Research Article

aps ASSOCIATION FOR PSYCHOLOGICAL SCIENCE

Psychological Science
21(7) 984–991
© The Author(s) 2010
Reprints and permission:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/0956797610372634
http://pss.sagepub.com
SAGE

Emotional Inertia and Psychological Maladjustment

Peter Kuppens[1,2], Nicholas B. Allen[2,3], and Lisa B. Sheeber[4]
[1]University of Leuven; [2]University of Melbourne; [3]Orygen Youth Health Research Centre, Parkville, Australia; and [4]Oregon Research Institute, Eugene, Oregon

Abstract

In this article, we examine the concept of emotional inertia as a fundamental property of the emotion dynamics that characterize psychological maladjustment. Emotional inertia refers to the degree to which emotional states are resistant to change. Because psychological maladjustment has been associated with both emotional underreactivity and ineffective emotion-regulation skills, we hypothesized that its overall emotion dynamics would be characterized by high levels of inertia. We provide evidence from two naturalistic studies that, using different methods, showed that the emotional fluctuations of individuals who exhibited low self-esteem (Study 1) and depression (Study 2) were characterized by higher levels of inertia in both positive and negative emotions than the emotional fluctuations of people who did not exhibit low self-esteem and depression. We also discuss the usefulness of the concept of emotional inertia as a hallmark of maladaptive emotion dynamics.

Keywords

emotion, psychological adjustment, emotional inertia, emotional variability

Received 7/8/09; Revision accepted 10/22/09

Feelings change. People's emotional lives are characterized by ups and downs, changes and fluctuations following the ebb and flow of daily life. Studying the patterns and characteristics of these changes gives researchers insight into the dynamics of emotions and how people regulate their emotions, for better or for worse. In this article, we examine the concept of emotional inertia as a fundamental feature of the dynamics of emotional experience and discuss its relationship to psychological maladjustment.

Emotional Variability and Adjustment

One of the most common findings in the study of emotion dynamics is that high levels of emotional variability are associated with maladaptive psychological functioning. For instance, individuals who display larger emotional variability over time (expressed, for instance, as the standard deviation of repeated emotion assessments across time) are characterized by higher levels of depression and neuroticism as well as lower levels of self-esteem (e.g., Eid & Diener, 1999; Kuppens, Van Mechelen, Nezlek, Dossche, & Timmermans, 2007).

This line of research could be interpreted as showing that psychological maladjustment is characterized by large emotional reactivity (Kuppens et al., 2008). Yet emotions are generally considered to be adaptive responses that aid and motivate an organism as it copes with the demands and threats in the environment (Frijda, 2007; Izard, 2009). Anger motivates antagonism and the removal of the object of frustration, fear motivates avoiding or fleeing a threatening environment, and happiness signals that things are going well and encourages further engagement in the current situation. In sum, the adaptive value of emotions lies in their capacity to mobilize the individual in response to internal or external events. It therefore seems contradictory that emotional reactivity per se would be maladaptive. Experiencing changing emotions should be generally functional and adaptive, depending on how attuned these emotional changes are to environmental contingencies. Lack of emotional responsiveness, instead, may be a sign that such responses have become decoupled from environmental or psychological demands and, thus, may be indicative of maladjustment.

Emotional Inertia and Adjustment

On closer inspection, emotional variability, as it has been measured in studies on its association with psychological

Corresponding Author:
Peter Kuppens, Department of Psychology, University of Leuven, Tiensestraat 102, 3000 Leuven, Belgium
E-mail: peter.kuppens@psy.kuleuven.be

maladjustment, may not reflect emotional reactivity as much as the range and extremity of emotional experiences (Larsen & Diener, 1987). Extremely intense emotions are very disruptive and characteristic of many emotional disorders (e.g., anxiety disorder, mania, depression). Experiencing a broad range of intense emotions is not, however, the same thing as being emotionally reactive. In fact, maladjustment may be characterized by reduced emotional reactivity. A recent meta-analysis (Bylsma, Morris, & Rottenberg, 2008) provided evidence that depressive disorder is characterized by what Rottenberg (2005) has labeled emotion context insensitivity, or reduced emotional reactivity to the environment, with regard to both positive and negative emotions. This lower responsiveness may typify not just the onset but also the maintenance of emotions. In general, psychological maladjustment is related to impaired emotion-regulation skills (Gross, 2007). Specifically, research has shown that indicators of low psychological well-being, such as neuroticism and low self-esteem, are related to impairments in affect repair (e.g., Heimpel, Wood, Marschall, & Brown, 2002; Hemenover, 2003), and evidence suggests that depressed individuals are characterized by a longer duration of negative moods and emotional states than nondepressed individuals are (Peeters, Nicolson, Berkhof, Delespaul, & deVries, 2003; Sheeber, Allen, Davis, & Sorensen, 2000; Silk, Steinberg, & Morris, 2003).

