Supplement

S1. Model Specifications and Set up

General Model Specifications

The present models included two latent processes, the rate of change ($d\theta_t$) in closeness discrepancies for both the male and female partner within the couple. Each latent variable was assessed by a single manifest indicator, with fixed loadings set to 1 across all measurement occasions for identification purposes. In the measurement model, manifest intercepts were fixed to zero, and manifest error variances and covariances were freely estimated for both processes. Continuous error variances and covariances (Q), along with the means, variances and covariances of the initial observations, were freely estimated. Random effects were introduced for means and intercepts. The inclusion of any additional random effects led to unstable model solutions and was therefore omitted.

The drift matrix, capturing the auto- and cross-effects (i.e., the effects of the processes on each other) of the two latent processes, underwent step-wise restrictions to ensure model fit. Initially, all drift parameters were estimated without constraints. Subsequently, the auto-effects were specified in a more complex manner, as detailed in the following section, and set equal for both partners. Except intercepts and error variances, parameters were set equal for male and female partners. The cross-effects were fixed to zero due to the absence of significant coefficients (fit indices are presented in Table ST1).

Complex auto-effects

With regard to the nonlinear capabilities of continuous time models, we incorporated complex auto-effect parameters into the model. This encompassed both a common auto-effect (A_{base}) and a state-dependent auto-effect (A*state*) for the two latent processes. This allowed for the estimation of distinct auto-effects based on whether an individual was currently experiencing closeness frustration or closeness surfeit. To maintain a stable node model where processes return to equilibrium, the auto-effects were constrained to be negative. To enforce this, a composed stan function was included (utilizing the rstan package [Stan Development Team, 2023; Version 2.21.5]). This function consists of the natural logarithm of 1 plus the natural exponentiation of x, i.e., $\ln(1 + e^{x})$. The resulting complex auto-effect is presented in Equation SE1.

$$\ln(1 + e^{Abase + Astate * \eta t}) \quad \text{(SE1)}$$

$$\ln(1 + e^{Abase + Astate * \eta t}) * \eta_t \quad \text{(SE2)}$$

The state-dependent component is dependent on the current state of the process (η_t). For instance, it is multiplied by 1 if individuals experience states of closeness surfeit of 1 and by -1 if individuals experience states of closeness frustration of -1. The auto-effect itself is contingent on the current state of the process (Equation SE2). This ensures that the process consistently returns to zero.

Covariate Models

In addition to the basic model, we implemented step-wise models incorporating covariates. In the initial step, daily contact duration (M; M_t) was introduced as a time-varying moderator. Initially, we included this time-dependent variable as a higher-order process to continuously influence the processes of interest. However, the estimated auto-effect of the higher-order process indicated that the influence of the covariate resembled a basic impulse shape (i.e., an input applied at a single moment in time) rather than a dissipative process. Consequently, we incorporated the covariate as a straightforward time-dependent predictor in the first-order model (Driver & Voelkle, 2018b). Subsequently, we specified both a basic and a state-dependent component of the effect (Equation SE3). This model was employed to estimate the main effect of daily contact duration on closeness regulation.

$$(\mathrm{M}base + \mathrm{M}state * \eta_t) * \mathrm{M}_t \tag{SE3}$$

Finally, time-independent covariates (B; i.e., explicit and implicit motivational orientation, respectively) were incorporated in a second and third covariate model, influencing all parameters. This allows for effects on the individual components of the auto-effects and the time-dependent predictor. For technical reasons, gender-specific parameters were specified for male and female partners.

Comparison of the Rates of Change given a Closeness Frustration of -1 and a Closeness Surfeit of 1

The rates of change were computed using simplified model equations. These equations included the complex auto-effects and the effects of both time-dependent and time-independent covariates. However, we excluded all nonsignificant coefficients of these parameters, as well as the continuous intercepts and the error matrix, from these calculations. An illustrative simplified model equation is shown in Equation SE4. The rate of change plotted in absolute values to enhance comprehension.

$$d\theta_t = \ln(1 + e^{\mathrm{A}base + \mathrm{B}base + (\mathrm{A}state + \mathrm{B}state) * \eta_t}) * \eta_t + (\mathrm{M}base + \mathrm{B}base + (\mathrm{M}state + \mathrm{B}state) * \eta_t) * \mathrm{M}_t \tag{SE4}$$

Table ST1

Fit Indices of the Stepwise Model Setup of the Basic Model

Model	Log-Likelihood	AIC
Free auto- and cross-effects	-3,698.36	7,444.71
Complex auto-effects and free cross-effects	-3,655.63	7,363.26
Complex auto-effects and no cross-effects	-3,657.04	7,362.08

Model	Log-Likelihood	AIC
Equal complex auto-effects and no cross-effects	-3,657.52	7,359.04

Note. AIC = Akaike Information Criterion.

