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Seeking Pleasure and Seeking Pain:

Differences in Pro- and Contra-Hedonic Motivation from Adolescence to Old Age

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Abstract

Using a mobile-phone based experience-sampling technology in 378 individuals ranging from 14 to 86 years of age, we investigated age differences in how people want to influence their feelings in their daily lives. Contra-hedonic motivations of wanting to maintain or enhance negative affect, or to dampen positive affect were most prevalent in adolescence, whereas pro-hedonic motivations of wanting to maintain, but not enhance, positive affect, and to dampen negative affect were most prevalent in old age. This pattern was mirrored by an age-related increase in day-to-day emotional well-being. Analyses of the emotional experiences going along with pro- and contra-hedonic motivations are consistent with the notions that contra-hedonic motivations are more likely to serve utilitarian rather than hedonic functions, and that people are more likely motivated to maintain negative affect when it is accompanied by positive affect. Implications for understanding affective development are discussed.

Seeking Pleasure and Seeking Pain: Differences in Pro- and Contra-Hedonic Motivation from Adolescence to Old Age

There are many occasions where we wish to, or should, control our feelings. Such affective self-regulation often aims at the enhancement of positive and the dampening of negative affect, such as the elevating of one's happiness or the calming of one's anger. There may, however, also be situations where people seek the contrary. Our aim in this research was to investigate age-related differences in the prevalence of such pro- and contra-hedonic motivations. We propose that we can better understand why individuals of different ages feel differently in their day-to-day lives if we are aware of differences in how they *want* to feel. To investigate this, we used mobile phones to assess affective experiences and affect-regulation motivations as they occurred in the everyday lives of individuals ranging in age from adolescence to late adulthood.

Affective experiences are not just irresistible and overwhelming forces, they can be regulated to some extent. Research on the proactive aspect of affective experience has primarily focused on the strategies people use to influence their feelings, and on how effective and cognitively demanding these strategies are (Koole, 2009). Little attention has been paid to the fact that such regulatory behaviors are preceded, and fundamentally shaped, by motivational processes. This is presumably so because most investigators have assumed that affect-regulation motivation is always directed at maximizing the individual's well-being (e.g., Larsen, 2000). Only few researchers have acknowledged that there can be situations where people want to maintain or enhance negative, or dampen positive affect. Attempts to explain why such contra-hedonic motivation may occur typically converge on one of two overarching themes. One explanatory theme is the idea that, occasionally, negative affect may be beneficial, or positive affect, detrimental, for attaining one's goals or for maintaining consistent views of oneself. Contra-hedonic motivation may hence serve utilitarian purposes

(e.g., Parrott, 1993; Tamir, Chiu, & Gross, 2007; Tamir, Mitchell, & Gross, 2008; Wood, Heimpel, Manwell, & Whittington, 2009). For instance, negative affect may be socially appropriate or instrumental in other ways, such as when anger helps standing one's ground in an interpersonal confrontation. Positive affect, conversely, can be socially inappropriate or otherwise obstructive, for example, when joy distracts one's concentration. The second explanatory theme is the idea that people may sometimes seek apparently negative affective experiences because, for them, these experiences entail positive facets as well, either concomitantly or in the aftermath. Andrade and Cohen (2007), for instance, demonstrated that students who liked to expose themselves to horror movies were inclined to experience both fear and happiness while watching, whereas those who avoided horror movies only experienced fear.

A small number of investigations have shown that contra-hedonic motivation can indeed be induced in young adults in experimentally controlled (and thereby more or less artificial) situations (Erber, Wegner, & Therriault, 1996; Tamir et al., 2007, 2008). To the best of our knowledge, there is currently no information available on potential *age-related differences* in pro- and contra-hedonic motivations as they *naturally* occur in people's everyday life contexts. There is, however, accumulating evidence on differences in day-to-day emotional experiences between individuals of different ages. Adolescence, for example, is characterized by emotional turmoil and a relatively high prevalence of negative emotionality (e.g., Larson, Moneta, Richards, & Wilson, 2002). Within adulthood, there are also typical patterns of age-related differences. When repeatedly asked to report their momentary feelings, older adults report higher emotional well-being in their daily lives than younger adult age groups (e.g., Carstensen, Pasupathi, Mayr, & Nesselroade, 2000), and this difference cannot be explained by age-related differences in time use (Riediger & Freund, 2008).