Taken together, these findings suggest that the emotion dynamics observed in psychological maladjustment might be characterized by what has been labeled emotional inertia (Suls, Green, & Hillis, 1998). Emotional inertia can be defined as resistance to emotional change, formalized as the degree to which a person's current emotional state can be predicted by his or her emotional state at a previous moment (with high predictability reflecting high inertia). High emotional inertia means that a person's emotional state is likely to persist from one moment to the next, which suggests that it may be highly resistant to external influences (e.g., changes in the environment) or internal influences (e.g., regulation efforts). High inertia may thus signal a slowing down of emotional experiences, reflecting a decoupling of emotions from their adaptive function. In turn, low emotional inertia means that a person's emotional state is more susceptible to change, which suggests that emotions are more likely to be influenced by environmental or psychological demands and more responsive to regulatory control.

It is important to underscore that emotional inertia is distinct from emotional variability (e.g., Jahng, Wood, & Trull, 2008). A person can display both high emotional inertia and high emotional variability (e.g., slow but large mood shifts), high inertia but low variability (e.g., slow but small mood shifts), low inertia and high variability (e.g., frequent but large mood shifts), and both low inertia and low variability (e.g., frequent but small mood shifts).

The concept of emotional inertia has implications for understanding both emotion generation and emotion control (cf. Koole, 2009). It captures the decreased reactivity that is central to emotion context insensitivity, as well as the decreased ability to change moods and emotions that reflects deficient emotion-regulation skills. Emotional inertia may therefore prove to be a hallmark of the emotion dynamics that are tied to psychological maladjustment.

Before research explores the boundary conditions and underlying processes of emotional inertia, it is crucial to establish that increased inertia indeed characterizes the emotion dynamics of individuals who show signs of psychological maladjustment (see Rozin, 2009). So far, the concept of emotional inertia has not been frequently researched. A notable exception is the study by Suls et al. (1998) that introduced the concept of affective inertia and demonstrated that neuroticism increases the likelihood that a negative mood at one moment will carry over to the next moment. Yet additional evidence is needed to establish the potential role of emotional inertia as a feature of maladaptive emotion dynamics. Also, it is important to examine whether maladjustment is associated with inertia solely of negative emotional states, or whether both positive and negative emotions display higher levels of inertia in maladjusted individuals compared to better-adjusted individuals.

Our aim in the present study was to examine the usefulness of the concept of emotional inertia by examining its relationship with indicators of psychological adjustment. We chose to focus on two central indicators of psychological adjustment: self-esteem, which is widely considered to be crucial to psychological functioning and well-being (Kernis, 2006), and major depression, a mood disorder that affects close to one sixth of the general population and that is projected to become the primary mental-health threat in the coming decades (Kessler, 2002). To examine the hypothesis that low self-esteem and depression (which are themselves highly related; Neiss, Stevenson, Legrand, Iacono, & Sedikides, 2009) are associated with increased emotional inertia, we conducted two studies that relied on different methodologies and focused separately on these two indicators of psychological adjustment. In Study 1, we examined the relationship between self-esteem and inertia in people's naturally occurring emotional experiences throughout their daily life. In Study 2, we examined the relationship between major depression and inertia in emotional behavior during emotionally evocative family interactions.

Study 1

An experience-sampling study (Csikszentmihalyi & Larsen, 1987) was conducted to collect data on the emotional changes and fluctuations that naturally occur during daily life. Because experience-sampling techniques capture data from life "as it is lived" (Bolger, Davis, & Rafaeli, 2003, p. 579), they benefit from high ecological validity and are less subject to recall biases than other self-report methodologies. In our study, participants recorded their momentary emotional experiences over the course of 2 weeks. Multilevel analyses were used to examine the hypothesis that low self-esteem, as an indicator of psychological maladjustment, is related to elevated levels of emotional inertia.

