Now You See It, Now You Don't: Solid and Subtle Differences Between Hedonic and Eudaimonic Wellbeing.

Kjærsti Thorsteinsen and Joar Vittersø

UiT The Arctic University of Norway

Word count: 7701

Author Note

Kjærsti Thorsteinsen, Department of Psychology, UiT The Arctic University of Norway; Joar Vittersø, Department of Psychology, UiT The Arctic University of Norway

Correspondence concerning this article should be addressed to Kjærsti Thorsteinsen, Department of Psychology, UiT The Arctic University of Norway, 9022 Tromsø. E-mail: kjarsti.thorsteinsen@uit.no

Abstract

Data from an intensive longitudinal goal intervention study in Norway ($N = 138$) were used to test the assumption that hedonic (HWB) and eudaimonic (EWB) wellbeing reflect two distinct dimensions of wellbeing. Based on multilevel factor analyses, a path model and hierarchical regression analyses the paper aimed to demonstrate that a basic duality between the two kinds of wellbeing exists. Compared with one-factor models, factor models that separated between HWB and EWB were better able to explain the correlation between the variables. The two factors correlated in the area of .50 to .70. A multitrait-multimethod test revealed acceptable convergent and discriminant validity for HWB and EWB. Furthermore, an experimental manipulation of a daily exercise partly supported discriminant validity. Aside from illuminating the debate with new data, the paper offers a new theoretical perspective. Yet, several essential issues remain to be settled in order to better understand the concept of wellbeing.

Keywords: subjective well-being, hedonic well-being, eudaimonic well-being, interventions, goal pursuit

Now You See It, Now You Don't: Solid and Subtle Differences Between Hedonic and Eudaimonic Wellbeing

Is there more than one kind of wellbeing? If so, what are they? Philosophers have discussed these questions for thousands of years without reaching common ground. Scientists have studied wellbeing systematically since the 1960s, and they also struggle to find a clear answer. A common framework for the debate is the dichotomy between hedonic wellbeing (HWB) and eudaimonic wellbeing (EWB; Biswas-Diener, Kashdan, & King, 2009; Ryan & Deci, 2001; Tov, 2018), and one line of argument is that whereas HWB is conceptually clear and empirically measurable, EWB is not well defined and lacks consistent measurement (Kashdan, Biswas-Diener, & King, 2008; Ward & King, 2016). The counterargument is that EWB has theoretical merit and is measurable as an independent concept (Huta & Waterman, 2014; Vittersø, 2016b; Waterman, 2008). The present paper contributes to the discussion with a theoretical perspective and empirical data. The purpose is to provide a conceptual rationale and empirical observations in favor of the idea that HWB and EWB are distinguishable dimensions of wellbeing. We consider the role of goals and goal pursuit as a key point in the debate and designed a longitudinal, goal-achievement intervention study to provide evidence. The study is grounded on the assumption that EWB is primarily associated with the pursuit of (challenging) goals, whereas HWB is primarily associated with the achievement of goals.

Goals

Goals are essential to human wellbeing. Indeed, several items in frequently used measures of wellbeing, like the Satisfaction with Life Scale (SWLS), specifically ask about goals and goal achievement (i.e., 'in most ways my life is close to my ideal' and 'so far I have gotten the important things I want in life'; Diener, Emmons, Larsen, & Griffin, 1985). Note

that these items do not mention the process of goal pursuit. Rather, they make the following statements: your life *is* (more or less) close to your ideal, and you *have* (more or less) gotten the important things in life. But a comprehensive psychology of goals cannot be limited to an investigation of end states; the plans, programs and executing behavior necessary to reach the goal must be addressed as well (e.g., Mayr, 2004). The process of moving toward a salient goal reflects a different functionality and phenomenology than goal achievement in itself (Hsee & Abelson, 1991; Klug & Maier, 2015; McGregor & Little, 1998; Vittersø, 2016a; Wiese & Freund, 2005). In analyzing the subjective meanings and experiences associated with goals, input, output and throughput must be included (Vittersø, 2018).

Dimensions of Wellbeing

Hedonic and eudaimonic wellbeing compete for hegemony in what might be referred to as the science of happiness. HWB is currently holding the upper hand, but EWB is growing in popularity (Sheldon, 2018; Tov, 2018). In this dual taxonomy, the term HWB has replaced the term subjective wellbeing; thus, HWB can, somewhat roughly, be conceptualized as the presence of pleasant affect, the absence of unpleasant affect and overall satisfaction with life (Diener, 2006; Tov & Lee, 2016). EWB, by contrast, holds that neither life satisfaction nor the preponderance of pleasant over unpleasant affect suffices as an explanation of a good life. Proponents of EWB hold that Aristotle's notion of a telos—the idea that a life is well lived to the extent that it develops toward some state of betterment—is an element so fundamental to human life that a conceptualization of wellbeing cannot do without it. Furthermore, an element of normativity, perhaps even ethics, is necessary to determine whether a particular developmental trajectory can be characterized as improvement or not. Such value-laden assumptions are also involved in studies of the HWB (e.g., Alexandrova, 2015; Kristjánsson, 2013), even if the normative part often is neglected in wellbeing research (e.g., Diener, 1984; Seligman, 2002). However, the idea of a value-free approach to wellbeing is grounded in a

misconceived perception of science as value-free (Douglas, 2009). Thus, the articulated normativity that is explicitly articulated in the concept of EWB is another reason why it remains an essential component of wellbeing.

The argument that HWB is unable to account for the improvement part of a good life is controversial. Fredrickson´s (2001) broaden-and-build theory claims for instance that pleasant feelings are exactly what people need in order to develop their potentials. Pleasure broadens up a person's thought-action repertoire, the theory claims, and this broadening fuel the kind of personal growth that are involved in eudaimonia. This line of thinking has, however, been criticized for not discriminating between different kinds of positive emotions. It has been known for some time that only emotions with moderate levels of arousal broaden awareness. High-arousal emotions narrow rather than open the bandwidth of attention. What is more, the positivity of the broaden-and-build theory is at least partly irrelevant, since emotions of moderate arousal broaden attention regardless of their valence: Both positive and negative emotions possess broadening capacities if the arousal level is moderate (Gable & Harmon-Jones, 2008; Harmon-Jones, Gable, & Price, 2013).