The psychological mechanisms underlying these age-related differences in daily-life affective experiences are not yet well understood. We propose that consideration of the proactive aspects of affective experience can provide new insights in this respect. That is, we assume that parts of the age-related differences in everyday emotional well-being are brought about by differences in how individuals wish to influence their feelings. Hence, we expected to find that age-related differences in everyday emotional well-being in an age-heterogeneous sample ranging from adolescence to old age are mirrored by age differences in affect-regulation motivation. Specifically, we expected *contra-hedonic* motivation—that is, the wish to maintain or enhance negative affect, or to dampen positive affect—to be most prevalent among adolescents. This hypothesis is based on the idea that exploring negative and nonconforming emotional experiences is one way by which adolescents repudiate conventions in order to seek emotional autonomy of parents and other adults and to test their identities (Azmitia, Syed, & Radmacher, 2008; Thorne, 2004; see also Erikson, 1968). We also predicted *pro-hedonic* motivations—that is, the wish to maintain or enhance positive affect, or to dampen negative affect—to be most prevalent among older adults. This prediction is in line with the claim that the shrinking horizon of time-to-live is shifting older people's motivations towards wanting to maximize their emotional well-being in the here and now (Carstensen, Fung, & Charles, 2003).

Furthermore, we expected *contra-hedonic* motivations to be less strongly related to the individual's current affect than *pro-hedonic* motivations. This prediction builds on the theme that *contra-hedonic* motivations are more likely to serve utilitarian rather than hedonic functions (e.g., Tamir et al., 2007, 2008). Regarding the relation between mixed emotional experiences and *contra-hedonic* motivations (e.g., Andrade & Cohen, 2007), we hypothesized that people are more likely motivated to maintain negative affect when they simultaneously experience intense positive and negative affect. We reasoned that in such situations, people

may be more likely to consider negative affect as worthwhile maintaining because of its accompaniment by positive affect.

Method

Participants

A fieldwork agency recruited 378 participants ranging in age from 14 to 86 years ($M = 42$, $SD = 19$) from three sites in Germany. The sample was stratified by age and gender (total sample: 50.3% men). Twenty-four percent of the participants held a college or university degree.

Procedure

Participants were provided with Nokia E50 mobile phones. A program controlled the participants' assessment schedule, presented items, and uploaded responses to a central server. Participants navigated and responded to the questionnaire using the phone's joystick and keypad. Participants carried the phone with them during three experience-sampling periods of at least three consecutive days, which covered six weekdays (Monday through Friday) and three weekend days (Saturday or Sunday) altogether and were separated by intervals of six days. On each experience-sampling day, six assessments were distributed throughout a time window of 12 hours, the beginning of which was chosen by the participants. Experience-sampling periods were extended if participants completed less than five of the six daily measurements. On average, participants completed 54.9 measurement occasions ($SD = 4.1$). They were reimbursed with 100 EUR (approximately \$140). The ethics committee of the Max Planck Institute for Human Development approved of the study.

Experience-Sampling Measures

At each measurement occasion, participants first indicated how much they were currently experiencing each of six emotions using a scale ranging from 0 "not at all" to 6 "very much". Averaging the responses for *joyful*, *content*, and *interested* yielded an indicator

of positive affect (average within-person $M = 3.06$, $SD = .82$), and averaging responses for *angry*, *nervous*, and *downhearted*, an indicator of negative affect (average within-person $M = 0.73$, $SD = 0.53$). The difference between positive and negative affect served as an indicator of emotional well-being ($M = 2.32$, $SD = 1.94$). The items were selected because they represent prototypical pleasant and unpleasant affective experiences that are relevant for, and evince sufficient intra-individual variation in, the daily lives of individuals from different age groups.

Participants also reported their current activity by checking the appropriate response option(s) among (a) *work/school/study*, (b) *chores/errands*, (c) *leisure activity*, (d) *doing nothing/sleeping/watching TV*, (e) *doctor visit/office run*, (f) *conversation/visit*, and (g) *other*.

They further indicated which other persons were present at that time by choosing a response (or several) from (a) *nobody*, (b) *partner*, (c) *family*, (d) *friends*, (e) *colleagues/fellow pupils or students*, (f) *strangers*, and (g) *other*.

At the end of the experience-sampling protocol, participants indicated for each of the six affect facets under study whether they currently wanted to (a) *dampen*, (b) *maintain*, (c) *enhance*, or (d) *not influence at all* the respective feeling. A count variable representing the number of responses indicating the wish to maintain or enhance positive affect (i.e., joy, interest, contentment) or to dampen negative affect (i.e., anger, nervousness, downheartedness) was used as an indicator of pro-hedonic motivation. Similarly, a count variable of the number of responses indicating the wish to maintain or enhance negative affect or to dampen positive affect served as an indicator of contra-hedonic motivation.

