77	0.446	0.31	1.22	0.26	-2.12 – 2.75	0.26	0.797	1.37	1.00	1.39	-0.63 – 3.36	1.37	0.175
Observations	77						77						77					
R ² / R ² adjusted	0.244 / 0.116						0.215 / 0.082						0.212 / 0.079					

Results of multiple linear regression models predicting burnout subscales at T2. Work dissatisfaction showed a positive association with depersonalisation and emotional exhaustion, while self-efficacy showed a positive association with personal accomplishment. None of the models explained a significant portion of variance (Depersonalisation: $R^2 = 0.24$, adj. $R^2 = 0.12$, $F(11, 65) = 1.90$, $p = .055$; Emotional Exhaustion: $R^2 = 0.22$, adj. $R^2 = 0.08$, $F(11, 65) = 1.62$, $p = .115$; Personal Accomplishment: $R^2 = 0.21$, adj. $R^2 = 0.08$, $F(11, 65) = 1.59$, $p = .123$). P -values below 0.05 are bolded.

Supplementary Table 9. Multiple linear regression predicting well-being at T1.

<i>Predictors</i>	Well-Being T1					
	<i>beta</i>	<i>SE</i>	<i>std. Beta</i>	<i>95% CI</i>	<i>T</i>	<i>p</i>
Intercept	24.01	31.91	-0.08	-39.42 – 87.44	0.75	0.454
Well-Being T0	0.31	0.08	0.32	0.15 – 0.47	3.76	<0.001
Internship Events T1 (imputed)	0.16	0.36	0.04	-0.56 – 0.89	0.44	0.660
Psychological Safety T1 (imputed)	0.39	0.25	0.15	-0.11 – 0.89	1.56	0.122
Work Dissatisfaction T1	-13.33	3.21	-0.41	-19.72 – -6.95	-4.15	<0.001
Stress Reactivity T0	0.18	0.24	0.08	-0.29 – 0.66	0.78	0.438
Self-Efficacy T0	0.46	0.44	0.11	-0.41 – 1.32	1.06	0.294
Prior Experience T0 (Linear)	2.06	2.88	0.12	-3.66 – 7.79	0.72	0.475
Prior Experience T0 (Quadratic)	-0.45	3.03	-0.03	-6.47 – 5.57	-0.15	0.882
Prior Experience T0 (Cubic)	1.78	3.36	0.10	-4.89 – 8.45	0.53	0.597
Prior Experience T0 (Quartic)	0.85	3.29	0.05	-5.68 – 7.39	0.26	0.796
Gender (Male)	4.86	3.30	0.29	-1.69 – 11.41	1.47	0.144
Gender (Unknown)	-10.00	13.13	-0.59	-36.09 – 16.09	-0.76	0.448
Observations	100					
R ² / R ² adjusted	0.514 / 0.447					

Results of the multiple linear regression model predicting well-being at T1. Work dissatisfaction showed a negative association. The model explained a significant portion of variance ($R^2 = 0.51$, adj. $R^2 = 0.45$, $F(12, 87) = 7.66$, $p < .001$). *P*-values below 0.05 are bolded.

Supplementary Table 10. Multiple linear regression predicting well-being at T2.

<i>Predictors</i>	Well-Being T2					
	<i>beta</i>	<i>SE</i>	<i>std. Beta</i>	<i>95% CI</i>	<i>T</i>	<i>p</i>
Intercept	34.01	31.23	-0.01	-28.10 – 96.12	1.09	0.279
Well-Being T0	0.26	0.09	0.28	0.08 – 0.44	2.91	0.005
Internship Events T2	-0.16	0.37	-0.04	-0.89 – 0.56	-0.44	0.660
Psychological Safety T2	0.21	0.24	0.09	-0.27 – 0.69	0.87	0.387
Work Dissatisfaction T2	-9.46	3.49	-0.29	-16.40 – -2.52	-2.71	0.008
Stress Reactivity T0	-0.05	0.27	-0.02	-0.59 – 0.49	-0.19	0.853
Self-Efficacy T0	0.79	0.48	0.18	-0.18 – 1.75	1.63	0.108
Prior Experience T0 (Linear)	4.96	3.33	0.30	-1.67 – 11.59	1.49	0.141
Prior Experience T0 (Quadratic)	-0.92	3.25	-0.05	-7.39 – 5.55	-0.28	0.778
Prior Experience T0 (Cubic)	-3.47	3.91	-0.21	-11.24 – 4.30	-0.89	0.377
Prior Experience T0 (Quartic)	1.07	3.62	0.06	-6.13 – 8.27	0.30	0.768
Gender (Male)	0.97	3.80	0.06	-6.59 – 8.53	0.26	0.798
Gender (Unknown)	16.63	14.96	0.99	-13.13 – 46.39	1.11	0.270
Observations	97					
R ² / R ² adjusted	0.363 / 0.272					

