Supplemental Materials: Naming before Taming? Emotion Differentiation and Emotion Regulation Variability Hinder Each Other within Adolescents

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Supplemental Materials 1: Pre-registration, *a priori* Power Analysis, and Deviations

Pre-registration: the Original and Updated Version

On 04 May 2022, we submitted our original version of pre-registration [https://osf.io/9vx7t?revisionId=62723c863252440156414dd8]. While we initially expected to have sufficient power to test our hypotheses usingthe G(F)ood together dataset from Radboud University, we are now using Bray-Curtis dissimilarity, a newly proposed emotion regulation variability (Lo et al., 2024), for testing our hypotheses. Therefore, we updated the power analysis. The new power analysis revealed that we are underpowered at 30% to test our hypotheses with multilevel modeling with only the G(F)ood together dataset. To ensure sufficient power, we decided to include more experience sampling method (ESM) datasets to test our hypotheses. We reached out to researchers who used ESM in Dutch-speaking regions with the same specified inclusion criteria in terms of frame of reference of ESM items and age group. We received favorable replies from researchers in accessing four ESM datasets, which provided us with a large enough sample size to reach 80% power. The pre-registered questions and hypotheses remained the same. We updated our pre-registration on 19 Oct 2023 prior to accessing the new datasets [https://osf.io/9vx7t].

Updated Power Analysis

The pooled sample size across five datasets was 811. We used the PowerAnalysisIL Shiny app (Lafit et al., 2021) to calculate power for Hypothesis 1 (greater emotion differentiation at a given moment will result in heightened variability in emotion regulation at the subsequent moment) and Hypothesis 2 (variability in emotion regulation at one moment will not be associated with emotion differentiation at the following moment). We obtained parameters needed analyzing an unrelated ESM dataset collected by are searcher in Radboud University, not involved in this specific project.

Hypothesis 1

Power analysis results for Hypothesis 1 are shown in Table S1.1. We concluded that power is likely to be over 80% when the final sample size approaches 800.

Table S1.1

Hypothesis 1 Power Analysis Results

Power Analysis Setup		Power Analysis Result	
Parameters	Value	Number of Participants	Simulated Power
Outcome	Emotion regulation variability	100	0.186
Predictor	Emotion differentiation	300	0.46
Number of observations per participant	13	500	0.681
Fixed Intercept	3.208	700	0.796
Fixed Slope	-0.016		
SD of error residual	0.636		
Autocorrelation of level-1 errors	0.21		
SD random intercept	0.738		
SD random slope	0.027		
Correlation (random intercept and random slope)	-0.174		
Mean of predictor	3.221		
SD of predictor	1.175		
Estimate AR(1) correlated errors	Yes		
Type I error	0.05		
Monte Carlo Replicates	1000		
Method	Maximizing the log-likelihood		

Hypothesis 2

Power analysis results for Hypothesis 2 are shown in Table S1.2. For Hypothesis 2, there was already enough power by only just using the G(F)ood together dataset (N after exclusion criteria applied = 83).

Table S1.2

Hypothesis 2 Power Analysis Results

Power Analysis Setup		Power Analysis Result	
Parameters	Value	Number of Participants	Simulated Power
Outcome	Emotion differentiation	80	0.938
Predictor	Emotion regulation variability	90	0.966
Number of observations per participant	13	100	0.984
Fixed Intercept	-1.75		
Fixed Slope	-0.187		
SD of error residual	2.583		
Autocorrelation of level-1 errors	0.118		
SD random intercept	0.514		
SD random slope	0.417		
Correlation (random intercept and random slope)	0.124		
Mean of predictor	-2.883		
SD of predictor	6.079		
Estimate AR(1) correlated errors	Yes		
Type I error	0.05		
Monte Carlo Replicates	1000		
Method	Maximizing the log-likelihood		

Deviations from pre-registration

Our study had three minor deviations from its original pre-registration.

First, in section 19 and 28 (indices), we initially planned to use intraclass correlation coefficient (ICC) for between-person emotion differentiation to test the between-person Hypothesis 3 (stated as Hypothesis 1 in the original pre-registration). In our actual analyses, we did not use ICC, but the between-person component of the momentary emotion differentiation index (Erbas et al., 2021). We considered this deviation a better approach because the within-person and between-person hypotheses could be tested together. Momentary emotion differentiation index, derived from ICC, was shown to be statistically perfectly related to ICC (Erbas et al., 2021). This supports us using the momentary emotion differentiation index in substitution of ICC in testing Hypothesis 3.

Second, in section 22 (analysis plan), we initially planned to test the between-person Hypothesis 3 (originally Hypothesis 1 in the pre-registration) with hierarchical regressions. In our actual analysis, we instead tested this hypothesis by examining the fixed effect estimates of the time-invariant between-person components in multilevel models. Although a minor procedural deviation, this approach is statistically highly similar as the pre-registered approach. Just like the first deviation, we chose this because this approach allows us to test the within-person and between-person hypotheses could be tested together.

Third, in section 27 (data exclusion), we specified the exclusion of data with zero variance across all observations. However, we did not clarify if this zero variance criterion was to be applied at the item level (e.g., for a specific emotion like sadness) or at the factor level (e.g., for a group of related emotions such as sad, angry, depressed, and anxious, useful in calculating negative emotion intensity and differentiation). In our actual analysis, we opted for the factor-level application. This decision was based on the understanding that some items might not be relevant to participants (see Discussion), leading to zero ratings, but this would not necessarily indicate poor data quality if there was variance in

other items within the same factor. Additionally, our dynamic indices evaluate multiple items, not just single ones. Applying the exclusion criterion at the factor level aligns more closely with our research objectives and ensures a more accurate assessment of data quality than excluding data based on single-item zero variance.

Supplemental Materials 2: Participants, Procedures and ESM Measures per Dataset

Note that though descriptions of ESM measures are in English here, questionnaires were presented in Dutch to participants across the five studies.

Dataset 1: G(F)ood together, Radboud University (main reference: Verhagen et al., 2022)

Participants

This study was part of a larger project (G(F)ood together; see van den Broek et al. (2020) for other details) that studied adolescents' eating behaviours and health with six longitudinal waves of data collection across 2017 to 2021 and one ESM phase (in 2021) among Dutch adolescents and their parents. The study procedures were approved by the Ethics Committee Social Sciences of Radboud University, Nijmegen, the Netherlands (ECSW20170805-516). The ESM phase was administered between the fifth and sixth wave in June and July 2021. An active parental consent procedure was used for the participation of the ESM phase.

The goal for the ESM phase was to recruit a subsample of 100 participants. 257 families whose parents or adolescents remained active at wave 5 of the G(V)oed voor elkaar study were invited to participate the ESM phase, resulting in the inclusion of 89 adolescent participants (age M = 16.42, SD = 0.61). After excluding observations in which each ESM item was completed in less than 500ms (potential careless responding) and excluding participants who showed zero variance across all ESM items, the final sample size consisted of 83 participants (age M = 16.43, SD = 0.68, female = 57.63%). Most of the participants were born in the Netherlands (97.59%).

Procedure

All participants completed ESM using the SEMA-app (version 3, O'Brien et al., 2023) which they installed on their mobile phones a few days before starting the study. A semi-random sampling scheme was employed, with participants receiving 10 notifications per day at random moments within a fixed time interval spanning from 07.30 a.m. to 09.00 p.m. over seven consecutive days. Upon receiving a notification, participants had a 30-minute window to complete the ESM assessment. For the end-of-the-day assessment, a longer period of 149 minutes was allowed. In cases where participants did not open the momentary assessments, the app sent two reminders at 15 minutes and 25 minutes after the initial notification (75 minutes and 145 minutes for the end-of-the-day assessment). Participants responded to 3674 out of 6020 (61%) ESM notifications sent. The median number of assessments completed per participant was 47 out of 70 (67%; M = 41.83, SD = 17.06). All participants entered into a raffle for two €250 vouchers. Participants were paid at least €5 and up to €25 if they and their parents both had high compliance in the study.