Results

Multilevel regression analysis performed with SAS PROC MIXED confirmed the expected age-related increase in daily-life emotional well-being (see Figure 1, and left column in Table 1), which remained robust ($p < .001$) after controlling for participants'

activities and social partners. This effect was driven more by the age-related increase in positive than by the decrease in negative affect (estimated increase of 0.01 in average positive affect per year of age, $p = 0.001$; estimated decrease of -0.003 in average negative affect per year of age, $p = 0.058$).

We predicted that the age differences in affective experiences would be mirrored by differences in affect-regulation motivations. On average, participants reported that they wanted to regulate their feelings in 84.0% of the assessments for positive, and in 48.9% of the assessments for negative affect facets. As expected, the vast majority of the reported affect-regulation motivations were pro-hedonic. Contra-hedonic motivation was reported, on average, in 15.0% of the measurements ($SD = 19.3$). There were significant age differences in the prevalence of pro- and contra-hedonic motivations. Contra-hedonic motivations were most prevalent in adolescence, and pro-hedonic motivations, in old age (see Figure 1 and two righthand columns in Table 1). These age effects remained significant after controlling for participants' momentary affect, as well as for their activities and social partners ($ps \leq .01$).

Parameter estimates of multilevel models predicting *pro-hedonic* motivations (three lefthand columns in Table 2) show that individuals wanted to enhance their positive affect when it was low, maintain their positive affect when it was high, and dampen their negative affect when it was high. Of interest are interactions with age for two of these effects, which indicate that, in situations with high positive affect, the older participants were, the more they were motivated to maintain, and the less they were motivated to further enhance their positive affect (see Figures 2 and 3).

Parameter estimates in the models predicting *contra-hedonic* motivations (three righthand columns in Table 2) showed significant associations with participants' current affect in two of the three models, indicating that contra-hedonic motivation tended to be more likely when affective well-being was relatively low. People were more likely to report the

motivation to dampen positive affect when their current positive affect was comparatively low, and they were more likely to report the motivation to enhance their current negative affect when it was comparatively high. The latter effect was attenuated the older participants were. Region of significance analyses (Bauer & Curran, 2005; Preacher, Curran, & Bauer, 2006) showed that this association was no longer significant for participants older than 52.9 years. Furthermore, and in accordance with our prediction, current affect accounted for considerably smaller proportions of within-person variance for contra-hedonic (2.2 – 12.6%) than for pro-hedonic motivations (17.0 – 24.7%).

Our final prediction was based on the idea that people may be more likely motivated to maintain negative affect when it is accompanied by positive affect. To investigate this, we identified episodes in which both positive and negative affect were at or above the individual's respective mean. On average, such episodes of mixed affect occurred in 11.0% of the measurements obtained per participant ($SD = 8.9$). Irrespective of the participants' age, episodes of mixed affect were associated with an increased prevalence of the motivation to maintain negative affect, $F[1,342] = 97.6, p = .002$, partial $\eta^2 = .03$. On average, participants reported being motivated to maintain negative affect in 7.0% ($SD = 14.7$) of their assessment occasions without, but in 10.4% ($SD = 21.6$) of those with mixed affect.

Adolescents showed the highest, and older adults the lowest prevalence of mixed affect, $F[6,371] = 4.4, p = .000$, partial $\eta^2 = .07$, which mirrors the age differences in the motivation to maintain negative affect (see Figure 4). However, the age effect in the motivation to maintain negative affect remained significant after controlling for the prevalence of mixed affect ($p < .05$), indicating that the two effects are empirically distinguishable.

Discussion

This research was guided by an interest in how people want to influence their emotional experiences. This interest arose from the idea that we can better understand why it is that individuals of different ages *do* feel differently in their everyday lives if we know whether they differ in how they *want to* feel.

