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ARE EMOTIONALLY INTELLIGENT PEOPLE MORE EMOTIONALLY STABLE? AN EXPERIENCE SAMPLING STUDY

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The temporal dynamic characteristics of mood play an important role in various aspects of our lives including our psychological health and well-being. It is assumed that the individuals with high emotional intelligence (EI) are characterized by more positive and stable moods. However, most studies analyze how EI is related to emotional traits or momentary assessments of mood; there are almost no findings on EI relationships with mood dynamics. The present study fills this gap. Two research questions were asked. How mood dynamics characteristics are related to each other and to what extent are they independent? Which aspects of EI are related to particular characteristics of mood dynamics?

Method. To collect data on mood dynamics, an experience sampling procedure was implemented. Twenty-six female participants reported their mood for two weeks, three times a day, using the EmoS-18 questionnaire. Their emotional intelligence was measured with the EmIn questionnaire. Mean mood scores calculated across all measurement points were regarded as static characteristics showing a mood background typical for the participant. Also, three dynamic characteristics of mood were calculated, namely variability, instability, and inertia.

Results. Mood variability and instability were found to be very closely related to each other, measuring essentially the same construct. Inertia is relatively independent. EI was not related to mean mood scores which contradicts the results of other studies and can be explained by the use of the experience sampling procedure. EI was positively related to the inertia of a positive mood with high arousal and a negative mood with low arousal. In addition, a negative relationship between EI and the instability of tension was found. Most of the correlations were low. Further studies with higher statistical power are needed for more decisive conclusions. However, the results show that experience sampling provides new important insights on the role of EI in mood.

JEL Classification: Z

Key words: emotional intelligence, mood dynamics, mood variability, mood instability, mood inertia.

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Emotions are fleeting phenomena and this is fundamental to their nature. Davidson, who coined the term affective chronometry (Davidson, 1998), emphasized the importance of studying the dynamic characteristics of emotions for a better understanding of affective disorders and psychological health and well-being (Davidson, 2015). Contemporary approaches to emotion, be they appraisal, evolutionary, or constructivist theories (Moors, 2014; Tracy, 2014; Barrett, 2014), underline the dynamic nature of emotions. Mood temporal dynamics play a critical role in psychopathology and is important for the diagnostic of some psychiatric disorders such as bipolar disorders (American Psychiatric Association, 2013). However, most experimental studies take a static perspective on emotions understanding them either as the states unchanging during certain periods of time or as traits (Kuppens, 2015).

Recently, more research has appeared showing the important role of the dynamic characteristics of mood in various aspects of our lives. It has been shown that emotion dynamics are related to a wide array of psychological characteristics including psychological health, well-being (Houben, Van Den Noortgate, & Kuppens, 2015), and the development or recovery of mood disorders (Wichers, Wigman, & Myin-Germeys, 2015).

In this article, we concentrate on the possible relationships between mood dynamics and emotional intelligence (EI), which generally refers to the understanding and management of one's own and other's emotions. The ability to understand and control one's own emotions is vital to psychological well-being (Zeidner, Matthews, & Roberts, 2012). It is assumed that individuals high in EI are characterized by more positive and stable moods. Most studies exploring this issue analyze how EI is related to emotional traits or momentary assessments of mood; there are almost no findings on the relationship between EI and mood dynamics.

The dynamic characteristics of mood are most often obtained through experience sampling, repetitive systematic self-reports over time. Typically, participants are asked to report their moods several times per day for several days or weeks. This method provides rich data that can be analyzed in different ways. The most popular dynamic characteristics include emotional variability, emotional instability, and inertia (Houben, Van Den Noortgate, & Kuppens, 2015).

Emotional variability refers to the amplitude of an individual's mood changes. It shows how far or close an individual's mood is in relation to their average values. A person with high emotional variability would be characterized by experiencing emotions at the extreme levels and

would have greater mood deviations from the average mood level. Emotional variability is usually calculated as a within-person standard deviation of mood across time.

Emotional instability refers to the extent to which mood varies from one occasion to another. This is distinct from emotional variability in the sense that an individual characterized by a higher level of instability experiences greater mood shifts from one moment to the other, whereas emotional variability concerns only the amplitude of the changes. Therefore, emotional instability and variability are conceptually different although positive correlations between these variables can be expected. The emotional instability index can be calculated as the mean squared successive difference (MSSD) involving consecutive emotional states.

Emotional inertia denotes the prediction of a current mood state based on a previous mood state. An individual with a higher level of emotional inertia is characterized by experiencing emotions that are more enduring. This is usually calculated using the autocorrelation of mood states across time.

