

Temporal Relations Between Affective, Cognitive, and Dissociative States in Patients with Borderline Personality Disorder: An Experience Sampling Approach

Outline

1. Research question and hypotheses
2. Data sets
3. Multilevel reliability
4. Multilevel modeling approach
5. Missing data
6. Results
7. Questions and discussion

1 Research question and hypotheses

Borderline personality disorders (BPD) is characterized by high levels of **arousal**, high levels of **perceived rejection**, and in some individuals high levels of **dissociative states**.

Temporal relation of these constructs?

We expected that (a) increases in perceived rejection precede increases in arousal; and (b) increases in arousal precede increases in dissociative states.

2 Data sets

Three diagnostic groups assessed on two consecutive days using e-diaries.

52 prompts every day (8am – 9pm), ca. every 15 min

Day 1: $n = 49$ patients with BPD, $n = 50$ patients with depressive disorders, $n = 51$ non-clinical controls

Day 2: $n = 49$ patients with BPD, $n = 47$ patients with depressive disorders, $n = 49$ non-clinical controls

2 Data sets

We used visual analoge scales (0-100) to assess states at the moment of the prompts.

Day 1/2: At the moment, I feel tense. [arousal]

Day 1: ..., I feel rejected. [rejection_1]

..., I feel accepted. [rejection_2]

Day 2: ..., I have the impression that my body does not belong to me
[dissociation_1]

..., I have the impression other people or things around me are
unreal. [dissociation_2]

3 Multilevel reliability

Multilevel composite reliability to decompose true (shared) and error (unshared) variance at the within- and the between-level (Lai, 2021; also see Geldhof et al., 2014)

Day 1: Composite: 0.86, 95% CI [0.82, 0.89] **rejection**
 Within-level: 0.77, 95% CI [0.75, 0.79]
 Between-level: 0.88, 95% CI [0.83, 0.91]

Day 2: Composite: 0.88, 95% CI [0.86, 0.91] **dissociation**
 Within-level: 0.66, 95% CI [0.64, 0.69]
 Between-level: 0.93, 95% CI [0.91, 0.95]

3 Multilevel modeling approach

Dynamic structural equation models in *Mplus* (Asparouhov et al., 2018)

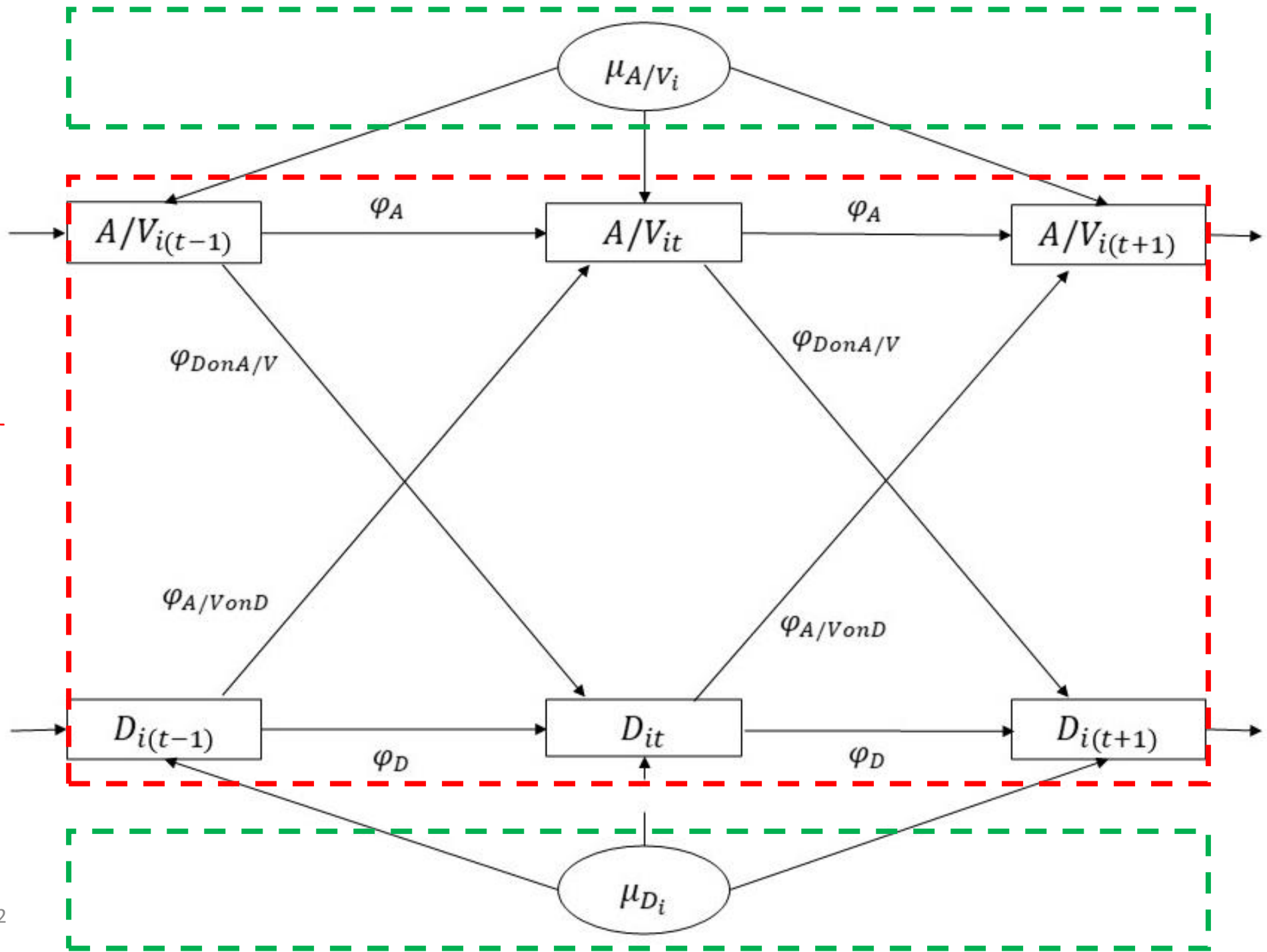
Between-level estimates:

