

Supplemental Material

Table S1

Concurrent Pearson Correlations between all Dynamic Measures and Psychopathological Features at Baseline (above the diagonal) and at One year Follow-up (below the diagonal)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Mean NA	-	.70**	.52**	.44**	-.43**	.28**	.21**	.14	.42**	.42**	.00
2. Variability NA	.64**	-	.81**	.42**	-.34**	.63**	.49**	.22**	.42**	.34**	.02
3. Instability NA ¹	.54**	.88**	-	-.09	-.24**	.54**	.64**	-.08	.32**	.18**	-.04
4. Inertia NA	.32**	.38**	-.01	-	-.19**	.20**	-.12	.49**	.14	.31**	.09
5. mean PA	-.37**	-.27**	-.15	-.29**	-	-.20**	-.06	-.32**	-.30**	-.44**	-.04
6. variability PA	.22**	.60**	.49**	.25**	-.21**	-	.78**	.31**	.24**	.25**	.01
7. instability PA ¹	.24**	.55**	.57**	-.03	-.08	.83**	-	-.29**	.19**	.09	-.04
8. Inertia PA	.03	.17*	-.04	.53**	-.42**	.33**	-.20**	-	.10	.28**	.14
9. BPD traits	.38**	.41**	.33**	.23**	-.32**	.16*	.10	.20**	-	.50**	.00
10. depressive features	0.33**	0.30**	0.19*	0.25**	-0.37**	0.20**	0.12	0.21**	0.57**	-	.23**
11. Gender	.05	-.03	-.03	.03	-.06	-.04	-.06	.08	.08	.26**	-

Note. PA=positive affect; NA= negative affect; BPD= borderline personality disorder

** correlation is significant at .01 level (two-tailed) *correlation is significant at the .05 level (two-tailed) ¹ Next to measures of emotional variability and inertia, additional analyses were conducted also including emotional instability, which are reported in Supplemental Online Material

Table S2

Prospective Pearson Correlations between Dynamic Measures and Psychopathological Features measured at Baseline and at One year Follow-up

	Baseline										
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Mean NA	.72**	.42**	.36**	.27**	-.31**	.14	.14	.01	.35**	.24**	.05
2. Variability NA	.50**	.57**	.54**	.20**	-.24**	.39**	.37**	.03	.39**	.25**	-.03
3. Instability NA ¹	.41**	.51**	.58**	.06	-.13	.34**	.39**	-.07	.24**	.08	-.03
4. Inertia NA	.24**	.17*	.02	.29**	-.25**	.06	-.03	.18*	.32**	.34**	.03
5. mean PA	-.28**	-.15	-.11	-.11	.71**	-.04	<-.01	-.14	-.29**	-.30**	-.06
6. variability PA	.18*	.44**	.41**	.09	-.15*	.66**	.55**	.14	.24**	.21**	-.04
7. instability PA ¹	.18*	.40**	.49**	-.05	-.07	.60**	.63**	-.05	.16*	.06	-.06
8. Inertia PA	.09	.16*	-.02	.26**	-.28**	.10	-.10	.34**	.23**	.32**	.08
9. BPD traits	.40**	.36**	.28**	.13	-.33**	.10	.09	.04	.63**	.37**	.08
10. depressive features	.30**	.31**	.24**	.15*	-.31**	.13	.09	.11	.49**	.48**	.26**
11. gender	.00	.02	-.04	.09	-.04	.01	-.04	.14	.00	.23**	1**

Note. PA=positive affect; NA= negative affect; BPD= borderline personality disorder

** correlation is significant at .01 level (two-tailed) *correlation is significant at the .05 level (two-tailed) ¹ Next to measures of emotional variability and inertia, additional analyses were conducted also including emotional instability, which are reported in Supplemental Online Material

Table S3

Concurrent Pearson Correlations between all Dynamic Measures and Individual Borderline Personality Disorder criteria Measured at Baseline (upper section) and at Follow-up (lower section)