There are quite a number of studies which have examined the relationship between EI and mood using different approaches. Although they usually analyzed only static emotional traits or momentary moods, these studies provided many valuable results. In many studies, momentary mood or mood as a trait was measured with the Positive Affect and Negative Affect Schedule (PANAS, Watson et al., 1988), whereas EI was measured with different questionnaires and tests. In spite of the diversity of EI measures, the results are reasonably consistent.

Saklofske, Austin, Mastoras, Beaton, and Osborne (2012) used an emotional intelligence questionnaire EQI (Bar-On, 2004) and the PANAS. All the five subscales of the EQI were positively correlated with positive mood (correlation coefficients ranging from .21 to .56) and negatively correlated with negative mood (rs from -.21 to -.57). Extremera and Rey (2016) measured ability EI with the MSCEIT (Mayer, Salovey, & Caruso, 2002). They found a weak positive correlation between EI and the positive affect scale of the PANAS (r = .11, p < .01), whereas the negative affect scale was negatively correlated with EI (r = -.19, p < .01). Lyusin and Ovsyannikova (2015) assessed mood with a Russian adaptation of the PANAS (Osin, 2012) and EI with the Russian emotional intelligence questionnaire EmIn. Consistent with other results, all the EmIn scales were positively related to positive affect (rs from .27 to .40); general scores of the EmIn and the scales of intrapersonal EI and emotion management were negatively related to negative mood (rs from -.26 to -.36). A longitudinal study by Sánchez-Álvarez, Extremera,

and Fernández-Berrocal (2015) assessed EI with the use of the Trait Meta-Mood Scale (TMMS) and mood with the PANAS on three occasions over two years. Their results showed that negative mood was positively correlated with attention to emotion (rs from .22 to .29) and positive mood positively correlated with mood clarity (rs from .17 to .42) and emotional repair (rs from .18 to .44).

In some studies which used the PANAS, general mood valence was assessed by affect balance calculated as the difference between the scores of positive and negative affect. For instance, Liu, Wang, and Lü (2013) measured EI with the Wong and Law Emotional Intelligence Scale (WLEIS) and found a positive correlation (r = .40) between affect balance and EI. Lyusin and Ovsyannikova (2015) also found positive correlations between affect balance and the scales of general EI, intrapersonal EI, and emotion management (rs from .39 to .45).

Some studies analyzed the associations between the PANAS and Schutte's Self-Report Emotional Intelligence Scale (Schutte et al., 1998). EI was found to be positively related to positive mood (r = .55), but there was no association with negative mood (Schutte et al., 2002). Another study (Koydemir, Şimşek, Schütz, & Tipandjan, 2013) conducted in two different cultures (Germany and India) found a positive correlation (r = .46 and r = .28 respectively) between affect balance and EI irrespective of the cultural background.

Stolarski, Jankowski, Matthews and Kawalerczyk (2016) measured mood twice, in the morning and in the evening with the use of the WIST mood adjective list. EI measured by the Test of Emotional Intelligence (Śmieja, Orzechowski, & Stolarski, 2014) was found to correlate negatively with tense arousal, but this association was stronger in the evening. No other significant correlations between EI and mood were found.

To sum up, practically all studies explore the relationships of EI with only static mood characteristics. Most often, higher EI is associated with a more positive and less negative affect irrespective of what measures were used; typical correlations are low or medium. Relationships between EI and the dynamic characteristics of mood remain mostly unstudied which makes it important to apply an experience sampling procedure to mood measurement and to relate the obtained mood characteristics to EI. Experience sampling will allow the analysis of mood dynamics and obtaining assessments of the mood background typical for an individual. These assessments can be regarded as analogous to mood traits measured with questionnaires but they

are more valid since they are based not on a momentary retrospective self-report but on repetitive self-reports over time.

The present study aimed to analyze the relationships between EI and mood dynamics. We used an experience sampling procedure and measured participant EI having two research questions in mind. (1) How are the characteristics of mood dynamics related to each other and to what extent are they independent? (2) Which aspects of EI are related to particular characteristics of mood dynamics? This study is exploratory in nature but still we had some expectations. First, people with higher EI should experience more positive and less negative moods. Secondly, the mood of emotionally intelligent people should be more stable and enduring; this association will be stronger for intrapersonal EI.

Method

Participants

Twenty-seven undergraduate students (all female) from Moscow, with age ranging from 17 to 21 years (M = 18.32, SD = 1.02) participated in the study for course credit. One participant was excluded from the analysis because she did not fill out all the questionnaires making the final sample comprised of 26 participants.