Method

Participants. Eighty university students took part in the study. One participant ended the study after 1 day, which resulted in a final sample of 79 participants (50 females, 29 males; mean age = 24 years). Participants were paid €40 for their participation.

Materials and procedure. In a first session, each participant received a palmtop computer along with instructions for its use. Each computer was programmed to beep 10 times a day for 14 consecutive days during the participant's waking hours. The beeps were programmed according to a stratified random-interval scheme: Participants' waking hours were divided into 10 equal intervals, and one beep was programmed to sound randomly within each interval. At each beep, the computer prompted participants to rate (in randomized order) how happy, excited, relaxed, satisfied, angry, anxious, depressed, and sad they felt at the moment of the beep, using a continuous slider scale that ranged from 0 (*not at all*) to 100 (*very much*). These emotion terms were selected because they represented all quadrants of the affective circumplex (Russell, 2003). For the next 2 weeks, participants carried the computer during their normal activities and responded to the questions when signaled. Compliance was good: Overall, participants responded to 82% of the programmed beeps. (Response frequency ranged between 55% and 99% for individual participants.) After 2 weeks, participants attended a second session and were paid for participation. In addition, each participant filled out the Rosenberg (1965) Self-Esteem scale (either before or after the sampling procedure, as determined by random assignment).

Results

Following a process approach to examine time as a facet of data (Larsen, Augustine, & Prizmic, 2009), we examined within-person emotion autocorrelations and their between-persons association with self-esteem in a multilevel framework. An autocorrelation (i.e., the correlation of a variable with itself at a time-lagged interval; Box & Jenkins, 1970) expresses the extent to which a currently observed variable can be predicted from the value of that variable at a previous point in time; autocorrelation can therefore be considered a direct operationalization of the concept of emotional inertia. We used multilevel techniques to take into account the nested data structure and resulting dependencies (e.g., Bryk & Raudenbush, 1992) and to examine the moderating role of self-esteem in individual differences in the emotions' autocorrelations. Specifically, at Level 1, we predicted each emotion at a given time (t) from the previous assessment of that same emotion ($t - 1$). At Level 2, the intercept and slope values of the emotion were allowed to vary across participants and were predicted by the level of participants' self-esteem.

Table 1 summarizes our findings. At Level 1, the significant intercept values indicate that participants experienced higher-than-zero levels on average for all emotions. The intercept values also reveal that participants experienced more positive than negative emotions on average, a pattern in line with previous findings (Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004; Zelenski & Larsen, 2000). All slope values were significant at Level 1. Thus, on average, all emotions displayed positive significant autocorrelations (i.e., participants' emotional states at time t were significantly predicted by their states at time $t - 1$). This suggests that some degree of emotional inertia is normative. At Level 2, self-esteem was a significant positive predictor of individual differences in intercept values for happy, excited, relaxed, and satisfied emotion; a significant negative predictor for intercept values for anxious, depressed, and sad emotion; and a marginally significant predictor for anger. These results indicate that participants with higher self-esteem on average felt more positive emotions, and they also felt less anxious, depressed, sad, and angry compared with participants who had lower self-esteem. These results replicate previous findings (Diener & Diener, 1995).

Finally, in findings central to our hypothesis, the slopes at Level 2 reflect how self-esteem was associated with individual differences in autocorrelation (or inertia) for the different emotions. The results show that self-esteem was significantly related to the autocorrelation slopes for the majority of the studied emotions. As predicted, lower levels of self-esteem were associated with higher inertia for happy, excited, angry, anxious, and depressed emotion. Self-esteem was not significantly related to inertia for relaxed, satisfied, or sad emotion, although the associations for these emotions were in the predicted direction.

Consistent with our hypothesis, evidence from Study 1 shows that low self-esteem is related to higher inertia across a variety of emotions in daily life. This means that relative to the emotional states of individuals with higher self-esteem, the emotional states of individuals with low self-esteem are more resistant to change. Our findings also show that the association between self-esteem and inertia holds for both positive and negative emotions, indicating that emotional inertia extends across hedonic boundaries.