ESM Measures

Emotions. At each momentary assessment, participants rated four positive emotions (content, relaxed, joyful, and energetic) and five negative emotions (irritated, worried, depressed, insecure, and lonely) presented in a randomized order on a 10-point slider scale (0 = not at all, 10 = a lot). The stem for these items was "Right now I feel [emotion]." These items were used in (Barrantes-Vidal et al., 2013). With 10 daily assessments over 7 days, the maximum possible number of measurements for negative and positive emotions was 70.

Emotion regulation strategies. At each even beep throughout the day (i.e., assessed five times daily), following the rating of negative emotions, participants responded to one additional question on a slider scale regarding the intensity of the most unpleasant event since the previous beep ("Think about the most unpleasant thing that you have

experienced, since the last beep. How unpleasant was it?" 0= not at all unpleasant, 10 = very much unpleasant). If the unpleasantness was 5 or higher, participants had the opportunity to rate their use of emotion regulation strategies related to the event. This branching was introduced with a rationale of collecting reports with more intensive use of emotion regulation strategies. At the final beep of each day, regardless of event intensity, questions about emotion regulation strategies were asked. For each of the five emotion regulation strategies listed below, participants rated their use on a 11-point scale (0 = not applicable at all, 10 = very applicable): acceptance ("I have accepted my feelings about it"; adapted from Brans et al. (2013)), reappraisal ("to feel better, I have changed the way I think about it"; adapted from Brans et al. (2013)), expression suppression ("I have avoided expressing my feelings about it"; adapted from Brans et al. (2013)), rumination ("I couldn't stop thinking my feelings about it"; adapted from Brans et al. (2013)), and sharing ("I talked about it to someone"; adapted from Brans et al. (2013)). With 5 even-beep assessments over 7 days, the maximum possible number of measurements for emotion regulation strategies was 35. Adolescents had a total of 719 beeps which they had the opportunity to report emotion regulation strategy use from 575 end-of-day beeps and 144 non-end-of-day even beeps which they rated having experienced a negative event with unpleasantness at 5 or above. Adolescents reported their use of emotion regulation strategies in 586 out of the 719 possible beeps (81.50%).

Dataset 2: Emotions in daily life 2011, KU Leuven (main reference: Koval et al., 2013)

Participants

Participants were recruited from a pool of 439 undergraduates at the University of Leuven, Belgium, in a study which the ethics committee of the University of Leuven approved of. All undergraduates completed a Dutch translation of the Center for Epidemiologic Studies Depression Scale (CES-D, Radloff, 1977) and were further selected

to maximize variation in depression scores. The target sample of 100 participants were contacted in 2011. Three participants were excluded because the devices they used had malfunction. There was no further exclusion based on careless responding (<500 ms) or zero variance instances. The final sample consisted of 97 participants. Mean age of the sample was 19.05 years ($SD = 1.27$), and 63% were women. Majority of the sample had Belgian nationality (97%).

Procedure

Participants took part in an introductory session in the laboratory, in which they gave informed consent to participate, filled out questionnaires unrelated to the current study, and received standardized devices (Tungsten E2 PalmOne, Mankato, MN), which were programmed with a program that assess ESM items. The ESM phase started the following day and lasted 7 days, during which 10 beeps occurred semi-randomly each day in a 12-hr time frame. Participants were informed that completing one measurement would take an average of 1 minute. Participants had to start the questionnaire within 2 minutes after the notification . Participants had 90 seconds to answer each question once they opened the questionnaire before it timed out. There were no reminders for participants in case they did not open the momentary assessments Participants answered 91.5% of the beeps ($SD = 6.2\%$, range: 67–100% of all beeps). The participants were reimbursed with 70 Euros for the entire study.

ESM measures

Emotions. At each momentary assessment, participants rated two positive emotions (relaxed, happy) and four negative emotions (angry, sad, anxious, and depressed) presented on a 100-point slider scale (1 = not at all, 100 = very much). The stem for these items was “How [emotion] do you feel at the moment?” With 10 daily assessments over 7 days, the maximum possible number of measurements for negative and positive emotions was 70.

Emotion regulation strategies. At each momentary assessment, participants rated the extent they used six emotion regulation strategies presented on a 100-point slider scale (1 = not at all, 100 = very much so). The stem for these items was "Since the last beep, did you…" and ended with "ruminate about your feelings" (rumination), "calmly reflect on your feelings?" (reflection), "see the event that caused your feelings from a different perspective?" (reappraisal), "try to distract yourself from your feelings?" (distraction), "suppress the expression of your feelings?" (expressive suppression), and "talk with others about your feelings" (social sharing). With 10 daily assessments over 7 days, the maximum possible number of measurements for emotion regulation strategies was 70.

Dataset 3: 3-wave longitudinal study, KU Leuven (main reference: Erbas et al., 2018)

Participants

Participants were undergraduates from the University of Leuven, Belgium. This three-wave study was approved by the ethics committee of the University of Leuven. Here, we only used the data from the first wave collected in 2012. 686 first-year undergraduates completed the Center for Epidemiologic Studies Depression Scale (CES-D, Radloff, 1977) as a prescreening questionnaire. 180 participants, formed by equal number of participants from four quartiles of the CES-D distribution, were selected following a stratified sampling approach. An additional 22 participants took part without completing the CES-D, resulting in a total of 202 participants. There were no participants excluded based on reaction time because reaction time was not available for ESM assessments in this dataset. No participants had zero variance across all ESM items, so the final sample was 202 participants. Mean age of the sample was 18.32 years (SD = 0.96), and 55% were women. Majority of the sample had Belgian nationality (93%).

Procedure

The participants took part in an introductory session in the laboratory and filled out questionnaires unrelated to the current study. Then, they received standardized devices (Motorola Defy Plus) with custom-built ESM software installed and were trained to use the phone to complete the ESM questionnaires. Participants practiced filling the ESM questionnaire and could clarify with an experimenter before leaving the lab. The ESM phase lasted for 7 consecutive days, during which 10 beeps occurred semi-randomly each day in a 12-hr time frame. Participants were informed that completing one measurement would take an average of 1-2 minutes. Participants had 90 seconds to answer each question once they opened the questionnaire before it timed out. There were no reminders for participants in case they did not open the momentary assessments. Participants answered 87.27% of the beeps (SD = 9.05%, range: 67–100% of all beeps). The participants were reimbursed with 60 Euros for this wave of study. They were eligible for an extra 60 EUR reimbursement for completing all three waves of study.

ESM measures

Emotions. At each momentary assessment, participants rated three positive emotions (happy, relaxed, cheerful) and six negative emotions (lonely, angry, anxious, sad, depressed, and stressed) presented on a slider scale from 0 (not at all) to 100 (very much). The stem for these items was "How [emotion] do you feel at the moment?" With 10 daily assessments over 7 days, the maximum possible number of measurements for negative and positive emotions was 70.

Emotion regulation strategies. At each momentary assessment, participants rated the extent they used six emotion regulation strategies presented on a slider scale from 0 (not at all) to 100 (almost all the time). The stem for these items was "Since the last beep, have you…" and ended with "viewed the cause of your feelings from a different perspective?" (cognitive reappraisal), "suppressed the expression of your feelings"

(expressive suppression), "distracted your attention away from your feelings" (distraction), "talked about your feelings with others" (social sharing), "brooded about something in the past" (rumination) and "brooded about something in the future" (worry). With 10 daily assessments over 7 days, the maximum possible number of measurements for emotion regulation strategies was 70.