Measures

Participant momentary mood was assessed with the emotional state questionnaire EmoS-18 (Lyusin, 2014). This is a Russian-language self-report measure consisting of 18 words that represent mood states such as happiness, enthusiasm, sadness, regret, agitation, tension, etc. The participants are asked to rate their mood with the use of these words on the Likert scales from 1 to 5. The EmoS-18 questionnaire is based on an empirically obtained three-dimensional model of mood. It comprises three scales (6 words for each), Positive Mood with High Arousal, Negative Mood with Low Arousal, and Tension with Cronbach's alphas of .84, .88, and .87, respectively.

EI was measured with the EmIn Questionnaire, a Russian self-report measure (Lyusin, 2006). It consists of 46 items with a 4-point Likert scale response format, from "completely disagree" to "completely agree". These items form four questionnaire scales: Interpersonal EI (e.g., "I understand other people's inner states without words"), Intrapersonal EI (e.g., "I know

what to do to improve my mood"), Emotion Comprehension (e.g., "Often, I can't find the words to describe my feelings to my friends"), and Emotion Management (e.g., "If I hurt somebody's feelings, I don't know how to restore a good relationship with them"). The aggregate score of these scales provides the assessment of General EI. The Cronbach's alphas of the EmIn scales were reported to range from .84 to .89 (Lyusin & Ovsyannikova, 2015).

Procedure

A meeting with participants was organized to give instructions and to explain how to fill out the questionnaires. The participants were asked to fill out the EmoS-18 questionnaire three times a day for a two-week period. They were told to implement the first measurement of mood in the morning right after waking up, the second measurement in the middle of the day, and the last one at night before they go to bed. Another meeting was organized a week later to discuss the progress made and to offer assistance on challenges they may have encountered during the process. At any moment participants could contact experimenters via email. Some of the participants completed the EmIn questionnaire during the first meeting; others during the second meeting.

Results

All the participants successfully followed the instructions and generally succeeded in reporting their mood for two weeks three times a day. Twelve participants implemented the procedure for 14 days, 11 participants for 13 days, 1 participant for 12 days, and 2 participants for 6 days. The average percentage of skipped measurement points across participants was 5%, ranging from 0–18%.

The results of one participant are presented in Figure 1. It shows how the three dimensions of mood measured by the EmoS-18 were changing over time.

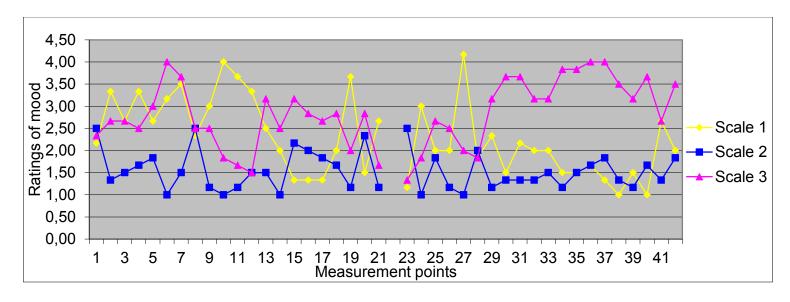


Fig. 1. Results of mood measurement with the use of experience sampling procedure (Participant 9). Scale 1 – Positive Mood with High Arousal, Scale 2 – Negative Mood with Low Arousal, Scale 3 – Tension.

Analysis of mood characteristics

The experience sampling procedure gave an array of mood characteristics for each participant, both static and dynamic. They were calculated separately for all three scales of the EmoS-18, namely Positive Mood with High Arousal (PM-HA), Negative Mood with Low Arousal (NM-LA), and Tension. Mean scores for each scale calculated across all measurement points can be regarded as the static characteristics showing a mood background typical for the participant. Variability scores were calculated as standard deviations; MSSD was used as an index for instability; inertia scores were calculated as first-order autocorrelations. The descriptive statistics are presented in Table 1.

Table 1. Descriptive statistics for static and dynamic mood characteristics based on the experience sampling procedure

Measure	Min	Max	Mean	Std. Deviation
Mean PM-HA	1.38	3.69	2.26	0.58
Mean NM-LA	1.07	2.74	1.69	0.46
Tension	1.3	3.65	2.10	0.50
Variability: PM-HA	0.39	1.42	0.84	0.25
Variability: NM-LA	0.10	1.34	0.72	0.33
Variability: Tension	0.28	1.42	0.69	0.27
Instability: PM-HA	0.21	3.93	1.24	0.95
Instability: NM-LA	0.02	3.39	0.91	0.86
Instability: Tension	0.1	2.53	0.79	0.71
Inertia: PM-HA	-0.12	0.61	0.20	0.19
Inertia: NM-LA	-0.24	0.84	0.20	0.25
Inertia: Tension	-0.14	0.74	0.27	0.23

Note: PM-HA – Positive mood with high arousal (Scale 1 of the EmoS-18), NM-LA – Negative mood with low arousal (Scale 2 of the EmoS-18).