In contrast to the broaden-and-build theory, the functional wellbeing approach (FWA; Vittersø, 2013, 2016a, 2018), proposes that broadening and building are governed by different subsets of positive emotions. Pleasant-like emotions do broaden attention, but they do not build the kind of resources involved in EWB. High-arousal emotions like interest, engagement and immersion on the other hand, assist in building psychological resources, but do not broaden up the span of attention. Indeed, it is precisely because these emotions organize a narrow awareness that they prepare individuals for the concentrated focus that are involved when difficult tasks are to be solved. It is such a narrowed attention that enables the resource building involved in personal growth to unfold (e.g., Ericsson, Krampe, & Tesch-Römer, 1993).

Although the distinction made between different kinds of positive emotions is regularly made in the psychology of emotion (e.g., Tugade, Shiota, & Kirby, 2014), it is not common practice to do so in the wellbeing literature. Thus, the distinction made in the present paper between hedonic and eudaimonic feelings, contributes novelty to the field.

Goal Pursuit Feelings

All organisms face a delicate balance of being involved in low aroused versus high aroused activities, i.e., between saving and spending energy (e.g., Friston, 2009). Being passive saves energy but prevents the kind of learning and development that may follow from active, but energy-costly endeavors. Given this distinction, it is reasonable to assume that high aroused and low aroused modes of actions are governed by different motivational systems. For example, pleasure and satisfaction facilitate savoring—a rewarding and low aroused activity, whereas interest and engagement facilitate exploration—a rewarding and high aroused activity. The rewards associated with high aroused activity has been linked with the creation of lasting values. Over time, we tend to value things that require effort and are complex more highly than things that are easy and familiar (Kruger, Wirtz, Van Boven, & Altermatt, 2004; Labroo & Kim, 2009; Norton, Mochon, & Ariely, 2012). Hence, our most valuable personal goals often require extended effort, addressing novel and complex tasks, and persistence when facing obstacles and distractions (Duckworth, Peterson, Matthews, & Kelly, 2007).

According to the cybernetic control theory (Carver & Scheier, 2001) the perceived discrepancy between the current state and the ideal goal state determines the affective responses. No discrepancy or reducing the discrepancy at a higher rate than expected is experienced as pleasure and satisfaction (Hsee & Abelson, 1991). A large discrepancy is highly unpleasant and characterized by negative emotions; however, a fitting discrepancy

activates the appetitive system associated with eudaimonic feelings such as interest, engagement, and absorption. Moreover, the role played by interest and other high-arousal emotions as facilitators of persistence in pursuing a goal has been pointed out by Sansone and others (Sansone & Thoman, 2005), whereas the role played by pleasure and other moderate arousal emotions as facilitators of coasting and goal-changers has been highlighted by others (Dreisbach & Goschke, 2004; Witt Huberts, Evers, & De Ridder, 2012). Research on self-regulation techniques further supports that pleasure and positive thinking are not adaptive for successful goal pursuit (Oettingen, Mayer, & Portnow, 2016). Interventions that facilitate a fitting discrepancy between goal state and the current state have shown more conducive to goal attainment (see Oettingen, 2014 for a review). While common measures of HWB, such as SWLS, covers the positive end state of goal achievement, the outlined research in this paragraph suggests that EWB better captures the positive experience of moving towards a goal.

The Present Study

Drawing on previously unpublished daily diary data from a project on goal pursuit and wellbeing (Thorsteinsen & Vittersø, 2018), we explore the overall hypothesis that HWB and EWB are different dimensions of wellbeing and that both can be measured with dual clusters of indicators that represent distinct dimensions of wellbeing. Participants in this study performed three different exercises relevant to goal pursuit. These exercises consisted of different kinds of daydreaming related to self-regulation techniques thought to influence goal pursuit feelings. One group was instructed to only think about the positive outcome of goal achievement (positive fantasizing), a second group to only think about obstacles and the step by step process of working towards a goal (process simulation) and a third group to think first about the positive outcome and then the obstacles (mental contrasting) of goal achievement.

Method

Participants

A student sample, $n = 69$, and a sample from the general population, $n = 116$, was recruited through various forms of advertising (for further details, see Thorsteinsen & Vittersø, 2018). Of these, 155 provided daily diary data on emotional experience and the goal pursuit process in a study period of two weeks. Due to a technical error, 17 participants did not complete the intake survey (including measures of age, gender and the T1 wellbeing measures), leaving $n = 138$ (57 students and 81 from the general sample). In the final sample, more women than men participated (79 % women), and the average age was 34.46 years ($SD = 13.21$), ranging from 21 to 76 years (one person did not report age and gender). Those who dropped out, did not differ from those who were included in the analyses on any of the intake questionnaire variables. Participants were randomly assigned to receive one in three interventions; the mental contrasting (MC; $n = 38$) and the positive fantasizing (PF; $n = 52$) techniques adapted from Oettingen et al. (2001), and the process simulation (PS; $n = 48$) technique adapted from Pham and Taylor (1999; for more details about the interventions, see Thorsteinsen & Vittersø, 2018). The distribution of missing data was not equal across intervention groups, χ^2 (2, $N = 185$) = 6.10, $p = .047$; proportionally more participants dropped out of the MC-group.

Procedure

During a brief intake survey upon registration for the online study, participants completed a questionnaire with trait indicators of HWB and EWB and basic demographic information. Over the next week, each participant received a text message with a link to a daily questionnaire every night at 9 p.m. As part of this questionnaire, participants were given (and asked to follow) instructions for the daydreaming exercise. Next, they were encouraged

to complete a short questionnaire tapping state measures of emotions. Trait indicators of HWB and EWB were again measured at the end of the intervention week and one week after. Participants received 200 NOK for participation in the first week and an extra 100 NOK for filling out the follow-up questionnaire a week later. The study was approved by the Norwegian Centre for Research Data and disseminated online.