		AB	REL	ID	IM	SUI	SH	AI	EM	ANG	STR
Concurrent correlations at baseline	Mean NA	.08	.14	.32**	.11	.14	.26**	.35**	.33**	.21**	.21**
	Variability NA	.09	.19**	.26**	.16*	.21**	.29**	.32**	.30**	.17*	.21**
	Instability NA ¹	.01	.23**	.20**	.14*	.13	.22**	.19**	.17*	.18*	.21**
	Inertia NA	.13	-.07	.08	-.03	.15*	.17*	.17*	.19**	-.07	.02
	mean PA	-.13	-.07	-.19**	.02	-.24**	-.27**	-.22**	-.31**	-.02	-.18*
	variability PA	.09	.05	.13	.04	.12	.09	.22**	.27**	.05	.19**
	instability PA ¹	.04	.08	.04	.07	.04	.09	.17*	.16*	.11	.20**
	Inertia PA	.09	-.06	.13	-.07	.19**	.08	.10	.17*	-.11	-.00
Concurrent correlations at follow-up	Mean NA	.26**	.22**	.20**	.16*	.13	.02	.30**	.22**	.20**	.31**
	Variability NA	.24**	.21**	.18*	.21**	.21**	.05	.28**	.31**	.24**	.31**
	Instability NA ¹	.23**	.16*	.10	.18*	.08	-.03	.22**	.25**	.24**	.32**
	Inertia NA	.12	.11	.13	.11	.27**	.18*	.18*	.15	.07	.11
	mean PA	-.11	-.13	-.26**	-.10	-.25**	-.22**	-.26**	-.26**	-.05	-.23**

variability PA	.06	.11	.06	.09	.11	-.05	.11	.23**	.02	.13
instability PA ¹	.02	.10	-.02	.05	.00	-.16*	.06	.17*	.08	.14
Inertia PA	.03	.07	.21**	.10	.24**	.23**	.16*	.18*	-.03	.04

Note. PA=positive affect; NA= negative affect; AB=abandonment anxiety; REL=unstable relationships; ID=unstable identity; IM=impulsivity; SUI=(threatened) suicidality; SH=self-harm; AI= affective instability; EM=emptiness; ANG=inappropriate anger; STR=stress induced dissociation or paranoia

** correlation is significant at .01 level (two-tailed) *correlation is significant at the .05 level (two-tailed)

¹ Next to measures of emotional variability and inertia, additional analyses were conducted also including emotional instability which are reported in Supplemental Online Material.

Supplemental Analyses

We also repeated the main analyses that were reported in the manuscript, however this time investigating the three main emotion dynamics patterns that are also examined in the meta-analysis by Houben et al. (2015): emotional variability, emotional instability and emotional inertia. Because the measures of emotional variability, instability and inertia are interrelated (Jahng et al., 2008), and one measure can be expressed as a function of the two other measures, not all three measures, but only pairs of dynamic measures were entered simultaneously as predictors of depressive features or BPD traits in separate models.

First, measures of emotional instability per person were calculated. Instability was quantified by estimating a multilevel model, in which squared successive differences of repeated PA or NA scores (excluding overnight changes in affect) were modeled using a random intercept. Next, estimates of this intercept for each person were extracted, and used as an index of instability in PA or NA. Measures of emotional variability and inertia were calculated as described in the main manuscript.

Next, all dynamic measures were used in several sets of hierarchical regression models. Note that standardized regression coefficients based on standardized predictors and outcomes were also computed. Moreover, tolerance and variance inflation factor (VIF) measures were carefully checked for indications of multicollinearity. For all analyses, no indications for multicollinearity were found, with all tolerance measures above .2 and all VIF measures below 10. The only exception are models in which measures of variability and instability from the follow-up wave were simultaneously entered as predictors of emotion dynamics, for which tolerance values of .19 and VIF measures of 5.26 were obtained. So these results should be interpreted with caution. However, note that similar analyses were conducted for the baseline data in which no indications for possible multicollinearity problems were detected. Separate models were estimated for PA and NA.