Table 2 provides a summary of the inter-correlations between all mood characteristics. Mean PM-HA and mean NM-LA (Scales 1 and 2 of the EmoS-18) are independent (r = -.02) whereas Tension (Scale 3) correlates positively with other scales, especially with NM-LA (r = .67). Variability scores for all three scales of the EmoS-18 positively correlate with each other (rs range from .43 to .63); the same holds for instability (rs from .67 to .80) and inertia (rs from .22 to .30) scores.

Of particular interest are correlations among variability, instability, and inertia scores because it is important to evaluate their degree of independence. Notably, there are high positive correlations between the variability and instability scores across all three EmoS-18 scales (*r*s from .87 to .92) which means that these two variables double each other and measure essentially the same construct. As a dynamic characteristic, instability seems to be more preferable than variability since it reflects moment-to-moment changes in mood whereas variability shows only the amplitude of mood changes. For these reasons, variability was excluded from the subsequent analysis.

An analysis of the relationships between static and dynamic mood characteristics shows that.

(1) mean PM-HA positively correlates only with the instability (and variability) of PM-HA;

- (2) mean NM-LA positively correlates with the instability (and variability) of all mood scales, but correlations with the instability (and variability) of NM-LA are the highest;
- (3) mean Tension positively correlates with the instability (and variability) of all mood scales without any obvious preferences;
- (4) there are almost no high correlations (and only one significant correlation) with inertia.

This correlation pattern further confirms the idea that variability can be excluded from the analysis since it doubles instability whereas inertia is a characteristic distinct from instability and variability.

Table 2. Results of correlation between static and dynamic mood characteristics

	1	2	3	4	5	6	7	8	9	10	11
1. Mean PM-HA											
2. Mean NM-LA	02										
3. Mean Tension	$.33^{\dagger}$.67**									
4. Variability: PM-HA	.62**	.42*	.54**								
5. Variability: PM-LA	09	.87**	.49*	.43*							
6. Variability: Tension	.19	.43*	.57**	.63**	.52**						
7. Instability: PM-HA	.52**	.41*	$.47^{*}$.92**	.46*	.74**					
8. Instability: NM –LA	.09	.81**	.63**	.60**	.87**	.68**	.67**				
9. Instability: Tension	.09	.56**	.56**	.64**	.61**	.92**	.78**	.80**			
10. Inertia: PM-HA	17	11	21	28	24	51**	56**	33 [†]	53**		
11. Inertia: NM-LA	04	.12	27	05	.20	28	19	18	33 [†]	.30	
12. Inertia: Tension	.35 [†]	43*	2	.03	37†	08	08	45*	40*	.26	.22

Note: PM-HA – Positive mood with high arousal (Scale 1 of the EmoS-18), NM-LA – Negative mood with low arousal (Scale 2 of the EmoS-18). ** p < 0.01, ** p < 0.05, †* p < 0.1.

Static and dynamic mood characteristics and emotional intelligence

The relationships between the obtained mood characteristics and EI are presented in Table 3. There are no significant relationships between static mood characteristics (that is, the mean positive mood with high arousal, the mean negative mood with low arousal and mean tension) and any scales of the EmIn questionnaire.

Table 3. Correlations between static and dynamic mood characteristics and emotional intelligence

	General EI	Intrapersonal EI	Interpersonal EI	Emotion understanding	Emotion management
1. Mean PM-HA	.14	04	.29	.09	.16
2. Mean NM-LA	.15	.05	.20	.13	.12
3. Mean Tension	.14	.02	.22	.02	.22
4. Instability: PM-HA	09	06	10	06	10
5. Instability: NM-LA	.02	.00	.03	.06	02
6. Instability: Tension	28	16	32	30	19
7. Inertia: PM-HA	.26	.07	.389*	.30	.16
8. Inertia: NM-LA	$.37^{\dagger}$.26	$.386^{\dagger}$.46*	.19
9. Inertia: Tension	.03	09	.15	.12	07

Note: PM-HA – Positive mood with high arousal, NM-LA – Negative mood with low arousal ** p < 0.01, * p < 0.05, † p < 0.10.