Measures

State emotions. The Basic Emotions State Test (BEST; Vittersø, Oelmann, & Wang, 2009), asks participants to rate the intensity with which they experience five basic emotions in a particular situation. The scale measures two positive emotions: pleasure and interest, and three negative emotions: anger, sadness and fear. Pleasure is measured with three items: pleasure, satisfaction and happiness. Interest is also measured with three items: interest, immersion, and engagement. The negative emotions are measured with one item each: anger, sadness and fear.

The items measuring event emotions were presented after the following introduction: 'When I was daydreaming, I felt …' Endpoint labeled response options were offered on a 5-point scale, with 1 = No, not at all, and 5 = Yes, absolutely. For the pleasure subscale, the average mean and standard deviation across the 7 events were $M = 3.47$ and $SD = 0.87$, whereas the average Cronbach's alpha was $\alpha = .90$. For the interest subscale, the average mean and standard deviation were $M = 3.12$ and $SD = 0.91$, and the average Cronbach's alpha was $\alpha = .88$. The negative emotions subscale had an average mean and standard deviation of $M = 1.51$ and a $SD = 0.73$, and the average Cronbach's alpha was $\alpha = .79$.

The items measuring daily emotions were presented after the following introduction: 'Finally, we would like to ask you some questions about how this day, and not just while you were working on the exercises, has been for you: During the entire day, I have been feeling …' The response options were identical to those used for the event measure. For the pleasure

subscale, the average means and standard deviations across the 7 days were $M = 3.52$, $SD = 0.92$, whereas the average Cronbach's alpha was $\alpha = .91$. For the interest subscale, the average mean and standard deviation were $M = 3.27$, $SD = 0.92$, and the average Cronbach's alpha was $\alpha = .87$. The negative subscale had an average mean and standard deviation of $M = 1.58$, and $SD = 0.70$, with an average Cronbach's alpha of $\alpha = .68$.

Trait emotions. At the dispositional level, emotions were measured with the Basic Emotions Trait Test (BETT; Vittersø et al., 2009). The BETT items are identical to the BEST items, but the introduction and the response options differ. For the BETT, participants are asked to report on overall frequency of the five basic emotions in their lives overall. The introduction reads: 'In general, how often do you feel …'. The response options run from 1 = Never to 7 = All the time. Means, standard deviation and Cronbach's alphas for the BETT are reported in Table 1.

Life satisfaction. Satisfaction with life was measured with the first three items of the SWLS (Diener et al., 1985)[1]. Participants were asked to evaluate to what extent the following items were true for them on a scale from 1 (Not true) to 7 (Completely true). The items

---

[1)] In the interest of saving time and space, the two last items of the SWLS are often skipped when the scale is used in survey research. According to Diener, a sumscore comprising the three fist items will do fine as an indicator of life satisfaction (Ed Diener, personal communication, November 18, 2013). A growing body of evidence has accumulated to testify Dieners's recommendation. For instance, in a cross-cultural study involving 42 countries, Vittersø, Røysamb and Diener (2002) found that the factor loading for the first 3 items were systematically higher than those for the last two. These results were replicated by Oishi (2006), using much larger samples from two countries (USA and China). Oishi extended his analysis to include an item response model, showing that items 4 and 5 of the SWLS had much larger differential item functionings (DIF) than the first three items. In terms of reliability, Lucas and Donnellan (2012) used data from four panel studies to show that single-item life satisfaction measures have acceptable reliability scores. Finally, Cheung and Lucas (2014) used four large samples to demonstrate acceptable validity for a single-item scale, as evaluated against theoretically relevant variables, such as demographics, subjective health, domain satisfaction, the SWLS and affect. Thus, it seems that a brief 3-item version of the SWLS is virtually as good as the five-item scale.

included were ‘In most ways my life is close to my ideal’, ‘The conditions of my life are excellent’ and ‘I am satisfied with my life’. Mean, standard deviation and Cronbach’s alpha for the SWLS are reported in Table 1.

Personal growth. We measured personal growth with the personal growth composite (PG; Straume & Vittersø, 2012; Vittersø & Søholt, 2011; Vittersø, Søholt, Hetland, Thoresen, & Røysamb, 2010). The scale comprises four subscales: curiosity (Amabile, Hill, Hennessey, & Tighe, 1994) with three items (α = .87); absorption (Kashdan, Rose, & Fincham, 2004) with three items (α = .74); complexity (from Cattell’s 16PF, see IPIP, 2002) with three items (α = .70); and competence (from Cloninger’s TCI, see IPIP, 2002) with three items (α = .69). The participants responded on a 5-point response format from 1 (Strongly disagree) to 5 (Strongly agree). Example items are: ‘I enjoy trying to solve complex problems’ (curiosity), ‘When I am participating in an activity, I tend to get so involved that I lose track of time’ (absorption), ‘I love to think up new ways of doing things’ (complexity), and ‘I can perform a wide variety of tasks’ (competence). The mean, standard deviation and Cronbach’s alpha for the entire PG scale are reported in Table 1.

Effort. The goal pursuit process was evaluated in terms of effort in the daily questionnaires. Participants were asked to indicate on a scale from 1 (Very little) to 5 (A lot) how much effort they had exerted in goal pursuit. The average mean and standard deviation over the seven measurement occasions for the effort variable were M = 2.68, SD = 1.26.

Analyses

The factor structure of the wellbeing variables was investigated by both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). For the EFA, maximum likelihood estimation and Promax rotation were applied as offered by SPSS. For the CFA, the full information maximum likelihood algorithm offered by Mplus version 8.0 (Muthén &

Muthén, 1998-2017) was used to fit both single-level and multilevel factor models to the data. We used the chi-square (χ^2), comparative fit index (CFI; > .96), root mean square of approximation (RMSEA; < .08) and standardized root mean square residual (SRMR; < .05) as indicators of model fit. The criteria we used to estimate model fit are presented in the parentheses associated with each indicator, following conventional criteria for evaluating goodness-of-fit (e.g., Hooper, Coughlan, & Mullen, 2008; Kenny, 2015; Kline, 2015).