Descriptive statistics

Mean levels of affect and emotional instability were significantly correlated only for NA, not for PA ($r=.52$ and $r=.51$ for NA; $r=-.06$ and $r=-.08$ for PA). Moreover, measures of

instability and variability were very highly correlated ($r = .81$ and $r = .88$ for NA and $r = .78$ and $r = .83$ for PA).

Simple correlations with depressive features showed a significant positive relationship with instability of NA ($r = .19$ and $.18$) but not PA ($r = .09$ and $r = .12$; $p > .05$). This is not fully in line with findings from a large scale meta-analysis (Houben et al., 2015) that reported a significant positive correlation between depressive features and instability of positive emotions, although the magnitude of the reported effect is similar in size with that reported in the meta-analysis ($r = .16$).

Simple correlations quantifying the relationship between BPD traits and instability indicated a significant positive association for NA ($r = .32$ and $r = .33$) and for PA at baseline, but not follow-up ($r = .19$ at baseline; $r = .10$, $p > .05$ at follow-up). These results are largely in line with findings from a meta-analysis (Houben et al., 2015) that reported overall positive significant correlations between BPD features and instability of positive and negative emotions.

Unique relationships

In a first set of analyses, unique relationships with psychopathological traits were examined, with correction for overlap between the different dynamic measures. Results for depressive features are shown in Table S4. When predicting depressive features by variability and instability of NA, results indicate that depressive features were uniquely linked to more variable NA, but also to less unstable NA. These results hold after correction for mean NA levels, and were also found in both waves. When variability and inertia of NA were considered together, results indicate that both are uniquely and positively linked to more depressive features. After correction for mean NA levels, only the association with inertia remained significant. However, note that at one year follow-up, this effect remained only marginally significant. Last, when considering inertia and instability of NA together, both were positively related to more depressive features, although again only the effect of inertia remained significant after correction of mean NA levels. This was again found in both waves. This finding shows that the association between depressive features and less unstable negative emotions, which was found in the first model when considered together with variability, seems to be driven by the overlap with inertia. Indeed, previous studies have

shown that higher inertia tend to go hand in hand with lower instability. The last model shows us that this relation between instability and depressive features reverses (becomes positive) after correction for inertia (but becomes insignificant after additional correction for mean NA levels). Overall, these results illustrate that mainly emotional inertia of NA shows a strong and robust association with depressive features.

The analyses with PA are less consistent across waves. When considering variability and instability together, results show that depressive features are linked to higher variability of PA, after correcting for mean levels of PA at baseline. In the follow-up wave, no significant relations were found above and beyond mean PA levels. Considering variability and inertia of PA together, again only variability remains significantly associated with depressive features, after correction for mean PA. However, again this was only the case at baseline. In the follow-up wave none of the dynamic measures were significantly related to depressive features, above and beyond mean PA levels. For instability and inertia of PA, only inertia remains positively related to depressive features at baseline, after correction for mean PA levels. However, in the follow-up wave, again only mean PA, but none of the dynamic measures was significantly related to depressive features. In sum, mainly variability and inertia of PA seem to be related to depressive features at baseline. However, these findings could not be replicated in the follow-up wave.

Next, we ran similar models for BPD traits (Table S5). When variability and instability were both entered as predictors, only variability of NA remained a significant predictor, also after correction for mean NA, but not instability. This was found in both waves. Results were similar for variability and inertia: only variability of NA remained a significant predictor of BPD traits, also after correction for mean NA levels. This finding was again also replicated in the follow-up wave. Results for inertia and instability showed that both were related to BPD traits, and both relationships remained significant after correction for mean NA in the follow-up wave, but not at baseline. In sum, variability of NA was most consistently and robustly associated with BPD traits.