Study 2

Contemporary research on depression suggests that the emotional life of depressed individuals is not characterized by increased emotional reactivity, but rather is characterized by increased emotional insensitivity (Rottenberg, 2005). In addition, depression is associated with impaired emotion-regulation skills (Gross & Muñoz, 1995) and ruminative thought (Watkins, 2008), which suggests a decreased capacity to change one's emotions and thoughts. Together, these observations suggest that the emotional changes exhibited by depressed individuals may be more inert than the emotional changes exhibited by nondepressed individuals.

Table 1. Multilevel Autocorrelation Analyses Predicting Emotion in Study 1

	Level 1			Level 2 (self-esteem)		
Emotion and parameter	*b*	*SE*	*p*	*b*	*SE*	*p*
Happy						
Intercept	58.58	1.48	.000	7.45	2.52	.005
Slope	0.30	0.02	.000	–0.07	0.03	.032
Excited						
Intercept	55.53	1.58	.000	8.54	2.52	.001
Slope	0.33	0.02	.000	–0.08	0.03	.025
Relaxed						
Intercept	61.53	1.42	.000	8.12	2.43	.002
Slope	0.27	0.02	.000	–0.04	0.04	.304
Satisfied						
Intercept	59.96	1.30	.000	9.29	2.38	.000
Slope	0.29	0.02	.000	–0.06	0.04	.123
Angry						
Intercept	6.63	0.70	.000	–2.57	1.46	.082
Slope	0.20	0.03	.000	–0.09	0.05	.051
Anxious						
Intercept	7.38	1.11	.000	–8.84	2.80	.003
Slope	0.22	0.02	.000	–0.14	0.04	.002
Depressed						
Intercept	6.70	0.75	.000	–7.11	1.79	.000
Slope	0.22	0.03	.000	–0.11	0.05	.025
Sad						
Intercept	8.58	0.87	.000	–5.20	1.80	.005
Slope	0.27	0.03	.000	–0.06	0.05	.297

Note: In each analysis, the lagged predictor was group-mean-centered at Level 1. To remove previous-day effects, we replaced the first measurement of each day for the lagged variables with a missing value. At Level 1, the intercept reflects the average emotion rating, and the slope reflects the average autocorrelation (inertia). At Level 2, self-esteem was grand-centered. At this level, the intercept reflects the association between self-esteem and the average emotion level across participants, and the slope reflects the association between self-esteem and the autocorrelation (inertia) across participants.

In Study 2, we examined this hypothesis using data on the emotional behavior of depressed and nondepressed adolescents during laboratory-based interactions with their parents. Because interpersonal relationships are strong elicitors of emotional states, and family relations are arguably the most salient interpersonal predictor of depressive symptomatology in adolescents (Sheeber, Hops, & Davis, 2001), family interactions provide an especially appropriate context for observing affective behavior. In addition, this study enabled us to examine emotional inertia on a much shorter time scale than in Study 1. Whereas the former study concerned inertia across relatively large time periods (hours), the current study allowed us to examine emotional inertia at the time scale of seconds. As in the previous study, multilevel analyses were used to examine the hypothesis that psychological maladjustment (in this case operationalized by the presence of depressive disorder) is related to elevated levels of emotional inertia.

Method

Participants. Participants were 141 adolescents (94 females, 47 males; mean age = 16 years) recruited using a two-gate procedure consisting of a school-based screening of depressive symptoms (Center for Epidemiologic Studies Depression Scale, CES-D; Radloff, 1977) followed by diagnostic interviews with selected youth (Kiddie-Schedule for Affective Disorders and Schizophrenia, K-SADS; Orvaschel & Puig-Antich, 1994). Depressed adolescents (n = 72) had elevated scores on the CES-D (> 31 for males and > 38 for females) during the screening and subsequently met the diagnostic criteria for current major depressive disorder in the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM–IV; American Psychiatric Association, 1994). Nondepressed adolescents (n = 69) scored below an adolescent-appropriate cutoff on the CES-D (< 21 for males and < 24 for

females) and did not meet criteria for depressive or other disorders at the subsequent interview.