A path model of the wellbeing variables was also estimated with Mplus. The purpose of this assessment was to investigate the convergent and discriminant validity of HWB and EWB, following the idea of a multitrait-multimethod test (MTMM). The MTMM (Campbell & Fiske, 1959) offers a scheme for analyzing construct validity by measuring multiple traits with multiple methods. The different traits in our study are HWB and EWB and the different methods are the multiple occasions on which we have measured wellbeing (see Marsh, Ellis, Parada, Richards, & Heubeck, 2005 for a review of rationale of using repeated measures as a proxy for multiple methods).

For the remaining analyses, multilevel modeling in the MIXED command in SPSS was utilized. In the latter analysis, we separated the within and between components of effort in accordance with Curran & Bauer (2011). Because we found evidence of growth in effort over the study period, we estimated case-based regressions of effort on grand-mean centered time and used the resulting residuals as the within-person component of effort and the individual intercepts as the between-person component of effort. Intervention groups were dummy coded and the PF-group was used as the reference category.

Results

Overall, our analysis data consisted of 822 daily diary entries from 138 participants. All episodic daydreaming emotions and daily emotions varied both within and between

participants; the ICCs were .55, .50 and .48 for the daydreaming pleasure, interest and negative emotions respectively. The ICCs were .42, .45, and .41 for daily pleasure, interest and negative emotions respectively. The inter-item correlations for the major study variables are presented in Table 1.

------Please insert Table 1 about here----------

The Exploratory Factor Models

Four EFAs with maximum likelihood extraction and Promax rotation were conducted and all showed KMO values above .70. For all the analyses, a parallel analysis method suggested a two-factor solution (see Fabrigar, Wegener, MacCallum, & Strahan, 1999)

Table 2 shows the results of the first three analyses, comprising the variables from the life overall, whole day and daydreaming emotions. A two-dimensional, simple-factor structure appears for all three ways of measuring emotion. The analyses suggest that the hedonic emotions load on a hedonic emotion factor and the eudaimonic variables load on a eudaimonic emotion factor. With two exceptions (i.e., sadness and fear for the trait emotions), all factor loadings are higher than .30 for the expected factors.

------Please insert Table 2 about here----------

Table 3 shows the results of the fourth EFA, comprising eight mean-score variables: for life satisfaction, for each of the four subscales of the personal growth composite, and for the overall emotions (i.e., the trait pleasure, trait interest and trait negative emotions mean-score variables). Because mean-score variables were used as input in the final factor analysis it conceptually represents a second-order factor model. Although a full second-order factor analysis might have replaced our last model, a recent critique argues against the use of full

second-order factor analyses, partly because the meanings of the higher-level factors are not clear (Eid & Koch, 2014).

------Please insert Table 3 about here----------

Together, these four factor analyses suggest that HWB and EWB comprises distinct dimensions, thus supporting our main hypothesis.

The Confirmatory Factor Models

The four EFA models presented above were next tested with a CFA approach. Table 4 shows the goodness-of-fit estimates for two-factor versions, three-factor versions and modified versions of these four models. Compared with the two-factor solution suggested by the EFAs, models that separated the hedonic factor into a positive emotion factor and a negative emotion factor while retaining the eudaimonia factor, were better able to account for the correlations among the wellbeing variables in our study. The state emotion data were particularly consistent with the three-factor model, as indicated by high CFIs (> .98), low RMSEAs (.03) and low SRMR (< .04 for the within-participants data and < .07 for the between-participants data). In the life overall emotions model, the changes needed to reach the fit criteria were empirically driven, as we followed the suggestion made by the modification index to allow the error terms for pleasure and happiness to correlate. In the overall wellbeing model, a theory-driven change, to allow the error terms among the four PG subscales to correlate, was not enough to meet the fit criteria. Hence, we also added a data-driven modification, by allowing the pleasure mean-score residual to correlate with the negative emotions mean-score residual.

In sum, the CFA also favored the hypothesis that HWB and EWB are distinct concepts. In accordance with a long-standing argument in the literature on subjective well-

being, the negative emotions seem to be best represented by a negatively correlated, but unique factor.

------Please insert Table 4 about here----------

The Path Model

The multilevel path model depicted in Figure 1 shows the MTMM approach used in the current study. The model shows acceptable goodness-of fit, $\chi^2(14, n = 1275_W, n = 184_B) = 58.9$, CFI = .96, RMSEA = .05, $SRMR_{Within} = .01$, $SRMR_{Between} = .11$. Figure 1 shows that the hedonic emotions have high temporal stabilities across occasions, and low crossover effects from the EWB emotions; it also shows that life satisfaction correlated highly with hedonic emotions and modestly with eudaimonic emotions. Although a positive and significant regression coefficient was observed from life satisfaction to eudaimonic trait emotions, $\beta = .28$, $p < .001$, the influence of life satisfaction on hedonic trait emotions, $\beta = .73$, $p < .001$, was significantly stronger, as shown by a Satorra-Bentler chi-square difference test for robust maximum likelihood estimation. The chi-square test showed a significant difference in goodness-of-fit between a model in which the two paths were free to vary and a nested model in which the two paths were constrained to be equal, $\Delta\chi^2(1) = 39.94$, $p < .001$. Worth noting is the correlation between life satisfaction and personal growth ($r = .27$, $p < .001$), which is substantially lower than comparable correlations between indicators of HWB and EWB reported elsewhere (e.g., Disabato, Goodman, Kashdan, Short, & Jarden, 2016).

The convergent validity (i.e., the similar-trait effects across the measurement occasions) is stronger at the between-participants level than at the within-participants level. For instance, whereas the between-participants path from daydreaming interest to whole day interest is $\beta = .82$, $p < .001$, the same path measured at the within-participants level is only $\beta = .21$, $p < .001$. A similar tendency is observed for similar-method measures. The correlations

between pleasure and interest for the whole day emotions are for example, $r = .71$, $p < .001$ between participants, and $r = .49$, $p < .001$ within participants.