Person-specific means of arousal, perceived rejection, and dissociation (daily averages). These were averaged across diagnostic groups.

Within-level estimates:

Autocorrelations of order 1 and cross-lagged effects. Fixed effects reflect averages across diagnostic groups and random-effects variances denote person-specific deviations from these averages.

within-
level



4 Missing data

Day 1 overall valid responses: 60.70% for arousal, 59.80% for rejection

Day 2 overall valid responses: 57.30% for arousal, 57.40% for dissociation

Problem: biased estimates, unequal time intervals between assessments

Solution: *Mplus* TINTERVAL option that inserts missing observations for omitted prompts.

5 Results (Day 1)

	All Participants		BPD Patients		DD Patients		HC Participants	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
	Unstandardized parameter estimates							Trait levels
$E(\mu_{TA})$	70.10	[62.55, 77.60]	55.26	[49.70, 60.64]	34.37	[27.11, 41.78]	15.73	[8.98, 22.32]
$E(\mu_{PR})$	66.40	[56.65, 76.06]	52.40	[43.36, 61.60]	35.17	[24.85, 45.83]	13.04	[7.75, 18.41]
$SD(\mu_{TA})$	15.31	[13.27, 17.88]	16.53	[12.27, 23.53]	21.23	[15.78, 30.41]	19.95	[14.74, 28.55]
$SD(\mu_{PR})$	20.20	[17.42, 23.79]	27.18	[20.55, 38.56]	32.38	[24.52, 45.01]	16.25	[12.11, 23.32]

1 = BPD, 2= DD, 3 = HC

Group as predictor

$\beta_E(\mu_{TA})$	-17.49	[-20.92, -14.01]
$\beta_E(\mu_{PR})$	-16.48	[-20.90, -11.97]

5 Results (Day 1)

	All Participants		BPD Patients		DD Patients		HC Participants	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
Fixed effects							Autoregressive Effects	
$\gamma_{\varphi TA}$	0.58	[0.41, 0.75]	0.49	[0.35, 0.61]	0.52	[0.37, 0.66]	0.35	[0.21, 0.49]
$\gamma_{\varphi PR}$	0.45	[0.24, 0.64]	0.30	[0.11, 0.47]	0.33	[0.25, 0.40]	0.22	[0.07, 0.38]
$\gamma_{\varphi PRonTA}$	0.12	[-0.05, 0.27]	0.28	[0.03, 0.55]	0.15	[0.01, 0.32]	0.15	[0.01, 0.31]
$\gamma_{\varphi TAonPR}$	0.06	[-0.05, 0.27]	0.07	[-0.00, 0.15]	0.07	[-0.03, 0.19]	0.18	[0.01, 0.38]
							Cross-Lagged Effects	
Group as predictor								
$\beta_{\gamma_{\varphi TA}}$	-0.06	[-0.14, 0.02]						
$\beta_{\gamma_{\varphi PR}}$	-0.05	[-0.14, 0.04]						
$\beta_{\gamma_{\varphi PRonTA}}$	0.02	[-0.03, 0.07]						
$\beta_{\gamma_{\varphi TAonPR}}$	0.02	[-0.04, 0.09]						