Results of the multiple linear regression model predicting well-being at T2. Work dissatisfaction showed a negative association. The model explained a significant portion of variance ($R^2 = 0.36$, adj. $R^2 = 0.27$, $F(12, 84) = 4.00$, $p < .001$). *P*-values below 0.05 are bolded.

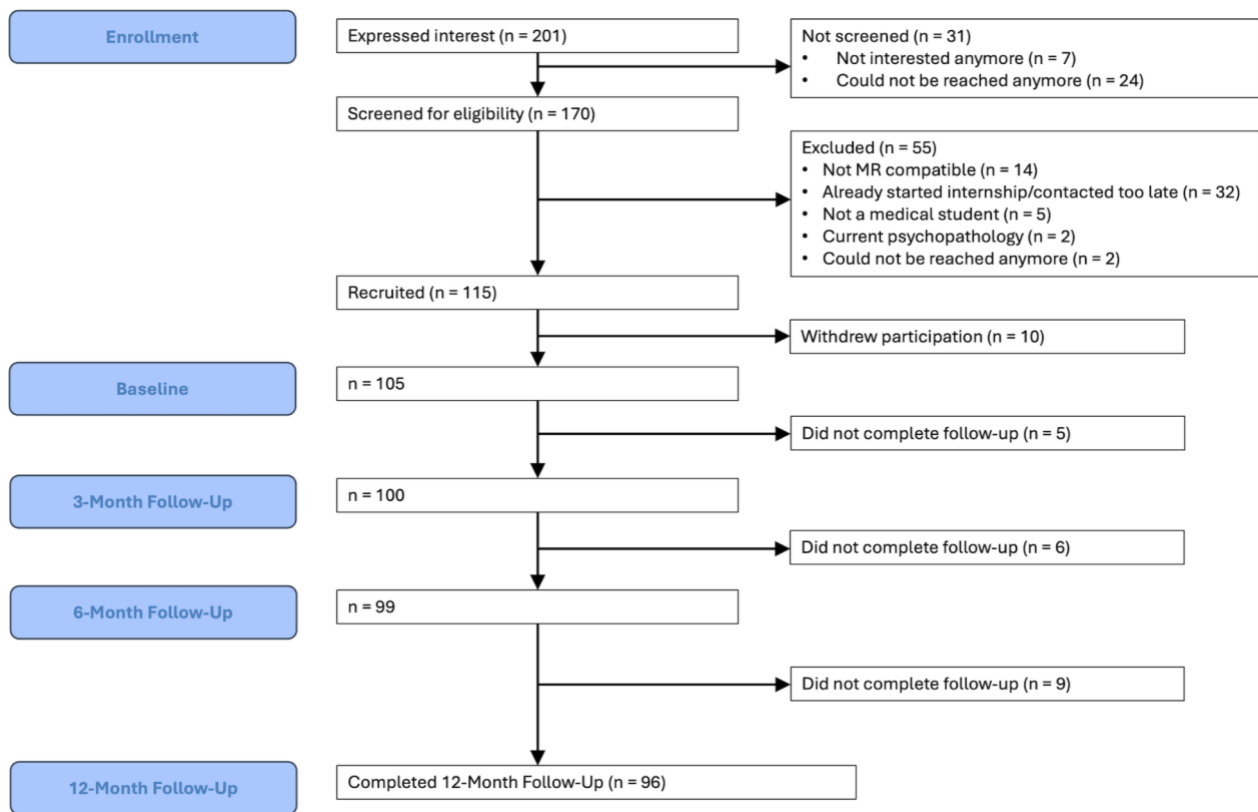
Supplementary Table 11. Ordinal logistic multiple regression predicting career motivation at T3.