Materials and procedure. Families of the selected adolescents participated in three family-interaction tasks in the laboratory. Each task consisted of two discussions that lasted 9 min each. In the first two discussions, families were instructed to plan a vacation and then to talk about a fun time they had experienced together (positive discussions). The second task consisted of two problem-solving interactions in which families were asked to discuss and resolve areas of conflict (conflict discussions). In the third task, families were asked to discuss two areas of family life. One discussion focused on identifying and describing the best and most difficult years the adolescent had experienced, and the other focused on the most challenging and most rewarding aspects of parenting the adolescent (reminiscence discussions). We have found that these tasks elicit differential levels of happy, angry, and dysphoric affect. During the interactions, family members were videotaped for subsequent behavioral coding.

The Living in Family Environments (LIFE) coding system (Hops, Biglan, Tolman, Arthur, & Longoria, 1995) was used to code the adolescents' behavior during the family interactions. The validity of the LIFE system has been established in numerous studies of adolescent depression (e.g., Katz & Hunter, 2007; Sheeber, Davis, Leve, Hops, & Tildesley, 2007). Observers, who were blind to participants' diagnostic status and our hypotheses, coded the adolescents' nonverbal affect and verbal content in real time. Three constructs indicating angry, dysphoric, and happy behavior were derived from the individual affect and content codes. Angry behavior included aggressive or contemptuous nonverbal actions and cruel or provoking statements. Dysphoric behavior was defined by sad nonverbal actions or statements. Happy behavior reflected cheerful nonverbal actions or statements. This procedure yielded second-by-second time-series information on the happy, angry, and dysphoric behavior of both depressed and nondepressed adolescents during several different interaction tasks with their parents.

Results

The data consisted of binary behavioral codes (e.g., happy/not happy) nested within interaction task discussion, nested in persons, and were accordingly analyzed using three-level logistic autocorrelation regression models. In a first series of analyses, adolescents' behavior (e.g., happy behavior) at time t was predicted by their behavior at time $t - 5$ s at Level 1 of the model, with the intercept and slope values being nested in the six interaction task discussions at Level 2. Person-specific intercept and slope values were predicted by the presence or absence of depression at Level 3. The results are presented in Table 2. At Level 1, participants displayed significant degrees of happy, angry, and dysphoric behavior, and each of these behaviors demonstrated a significant degree of autocorrelation (inertia). At Level 3, examination of the intercepts showed that depressed participants displayed significantly more angry (but not dysphoric or happy) behavior than nondepressed participants did. In confirmation of our hypothesis, the results showed that depressed participants overall differed significantly from nondepressed adolescents in their autocorrelation, or inertia. Also consistent with our hypothesis, the findings indicated that depressed participants displayed greater inertia for happy, angry, and dysphoric emotional behavior.

In a second series of analyses, we explored how the observed difference in emotional inertia varied as a function of the interaction task. Emotional demands may be higher in tasks that require focus on areas of disagreement (conflict

Table 2. Logistic Multilevel Autocorrelation Analyses Predicting Emotional Behavior in Study 2

	Level 1			Level 3 (depression)		
Behavior and parameter	*b*	*SE*	*p*	*b*	*SE*	*p*
Happy						
Intercept	–1.60	0.09	.000	–0.16	0.15	.279
Slope	1.63	0.05	.000	0.21	0.07	.005
Angry						
Intercept	–3.89	0.16	.000	0.83	0.21	.000
Slope	1.79	0.09	.000	0.26	2.28	.024
Dysphoric						
Intercept	–2.37	0.10	.000	0.16	0.14	.387
Slope	1.84	0.06	.000	0.24	0.09	.010

Note: At Level 1, the intercept reflects the log odds ratio of the average probability to display emotional behavior for nondepressed participants, and the slope reflects the average autocorrelation (inertia) for nondepressed participants. At Level 3, the intercept reflects the deviation from these average intercept and slope values for depressed participants.

discussions) or challenge (reminiscence discussions), as opposed to pleasurable tasks (positive discussions), so it is plausible that differences in inertia may be particularly salient in the former tasks. We therefore examined whether the difference between depressed and nondepressed participants in emotional inertia was larger in the conflict and reminiscence discussions than in the positive discussions. We estimated multilevel models in which emotional behavior at time *t* was predicted by emotional behavior at time *t* – 5 s at Level 1; at Level 2 of the model, the intercept and slope values of this prediction were modeled separately as a function of interaction task (either positive, conflict, or reminiscence),[1] which were then predicted by depression at Level 3. For parsimony, we limit ourselves here to reporting the results relevant to differences in inertia between depressed and nondepressed participants as a function of interaction type.