Significant relationships between dynamic mood characteristics and EI are scarce but informative. There are only two correlations that are significant at the conventional level of p < .05, a correlation of .389 between the inertia of PM-HA and Interpersonal EI and a correlation of .46 between the inertia of NM-LA and Emotion Understanding. Also, there are two correlations with ps < .10, a correlation between the inertia of NM-LA and General EI (r = .37, p = .06) and a correlation between the inertia of NM-LA and Interpersonal EI (r = .386, p = .051). Due to the limited sample size, only correlations higher than .388 are significant at the conventional level of .05 in this study. However, it makes sense to look at some other correlations that are not significant from a technical point of view but are informative for exploratory purposes. There are at least two consistent patterns of correlations: the instability of Tension yields negative correlations with all the EI scales (rs from -.16 to -.32), whereas inertia of NM-LA correlates positively with all the EI scales (rs from .19 to .46).

Discussion

The first research question concerned the degree of independence among the calculated mood dynamic characteristics: emotional variability, instability, and inertia. We found that mood variability operationalized as a within-person standard deviation of mood across time and mood

instability operationalized as MSSD were closely related to each other and yielded very similar correlation patterns with other variables. Therefore, they measure essentially the same construct. We consider instability to be a more adequate dynamic characteristic of mood, since it reflects moment-to-moment changes in mood. Interestingly, some studies do not distinguish between variability and instability and use MSSD as an index of variability (e.g., Bowen, Baetz, Hawkes, & Bowen, 2006). Mood inertia was found to be a distinct characteristic of mood dynamics independent of mood variability and instability.

The second research question concerned relationships between EI and static and dynamic mood characteristics. Static mood characteristics were calculated as mean scores for each scale of the EmoS-18 across all measurement points. None yielded any significant correlations with the EmIn scales. This finding is inconsistent with previous studies that reported significant relationships between mood and EI (Extremera & Rey, 2016; Liu, Wang, & Lü, 2013; Sánchez-Álvarez, Extremera, & Fernández-Berrocal, 2015). This unusual result can be attributed to the fact that static mood indices were calculated as the average mood within the two-week period. It is possible that in other studies, where mood and EI were typically measured once, participants reported their current mood and level of EI more or less at the same time which could provide spurious correlations. Hence, if their current mood was more positive they rated their EI higher. On the other hand, participants were likely to report low EI when they were experiencing a negative mood.

The absence of significant correlations between EI and the usual background mood obtained with the use of experience sampling raises doubts about the seemingly established consensus on the relationships between mood and EI based on the research with different methodology.

We expected to find relationships between dynamic mood characteristics and EI. A more precise prediction claimed that the mood of emotionally intelligent people would be more stable and enduring, and this association would be stronger for intrapersonal EI. Few significant correlations were found. It is important to bear in mind that the sample size in this study was limited which results in low statistical power. For explorative purposes, we interpret the results taking into account marginally significant correlations (p < .10) and some insignificant correlations if their patterns seem to be consistent. This type of analysis allows us to see what should be explored more closely in the future studies with higher statistical power.

The inertia of PM-HA and NM-LA correlates positively with almost all aspects of EI. These correlations are larger for interpersonal EI and emotion understanding. It can be suggested that higher EI helps maintain emotional states in terms of valence but not in terms of activation level. Contrary to our expectations, interpersonal EI plays a more important role in mood inertia compared to intrapersonal EI. Probably, social interactions are more successful or at least more predictable in individuals with higher interpersonal EI (and higher emotion understanding) and this helps them to maintain a smoother mood.

Another noteworthy result is the negative relationship between the instability of tension and EI. The correlations are not statistically significant but consistent across all the scales of the EmIn questionnaire and achieve -.32 which is rather high not only for this study but also for other studies in the field. At the same time, there are no significant or consistent relationships between the instability of PM-HA and NM-LA and EI. This result suggests that the mild flexibility in valence is a normal response to everyday events and does not concern the level of EI. In contrast, EI is more relevant to instability in emotional tension. People with higher EI benefit from more stable emotional states in terms of tension.

To sum up, the experience sampling procedure implemented in this study enabled us to obtain static and dynamic characteristics of mood and to analyze their relationships with each other and with EI. The findings suggest that higher EI is related to more enduring mood states, i.e., higher mood inertia, and higher stability of the tension dimension of mood. The main limitation of the study is the small sample size resulting in low statistical power. More significant and informative correlations between EI and mood could be found in future studies with higher statistical power. All the participants of the present study were female and it remains unclear to what extent the findings would be similar for male participants. In general, the results show that the analysis of mood dynamics based on experience sampling provides new important insights on the role of EI in mood.

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