<i>Predictors</i>	<i>Odds Ratios</i>	<i>SE</i>	Career Motivation T3			
			<i>Std. Odds Ratio</i>	<i>95% CI</i>	<i>T</i>	<i>p</i>
less_likely no_change	280.14	795.38	0.05	0.95 – 82508.40	1.98	0.052
no_change more_likely	5927.70	17678.31	1.00	15.11 – 2325370.91	2.91	0.005
Average Emotional Exhaustion (T1+T2)	0.50	0.15	0.48	0.27 – 0.87	-2.35	0.022
Average Depersonalisation (T1+T2)	1.41	0.41	1.45	0.81 – 2.54	1.18	0.244
Average Personal Accomplishment (T1+T2)	2.41	0.91	2.07	1.17 – 5.25	2.32	0.024
Change in Well-Being (average of T1+T2)-T0	1.01	0.02	1.10	0.98 – 1.04	0.36	0.718
Skills Improvement T2	4.13	2.55	1.96	1.26 – 14.67	2.29	0.025
Prior Experience T0 (Linear)	0.96	0.56	0.96	0.31 – 3.00	-0.07	0.947
Prior Experience T0 (Quadratic)	0.31	0.18	0.31	0.09 – 0.97	-1.97	0.054
Prior Experience T0 (Cubic)	1.11	0.73	1.11	0.30 – 4.07	0.15	0.880
Prior Experience T0 (Quartic)	3.38	2.36	3.38	0.89 – 14.13	1.74	0.087
Gender (Male)	0.38	0.24	0.38	0.10 – 1.30	-1.52	0.133
Gender (Unknown)	0.37	0.77	0.37	0.01 – 22.21	-0.48	0.634
Observations	70					
R ² Nagelkerke	0.446					

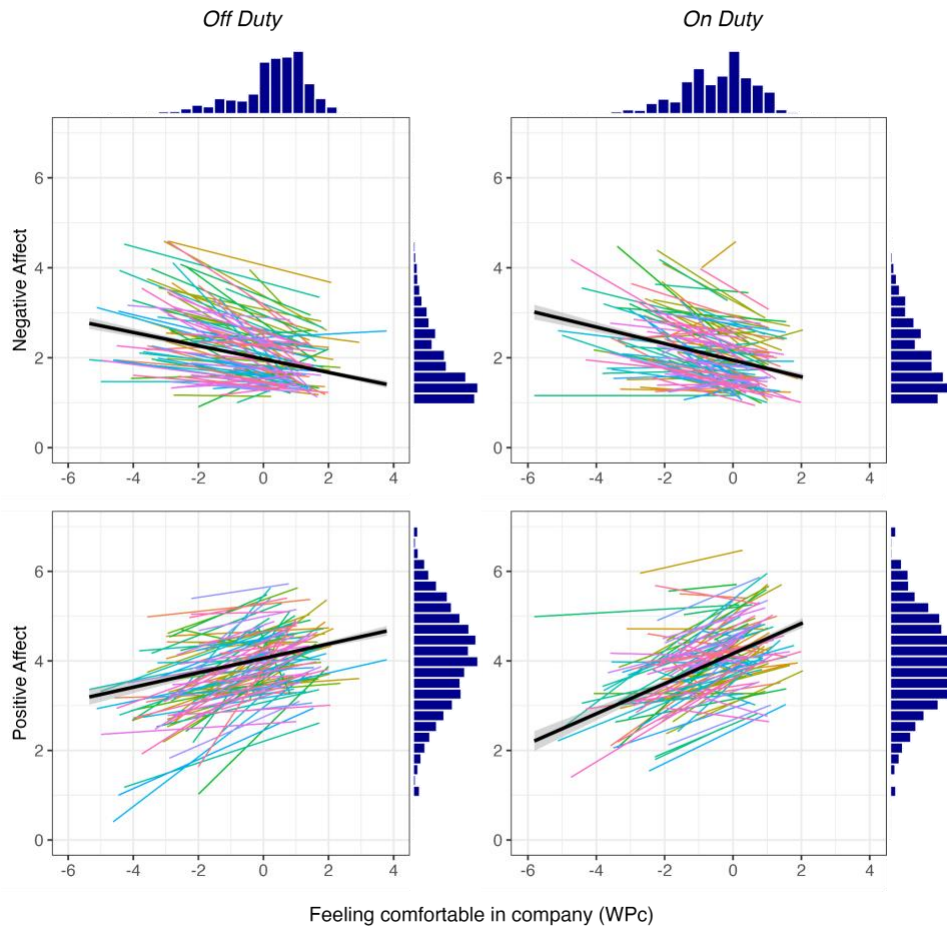
Results of the ordinal logistic regression predicting career motivation reported at T3. The R^2 Nagelkerke was 0.45. Skills improvement reported at T2 and average personal accomplishment across T1 and T2 was positively associated with higher career motivation while emotional exhaustion reported across T1 and T2 was negatively associated. All other predictors were not significantly associated (all $ps > 0.1$). P -values below 0.05 are bolded.