S2. Effects of Time-Independent Covariates

Table ST2

Effects of Implicit Motivational Orientation on the Latent Process Parameters of the Continuous Time Model

Effect on	Male Partner's Motivational Orientation			Female Partner's Motivational Orientation		
	β	*SE*	95% CI	β	*SE*	95% CI
b_m	0.31	0.25	[-0.17, 0.80]	-0.12	0.25	[-0.61, 0.36]
b_f	-0.06	0.21	[-0.47, 0.35]	0.19	0.23	[-0.26, 0.63]
$A\mathit{base}_m$	0.07	0.29	[-0.49, 0.64]	0.30	0.29	[-0.27, 0.88]
$A\mathit{base}_f$	-0.29	0.31	[-0.89, 0.31]	-0.27	0.34	[-0.94, 0.41]
$A\mathit{state}_m$	-0.00	0.07	[-0.15, 0.14]	0.04	0.07	[-0.10, 0.17]
$A\mathit{state}_f$	-0.11	0.08	[-0.26, 0.04]	-0.07	0.07	[-0.20, 0.06]
$M\mathit{base}_m$	-0.04	0.03	[-0.11, 0.02]	-0.03	0.04	[-0.10, 0.04]
$M\mathit{base}_f$	0.04	0.04	[-0.03, 0.12]	0.04	0.03	[-0.10, 0.02]
$M\mathit{state}_m$	-0.08 *	0.04	[-0.15, -0.002]	-0.08 **	0.03	[-0.15, -0.02]
$M\mathit{state}_f$	0.17 **	0.06	[0.05, 0.28]	-0.10 ***	0.03	[-0.15, -0.05]
Q_m	0.26	0.33	[-0.33, 0.96]	0.58	0.33	[0.03, 1.29]
Q_f	-0.44	0.31	[-1.13, 0.09]	-0.46	0.25	[0.02, 0.99]
$Q_{m,f}$	-0.08 *	0.03	[-0.14, -0.01]	0.00	0.04	[-0.07, 0.08]

Note. b = continuous intercept, A = auto-effect, M = effect of daily contact duration, Q = continuous error (co-)variance, *base* = base term, *state* = state-dependent term, m = male partner, f = female partner. Random effects are presented in standard deviations.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table ST3

Effects of Explicit Motivational Orientation on the Latent Process Parameters of the Continuous Time Model

Effect on	Male Partner's Motivational Orientation			Female Partner's Motivational Orientation		
	β	*SE*	95% CI	β	*SE*	95% CI
b_m	-0.09	0.24	[-0.57, 0.39]	0.03	0.22	[-0.40, 0.46]
b_f	0.32	0.23	[-0.13, 0.77]	-0.33	0.21	[-0.74, 0.09]
$A\mathit{base}_m$	-0.33	0.35	[-1.01, 0.36]	-0.10	0.30	[-0.69, 0.49]
$A\mathit{base}_f$	0.07	0.27	[-0.46, 0.58]	-0.26	0.32	[-0.90, 0.37]
$A\mathit{state}_m$	-0.07	0.12	[-0.31, 0.18]	-0.05	0.10	[-0.25, 0.16]
$A\mathit{state}_f$	0.19 **	0.07	[0.05, 0.32]	-0.11	0.07	[-0.25, 0.04]
$M\mathit{base}_m$	-0.02	0.03	[-0.08, 0.05]	-0.03	0.03	[-0.09, 0.03]
$M\mathit{base}_f$	0.02	0.03	[-0.04, 0.08]	-0.03	0.03	[-0.09, 0.03]
$M\mathit{state}_m$	-0.01	0.03	[-0.08, 0.06]	-0.07 *	0.03	[-0.14, -0.003]
$M\mathit{state}_f$	0.05	0.03	[-0.01, 0.10]	-0.13 ***	0.04	[-0.19, -0.06]
Q_m	-0.62	0.32	[-1.18, 0.11]	0.15	0.35	[-0.23, 1.11]
Q_f	-0.77 **	0.25	[-1.31, -0.34]	0.51 *	0.22	[0.11, 0.98]
$Q_{m,f}$	0.15 *	0.06	[0.01, 0.24]	-0.03	0.04	[-0.10, 0.05]

Note. b = continuous intercept, A = auto-effect, M = effect of daily contact duration, Q = continuous error (co-)variance, *base* = base term, *state* = state-dependent term, m = male partner, f = female partner. Random effects are presented in standard deviations.

* $p < .05$. ** $p < .01$. *** $p < .001$.