Dataset 4: Emotion regulation in daily life, Tilburg University (main reference: Van Roekel & Trompetter, 2023)

Participants

Participants were undergraduates from Tilburg University, the Netherlands. This study was approved by the ethics committee of the Tilburg School of Social and Behavioral Sciences (protocol number: EC-2017.95). Data were collected in 2018. 242 first-year undergraduates who needed to earn course credits were recruited. For this study, only data from participants who were younger than 25 years old were used. Therefore, the initial sample consisted of 179 participants (age M = 20.84 , SD = 1.67). After excluding participants who had zero variance across all ESM items, there was a final sample of 178 participants. There were no participants excluded based on reaction time because reaction time was not available for ESM assessments in this dataset. Mean age of the sample was 20.85 years (SD = 1.67), and 78% were women. Majority of the sample was born in the Netherlands (93%).

Procedure

Participants were recruited through the University course credit system, where they were able to read information about the research and could register via the same system. To participate, students had to click a link in an information letter sent to them by email. There, they signed informed consent and completed a questionnaire with baseline data that were not relevant for this study. The email also instructed participants to download the app "Ethica" (www.ethicadata.com) on their smartphone for the ESM assessments. The

ESM period started within a few days after completing the baseline questionnaires. The ESM phase lasted for 14 consecutive days, during which the Ethica app gave 5 beeps quasi-randomly each day in a 12-hr time frame. The participants had to complete the questionnaire within 30 minutes after the notification. Participants were informed that completing one measurement would take an average of 3 minutes. In cases where participants did not open the momentary assessments, the app sent after the initial notification, but the details of the notification setting were lost due to interface change of Ethica. The median number of completed assessments per participant was 52 out of 70 (73.97%, M = 66.36% , SD = 23.50%, range: 5.35–98.63% of all beeps). When the 14 days were over, the study was completed and the participants were rewarded with 4 test credits for participants recruited via the Tilburg course credit system or a chance of winning 30-Euro shopping vouchers for participants recruited via other channels.

ESM measures

Emotions. At each momentary assessment, participants rated seven positive emotions (enthusiastic, content, energetic, calm, powerful, cheerful, and grateful) and six negative emotions (irritated, bored, nervous, sad, angry, and depressed) presented on a slider scale from 0 (not at all) to 100 (very much). The stem for these items was "I now feel (right before the beep went off) [emotion]." With 10 daily assessments over 7 days, the maximum possible number of measurements for negative and positive emotions was 70.

Emotion regulation strategies. At each momentary assessment, participants rated the extent they used seven emotion regulation strategies presented on a slider scale from 0 (not at all) to 100 (very much). The stem for these items was "Indicate to what extent you have used each of the following strategies since the last beep, regardless of whether they helped. To change my negative emotions, I have…" and ended with "addressed the situation that caused my emotions or have made plans for addressing it" (problem solving), "brooded my emotions with others" (co-brooding), "sought distraction"

(distraction), "suppressed, ignored or avoided (the thoughts about) my emotions or the situation that caused them." (avoidance), "talked about my feelings with others for advice or support" (social sharing), "been thinking about my feelings and their causes and/or consequences" (rumination) and "experienced my emotions as they are without wanting them change: it is OK that they are there" (acceptance). With 10 daily assessments over 7 days, the maximum possible number of measurements for emotion regulation strategies was 70.

Dataset 5: Outside-in, Ghent University (main reference: Braet et al., 2023)

Participants

244 students were recruited from local schools in Belgium (age M = 13.46, SD = 0.42; female = 48%). This 3-wave study was approved by the Medical Ethics Committee of Ghent University Hospital (protocol number: BC-09559). For our analysis, we only utilized data from the third wave, which was collected in 2022. This choice ensures that participants from this study have a closer age range to participants in other studies. After excluding observations in which each ESM item was completed in less than 500ms and excluding participants who showed zero variance across all ESM items, the final sample consisted of 212 participants. Mean age of the sample was 13.46 years (SD = 0.42), and 44% were female. Majority of the sample were born to Belgian parents (90%).

Proceure

Participants were recruited through nine different schools (Flanders region). Parental consent and written assent from adolescents were obtained. All participants installed the m-path app on their smartphones (www.m-path.io, Mestdagh et al., 2023). The ESM period started within a few days after completing different baseline questionnaires. The ESM phase lasted for 14 consecutive days during school weeks, during which the m-path app gave 5 beeps at fixed intervals each day in a 12-hr time frame. One measurement took an average of 2 minutes . The participants had 50 to 120 minutes after

the notification to complete the questionnaire (first to third beep of the day: 50 minutes, fourth beep of the day: 90 minutes, and last beep of the day: 120 minutes). In cases where participants did not open the momentary assessments, the app sent reminders every 10 minutes after the initial notification. Compliance rate was also monitored during the study for each participant, after two days of low compliance participants received a message via m-path. Out of all participants, one discontinued the study after seven days, thus only receiving 35 beeps. Two participants encountered technical issues that prevented them from receiving some beeps on weekends, resulting in only 52 and 56 beeps received. Another 27 participants experienced occasional technical issues, receiving 65 to 69 beeps over the course of 14 days. The median number of assessments completed per participant was 49 out of 70 (70%, M = 64.51% , SD = 24.97%, range: 1.4%–100% of all possible beeps). When the 14 days were over, the study was completed and the participants were rewarded with a gift voucher worth €20 when they completed at least 70% of surveys, while a voucher of €10 was given to those who completed between 50% and 70% of surveys.

ESM measures

Emotions. At each momentary assessment, participants rated three positive emotions (happy, energetic, and relaxed) and six negative emotions (sad, angry, anxious, uncertain, annoyed, and stressed) presented on a 7-point scale from 1 (totally not) to 7 (totally). The stem for these items was "I now feel: [emotion]." With 5 daily assessments over 14 days, the maximum possible number of measurements for negative and positive emotions was 70.

Emotion regulation strategies. First, participants reported the intensity of their experienced negative emotions since the last survey (or after waking up). In case no negative emotion was experienced, participants were instructed to respond with a score of 1. Then, Participants rated the extent they used eight emotion regulation strategies presented on a 7-point scale from 1 (totally not) to 7 (totally). The stem for these items

was "When I felt those negative emotions…." With reference to (Medland et al., 2020), five items ended with "I tried to see the situation in other ways" (cognitive reappraisal), "I tried to hide my emotions" (expressive suppression), "I did things to distract myself" (distraction), "I could not stop thinking about them" (rumination), and "I tried to express my emotions" (expression). Next, one item was added to assess social sharing, "I talked with someone else about the situation" (social sharing). Finally, based on Berking and Znoj (2011), two more self-compassion items were included: "I have supported myself" (self-compassion) and "I tried to cheer up myself" (self-compassion). With 5 daily assessments over 14 days, the maximum possible number of measurements for emotion regulation strategies was 70.