Supplementary Figures

Supplementary Figure 1. Participant flowchart.

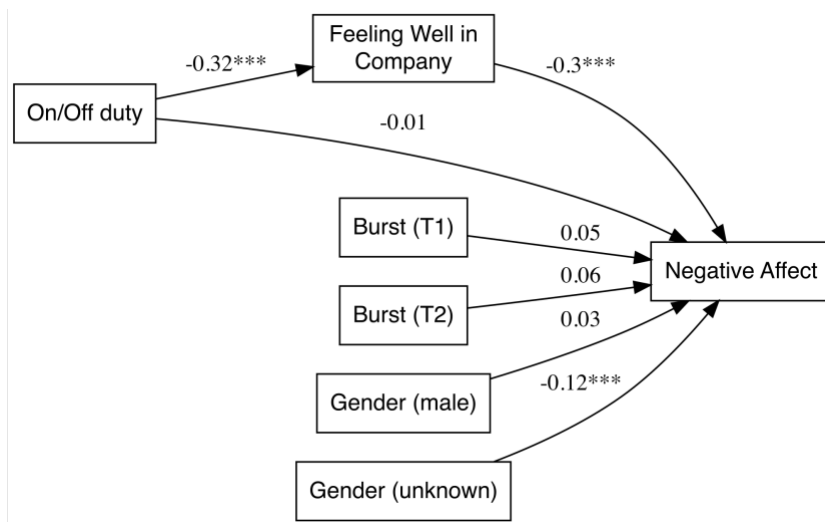


Supplementary Figure 2. Momentary negative and positive affect by feeling well in company.



Feeling comfortable in current company on negative (top) and positive (bottom) affect across all prompts, days, and bursts, split by being off (left) or on (right) duty. Each colour is a regression line for one student. The black line is the average across all students with a shaded 95% confidence interval. Feeling comfortable in company was within-person centred (WPc). $n = 103$ participants.

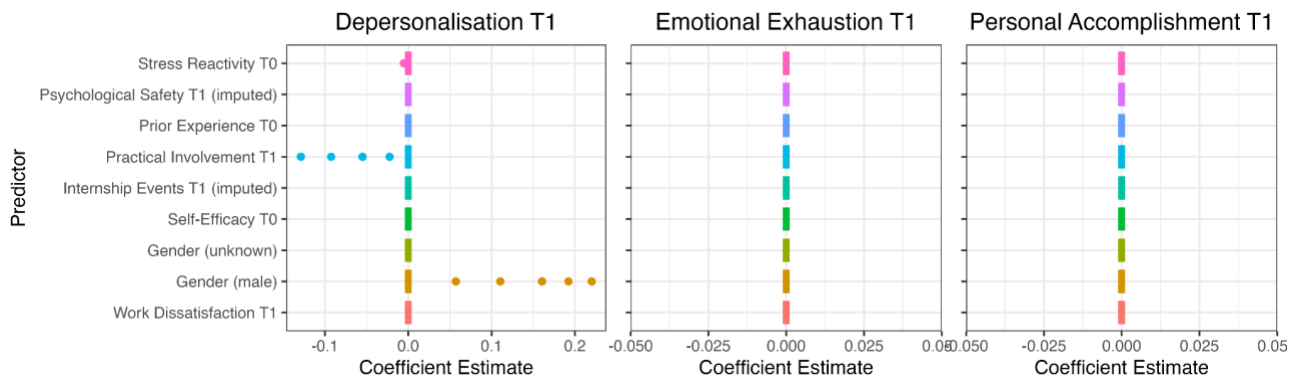
Supplementary Figure 3. Mediation of feeling comfortable in company on relationship between being on/off duty and negative affect.