We take the results of the path model as partly supporting convergent and discriminant validity for HWB and EWB, respectively. On the one hand, across methods, the similar-trait coefficients are much stronger than the different-trait coefficients, suggesting both convergent and discriminant validity. On the other hand, the similar-method coefficients were high between the two traits, approximately .70 between participants and about .50 within participants. Thus, as a second way of testing the discriminant validity of presumably distinct dimensions of wellbeing, the final set of analyses examines how HWB and EWB differ in their relationships with other concepts of theoretical relevance.

The Regression Models

Four hierarchical multilevel regression models were estimated to further investigate the issue of discriminant validity. The first analysis had daydreaming pleasure as the dependent variable, and the second had daydreaming interest as the dependent variable. The third model had whole day pleasure as the dependent variable and the last model had whole day interest as the dependent variable. All four models had time, age, gender and two dummy coded intervention group variables as independent variables at the first level and effort–both within and between participants–as additional independent variables at the second level. We included a random intercept because this increased the -2LL significantly compared to a basic fixed effects model in all the four models. Also including a random slope did not improve model fit significantly for two of the models (those with daydreaming and whole day interest as dependent variables) and the slopes and intercepts did not significantly covary in all four models. Thus, our final models included only a random intercept.

In line with our expectations, Table 5 shows that on average, both the MC group and the PS group experienced less pleasure during the daydreaming event than did the PF group. However, the effect in the MC group disappeared when effort was entered into the regression. Daydreaming interest was not affected by the interventions. Unexpectedly, effort had a significant impact on both pleasure and interest, and this effect was observed at both the within-participants level and the between-participants level. We expected that only interest would have a positive association with effort. However, a suppressor effect seemed to appear in the interest model. It shows that interest decreased over time but only when the effort variables were included in the equation. Because effort is positively correlated with time (B = .06, $p < .001$), and effort and interest are also positively correlated (Bs = .30 and .40 for within and between participants, respectively; both ps < .001), a nonsignificant coefficient might be observed at the zero level even when there is a true relationship between interest and time (e.g., Hayes, 2013). The suppression may be accounted for as follows. First, interest tends to decrease for tasks that are repeated (e.g., Silvia, 2006), which was the case in the present data as well. Second, as time went by, the participants in the present study reported that they spent more effort on completing their daily tasks. Third, effort and interest were positively correlated. Finally, the combination of a negative association between interest and task repetition on the one hand, and the positive association between interest and effort on the other hand, leads to a zero correlation between time and interest as long as effort increases with the repetition of tasks (See Bollen, 1989, p. 50 for another example of the suppressor effect). Following Cohen and Cohen (1983, p. 94) we have identified a suppressor effect in our data because the association between time an interest (-.03) is smaller than the product of .06 (the correlation between effort and time) and .40 (the correlation between effort and interest). We interpret these results to mean that participants lose interest in repeating the exercises over time, although the effect is only visible when the association between effort

and interest is controlled. Because this effect was not observed for the pleasure variable, we take these results to indicate further support for the existence of a discriminant validity between HWB and EWB.

------Please insert tables 5 and 6 about here----------

The last two regression models reported in Table 6 show that no significant effect from the experimental variables was observed. We did, however, observe an increase in the experience of pleasure over time, whereas as no such effect was found for interest. Again, this difference between HWB and EWB in predicting capacity further suggests a difference between the two concepts.

Discussion

Overall, the results supported the assumption that HWB and EWB are different concepts, although some of the analyses also revealed considerable overlap between the concepts. A set of EFAs identified HWB and EWB as correlated, but distinct dimensions of wellbeing. Several confirmatory factor analyses verified the idea that these indicators originate from different latent variables. A MTMM approach provided evidence for both convergent and discriminant validity, although the distinction was less convincing for the similar-method estimates. The experimental part of the study also favored the discriminant hypothesis.

The empirical evidence provided in this article disputes earlier studies testing the dimensionality of wellbeing. For example, Disabato et al.´s (2016) results suggested that HWB and EWB were the same type of wellbeing and presented a .96 correlation between their measures of HWB and EWB. The profound difference from our results is likely due to the operationalizations of the wellbeing constructs, a problem also observed when connecting wellbeing to other vital concepts (Zacher & Staudinger, 2018). A common measure of EWB,

also used by Disabato et al. (2016), is Ryff´s scales for measuring psychological wellbeing (PWB; Ryff, 1989; Ryff & Keyes, 1995). The PWB construct consists of six subscales that tap into different dimensions of life: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life and personal growth. Some of these subscales are closely connected to HWB. For example, environmental mastery is connected to goal achievement and social relations that usually involve pleasurable feelings—both indicators of HWB. Despite these overlaps between PWB and HWB, Disabato et al. (2016) found that hope, meaning orientation and grit related differently to HWB and EWB (measured with PWB and meaning). These findings support the key role of goal pursuit activities in differentiating HWB and EWB. Through focusing on the process of goal pursuit we were able to find subtle but important differences between the two, and solid converging evidence supporting HWB (measured by life satisfaction and pleasure) and EWB (measured by personal growth and interest) as distinct concepts. Our findings thus respond to the criticism that EWB lacks empirical support (Kashdan et al., 2008).

Related to this, in the analyses supporting a two-factor solution, eudaimonic emotions—and not negative emotions—form the second factor. Contrasting with Fredrickson's broaden-and-build theory (2001), it thus seems more important to separate between hedonic and eudaimonic emotions than between positive and negative emotions when studying wellbeing.

The less convincing results of similar-methods estimates point to the complexity in wellbeing research. Pleasure and interest were indicators of hedonic and eudaimonic feeling states, respectively, and these state-level measures had higher correlations than our trait-level measures. One explanation is that the relation between pleasure and interest tends to be unbalanced. Some interesting experiences may be characterized as pleasant; yet, unpleasant experiences may also be interesting (e.g., Turner & Silvia, 2006). Nevertheless, considerable

research support interest and pleasure as distinct feelings (see Silvia, 2006). In our study, the intensive goal pursuit week probably included both challenge and difficulty (associated with interest), and feelings of mastery (associated with pleasure). Still, daily pleasure (and not interest) increased towards the end of the weeklong experiment when participants were nearer goal achievement.