Supplemental Materials 3 – Multilevel Confirmatory Factor Analysis per Dataset

We ran Multilevel Confirmatory Factor Analyses (MCFA; see procedures in Eisele et al., 2021) to confirm the factor structure for positive emotions and negative emotions at both within-adolescent and between-adolescent levels. In the MCFA, positive emotion items were loaded on an overall positive emotion factor, negative emotion items were loaded on an overall negative emotion factor. The positive and negative emotion latent factors were allowed to correlate. We inspected model fit with conventional cutoff values (RMSEA $< .08$, CFI $> .90$ and TLI $> .90$; see Schermelleh-Engel et al., 2003). When model fits were unsatisfactory, as in datasets 3, 4, and 5, we allowed residual variance of overlapping items to correlate to improve model fit. In general, model fit at the within-person level was usually worse than at the between-person level. While the TLI is not acceptable in some models, both the RMSEA and CFI are. Overall, positive and negative emotions loaded separately on two factors as indicated with satisfactory fit indices, as shown in Table S3. In other words, it was suitable to take the mean of the positive emotions as a single-factor index, and likewise for negative emotions.

Table S3

Multilevel Confirmatory Factor Analysis per Datasets

Dataset	Within-person					Between-person				
	SFL	**X2**	**RMSEA**	**CFI**	**TLI**	**SFL**	**X2**	**RMSEA**	**CFI**	**TLI**
G(F)ood together (Radboud)	.43–.77	359.27	.06	.95	.86	.57–.98	74.06	.02	.99	.98
Emotions in daily life 2011 (Leuven)	.50–.84	231.03	.07	.98	.91	.70–.98	24.69	.02	> .99	.99
3-wave longitudinal study (Leuven)*	.43–.85	1,025.20	.06	.97	.91	.68–.99	104.47	.02	> .99	.99
Emotions in daily life (Tilburg)*	.26–.80	3,011.13	.08	.90	.76	.44–.97	408.03	.03	.99	.97
Outside-in (Ghent)*	.38–.76	876.50	.06	.95	.84	.72–.94	235.35	.03	.99	.96

Note: SFL = standardized factor loadings (all $p < .001$). X2 = Chi-square. RMSEA = Root Mean Square Error of Approximation. CFI = Comparative Fit Index. TLI = Tucker Lewis Index. When evaluating the fit of the within-person model, a saturated between-person model was specified. When evaluating the between-person model, a saturated within-person was specified. * For datasets 3, 4 and 5, we included correlations between residual variances of overlapping items (e.g., relaxed with stressed) to improve model fit. For the within-person model for dataset 3, we included the correlation between the items "relaxed" and "stressed" at the within-person level. For the within-person model for dataset 4, we included the correlation between the items "angry" and "irritated" and "sad" and "low" at the within-person level. For the within-person model for dataset 5, we included the correlation between the items "angry" and "sad" at the within-person level.

Supplemental Materials 4: Descriptive statistics and correlations per dataset

Table S4.1

Within- and Between-person Correlations of Momentary Indices in the Pooled Dataset (N=778)

Index	n	M	SDw	SDb	1	2	3	4	5	6	7	8
1. Positive emotion intensity	39286	5.78	1.53	1.65		.27	-.44	.14	-.03	-.12	.03	-.24
						[.20, .33]	[-.50,-.39]	[.07, .21]	[-.10, .05]	[-.19,-.05]	[-.04, .10]	[-.31,-.18]
2. Positive emotion differentiation	39230	-1.98	3.06	0.76	.23		-.10	.24	-.02	.00	.03	-.05
					[.22, .24]		[-.16,-.02]	[.17, .30]	[-.10, .05]	[-.07, .07]	[-.04, .10]	[-.12, .02]
3. Negative emotion intensity	39179	1.46	0.98	1.16	-.45	-.19		-.26	.41	-.10	-.20	.11
					[-.46,-.44]	[-.20,-.18]		[-.32,-.19]	[.35, .47]	[-.17,-.03]	[-.26,-.13]	[.04, .18]
4. Negative emotion differentiation	39179	-2.15	4.8	0.82	.22	.28	-.51		-.07	-.02	-.04	.03
					[.21, .23]	[.28, .29]	[-.52,-.50]		[-.14, .00]	[-.09, .05]	[-.11, .03]	[-.04, .10]
5. Emotion regulation intensity	36383	2.28	1.06	1.62	-.10	-.06	.28	-.16		-.24	-.40	.14
					[-.11,-.09]	[-.07,-.05]	[.27, .29]	[-.17,-.15]		[-.31,-.17]	[-.45,-.34]	[.07, .21]
6. Emotion regulation variability	36218	4.03	1.13	1.78	-.03	-.11	.06	-.15	-.04		.81	.57
					[-.04,-.02]	[-.12,-.10]	[.05, .07]	[-.16,-.14]	[-.05,-.03]		[.79, .83]	[.52, .61]
7. Endorsement change	36218	2.35	1.13	1.47	-.01	-.07	.04	-.13	-.04	.76		-.02
					[-.02, .00]	[-.08,-.06]	[.03, .05]	[-.14,-.12]	[-.05,-.03]	[.75, .76]		[-.09, .05]
8. Strategy switching	36218	1.68	0.75	1.05	-.03	-.06	.03	-.02	-.01	.34	-.36	
					[-.04,-.02]	[-.07,-.05]	[.02, .04]	[-.03,-.01]	[-.02, .00]	[.33, .35]	[-.36,-.35]	

Note: SDw: Within-person SD. SDb: Between-person SD. Within-person correlations at lower triangle and between-person correlations at upper triangle. Confidence interval of correlations in squared brackets. All these indices were calculated only in observations with no missingness in relevant ESM items, so the lower n for emotion regulation indices reflected more missing items in constituent ESM items.

Table S4.2.1

Within- and Between-person Correlations of Momentary Indices Dataset 1: G(F)ood together (Radboud)

Index	n	M	SDw	SDb	1	2	3	4	5	6	7	8
1. Positive emotion intensity	3384	6.76	1.14	1.19		.39	-.64	.41	.00	-.07	.03	-.18
						[.19, .56]	[-.75,-.49]	[.21, .57]	[-.22, .22]	[-.28, .16]	[-.19, .25]	[-.38, .04]
2. Positive emotion differentiation	3384	-1.92	2.78	0.61	.30		-.38	.53	-.04	-.13	-.04	-.13
					[.27, .33]		[-.55,-.18]	[.35, .67]	[-.26, .18]	[-.34, .10]	[-.26, .18]	[-.34, .09]
3. Negative emotion intensity	3331	1.29	0.9	1.13	-.54	-.23		-.35	.09	-.07	-.16	.20
					[-.56,-.51]	[-.27,-.20]		[-.52,-.14]	[-.13, .30]	[-.28, .16]	[-.37, .06]	[-.02, .40]
4. Negative emotion differentiation	3331	-1.81	3.41	0.68	.28	.34	-.50		.10	-.17	-.07	-.17
					[.24, .31]	[.31, .37]	[-.53,-.47]		[-.12, .32]	[-.38, .05]	[-.28, .16]	[-.38, .05]
5. Emotion regulation intensity	583	3.48	1.58	1.48	-.16	-.14	.22	-.12		-.52	-.61	.28
					[-.24,-.08]	[-.22,-.06]	[.14, .30]	[-.21,-.04]		[-.67,-.34]	[-.73,-.45]	[.06, .47]
6. Emotion regulation variability	583	4.28	1.21	1.87	.00	-.04	-.01	-.03	-.20		.85	.07
					[-.09, .08]	[-.12, .04]	[-.09, .08]	[-.12, .05]	[-.28,-.13]		[.78, .90]	[-.15, .28]
7. Endorsement change	583	2.93	1.13	2.11	.04	.02	-.04	-.01	-.26	.83		-.46
					[-.05, .12]	[-.07, .10]	[-.12, .05]	[-.10, .07]	[-.34,-.19]	[.80, .85]		[-.62,-.27]
8. Strategy switching	583	1.34	0.67	1.11	-.07	-.09	.05	-.03	.10	.28	-.31	
					[-.15, .02]	[-.17,-.01]	[-.03, .13]	[-.12, .05]	[.02, .18]	[.20, .35]	[-.39,-.24]	

Note: SDw: Within-person SD. SDb: Between-person SD. Within-person correlations at lower triangle and between-person correlations at upper triangle. Confidence interval of correlations in squared brackets. All these indices were calculated only in observations with no missingness in relevant ESM items, so the lower n for emotion regulation indices reflected more missing items in constituent ESM items.