For PA, only variability was significantly linked to BPD traits, when considering together with instability at baseline. However, results seemed to be driven by mean PA levels: in both waves, none of the dynamic measures were linked to BPD traits above and beyond mean PA levels. When considered together with inertia, variability of PA was again a

significant predictor, even after correction for mean PA, however only at baseline. When instability and inertia were entered together, both were positively linked to BPD traits at baseline. Only the relation with instability remained, after correcting for mean PA levels. In the follow-up wave, mainly inertia of PA was linked to BPD traits, although this effect also disappeared after correcting for mean PA. In sum, some indications were found for a unique relationship between BPD traits and variability and instability of PA. However, these result could not be replicated in the follow-up wave.

Specific relationships

Next, specific relationships were examined between dynamic measures and psychopathological traits, with correction for overlap between depressive features and BPD traits. Results are shown in Table S6 and indicated that BPD traits, and not depressive features, were linked to higher levels of variability in NA and more instability in NA, above and beyond mean NA levels. This was found in both waves. Depressive features were uniquely linked to higher levels of inertia NA, above average NA levels (however only at baseline).

Regarding PA, results were more mixed between waves. At baseline, BPD traits, and not depressive features were linked to higher levels of instability in PA, above average PA levels. In turn, depressive features and not BPD traits were linked to more inert PA. In the follow-up wave, none of the psychopathological features were linked to dynamic measures of PA above and beyond mean PA levels. In sum, taking overlap between psychopathological features into account, higher levels of variability and instability in NA was most consistently and uniquely linked to BPD traits. Next, indications were found that depressive features were uniquely linked to higher levels of inertia in PA and NA, but these results were less consistent across waves.

Conclusion

In sum, when taking overlap between different dynamic measures, different type of psychopathological features and mean affect levels into account, indications were found that depressive features were uniquely and specifically linked to higher levels of inertia in NA, and BPD traits were linked to higher levels of variability (and not instability) in NA.

Table S4

Hierarchical Multiple Regression in which Depressive Features are Predicted by Pairs of Dynamic Measures (Step 1) and Additionally by Mean Affect (Step 2)

		Baseline			One year follow-up		
		Unstandardized B (SE)	Standardized beta	p-value	Unstandardized B (SE)	Standardized beta	p-value
Step 1	Variability of NA	1.02 (.20)	.57	<.001	.91 (.24)	.58	<.001
	Instability of NA	-.02 (.01)	-.28	.014	-.02 (.01)	-.32	.036
Step 2	Variability of NA	.55 (.23)	.31	.019	.65 (.25)	.41	.011
	Instability of NA	-.02 (.01)	-.24	.032	-.02 (.01)	-.30	.044
	Mean NA	.30 (.08)	.33	<.001	.20 (.08)	.23	.011
Step 1	Variability of NA	.46 (.13)	.26	<.001	.38 (.12)	.24	.002
	Inertia of NA	10.88 (3.84)	.20	.005	8.01 (4.03)	.15	.048
Step 2	Variability of NA	.12 (.16)	.07	.455	.16 (.15)	.10	.273
	Inertia of NA	7.98 (3.85)	.15	.039	6.98 (4.00)	.13	.083
	Mean NA	.28 (.08)	.30	.001	.19 (.08)	.22	.015
Step 1	Inertia of NA	17.62 (3.51)	.33	<.001	12.89 (3.75)	.25	.001
	Instability of NA	.02 (.01)	.21	.002	.01 (.01)	.19	.008
Step 2	Inertia of NA	9.02 (4.16)	.17	.031	8.66 (3.99)	.17	.031
	Instability of NA	.00 (.01)	.03	.763	.00 (.01)	.06	.512
	Mean NA	.30 (.08)	.33	<.001	.21 (.08)	.25	.007