Consistent with evidence from other studies (e.g., Carstensen et al., 2000; Riediger & Freund, 2008), we found an age-related increase in day-to-day emotional well-being. Interestingly, these age differences largely corresponded to differences in how people wanted to influence their feelings. Specifically, contra-hedonic motivations to enhance or maintain negative affect, or to dampen positive affect, were most prevalent among adolescents, and decreased thereafter. Pro-hedonic motivation, in contrast, was most prevalent in later adulthood (i.e., 60+ years), and this effect was driven by the motivations to maintain (but not to enhance) positive, and to dampen negative affect. This latter finding is in line with a central prediction of Socioemotional Selectivity Theory, according to which awareness of the finitude of remaining lifetime shifts individuals' motivation towards wanting to maximize their emotional well-being (Carstensen et al., 2003). Importantly, the age differences in pro- and contra-hedonic motivation could not be attributed to age-related differences in daily-life emotional experiences, activities, or social partners. Instead, we propose that part of the negative emotionality that is characteristic for adolescence, and part of the positive emotionality that is characteristic for older adulthood, is intentionally sought and maintained by the individual.

Pro-hedonic motivations corresponded with the individuals' current affect, that is, people wanted to enhance positive affect when it was low, maintain positive affect when it was high, and dampen negative affect when it was high. Interestingly, the older individuals were, the less motivated they were to further enhance, but the more motivated they were to

maintain, high positive affect. Assuming that it is more resource-intensive to enhance than to maintain positive affect, this suggests that people adapt their affect-regulation motivations to age-related declines in available resources (Riediger, Li, & Lindenberger, 2006).

Contra-hedonic motivations were less strongly related to current affect than pro-hedonic motivations. This is consistent with the idea that contra-hedonic motivations are likely to serve functions that are not necessarily strongly related to the individual's current affective state (e.g., Parrott, 1993; Tamir et al., 2007, 2008). What these functions are in people's natural life contexts, and whether there are age-related differences, are open questions for future research. The relatively high prevalence of contra-hedonic motivations in adolescents nurtures the speculation that contra-hedonic motivations play an important role in adolescents' socio-emotional development. Repudiating prevailing hedonic conventions may help adolescents to tackle developmental tasks they face, for example, to establish emotional autonomy from their parents, affirm a sense of maturity, and develop their personal and social identity (e.g., Azmitia et al., 2008; Thorne, 2004). This interpretation is in line with research proposing that a temporary increase in so-called risky behaviors during adolescence—that is, in behaviors that depart from familial or social standards and that pose some risks to the well-being of the individual or others—is normative and adaptive (e.g., Maggs, Almeida, & Galambos, 1995; Michaud, 2006; Moffitt, 1993). Contra-hedonic motivation may also help adolescents in the refinement of self-regulation competencies. This interpretation also builds on recent evidence by Wrosch and Miller (in press) who found that dysphoric mood in adolescents facilitated the development of goal-disengagement capacities over the course of 1.5 years, which in turn contributed to a long-term reduction in subsequent depressive symptoms.

Our findings further demonstrate that adolescents were more likely than individuals of older age groups to experience episodes of mixed affect, that is, to simultaneously experience

positive and negative affect of high intensity. This raises the question whether adolescents are, in part, more motivated to maintain negative affect because they are more likely to experience it as worthwhile maintaining due to its accompaniment by positive affect. In fact, this study shows that people were more likely motivated to maintain negative affect during episodes of mixed affect. However, the adolescents' higher motivation to maintain negative affect could not be statistically accounted for by the higher prevalence of mixed affect in that age group. The mechanisms driving the higher prevalence of contra-hedonic motivations in adolescence as well as potential linkages to biological changes in puberty thus remain to be explored.

Overall, this study demonstrates that taking into account motivational aspects of how people want to influence their feelings contributes to our understanding of affective development above and beyond what can be deduced by observing age-related differences in actual affective experience. Our study focused on the age range from adolescence to old age and on consciously accessible aspects of affect-regulation motivations. Intriguing quests for future research will be the inclusion of other age groups and the implementation of assessment methods that allow measuring affect-regulation motivations operating beyond conscious awareness in everyday life. Furthermore, longitudinal investigations are necessary to determine whether the age-related differences observed in this study correspond to intra-individual changes as people grow older, and to explore the antecedents, correlates, and consequences of interindividual differences in these changes (cf. Baltes, Nesselroade, & Cornelius, 1978).

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Footnotes

¹ Full model tested: Level 1 (experience samples): $DV = \beta_{0j} + r_{ij}$ (where DV = dependent variable, β_{0j} = random intercept, and r_{ij} = random residual associated with i^{th} assessment in j^{th} individual); Level 2 (persons): $\beta_{0j} = \gamma_{00} + \gamma_{01} \text{Age} + \gamma_{02} \text{Age} \times \text{Age} + u_{0j}$ (where γ_{00} = fixed intercept, γ_{0k} = fixed slope for k^{th} predictor, and u_{0j} = random residual for j^{th} person). Table 1 reports fixed intercept and slopes only.