Table S4.2.2

Within- and Between-person Correlations of Momentary Indices Dataset 2: Emotions in daily life (Leuven)

Index	n	M	SDw	SDb	1	2	3	4	5	6	7	8
1. Positive emotion intensity	5816	5.67	1.75	1.32		.16	-.62	.21	-.23	.18	.21	.07
						[-.04, .35]	[-.73,-.48]	[.01, .40]	[-.41,-.03]	[-.02, .36]	[.01, .39]	[-.13, .27]
2. Positive emotion differentiation	5816	-1.49	2.05	0.2	.21		-.04	.27	-.10	.00	.04	-.04
					[.19, .24]		[-.24, .16]	[.07, .44]	[-.29, .10]	[-.20, .20]	[-.16, .24]	[-.24, .16]
3. Negative emotion intensity	5814	1.47	0.99	1.08	-.48	-.17		-.41	.61	-.50	-.48	-.32
					[-.50,-.46]	[-.20,-.15]		[-.57,-.23]	[.47, .72]	[-.64,-.33]	[-.62,-.31]	[-.49,-.13]
4. Negative emotion differentiation	5814	-2.05	4.8	0.48	.26	.33	-.54		-.30	.13	.11	.09
					[.24, .29]	[.31, .35]	[-.56,-.52]		[-.47,-.11]	[-.08, .32]	[-.09, .31]	[-.11, .28]
5. Emotion regulation intensity	5815	2.32	1	1.06	-.14	-.07	.37	-.24		-.66	-.72	-.33
					[-.17,-.12]	[-.09,-.04]	[.35, .40]	[-.26,-.21]		[-.76,-.53]	[-.80,-.61]	[-.49,-.14]
6. Emotion regulation variability	5815	4.48	0.85	1.48	.03	-.08	-.06	-.09	-.19		.83	.78
					[.01, .06]	[-.10,-.05]	[-.09,-.04]	[-.11,-.06]	[-.21,-.16]		[.75, .88]	[.69, .85]
7. Endorsement change	5815	2.32	0.93	0.96	.01	.00	.00	-.10	-.05	.54		.30
					[-.01, .04]	[-.03, .02]	[-.03, .02]	[-.13,-.08]	[-.08,-.03]	[.52, .56]		[.11, .47]
8. Strategy switching	5815	2.17	0.87	0.87	.02	-.07	-.06	.03	-.13	.40	-.55	
					[-.01, .04]	[-.10,-.05]	[-.09,-.04]	[.00, .05]	[-.15,-.10]	[.38, .42]	[-.57,-.53]	

Note: SDw: Within-person SD. SDb: Between-person SD. Within-person correlations at lower triangle and between-person correlations at upper triangle. Confidence interval of correlations in squared brackets. All these indices were calculated only in observations with no missingness in relevant ESM items, so the lower n for emotion regulation indices reflected more missing items in constituent ESM items.

Table S4.2.3

Within- and Between-person Correlations of Momentary Indices Dataset 3: 3-wave longitudinal study (Leuven)

Index	n	M	SDw	SDb	1	2	3	4	5	6	7	8
1. Positive emotion intensity	12346	5.69	1.63	1		.21	-.45	.25	-.28	.13	.21	-.05
						[.07, .34]	[-.55,-.33]	[.11, .37]	[-.40,-.15]	[.00, .27]	[.07, .33]	[-.19, .09]
2. Positive emotion differentiation	12346	-1.88	2.63	0.36	.15		-.22	.27	-.22	.10	.16	-.05
					[.13, .17]		[-.35,-.09]	[.14, .39]	[-.35,-.08]	[-.04, .23]	[.02, .29]	[-.19, .09]
3. Negative emotion intensity	12346	1.48	0.94	0.88	-.53	-.22		-.40	.72	-.51	-.53	-.19
					[-.55,-.52]	[-.24,-.20]		[-.51,-.28]	[.64, .78]	[-.61,-.40]	[-.62,-.42]	[-.32,-.05]
4. Negative emotion differentiation	12346	-2.3	5.07	0.81	.24	.33	-.54		-.37	.20	.20	.10
					[.22, .25]	[.31, .34]	[-.55,-.53]		[-.48,-.25]	[.07, .33]	[.06, .32]	[-.04, .24]
5. Emotion regulation intensity	12346	2.11	0.96	1.13	-.17	-.08	.34	-.20		-.61	-.70	-.13
					[-.19,-.15]	[-.10,-.06]	[.32, .35]	[-.22,-.19]		[-.69,-.52]	[-.76,-.62]	[-.26, .01]
6. Emotion regulation variability	12346	4.57	0.95	1.6	.03	-.09	-.01	-.09	-.18		.86	.63
					[.02, .05]	[-.11,-.07]	[-.03, .01]	[-.11,-.08]	[-.20,-.16]		[.82, .89]	[.54, .71]
7. Endorsement change	12346	2.6	1.06	1.25	.03	-.04	.00	-.09	-.13	.57		.15
					[.01, .04]	[-.06,-.02]	[-.01, .02]	[-.10,-.07]	[-.15,-.12]	[.56, .59]		[.02, .29]
8. Strategy switching	12346	1.96	0.93	0.82	.00	-.05	-.02	.00	-.03	.38	-.54	
					[-.01, .02]	[-.07,-.03]	[-.03, .00]	[-.02, .02]	[-.05,-.02]	[.37, .40]	[-.55,-.53]	

Note: SDw: Within-person SD. SDb: Between-person SD. Within-person correlations at lower triangle and between-person correlations at upper triangle. Confidence interval of correlations in squared brackets. All these indices were calculated only in observations with no missingness in relevant ESM items, so the lower n for emotion regulation indices reflected more missing items in constituent ESM items.

Table S4.2.4

Within- and Between-person Correlations of Momentary Indices Dataset 4: Emotion regulation in daily life (Tilburg)

Index	n	M	SDw	SDb	1	2	3	4	5	6	7	8
1. Positive emotion intensity	7904	4.58	1.28	1.17		-.06	-.20	.00	.19	-.13	-.14	-.02
						[-.20, .09]	[-.34,-.05]	[-.15, .15]	[.04, .33]	[-.27, .02]	[-.28, .01]	[-.17, .12]
2. Positive emotion differentiation	7904	-2.95	3.94	0.79	.13		-.01	.32	-.10	-.16	-.13	-.09
					[.11, .15]		[-.16, .14]	[.19, .45]	[-.25, .05]	[-.30,-.01]	[-.27, .02]	[-.23, .06]
3. Negative emotion intensity	7852	1.54	0.92	0.93	-.47	-.21		-.32	.63	-.29	-.31	-.07
					[-.49,-.46]	[-.23,-.18]		[-.44,-.18]	[.53, .71]	[-.42,-.15]	[-.44,-.17]	[-.21, .08]
4. Negative emotion differentiation	7852	-2.15	4.31	0.8	.27	.33	-.57		-.31	.09	.09	.03
					[.25, .29]	[.31, .35]	[-.58,-.55]		[-.44,-.17]	[-.06, .24]	[-.06, .24]	[-.12, .17]
5. Emotion regulation intensity	7802	2.32	0.9	1.08	.00	-.05	.25	-.16		-.41	-.55	.07
					[-.03, .02]	[-.07,-.03]	[.23, .27]	[-.18,-.14]		[-.53,-.28]	[-.65,-.44]	[-.08, .21]
6. Emotion regulation variability	7637	3.88	0.86	1.43	-.08	-.15	.08	-.18	-.03		.81	.58
					[-.10,-.06]	[-.17,-.12]	[.06, .11]	[-.20,-.15]	[-.05,-.01]		[.75, .86]	[.48, .67]
7. Endorsement change	7637	2.13	0.84	1.19	.00	-.06	.00	-.09	-.08	.62		.00
					[-.02, .03]	[-.08,-.03]	[-.03, .02]	[-.11,-.07]	[-.10,-.06]	[.60, .63]		[-.15, .15]
8. Strategy switching	7637	1.75	0.76	0.87	-.10	-.11	.10	-.10	.05	.46	-.41	
					[-.12,-.08]	[-.13,-.08]	[.08, .12]	[-.12,-.08]	[.03, .07]	[.44, .48]	[-.43,-.40]	