Multilevel mediation model with being on/off-duty as the independent variable, negative affect as the dependent variable, feeling well in company as the mediator, and gender (2nd level) and burst (1st level) as covariates. Regression paths are presented with standardised coefficients and *** denoting $p < .001$, ** denoting $p < .01$, and * denoting $p < .05$. $n = 103$ participants. This plot was created with the lavaanPlot package³. See the Methods in the main manuscript for model details.

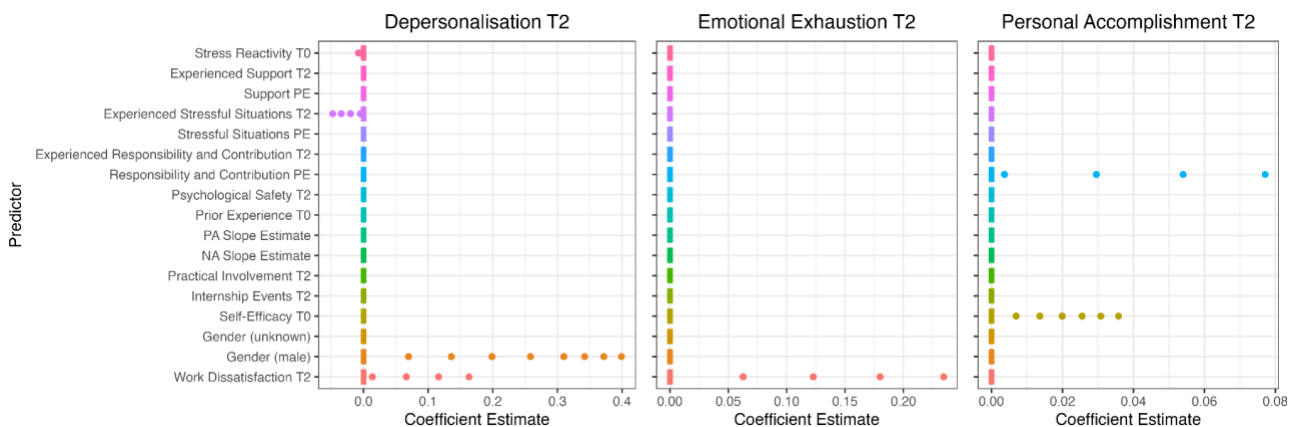
In this model, the total effect (of being on/off-duty on negative affect controlling for burst as a covariate but not controlling for feeling well in company) was significantly negative ($\beta = -0.09$, $z = 4.51$, $p < .001$). The direct effect (of being on/off-duty on negative affect when controlling for feeling well in company) was non-significant ($\beta = -0.01$, $z = -0.47$, $p = .635$). The indirect effect (of being on/off-duty on negative affect *via* feeling well in company, i.e., the effect of being on/off-duty on feeling well in company ($\beta = -0.32$, $z = -11.14$, $p < .001$) multiplied by the effect of feeling well in company on negative affect ($\beta = -0.30$, $z = -11.62$, $p < .001$)) was also significant ($\beta = 0.10$, $z = 8.29$, $p < .001$). This suggests a full mediation effect. The model fit was generally good (Chi-squared = 34.43 ($p < 0.001$), CFI = 0.96, TLI = 0.89, RMSEA_{robust} = 0.04, SRMR_{between} = 0.04, SRMR_{within} = 0.02) given that the chi-squared statistic is sensitive to large sample sizes.

Supplementary Figure 4. Elastic net results for predicting burnout subscales reported at T1.