Step 1	Variability of PA	.78 (.18)	.47	<.001	.42 (.18)	.30	.022
	Instability of PA	-.01 (.01)	-.28	.011	-.01 (.01)	-.13	.318
Step 2	Variability of PA	.53 (.17)	.32	.002	.20 (.18)	.15	.258
	Instability of PA	-.01 (.01)	-.19	.069	-.00(.01)	-.03	.830
	Mean PA	-.30 (.05)	-.39	<.001	-.21 (.05)	-.34	<.001
Step 1	Variability of PA	.30 (.12)	.18	.011	.20 (.11)	.14	.072
	Inertia of PA	14.42 (4.49)	.23	.002	9.24 (4.38)	.16	.036
Step 2	Variability of PA	.23 (.11)	.14	.037	.16 (.10)	.11	.126
	Inertia of PA	7.72 (4.35)	.12	.078	1.99 (4.52)	.04	.660
	Mean PA	-.29 (.05)	-.37	<.001	-.20 (.05)	-.33	<.001
Step 1	Inertia of PA	21.40 (4.45)	.34	<.001	13.75 (4.19)	.24	.001
	Instability of PA	.01 (.00)	.19	.010	.01 (.00)	.17	.025
Step 2	Inertia of PA	12.88 (4.44)	.20	.004	5.72 (4.49)	.10	.204
	Instability of PA	.01 (.00)	.12	.063	.01 (.00)	.12	.112
	Mean PA	-.28 (.05)	-.37	<.001	-.19 (.05)	-.32	<.001

Note. PA= positive affect; NA = negative affect; SE = standard error

Table S5

Hierarchical Multiple Regression in which BPD Traits are Predicted by Pairs of Dynamic Measures (Step 1) and Additionally by Mean Affect (Step 2)

		Baseline			One year follow-up		
		Unstandardized B (SE)	Standardized beta	p-value	Unstandardized B (SE)	Standardized beta	p-value
Step 1	Variability of NA	.81 (.20)	.46	<.001	.91 (.25)	.53	<.001
	Instability of NA	-.00 (.01)	-.05	.641	-.01 (.01)	-.14	.346
Step 2	Variability of NA	.47 (.23)	.27	.041	.69 (.27)	.40	.011
	Instability of NA	-.00 (.01)	-.02	.843	-.01 (.01)	-.12	.392
	Mean NA	.22 (.08)	.24	.007	.17 (.08)	.19	.034
Step 1	Variability of NA	.78 (.13)	.44	<.001	.65 (.13)	.38	<.001
	Inertia of NA	-2.62 (3.74)	-.05	.484	4.97 (4.20)	.09	.238
Step 2	Variability of NA	.48 (.16)	.27	.003	.46 (.16)	.27	.003
	Inertia of NA	-5.17 (3.76)	-.10	.171	4.05 (4.18)	.07	.334
	Mean NA	.25 (.08)	.27	.003	.17 (.08)	.18	.040
Step 1	Inertia of NA	8.61 (3.49)	.16	.015	13.41 (3.90)	.24	.001
	Instability of NA	.03 (.01)	.33	<.001	.03 (.01)	.34	<.001
Step 2	Inertia of NA	-.29 (4.12)	-.01	.945	9.73 (4.18)	.17	.021
	Instability of NA	.01 (.01)	.14	.095	.02 (.01)	.23	.007
	Mean NA	.31 (.08)	.35	<.001	.18 (.08)	.20	.025