Note: SDw: Within-person SD. SDb: Between-person SD. Within-person correlations at lower triangle and between-person correlations at upper triangle. Confidence interval of correlations in squared brackets. All these indices were calculated only in observations with no missingness in relevant ESM items, so the lower n for emotion regulation indices reflected more missing items in constituent ESM items.

Table S4.2.5

Within- and Between-person Correlations of Momentary Indices Dataset 5: Outside-in (Ghent)

Index	n	M	SDw	SDb	1	2	3	4	5	6	7	8
1. Positive emotion intensity	9836	6.58	1.7	2.11		-.09	-.51	.09	-.08	-.27	-.13	-.30
						[-.23, .04]	[-.60,-.40]	[-.04, .22]	[-.21, .05]	[-.39,-.14]	[-.26, .00]	[-.42,-.17]
2. Positive emotion differentiation	9780	-1.63	3.3	0.55	.36		-.05	.37	.05	-.03	-.12	.13
					[.35, .38]		[-.18, .08]	[.25, .48]	[-.08, .18]	[-.16, .11]	[-.25, .02]	[.00, .26]
3. Negative emotion intensity	9836	1.42	1.11	1.55	-.33	-.17		-.14	.37	.22	.01	.39
					[-.35,-.31]	[-.19,-.15]		[-.27,-.01]	[.25, .48]	[.09, .34]	[-.13, .14]	[.27, .50]
4. Negative emotion differentiation	9836	-2.15	5.48	0.96	.17	.24	-.45		.02	-.18	-.27	.07
					[.15, .19]	[.22, .26]	[-.46,-.43]		[-.11, .15]	[-.31,-.05]	[-.39,-.14]	[-.06, .20]
5. Emotion regulation intensity	9837	2.35	1.1	2.3	-.06	-.04	.21	-.10		.01	-.27	.42
					[-.08,-.04]	[-.06,-.02]	[.19, .23]	[-.12,-.08]		[-.13, .14]	[-.39,-.14]	[.30, .52]
6. Emotion regulation variability	9837	3.19	1.62	2.05	-.09	-.11	.14	-.19	.08		.84	.57
					[-.11,-.07]	[-.13,-.09]	[.12, .15]	[-.21,-.17]	[.06, .10]		[.79, .87]	[.47, .65]
7. Endorsement change	9837	2.2	1.53	1.69	-.06	-.10	.10	-.19	.06	.92		.03
					[-.08,-.04]	[-.12,-.08]	[.08, .12]	[-.20,-.17]	[.04, .08]	[.92, .92]		[-.11, .16]
8. Strategy switching	9837	0.99	0.56	1.12	-.08	-.03	.10	-.04	.06	.31	-.09	
					[-.10,-.06]	[-.05,-.01]	[.08, .12]	[-.06,-.02]	[.04, .08]	[.29, .33]	[-.11,-.07]	

Note: SDw: Within-person SD. SDb: Between-person SD. Within-person correlations at lower triangle and between-person correlations at upper triangle. Confidence interval of correlations in squared brackets. All these indices were calculated only in observations with no missingness in relevant ESM items, so the lower n for emotion regulation indices reflected more missing items in constituent ESM items.

Supplemental Materials 5: Full multilevel model results

Table S5

Fixed Effect Estimates of Within-Person Temporal Associations and Between-Person Differences Between Emotion Differentiation and Emotion Regulation Variability

	Negative Emotions *b* [95% *CI]*	Positive Emotions *b* [95% *CI]*
Outcome: Emotion regulation variability (Model 1A)	N = 752, n = 25867	N = 751, n = 25851
Within-person (time-varying)		
Lagged emotion differentiation	**-0.009 [-0.014, -0.005]**	**-0.009 [-0.014, -0.004]**
Lagged emotion intensity	-0.018 [-0.043, 0.007]	-0.005 [-0.017, 0.007]
Emotion regulation intensity	0.295 [-0.283, 0.872]	0.280 [-0.276, 0.837]
Time trend	**-0.003 [-0.004, -0.003]**	**-0.003 [-0.004, -0.002]**
Between-person (time-invariant)		
Intercept	**3.895 [2.773, 5.018]**	**4.056 [2.819, 5.294]**
Emotion differentiation	0.068 [-0.072, 0.207]	-0.053 [-0.258, 0.153]
Emotion intensity	-0.023 [-0.128, 0.083]	**-0.107 [-0.181, -0.034]**
Emotion regulation intensity	**-0.552 [-0.629, -0.475]**	**-0.561 [-0.631, -0.492]**
Age	-0.005 [-0.063, 0.054]	-0.012 [-0.077, 0.053]
Gender (female = 1, male = 0)	**0.412 [0.188, 0.637]**	**0.347 [0.120, 0.575]**
Outcome: Strategy switching (Model 1B)	N = 752, n = 25867	N = 751, n = 25851
Within-person (time-varying)		
Endorsement change	**-0.436 [-0.576, -0.296]**	**-0.437 [-0.575, -0.300]**
Lagged emotion differentiation	**-0.004 [-0.007, -0.002]**	**-0.004 [-0.007, 0.000]**
Lagged emotion intensity	-0.010 [-0.025, 0.005]	-0.002 [-0.013, 0.009]
Emotion regulation intensity	**-0.102 [-0.153, -0.051]**	**-0.102 [-0.149, -0.055]**
Time trend	**-0.002 [-0.002, -0.001]**	**-0.002 [-0.002, -0.001]**
Between-person (time-invariant)		
Intercept	**0.978 [0.346, 1.610]**	**0.993 [0.317, 1.670]**
Endorsement change	0.017 [-0.027, 0.061]	0.008 [-0.036, 0.052]
Emotion differentiation	**0.156 [0.086, 0.226]**	0.017 [-0.089, 0.123]
Emotion intensity	0.032 [-0.022, 0.085]	-0.035 [-0.073, 0.002]
Emotion regulation intensity	0.015 [-0.029, 0.058]	0.011 [-0.029, 0.052]
Age	**0.032 [0.002, 0.061]**	0.031 [-0.001, 0.064]
Gender (female = 1, male = 0)	**0.138 [0.026, 0.250]**	**0.127 [0.012, 0.242]**
Outcome: Endorsement change (Model 1C)	N = 752, n = 25867	N = 751, n = 25851

Table S5

Fixed Effect Estimates of Within-Person Temporal Associations and Between-Person Differences Between Emotion Differentiation and Emotion Regulation Variability (continued)