5 Results (Day 1)

	All Participants		BPD Patients		DD Patients		HC Participants	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
Unstandardized parameter estimates								
Random-effects variances								
φ_{TA}	0.07	[0.05, 0.11]	0.11	[0.05, 0.26]	0.16	[0.08, 0.34]	0.14	[0.07, 0.32]
φ_{PR}	0.11	[0.07, 0.16]	0.21	[0.10, 0.48]	0.19	[0.09, 0.40]	0.19	[0.10, 0.41]
φ_{PRonTA}	0.02	[0.01, 0.03]	0.02	[0.01, 0.06]	0.16	[0.06, 0.40]	0.09	[0.02, 0.33]
φ_{TAonPR}	0.04	[0.02, 0.09]	0.39	[0.14, 1.01]	0.06	[0.02, 0.16]	0.13	[0.04, 0.41]
$\ln(\sigma_{\zeta_{TA}}^2)$	6.78	[5.05, 9.62]	9.78	[4.30, 23.36]	5.69	[2.83, 14.05]	21.35	[12.23, 43.52]
$\ln(\sigma_{\zeta_{PR}}^2)$	8.31	[6.31, 11.12]	6.23	[3.37, 12.76]	10.62	[5.94, 20.89]	16.64	[9.10, 34.54]
$\ln(\sigma_{\zeta_{TA_PR}}^2)$	8.99	[6.79, 12.18]	5.82	[3.03, 12.34]	10.58	[5.45, 21.81]	21.24	[11.68, 41.67]

5 Results (Day 2)

	BPD Patients		DD Patients		NCC Participants	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
	Unstandardized parameter estimates					Trait levels
$E(\mu_A)$	5.74	[5.28, 6.01]	3.52	[2.66, 4.37]	1.40	[0.92, 2.06]
$E(\mu_D)$	2.11	[1.17, 3.06]	1.13	[0.39, 1.86]	0.40	[0.09, 0.71]
$SD(\mu_A)$	1.13	[0.74, 1.76]	2.48	[1.91, 3.37]	1.42	[0.81, 2.21]
$SD(\mu_D)$	2.95	[2.23, 4.19]	2.32	[1.81, 3.10]	0.92	[0.67, 1.30]

5 Results (Day 2)

	BPD Patients		DD Patients		NCC Participants	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
Unstandardized parameter estimates						
Fixed effects						Autoregressive Effects
$\gamma_{\varphi A}$	0.60	[0.47, 0.72]	0.58	[0.44, 0.70]	0.46	[0.31, 0.60]
$\gamma_{\varphi D}$	0.27	[0.09, 0.43]	0.42	[0.23, 0.55]	0.01	[-0.02, 0.03]
$\gamma_{\varphi DonA}$	0.25	[0.05, 0.51]	-0.02	[-0.17, 0.01]	0.00	[-0.01, 0.01]
$\gamma_{\omega AonD}$	-0.02	[-0.17, 0.10]	0.01	[-0.02, 0.06]	0.01	[-0.01, 0.02]
						Cross-Lagged Effects

5 Results (Day 2)

	BPD Patients		DD Patients		NCC Participants	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
Unstandardized parameter estimates						
Random-effects variances						
φ_A	0.09	[0.04, 0.22]	0.12	[0.06, 0.24]	0.13	[0.07, 0.25]
φ_D	0.19	[0.09, 0.42]	-	-	-	-
φ_{DonA}	0.24	[0.05, 0.86]	-	-	-	-
φ_{AonD}	0.04	[0.01, 0.18]	-	-	-	-
$\ln(\sigma_{\zeta A}^2)$	4.24	[2.39, 8.50]	4.09	[2.52, 7.23]	5.81	[3.58, 10.70]
$\ln(\sigma_{\zeta D}^2)$	13.47	[7.82, 25.55]	12.42	[7.63, 21.73]	12.51	[7.74, 22.56]
$\ln(\sigma_{\zeta A-D}^2)$	2.47	[0.97, 5.78]	-	-	-	-

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Thank you for your attention!

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Publications

Day 1 (arousal and perceived rejection):

Heekerens, J. B., Schulze, L., Enge, J., Renneberg, B., & Roepke, S. (2022). The temporal relation of arousal and perceived rejection in patients with borderline personality disorder and depressive disorders: An experience sampling approach. *Personality Disorders: Theory, Research, and Treatment*. Advanced online publication. doi: 10.1037/per0000546.

Preprint available at doi: 10.31234/osf.io/p76ej

Data and code are available at <https://osf.io/83b4x/>

Day 2 (arousal and dissociation):

Heekerens, J. B., Schulze, L., Enge, J., Renneberg, B., & Roepke, S. (2022). Arousal temporally precedes dissociation in patients with borderline personality disorder: An experience sampling approach.

Preprint. <https://doi.org/10.31234/osf.io/ty9pk>

Data and code are available at <https://osf.io/qdheu/>