Pleasure, but not interest, was also sensitive to the daydreaming exercises; participants who were assigned to perform mental contrasting and process simulation, which both involves identifying obstacles and step-by-step planning, had lower levels of pleasure compared to participants simply fantasizing about the positive outcome. Such a difference was not observed for the experience of interest. Identifying obstacles and planning requires mental effort (Shenhav et al., 2017), thus this finding suggest a negative association between effort and pleasure. In contrast, the suppressor effect for daydreaming interest suggests that effort helps mitigate the reduction in interest as novelty and complexity wears off. The finding that effort increased both daydreaming pleasure and interest moderates these deductions.

Limitations

The study was conducted with a relatively small sample of WEIRD participants (i.e., from a Western Educated Industrialized Rich Democratic society; Henrich, Heine, & Norenzayan, 2010) and may not be generalizable to people from different cultures. Additionally, the findings should be replicated in a larger sample.

Furthermore, the design of the study, using daily reports in which emotions and goal-related questions were presented in the same questionnaire, made it difficult to disentangle the effects of interest on effort from the effects of effort on pleasure, which might reflect why effort increased both interest and pleasure. A random sampling procedure with multiple

signals a day is thus better suited to test this hypothesis. Nevertheless, the focus on the whole goal pursuit process connected to wellbeing is a strength of this study, offering a developmental perspective on wellbeing.

Note that we follow the tradition of using a causal language in reporting the results from the regression analysis. The causality implied by claiming that an independent variable has an effect on a dependent variable refers to a theoretical assumption inherent in regression models, even if the causality is not tested empirically (e.g., Davis, 1985). Despite the framing of results in terms like cause and effect, such results should be interpreted as associations with an assumed, but not confirmed, causality.

Conclusions

There might be only one kind of wellbeing. However, this overarching wellbeing concept clearly consists of two related but distinct underlying constructs (van de Weijer, Baselmans, van der Deijl, & Bartels, 2018). If the interest of future research focuses on situations in which hedonia and eudaimonia conflict and diverge, rather than when they overlap, we might gain a better understanding of the complexity and richness that so commonly are associated with wellbeing and good lives.

References

Alexandrova, A. (2015). The science of wellbeing. In G. Fletcher (Ed.), *The Routledge handbook of philosophy of well-being*. London: Routledge.

Amabile, T. M., Hill, K. G., Hennessey, B. A., & Tighe, E. M. (1994). The Work Preference Inventory: Assessing intrinsic and extrinsic motivational orientations. *Journal of Personality and Social Psychology, 66*(5), 950-967. doi:10.1037/0022-3514.66.5.950

Biswas-Diener, R., Kashdan, T. B., & King, L. A. (2009). Two traditions of happiness research, not two distinct types of happiness. *The Journal of Positive Psychology, 4*(3), 208-211. doi:10.1080/17439760902844400

Bollen, K. A. (1989). *Structural equations with latent variables*. New York: John Wiley & Sons.

Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin, 56*(2), 81-105.

Carver, C. S., & Scheier, M. F. (2001). *On the self-regulation of behavior*. New York: Cambridge University Press.

Cheung, F., & Lucas, R. E. (2014). Assessing the validity of single-item life satisfaction measures: Results from three large samples. *Quality of Life Research, 23*, 2809-2818. doi:10.1007/s11136-014-0726-4

Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences* (2. ed.). Hillsdale, NJ: Lawrence Erlbaum.

Curran, P. J., & Bauer, D. J. (2011). The disaggregation of within-person and between-person effects in longitudinal models of change. *Annual Review of Psychology, 62,* 583–619. doi:10.1146/annurev.psych.093008.100356

Davis, J. A. (1985). *The logic of causal order*. London: Sage.

Diener, E. (1984). Subjective well-being. *Psychological Bulletin, 95*(3), 542-575. doi:10.1037/0033-2909.95.3.542

Diener, E. (2006). Guidelines for national indicators of subjective well-being and ill-being. *Journal of Happiness Studies, 7*, 397-404. doi:0.1007/s10902-006-9000-y

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49*(1), 71-75. doi:10.1207/s15327752jpa4901_13

Disabato, D. J., Goodman, F. R., Kashdan, T. B., Short, J. L., & Jarden, A. (2016). Different types of well-being? A cross-cultural examination of hedonic and eudaimonic well-being. *Psychological assessment, 28*(5), 471-482. doi:10.1037/pas0000209

Douglas, H. (2009). *Science, policy, and the value-free ideal*. Pittsburgh, PA: University of Pittsburgh Press.

Dreisbach, G., & Goschke, T. (2004). How positive affect modulates cognitive control: reduced perseveration at the cost of increased distractibility. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 30*(2), 343-353. doi:10.1037/0278-7393.30.2.343

Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: perseverance and passion for long-term goals. *Journal of Personality and Social Psychology, 92*(6), 1087-1101. doi:10.1037/0022-3514.92.6.1087

Eid, M., & Koch, T. (2014). The meaning of higher-order factors in reflective-measurement models. *Measurement: Interdisciplinary Research & Perspectives, 12*(3), 96-101. doi:10.1080/15366367.2014.943591

Ericsson, K. A., Krampe, R. T., & Tesch-Römer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review, 100*(3), 363-403. doi:10.1037/0033-295X.100.3.363

Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods, 4*(3), 272-299. doi:10.1037/1082-989X.4.3.272

Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist, 56*(3), 218-226. doi:10.1037/0003-066X.56.3.218

Friston, K. (2009). The free-energy principle: A rough guide to the brain? *Trends in Cognitive Sciences, 13*, 293-301. doi: 10.1016/j.tics.2009.04.005

Gable, P. A., & Harmon-Jones, E. (2008). Approach-motivated positive affect reduces breadth of attention. *Psychological Science, 19*(5), 476-482. doi:10.1111/j.1467-9280.2008.02112.x

Harmon-Jones, E., Gable, P. A., & Price, T. F. (2013). Does negative affect always narrow and positive affect always broaden the mind? Considering the influence of motivational intensity on cognitive scope. *Current Directions in Psychological Science, 22*(4), 301-307.