	Negative Emotions *b* [95% *CI*]	Positive Emotions *b* [95% *CI*]
Within-person (time-varying)		
Strategy switching	0.312 [-1.140, 1.764]	0.302 [-1.135, 1.740]
Lagged emotion differentiation	**-0.008 [-0.012, -0.004]**	**-0.007 [-0.012, -0.003]**
Lagged emotion intensity	**-0.017 [-0.034, 0.000]**	-0.004 [-0.012, 0.004]
Emotion regulation intensity	0.054 [-0.233, 0.341]	0.058 [-0.228, 0.344]
Time trend	**-0.002 [-0.003, -0.002]**	**-0.002 [-0.003, -0.001]**
Between-person (time-invariant)		
Intercept	**2.427 [1.550, 3.304]**	**2.523 [1.653, 3.392]**
Strategy switching	**-0.234 [-0.318, -0.150]**	**-0.238 [-0.322, -0.154]**
Emotion differentiation	-0.082 [-0.184, 0.019]	**-0.148 [-0.296, 0.000]**
Emotion intensity	-0.072 [-0.148, 0.004]	0.025 [-0.028, 0.079]
Emotion regulation intensity	**-0.677 [-0.733, -0.621]**	**-0.696 [-0.746, -0.645]**
Age	-0.009 [-0.056, 0.039]	-0.014 [-0.061, 0.033]
Gender (female = 1, male = 0)	**0.215 [0.054, 0.376]**	**0.203 [0.041, 0.366]**
Outcome: Emotion differentiation (Model 2A)	N = 751, n = 25830	N = 750, n = 25834
Within-person (time-varying)		
Emotion regulation variability	**-0.514 [-0.731, -0.296]**	**-0.276 [-0.496, -0.057]**
Lagged emotion differentiation	**-0.020 [-0.032, -0.007]**	**0.031 [0.001, 0.062]**
Emotion intensity	**-3.884 [-4.989, -2.779]**	**0.519 [0.206, 0.832]**
Emotion regulation intensity	-0.026 [-0.110, 0.058]	**-0.150 [-0.246, -0.055]**
Time trend	**-0.006 [-0.008, -0.004]**	**0.004 [0.003, 0.006]**
Between-person (time-invariant)		
Intercept	**-1.225 [-1.874, -0.576]**	-0.547 [-1.221, 0.127]
Emotion regulation variability	-0.035 [-0.072, 0.001]	-0.012 [-0.039, 0.015]
Emotion intensity	**-0.238 [-0.296, -0.180]**	**0.035 [0.005, 0.065]**
Emotion regulation intensity	-0.043 [-0.087, 0.001]	-0.014 [-0.044, 0.015]
Age	**-0.046 [-0.081, -0.011]**	**-0.069 [-0.100, -0.037]**
Gender (female = 1, male = 0)	0.047 [-0.074, 0.168]	**-0.149 [-0.239, -0.058]**
Outcome: Emotion differentiation (Model 2B)	N = 751, n = 25830	N = 750, n = 25834

Table S5

Fixed Effect Estimates of Within-Person Temporal Associations and Between-Person Differences Between Emotion Differentiation and Emotion Regulation Variability (continued)

	Negative Emotions *b* [95% *CI]*	Positive Emotions *b* [95% *CI]*
Within-person (time-varying)		
Strategy switching	**-0.432 [-0.730, -0.133]**	**-0.306 [-0.525, -0.086]**
Endorsement change	**-0.550 [-0.771, -0.328]**	**-0.262 [-0.480, -0.043]**
Lagged emotion differentiation	**-0.018 [-0.030, -0.006]**	**0.031 [0.000, 0.062]**
Emotion intensity	**-3.887 [-5.009, -2.764]**	**0.519 [0.205, 0.833]**
Emotion regulation intensity	-0.035 [-0.121, 0.051]	**-0.149 [-0.243, -0.054]**
Time trend	**-0.006 [-0.008, -0.004]**	**0.004 [0.003, 0.006]**
Between-person (time-invariant)		
Intercept	**-1.264 [-1.921, -0.606]**	-0.558 [-1.234, 0.119]
Strategy switching	0.055 [-0.008, 0.118]	-0.004 [-0.052, 0.044]
Endorsement change	**-0.091 [-0.140, -0.042]**	-0.018 [-0.055, 0.019]
Emotion intensity	**-0.239 [-0.297, -0.181]**	**0.034 [0.004, 0.064]**
Emotion regulation intensity	**-0.068 [-0.114, -0.022]**	-0.017 [-0.049, 0.015]
Age	**-0.044 [-0.079, -0.009]**	**-0.068 [-0.099, -0.037]**
Gender (female = 1, male = 0)	0.034 [-0.086, 0.153]	**-0.148 [-0.238, -0.057]**

Note: Significant effects are displayed in bold. n: number of ESM assessments; N: number of adolescents; b: unstandardized effect; CI: confidence interval.

Supplemental Materials 6: Sensitivity analyses using the successive approach to calculate Bray-Curtis dissimilarity

In the main analyses, we calculated emotion regulation variability as Bray-Curtis dissimilarity by comparing the moment of interest with all other moments the same individual reported, which is known as the all-moment comparison approach. An alternative approach to calculating Bray-Curtis dissimilarity is by the successive temporal comparison which compares the moment of interest with the previous moment. This approach of calculation is not available if such previous moments have missingness, but the all-moment comparison approach can still compute the dissimilarity as long as there are at least two observations. As sensitivity analyses, we ran the same analyses with the successive temporal comparison approach. As shown in Table S6, the momentary reciprocal hinderance between negative emotion differentiation and emotion regulation variability was also seen when emotion regulation variability was calculated in the successive temporal comparison approach. In terms of individual differences, similar to our main findings, there were no significant associations between negative emotion differentiation and emotion regulation variability (model 2A). In summary, our confirmatory hypotheses about the relations between negative emotion differentiation and emotion regulation variability were robust.

As for the sensitivity analyses of exploratory models on two emotion regulation variability subcomponents, model 1B, 1C, and 2B showed similar findings that there were momentary reciprocal hinderance between negative emotion differentiation and emotion regulation variability, except that the strategy switching subsequent no longer significantly predict changes in emotion differentiation in the subsequent moment (model 2B). In terms of individual difference, interestingly, in addition to the between-person negative association between negative emotion differentiation and endorsement change, there was a positive association between negative emotion differentiation and strategy switching (model 2B). In other words, the degree to which participants switched from one strategy to

another on average was positively related to their baseline negative emotion differentiation. In summary, the relations between negative emotion differentiation and emotion regulation variability subcomponents were also largely robust.

Sensitivity analyses of exploratory models on positive emotion differentiation showed that relations between positive emotion differentiation and emotion regulation variability were less robust than those between negative emotion differentiation and emotion regulation variability. Higher positive emotion differentiation preceded lower emotion regulation variability (model 1A) and specifically lower endorsement change (model 1C). Other than these, no other within-person temporal relations or between-person relations were found (model 1B, 2A, and 2B).