² Full model tested: Level 1 (experience samples): $DV = \beta_{0j} + \beta_{1j} \text{PA} + \beta_{2j} \text{NA} + r_{ij}$ (where DV = dependent variable, PA = positive affect, NA = negative affect, β_{0j} = random intercept, β_{kj} = random slope for k^{th} predictor in j^{th} individual, and r_{ij} = random residual associated with i^{th} assessment in j^{th} individual); Level 2 (persons): $\beta_{mj} = \gamma_{m0} + \gamma_{m1} \text{Age} + u_{mj}$ (where γ_{m0} = fixed intercept for m^{th} random coefficient, γ_{m1} = fixed slope for age as predictor of m^{th} random coefficient, and u_{mj} = random residual associated with m^{th} random coefficient for j^{th} person). Table 2 reports fixed intercept and slopes only.

Table 1

Age Effects in Emotional Well-Being and in Pro- and Contra-Hedonic Motivations in Day-to-Day Life: Selected Results from Multilevel Regression Models

Model parameters	Prediction of		
	Emotional well-being	Pro-hedonic motivation	Contra-hedonic motivation
	Estimate	Estimate	Estimate
Fixed effects			
Intercept	2.31**	3.54**	0.14**
Age	0.01**	0.01*	-0.01**
Age x Age	< 0.0001ns	0.0006**	.0002**
Modeled between-person variance ^a			
Pseudo R ² _{Intercept}	2.46%	3.65%	10.65%

Notes. Restricted maximum likelihood parameter estimates after fitting multilevel regression models with spatial power residual covariance structures (Littell, Milliken, Stroup, Wolfinger, & Schabenberger, 2007). Age is grand-mean centered. Interpretation of the fixed effects shown in the table is equivalent to standard regression analyses. The models also included random effects for the intercept and residual.¹

^a Proportional reductions in variance component intercept in comparison to models without explanatory variables (Singer & Willet, 2003).

ns $p > .05$. * $p < .05$. ** $p < .01$.

Table 2

Associations Between Momentary Affect and Pro- and Contra-Hedonic Motivations: Selected Results from Multilevel Regressions

Model parameters	Prediction of					
	Pro-hedonic motivations			Contra-hedonic motivations		
	Enhance	Maintain	Dampen	Enhance	Maintain	Dampen
	positive affect	positive affect	negative affect	negative affect	negative affect	positive affect
	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate
Fixed effects						
Intercept	1.17**	1.27**	1.38**	.019**	.11**	.08**
Momentary positive affect	-.20**	.27**	–	–	–	-.04**
Momentary negative affect	–	–	.39**	.01**	.002 ns	–
Age	-.005**	.010**	.007**	-.001**	-.004**	-.002**
Age × Momentary positive affect	-.002*	.002*	–	–	–	< .001 ns
Age × Momentary negative affect	–	–	.002ns	-.0004**	< -.001 ns	–
Explained within-person variance^a						
Pseudo R ² _{Residual}	16.98%	19.37%	24.71%	2.23%	4.05%	12.63%

Notes. Restricted maximum likelihood parameter estimates after fitting multilevel regression models with spatial power residual covariance structures (Littell et al., 2007). All predictors are grand-mean centered. Interpretation of the fixed effects shown in the table is equivalent to standard regression analyses. The models also included random effects for intercept, residual, and momentary affect.²

^a Proportional reductions in the variance component residual in comparison to models without explanatory variables (Singer & Willet, 2003).

ns $p > .05$. * $p < .05$. ** $p < .01$.

Figure Captions

Figure 1. Age-related differences in everyday emotional well-being and in everyday pro- and contra-hedonic motivation.

Notes. Scores are shown as standardized deviations from the grand mean. Error bars represent two standard errors of the respective age group mean.

Figure 2. Age-related differences in the association between momentary positive affect and the motivation to *maintain* positive affect.

Figure 3. Age-related differences in the association between momentary positive affect and the motivation to *enhance* positive affect.

Figure 4. Age-related differences in the motivation to maintain negative affect mirror age-related differences in the prevalence of mixed affect.

Notes. Mixed affect is operationalized as the simultaneous co-occurrence of both positive and negative affect at or above the individual's respective average. All scores are shown as standardized deviations from the grand mean. Error bars represent two standard errors of the respective age group mean.