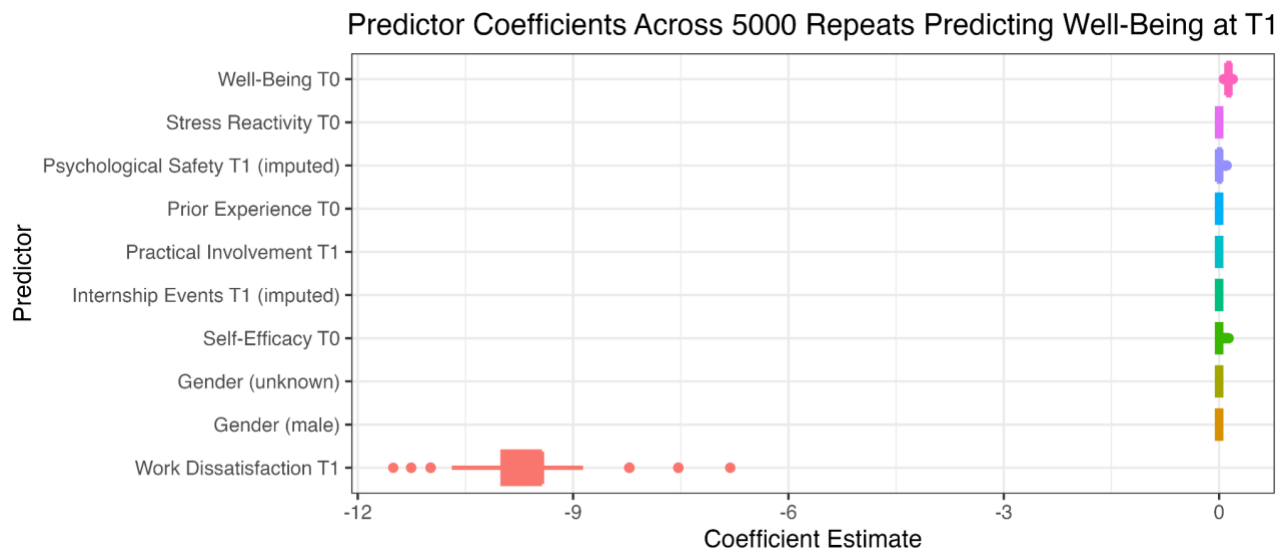
Distribution of coefficient estimates across the 5000 elastic net regression repeats predicting depersonalisation (left), emotional exhaustion (middle) and personal accomplishment (right) at T1. All predictors had an absolute average coefficient < 0.001 . $n = 79$ participants. Optimal lambda (lambda.1se) was Depersonalisation: $M = 0.71$, $SD = 0.01$, range = 0.45 – 0.71; Emotional Exhaustion: $M = 0.64$, $SD = 0.00$, range = 0.64 – 0.64; Personal Accomplishment: $M = 0.52$, $SD = 0.00$, range = 0.52 – 0.52. The deviance ratio was $M < 0.001$ for all subscales. Boxplots show the first and third quartiles as hinges, 1.5 times the interquartile range as whiskers, and outliers as points.

Supplementary Figure 5. Elastic net results for predicting burnout subscales reported at T2.