Table S6

Fixed Effect Estimates of Within-Person Temporal Associations and Between-Person Differences Between Emotion Differentiation and Emotion Regulation Variability Calculated as the Successive Comparison Approach

	Negative Emotions *b* [95% *CI]*	Positive Emotions *b* [95% *CI]*
Outcome: Emotion regulation variability (Model 1A)	N = 678, n = 25522	N = 677, n = 25502
Within-person (time-varying)		
Lagged emotion differentiation	**-0.017 [-0.025, -0.010]**	**-0.021 [-0.039, -0.003]**
Lagged emotion intensity	-0.031 [-0.198, 0.136]	-0.006 [-0.051, 0.038]
Emotion regulation intensity	0.027 [-0.322, 0.376]	0.017 [-0.328, 0.361]
Time trend	**-0.006 [-0.008, -0.005]**	**-0.006 [-0.008, -0.004]**
Between-person (time-invariant)		
Intercept	**3.330 [2.293, 4.368]**	**3.145 [2.043, 4.247]**
Emotion differentiation	0.078 [-0.047, 0.204]	-0.020 [-0.214, 0.174]
Emotion intensity	0.014 [-0.083, 0.110]	-0.058 [-0.125, 0.009]
Emotion regulation intensity	**-0.504 [-0.573, -0.435]**	**-0.508 [-0.571, -0.445]**
Age	-0.002 [-0.053, 0.049]	0.008 [-0.047, 0.064]
Gender (female = 1, male = 0)	**0.240 [0.041, 0.440]**	**0.241 [0.036, 0.447]**
Outcome: Strategy switching (Model 1B)	N = 678, n = 25522	N = 677, n = 25502
Within-person (time-varying)		

Table S6

Fixed Effect Estimates of Within-Person Temporal Associations and Between-Person Differences Between Emotion Differentiation and Emotion Regulation Variability Calculated as the Successive Comparison Approach (continued)

	Negative Emotions *b* [95% *CI]*	Positive Emotions *b* [95% *CI]*
Endorsement change	**-0.382 [-0.488, -0.275]**	**-0.380 [-0.484, -0.276]**
Lagged emotion differentiation	**-0.009 [-0.016, -0.002]**	-0.007 [-0.019, 0.005]
Lagged emotion intensity	-0.027 [-0.117, 0.062]	-0.007 [-0.041, 0.026]
Emotion regulation intensity	-0.071 [-0.154, 0.013]	-0.073 [-0.164, 0.018]
Time trend	**-0.004 [-0.005, -0.003]**	**-0.004 [-0.005, -0.002]**
Between-person (time-invariant)		
Intercept	**1.513 [1.035, 1.991]**	**1.470 [0.995, 1.944]**
Endorsement change	**0.092 [0.056, 0.128]**	**0.090 [0.054, 0.126]**
Emotion differentiation	**0.098 [0.044, 0.152]**	0.070 [-0.016, 0.155]
Emotion intensity	0.000 [-0.047, 0.047]	-0.017 [-0.045, 0.011]
Emotion regulation intensity	0.005 [-0.030, 0.040]	-0.008 [-0.039, 0.024]
Age	-0.002 [-0.018, 0.014]	0.001 [-0.016, 0.017]
Gender (female = 1, male = 0)	0.085 [-0.001, 0.171]	0.084 [-0.003, 0.170]
Outcome: Endorsement change (Model 1C)	N = 678, n = 25522	N = 677, n = 25502
Within-person (time-varying)		
Strategy switching	**-0.487 [-0.525, -0.449]**	**-0.486 [-0.522, -0.451]**
Lagged emotion differentiation	**-0.015 [-0.022, -0.008]**	**-0.020 [-0.036, -0.005]**
Lagged emotion intensity	-0.040 [-0.177, 0.096]	0.004 [-0.029, 0.037]
Emotion regulation intensity	-0.017 [-0.303, 0.270]	-0.027 [-0.319, 0.264]
Time trend	**-0.005 [-0.007, -0.004]**	**-0.005 [-0.007, -0.003]**
Between-person (time-invariant)		
Intercept	**1.446 [0.725, 2.167]**	**1.507 [0.788, 2.227]**
Strategy switching	**0.108 [0.036, 0.180]**	**0.090 [0.018, 0.162]**
Emotion differentiation	-0.011 [-0.096, 0.073]	-0.074 [-0.203, 0.055]
Emotion intensity	-0.052 [-0.119, 0.014]	-0.008 [-0.052, 0.035]
Emotion regulation intensity	**-0.325 [-0.374, -0.276]**	**-0.347 [-0.391, -0.304]**
Age	0.022 [-0.016, 0.060]	0.019 [-0.019, 0.056]
Gender (female = 1, male = 0)	0.089 [-0.042, 0.219]	0.088 [-0.044, 0.220]
Outcome: Emotion differentiation (Model 2A)	N = 678, n = 25510	N = 673, n = 25402

Table S6

Fixed Effect Estimates of Within-Person Temporal Associations and Between-Person Differences Between Emotion Differentiation and Emotion Regulation Variability Calculated as the Successive Comparison Approach (continued)

	Negative Emotions *b* [95% *CI]*	Positive Emotions *b* [95% *CI]*
Within-person (time-varying)		
Emotion regulation variability	**-0.087 [-0.135, -0.038]**	0.005 [-0.011, 0.021]
Lagged emotion differentiation	**-0.022 [-0.034, -0.009]**	0.026 [-0.006, 0.057]
Emotion intensity	**-4.415 [-5.598, -3.233]**	**0.671 [0.422, 0.920]**
Emotion regulation intensity	0.074 [-0.006, 0.154]	-0.040 [-0.093, 0.013]
Time trend	**-0.005 [-0.008, -0.003]**	**0.004 [0.002, 0.006]**
Between-person (time-invariant)		
Intercept	**-1.611 [-2.247, -0.975]**	-0.077 [-0.691, 0.537]
Emotion regulation variability	-0.017 [-0.057, 0.024]	-0.006 [-0.036, 0.023]
Emotion intensity	**-0.238 [-0.299, -0.177]**	**0.035 [0.004, 0.065]**
Emotion regulation intensity	**-0.047 [-0.092, -0.001]**	-0.011 [-0.041, 0.018]
Age	-0.029 [-0.064, 0.006]	**-0.068 [-0.099, -0.036]**
Gender (female = 1, male = 0)	0.068 [-0.058, 0.193]	**-0.157 [-0.248, -0.065]**
Outcome: Emotion differentiation (Model 2B)	N = 678, n = 25510	N = 673, n = 25402
Within-person (time-varying)		
Strategy switching	-0.065 [-0.145, 0.014]	0.017 [-0.004, 0.039]
Endorsement change	**-0.099 [-0.147, -0.051]**	0.000 [-0.017, 0.017]
Lagged emotion differentiation	**-0.022 [-0.035, -0.009]**	0.025 [-0.006, 0.057]
Emotion intensity	**-4.399 [-5.535, -3.264]**	**0.672 [0.423, 0.921]**
Emotion regulation intensity	0.072 [-0.005, 0.149]	-0.040 [-0.093, 0.014]
Time trend	**-0.005 [-0.008, -0.003]**	**0.004 [0.002, 0.006]**
Between-person (time-invariant)		
Intercept	**-1.659 [-2.318, -1.001]**	-0.100 [-0.711, 0.512]
Strategy switching	0.069 [-0.003, 0.141]	0.019 [-0.034, 0.072]
Endorsement change	**-0.081 [-0.141, -0.021]**	-0.025 [-0.068, 0.019]
Emotion intensity	**-0.242 [-0.303, -0.181]**	**0.035 [0.005, 0.065]**
Emotion regulation intensity	**-0.067 [-0.115, -0.019]**	-0.018 [-0.051, 0.014]
Age	-0.026 [-0.062, 0.010]	**-0.066 [-0.098, -0.035]**
Gender (female = 1, male = 0)	0.060 [-0.065, 0.185]	**-0.157 [-0.249, -0.066]**

Table S6

Fixed Effect Estimates of Within-Person Temporal Associations and Between-Person Differences Between Emotion Differentiation and Emotion Regulation Variability Calculated as the Successive Comparison Approach (continued)

	Negative Emotions *b* [95% *CI]*	Positive Emotions *b* [95% *CI]*

Note: Significant effects are displayed in bold. n: number of ESM assessments; N: number of adolescents; b: unstandardized effect; CI: confidence interval.

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