Regarding happy behavior, the findings showed that depressed adolescents evidenced significantly higher autocorrelations in both the conflict task ($b = 0.40$, $SE = 0.12$, $p = .002$) and the reminiscence task ($b = 0.33$, $SE = 0.11$, $p = .005$), but not in the positive task ($b = –0.03$, $SE = 0.08$, $p = .745$). The results were similar for dysphoric behavior: Depressed participants displayed higher autocorrelations in both the conflict task ($b = 0.26$, $SE = 0.13$, $p = .048$) and the reminiscence task ($b = 0.30$, $SE = 0.12$, $p = .014$), but not in the positive task ($b = 0.16$, $SE = 0.14$ $p = .256$). Although the results trended in the same direction for angry behavior, the differences were not significant (conflict: $b = 0.28$, $SE = 0.17$, $p = .111$; reminiscence: $b = 0.27$, $SE = 0.16$, $p = .085$; positive: $b = 0.13$, $SE = 0.17$ $p = .438$). Taken together, these results suggest that depressed participants displayed increased emotional inertia specifically during tasks that were more conflictual or challenging.

Study 2 differed in several notable respects from Study 1. First, in Study 1 we examined self-esteem, whereas in Study 2 we focused on major depression as an indicator of psychological maladjustment. Second, we examined self-reported emotions throughout daily life in Study 1, and we directly observed emotional behavior in Study 2. Finally, Study 1 allowed us to examine emotional inertia over the course of hours, whereas Study 2 enabled us to examine it across seconds. Despite these differences, both studies supported the conclusion that individuals evidencing poorer psychological adjustment manifest markedly higher levels of inertia in both positive and negative emotions. Moreover, Study 2 provided additional evidence that this is particularly the case in contexts that are stressful or involve negative interactions with significant others.

Discussion

In these studies, we explored emotional inertia as a potentially fundamental feature of the emotion dynamics associated with psychological maladjustment. We hypothesized that the emotional fluctuations of individuals experiencing more psychological maladjustment would show a greater resistance to change and thus display higher inertia than the emotional fluctuations of individuals who were less maladjusted. Findings from these two studies supported this hypothesis by showing that the emotions experienced by individuals with low self-esteem display higher autocorrelations throughout daily life compared with the emotions of individuals with high self-esteem (Study 1) and that the emotional behavior of depressed adolescents displays higher autocorrelations during emotionally evocative interactions with their parents relative to the emotional behavior of nondepressed adolescents (Study 2). The higher levels of inertia we observed may therefore reveal a fundamental feature of the emotion dynamics characteristic of low self-esteem and depression, as indicators of psychological maladjustment: Changes are less sudden, states are more pervasive, and responsiveness is diminished or slowed. In other words, emotional inertia "flattens the emotional landscape" (Rottenberg, 2005, p. 169).

Of note is the finding from Study 2 indicating that differences in emotional inertia were particularly evident during emotionally taxing circumstances. This finding suggests that emotional inertia may not be a persistent traitlike disposition, but instead might be especially prominent in particular circumstances. An important direction for future research is to study the nature of situations in which emotional inertia is displayed, as well as the impact of emotional inertia on individuals' ability to successfully navigate those situations.

A striking finding in these two studies was that low self-esteem and depression were associated with higher inertia for both positive and negative emotions. Whereas it is intuitively understandable that psychological maladjustment is characterized by lowered positive reactivity, it seems less straightforward that it is also associated with persistence of positive emotions and mood. Yet our findings suggest that the resistance to change applies to both positive and negative emotions. To be sure, individuals characterized by low psychological adjustment experience lower levels of positive emotions than individuals characterized by normal psychological adjustment do. Yet once they experience positive emotions, these states may be slow to change. Emotional inertia therefore seems to have a profound impact on the dynamics of emotions, affecting emotions irrespective of their hedonic value.