Hayes, A. F. (2013). *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-based Approach*. New York: The Guilford Press.

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences, 33*(2-3), 61-83. doi:10.1017/S0140525X0999152X

Hooper, D., Coughlan, J., & Mullen, M. (2008). Structural equation modelling: Guidelines for determining model fit. *Electronic Journal of Business Research, 6*, 53-60.

Hsee, C. K., & Abelson, R. P. (1991). Velocity relation: Satisfaction as a function of the first derivative of outcome over time. *Journal of Personality and Social Psychology, 60*(3), 341-347. doi:10.1037/0022-3514.60.3.341

Huta, V., & Waterman, A. S. (2014). Eudaimonia and Its Distinction from Hedonia: Developing a Classification and Terminology for Understanding Conceptual and Operational Definitions. *Journal of Happiness Studies, 15*(6), 1425-1456. doi:10.1007/s10902-013-9485-0

IPIP. (2002). International Personality Item Pool: A scientific collaboration for the development of advanced measurement of personality traits and other individual differences. Retrieved from http://ipip.ori.org/

Kashdan, T. B., Biswas-Diener, R., & King, L. A. (2008). Reconsidering happiness: The costs of distinguishing between hedonics and eudaimonia. *The Journal of Positive Psychology, 3*(4), 219-233. doi:10.1080/17439760802303044

Kashdan, T. B., Rose, P., & Fincham, F. D. (2004). Curiosity and exploration: Facilitating positive subjective experiences and personal growth opportunities. *Journal of Personality Assessment, 82*(3), 291-305. doi:10.1207/s15327752jpa8203_05

Kenny, D. A. (2015). Measuring model fit. http://davidakenny.net/cm/fit.htm

Kline, R. B. (2015). *Principles and practice of structural equation modeling* (4 ed.). New York: The Guilford Press.

Klug, H. J., & Maier, G. W. (2015). Linking goal progress and subjective well-being: A meta-analysis. *Journal of Happiness Studies, 16*(1), 37-65. doi:10.1007/s10902-013-9493-0

Kristjánsson, K. (2013). *Virtues and vices in positive psychology*. New York: Cambridge University Press.

Kruger, J., Wirtz, D., Van Boven, L., & Altermatt, T. W. (2004). The effort heuristic. *Journal of Experimental Social Psychology, 40*(1), 91-98.

Labroo, A. A., & Kim, S. (2009). The "instrumentality" heuristic: Why metacognitive difficulty is desirable during goal pursuit. *Psychological Science, 20*(1), 127-134. doi:10.1111/j.1467-9280.2008.02264.x

Lucas, R. E., & Donnellan, M. B. (2012). Estimating the reliability of single-item life satisfaction measures: Results from four national panel studies. *Social Indicators Research, 105*, 323-331. doi:10.1007/s11205-011-9783-z

Marsh, H. W., Ellis, L. A., Parada, R. H., Richards, G., & Heubeck, B. G. (2005). A short version of the Self Description Questionnaire II: operationalizing criteria for short-form evaluation with new applications of confirmatory factor analyses. *Psychological Assessment, 17*(1), 81-102. doi:10.1037/1040-3590.17.1.81

Mayr, E. (2004). *What makes biology unique?: Considerations on the autonomy of a scientific discipline.* New York: Cambridge University Press.

McGregor, I., & Little, B. R. (1998). Personal projects, happiness, and meaning: on doing well and being yourself. *Journal of Personality and Social Psychology, 74*(2), 494-512. doi:10.1037/0022-3514.74.2.494

Muthén, L. K., & Muthén, B. O. (1998-2017). *Mplus user's guide* (7 ed. Vol. 8). Los Angeles, CA: Muthén & Muthén.

Norton, M. I., Mochon, D., & Ariely, D. (2012). The IKEA effect: When labor leads to love. *Journal of Consumer Psychology, 22*(3), 453-460.

Oettingen, G. (2014). *Rethinking positive thinking: Inside the new science of motivation*. New York: Current.

Oettingen, G., Mayer, D., & Portnow, S. (2016). Pleasure now, pain later: Positive fantasies about the future predict symptoms of depression. *Psychological Science, 27*(3), 345-353. doi:10.1177/0956797615620783

Oishi, S. (2006). The concept of life satisfaction across cultures: An IRT analysis. *Journal of Research in Personality, 40*, 411-423. doi:10.1016/j.jrp.2005.02.002

Pham, L. B., & Taylor, S. E. (1999). From thought to action: Effects of process-versus outcome-based mental simulations on performance. *Personality and Social Psychology Bulletin, 25*(2), 250-260.

Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology, 52*(1), 141-166. doi:10.1146/annurev.psych.52.1.141

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology, 57*(6), 1069-1091. doi:10.1037/0022-3514.57.6.1069

Ryff, C. D., & Keyes, C. L. M. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology, 69*(4), 719. doi:10.1037/0022-3514.69.4.719

Sansone, C., & Thoman, D. B. (2005). Interest as the missing motivator in self-regulation. *European Psychologist, 10*(3), 175-186. doi:10.1027/1016-9040.10.3.175

Seligman, M. E. P. (2002). *Authentic happiness. Using the new positive psychology to realize your potential for deep fulfillment*. London: Nicholas Brealey Publishing.

Sheldon, K. M. (2018). Understanding the Good Life: Eudaimonic Living Involves Well-Doing, Not Well-Being. In J. P. Forgas & R. F. Baumeister (Eds.), *The Social Psychology of Living Well* (pp. 132-152): Routledge.