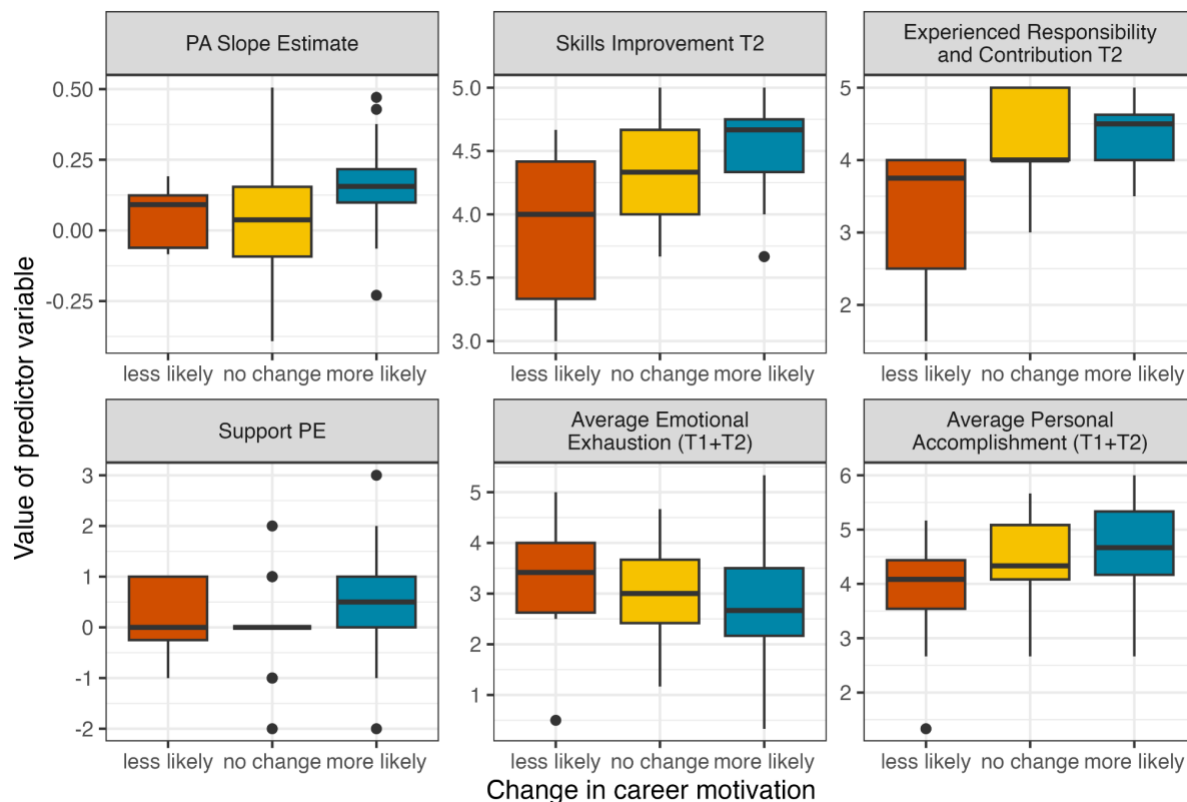
Distribution of coefficient estimates across the 5000 elastic net regression repeats predicting depersonalisation (left), emotional exhaustion (middle) and personal accomplishment (right) at T2. Work dissatisfaction had a very small and inconsistent positive association with emotional exhaustion ($M = 0.005$, $SD = 0.03$), and self-efficacy had a very small and inconsistent positive association with personal accomplishment ($M = 0.002$, $SD = 0.005$). All other predictors of interest had an absolute average coefficient < 0.001 . $n = 76$ participants. Optimal lambda (lambda.1se) was Depersonalisation: $M = 0.89$, $SD = 0.05$, range = 0.43 – 0.90; Emotional Exhaustion: $M = 0.93$, $SD = 0.03$, range = 0.64 – 0.93; Personal Accomplishment: $M = 0.78$, $SD = 0.05$, range = 0.45 – 0.80. The deviance ratio was $M < 0.01$ for all subscales. Boxplots show the first and third quartiles as hinges, 1.5 times the interquartile range as whiskers, and outliers as points.

Supplementary Figure 6. Elastic net results for predicting well-being reported at T1.



Distribution of coefficient estimates across the 5000 elastic net regression repeats predicting well-being at T1. Work dissatisfaction showed a large negative association on average ($M = -9.62$, $SD = 0.66$). Psychological safety had a small positive average coefficient ($M = 0.01$, $SD = 0.02$), and self-efficacy showed a negligible positive coefficient ($M = 0.006$, $SD = 0.02$). $n = 100$ participants. Optimal lambda (lambda.1se) was $M = 7.40$, $SD = 0.90$, range = 4.38 – 11.10. The mean deviance ratio was $M = 0.37$ ($SD = 0.02$, range = 0.27 – 0.45). Boxplots show the first and third quartiles as hinges, 1.5 times the interquartile range as whiskers, and outliers as points.

Supplementary Figure 7. Boxplots relating variables associated with career motivation.



Boxplots of different predictors against career motivation. The predictors shown had non-negligible average coefficients in the elastic net regression. The boxplots show the median as the bold line, the first and third quartiles as hinges, 1.5 times the interquartile range as whiskers, and outliers as black points. $n = 70$ participants.

Supplementary Figure 8. Documents and topics.



Note. Topic space as output by BERTopic following merging of topics, prior to assignment of outliers and subtopic *Social Exchange*. $n = 77$ participants.

Further Members of the HMZ STRESS Consortium

Further members of the HMZ STRESS consortium who did not contribute directly to the content of this article and were not involved in funding acquisition:

Abraham Bernstein, Andrew Demello, Bruno Weber, Elisabeth Stark, Flurin Cathomas, Guido Seiler, Roland von Känel, Susanne Walitza.

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Supplementary References

1. Maslach, C., Jackson, S. E. & Leiter, M. P. Maslach Burnout Inventory: Third edition. in *Evaluating stress: A book of resources* 191–218 (Scarecrow Education, Lanham, MD, US, 1997).
2. Barr, D. J. Random effects structure for testing interactions in linear mixed-effects models. *Front Psychol* **4**, 328 (2013).
3. Lishinski, A. lavaanPlot: Path Diagrams for ‘Lavaan’ Models via ‘DiagrammeR’. (2024).