Our study does not speak to the mechanisms that underlie emotional inertia. We offer the hypothesis that emotional inertia results from reductions in responsiveness to internal and external stimuli, as well as from failures of emotion-regulation processes aimed at altering emotional states. Emotions are thought to be adaptive largely because of their ability to prepare and motivate an organism to respond to personally relevant threats and challenges. Emotion regulation, in turn, alters the experience or expression of these emotions as a function of the constraints placed by the individual or society on hedonistic or instrumental motives (Tamir, 2009). Increased emotional inertia may reflect what happens when the adaptive processes of emotion responding and control are dampened. In addition, it is likely that inertia is affected by interpersonal processes that may arise from maladaptive ways of eliciting social

information from, and reciprocating it with, other people. Moreover, the fact that emotional inertia was observed across different time scales does not necessarily imply that similar mechanisms are at work in emotional inertia observed across seconds, minutes, and hours. Clarifying the meaning of different inertia time scales and the underlying intrapsychic and interpersonal processes will be an important task for future research.

In conclusion, emotional inertia appears to be a useful, but understudied, unifying concept that captures a fundamental feature of how emotions unfold over time and that is characteristic of the emotion dynamics that are tied to psychological maladjustment. Further research is needed, however, to pinpoint the underlying processes and determinants of emotional inertia, to examine its occurrence in other manifestations of psychological maladjustment (e.g., it may feature in the emotional numbing that is characteristic of post traumatic stress disorder symptoms), and to determine its impact on subsequent functioning and social interactions.

Acknowledgments

The first author is a Postdoctoral Research Fellow with the Fund for Scientific Research-Flanders. We gratefully acknowledge Stephen Loughnan and Zita Oravecz for providing comments on an earlier version of this article.

Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

Funding

This research was supported by KULeuven Research Council Grant GOA/05/04 and National Institute of Mental Health Grant R01 MH65340 (Lisa Sheeber, principal investigator). Nicholas Allen is supported by a grant from the Colonial Foundation.

Note

1. To this end, dummy variables indicating the three types of interaction tasks were added at Level 2 of the models, and the intercept term was omitted at this level.

References

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Bolger, N., Davis, A., & Rafaeli, E. (2003). Diary methods: Capturing life as it is lived. *Annual Review of Psychology*, *54*, 579–616.

Box, G.E.P., & Jenkins, G.M. (1970). *Time series analysis, forecasting and control*. San Francisco: Holden-Day.

Bryk, A.S., & Raudenbush, S.W. (1992). *Hierarchical linear models for social and behavioural research: Applications and data analysis methods*. Newbury Park, CA: Sage.

Bylsma, L.M., Morris, B.H., & Rottenberg, J. (2008). A meta-analysis of emotional reactivity in major depressive disorder. *Clinical Psychology Review*, *28*, 676–691.

Csikszentmihalyi, M., & Larsen, R. (1987). Validity and reliability of the experience sampling method. *Journal of Nervous and Mental Disease*, *175*, 526–536.

Diener, E., & Diener, M. (1995). Cross-cultural correlates of life satisfaction and self-esteem. *Journal of Personality and Social Psychology*, *68*, 653–663.

Eid, M., & Diener, E. (1999). Intraindividual variability in affect: Reliability, validity, and personality characteristics. *Journal of Personality and Social Psychology*, *76*, 662–676.

Frijda, N.H. (2007). *The laws of emotion*. Mahwah, NJ: Erlbaum.

Gross, J.J. (Ed.). (2007). *Handbook of emotion regulation*. New York: Guilford Press.

Gross, J.J., & Muñoz, R.F. (1995). Emotion regulation and mental health. *Clinical Psychology: Science and Practice*, *2*, 151–164.

Heimpel, S.A., Wood, J.V., Marschall, M.A., & Brown, J.D. (2002). Do people with low self-esteem really want to feel better? Self-esteem differences in motivation to repair negative moods. *Journal of Personality and Social Psychology*, *82*, 128–147.

Hemenover, S.H. (2003). Individual differences in rate of affect change: Studies in affective chronometry. *Journal of Personality and Social Psychology*, *85*, 121–131.

Hops, H., Biglan, A., Tolman, A., Arthur, J., & Longoria, N. (1995). *Living in Family Environments (LIFE) coding system: Manual for coders (revised)*. Eugene: Oregon Research Institute.

Izard, C.E. (2009). Emotion theory and research: Highlights, unanswered questions, and emerging issues. *Annual Review of Psychology*, *60*, 1–25.

Jahng, S., Wood, P.K., & Trull, T.J. (2008). Analysis of affective instability in EMA: Indices using successive difference and group comparison via multilevel modeling. *Psychological Methods*, *13*, 345–375.