Step 1	Variability of PA	.40 (.18)	.25	.026	.38 (.20)	.25	.062
	Instability of PA	.00 (.01)	-.00	.973	-.01 (.01)	-.11	.416
Step 2	Variability of PA	.24 (.18)	.15	.189	.17 (.20)	.11	.409
	Instability of PA	.00 (.01)	.06	.581	-.00 (.01)	-.02	.906
	Mean PA	-.20 (.05)	-.26	<.001	-.20 (.05)	-.30	<.001
Step 1	Variability of PA	.39 (.12)	.24	.001	.16 (.12)	.11	.178
	Inertia of PA	1.39 (4.55)	.02	.760	9.85 (4.78)	.16	.041
Step 2	Variability of PA	.34 (.12)	.21	.004	.13 (.12)	.08	.274
	Inertia of PA	-3.45 (4.58)	-.06	.452	3.05 (5.00)	.05	.543
	Mean PA	-.21 (.05)	-.27	<.001	-.19 (.05)	-.28	<.001
Step 1	Inertia of PA	10.35 (4.51)	.16	.023	13.72 (4.58)	.22	.003
	Instability of PA	.01 (.00)	.24	.001	.01 (.00)	.14	.059
Step 2	Inertia of PA	4.34 (4.68)	.07	.355	6.21 (4.96)	.10	.212
	Instability of PA	.01 (.00)	.19	.007	.00 (.00)	.10	.190
	Mean PA	-.20 (.05)	-.26	<.001	-.18 (.05)	-.27	.001

Note. PA=positive affect; NA = negative affect. SE= standard error; BPD= Borderline personality disorder

Table S6

Hierarchical Multiple Regression Models Predicting each Dynamic Measure by Mean Affect (Step 1) and also by Depressive and BPD Traits (Step 2)

Outcome		Predictors	Baseline			One year follow-up		
			Unstandardized	Standardized	p-value	Unstandardized	Standardized	p-value
			B (SE)	Beta		B (SE)	Beta	
Variability in NA	Step 1	Mean NA	.36 (.03)	.70	<.001	.34 (.03)	.64	<.001
	Step 2	Mean NA	.32 (.03)	.63	<.001	.30 (.03)	.56	<.001
		Depressive features	.00 (.03)	.00	.969	-.00 (.04)	-.01	.926
		BPD traits	.09 (.03)	.15	.012	.12 (.04)	.21	.004
Instability in NA	Step 1	Mean NA	5.92 (.69)	.52	<.001	6.47 (.75)	.54	<.001
	Step 2	Mean NA	5.66 (.77)	.50	<.001	5.94 (.08)	.50	<.001
		Depressive features	-1.36 (.89)	-.11	.128	-1.22 (1.09)	-.09	.263
		BPD traits	2.10 (.90)	.17	.020	2.53 (1.02)	.19	.014
Inertia in NA	Step 1	Mean NA	.01 (.00)	.44	<.001	.01 (.00)	.32	<.001
	Step 2	Mean NA	.01 (.00)	.41	<.001	.00 (.00)	.25	.001
		Depressive features	.00 (.00)	.21	.005	.00 (.00)	.12	.165
		BPD traits	-.00 (.00)	-.14	.058	.00 (.00)	.07	.444
Variability in PA	Step 1	Mean PA	-.09 (.03)	-.20	.005	-.09 (.03)	-.21	.005
	Step 2	Mean PA	-.05 (.04)	-.10	.204	-.07 (.04)	-.16	.053

		Depressive features	.08 (.05)	.13	.113	.08 (.07)	.11	.224
		BPD traits	.09 (.05)	.15	.061	.03 (.06)	.05	.614
Instability in PA	Step 1	Mean PA	-1.05 (1.20)	-.06	.383	-1.16 (1.14)	-.08	.309
	Step 2	Mean PA	-.18 (1.32)	-.01	.891	-.50 (1.24)	-.03	.687
		Depressive features	-.31 (1.90)	-.01	.873	2.11 (2.32)	.09	.363
		BPD traits	4.33 (1.81)	.19	.018	.87 (2.10)	.04	.680
Inertia in PA	Step 1	Mean PA	-.00 (.00)	-.32	<.001	-.01 (.00)	-.42	<.001
	Step 2	Mean PA	-.00 (.00)	-.25	.001	-.00 (.00)	-.39	<.001
		Depressive features	.00 (.00)	.22	.009	.00 (.00)	.04	.635
		BPD traits	-.00 (.00)	-.09	.263	.00 (.00)	.05	.572

Note. BPD= borderline personality disorder, SE= standard error, NA= negative affect, PA= positive affect