Kahneman, D., Krueger, A.B., Schkade, D.A., Schwarz, N., & Stone, A.A. (2004). A survey method for characterizing daily life experience: The day reconstruction method. *Science*, *306*, 1776–1780.

Katz, L.F., & Hunter, E.C. (2007). Maternal meta-emotion philosophy and adolescent depressive symptomatology. *Social Development*, *16*, 343–360.

Kernis, M.H. (2006). *Self-esteem issues and answers: A sourcebook of current perspectives*. New York: Psychology Press.

Kessler, R.C. (2002). Epidemiology of depression. In I.H. Gotlib & C.L. Hammen (Eds.), *Handbook of depression* (pp. 23–42). New York: Guilford Press.

Koole, S.L. (2009). The psychology of emotion regulation: An integrative review. *Cognition & Emotion*, *23*, 4–41.

Kuppens, P., Van Mechelen, I., Nezlek, J.B., Dossche, D., & Timmermans, T. (2007). Individual differences in core affect variability and their relationship to personality and adjustment. *Emotion*, *7*, 262–274.

Larsen, R.J., Augustine, A.A., & Prizmic, Z. (2009). A process approach to emotion and personality: Using time as a facet of data. *Cognition & Emotion*, *23*, 1407–1426.

Larsen, R.J., & Diener, E. (1987). Affect intensity as an individual difference characteristic: A review. *Journal of Research in Personality*, *21*, 1–39.

Neiss, M.B., Stevenson, J., Legrand, L.N., Iacono, W.G., & Sedikides, C. (2009). Self-esteem, negative emotionality, and depression as a common temperamental core: A study of mid-adolescent twin girls. *Journal of Personality*, *77*, 327–346.

Orvaschel, H., & Puig-Antich, J. (1994). *Schedule for Affective Disorders and Schizophrenia for School-Age Children-Epidemiologic Version-5 (K-SADS-E-5)*. Fort Lauderdale, FL: Nova Southeastern University.

Peeters, F., Nicolson, N.A., Berkhof, J., Delespaul, P., & deVries, M. (2003). Effects of daily events on mood states in major depressive disorder. *Journal of Abnormal Psychology*, *112*, 203–211.

Radloff, L.S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, *1*, 385–401.

Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.

Rottenberg, J. (2005). Mood and emotion in major depression. *Current Directions in Psychological Science*, *14*, 167–170.

Rozin, P. (2009). What kind of empirical research should we publish, fund, and reward? A different perspective. *Perspectives on Psychological Science*, *4*, 435–439.

Russell, J.A. (2003). Core affect and the psychological construction of emotion. *Psychological Review*, *110*, 145–172.

Sheeber, L.B., Allen, N., Davis, B., & Sorensen, E.D. (2000). Regulation of negative affect during mother-child problem-solving interactions: Adolescent depressive status and family processes. *Journal of Abnormal Child Psychology*, *28*, 467–479.

Sheeber, L.B., Davis, B., Leve, C., Hops, H., & Tildesley, E. (2007). Adolescents' relationships with their mothers and fathers: Associations with depressive disorder and subdiagnostic symptomatology. *Journal of Abnormal Psychology*, *116*, 144–154.

Sheeber, L.B., Hops, H., & Davis, B. (2001). Family processes in adolescent depression. *Clinical Child and Family Psychology Review*, *4*, 19–35.

Silk, J.S., Steinberg, L., & Morris, A.S. (2003). Adolescents' emotion regulation in daily life: Links to depressive symptoms and problem behavior. *Child Development*, *74*, 1869–1880.

Suls, J., Green, P., & Hillis, S. (1998). Emotional reactivity to everyday problems, affective inertia, and neuroticism. *Personality and Social Psychology Bulletin*, *24*, 127–136.

Tamir, M. (2009). What do people want to feel and why? *Current Directions in Psychological Science*, *18*, 101–105.

Watkins, E.R. (2008). Constructive and unconstructive repetitive thought. *Psychological Bulletin*, *134*, 163–206.

Zelenski, J.M., & Larsen, R.J. (2000). The distribution of emotions in everyday life: A state and trait perspective from experience sampling data. *Journal of Research in Personality*, *34*, 178–197.