Shenhav, A., Musslick, S., Lieder, F., Kool, W., Griffiths, T. L., Cohen, J. D., & Botvinick, M. M. (2017). Toward a rational and mechanistic account of mental effort. *Annual Review of Neuroscience, 40*, 99-124. doi:10.1146/annurev-neuro-072116-031526

Silvia, P. J. (2006). *Exploring the psychology of interest*. New York: Oxford University Press.

Straume, L. V., & Vittersø, J. (2012). Happiness, inspiration and the fully functioning person: Separating hedonic and eudaimonic well-being in the workplace. *The Journal of Positive Psychology, 7*(5), 387-398. doi:10.1080/17439760.2012.711348

Thorsteinsen, K., & Vittersø, J. (2018). Striving for wellbeing: The different roles of hedonia and eudaimonia in goal pursuit and goal achievement. *International Journal of Wellbeing, 8*(2), 89-109. doi:10.5502/ijw.v8i2.733

Tov, W., & Lee, H. W. (2016). A closer look at the hedonics of everyday meaning and satisfaction. *Journal of Personality and Social Psychology*, 111(4), 585-609. doi: 10.1037/pspp0000081

Tov, W. (2018). Well-being concepts and components. In E. Diener, S. Oishi, & L. Tay (Eds.), *Handbook of well-being*. Salt Lake City, UT: DEF Publishers

Tugade, M. M., Shiota, M. N., & Kirby, L. D. (Eds.). (2014). *Handbook of positive emotions*. New York: Guilford Press.

Turner, S. A. J., & Silvia, P. J. (2006). Must interesting things be pleasant? A test of competing appraisal structures. *Emotion, 6*(4), 670-674. doi:10.1037/1528-3542.6.4.670

van de Weijer, M., Baselmans, B., van der Deijl, W., & Bartels, M. (2018). A growing sense of well-being: a literature review on the complex framework well-being.

Vittersø, J. (2013). Functional well-being: Happiness as feelings, evaluations, and functioning. In S. David, I. Boniwell, & A. C. Ayers (Eds.), *The Oxford handbook of happiness* (pp. 227-244). Oxford, UK: Oxford University Press.

Vittersø, J. (2016a). The feeling of excellent functioning: Hedonic and eudaimonic emotions. In J. Vittersø (Ed.), *Handbook of Eudaimonic Well-Being* (pp. 253-276). Cham, Switzerland: Springer International Publishing.

Vittersø, J. (2016b). *Handbook of Eudaimonic Well-Being*. Cham, Switzerland: Springer International Publishing.

Vittersø, J. (2018). Do it! Activity theories and the good life. In E. Diener, S. Oishi, & L. Tay (Eds.), *Handbook of well-being*. Salt Lake City, UT: DEF Publishers.

Vittersø, J., Oelmann, H. I., & Wang, A. L. (2009). Life satisfaction is not a balanced estimator of the good life: Evidence from reaction time measures and self-reported emotions. *Journal of Happiness Studies, 10*(1), 1-17. doi:10.1007/s10902-007-9058-1

Vittersø, J., Røysamb, E., & Diener, E. (2002). The concept of life satisfaction across cultures: Exploring its divers meaning and relation to economic wealth. In E. Gullone & R. Cummins (Eds.), *The universality of subjective wellbeing indicators. A multi-diciplinary and multi-national perspective* (pp. 81-103). Dordrecht, The Netherlands: Kluwer Academic Publishers.

Vittersø, J., & Søholt, Y. (2011). Life satisfaction goes with pleasure and personal growth goes with interest: Further arguments for separating hedonic and eudaimonic well-being. *The Journal of Positive Psychology, 6*(4), 326-335. doi:10.1080/17439760.2011.584548

Vittersø, J., Søholt, Y., Hetland, A., Thoresen, I. A., & Røysamb, E. (2010). Was Hercules happy? Some answers from a functional model of human well-being. *Social Indicators Research, 95*(1), 1-18. doi:10.1007/s11205-009-9447-4

Ward, S. J., & King, L. A. (2016). Socrates' Dissatisfaction, a Happiness Arms Race, and the Trouble with Eudaimonic Well-Being. In J. Vittersø (Ed.), *Handbook of Eudaimonic Well-Being* (pp. 523-529). Cham: Springer International Publishing.

Waterman, A. S. (2008). Reconsidering happiness: A eudaimonist's perspective. *The Journal of Positive Psychology, 3*(4), 234-252. doi:10.1080/17439760802303002

Wiese, B., & Freund, A. (2005). Goal progress makes one happy, or does it? Longitudinal findings from the work domain. *Journal of Occupational and Organizational Psychology, 78*(2), 287-304.

Witt Huberts, J. C., Evers, C., & De Ridder, D. T. (2012). License to sin: Self-licensing as a mechanism underlying hedonic consumption. *European Journal of Social Psychology, 42*(4), 490-496. doi:10.1002/ejsp.861

Zacher, H., & Staudinger, U. (2018). Wisdom and well-being. In *Handbook of Well-Being.* Salt Lake City, UT: DEF Publishers.

Table 1

Means, Pearson's Product-Moment Correlations and Cronbach's Alphas for Demographic Variables and Dispositions

	M	*SD*	1	2	3	4	5	6	7
1 Sex	.20	.41							
2 Age	34.46	13.21	0.165						
3 SWLS	4.96	1.11	-.138	.032	.87				
4 PG	3.51	0.54	.102	.130	.291**	.80			
5 Pleasure	4.59	1.01	-.258**	-.059	.722**	.286**	.89		
6 Interest	4.96	1.04	-.039	.021	.388**	.514**	.519**	.86	
7 Negative Emotions	2.78	0.81	-.106	-.014	-.295**	-.159	-.210*	-.077	.62

Note. Chronbachs alpha in diagonal. SWLS items were measured on a scale from *1(not true) 7(completely true), PG was measured on a scale* from 1(strongly disagree) to 5(strongly agree), pleasure, interest and negative emotions was measured on a scale from 1(never) to 7(all the time). Sex wa coded male = 0 and female = 1. SWLS = Satisfaction with life scale; PG = Personal growth composite. *p < .05 ,**p < .01, ***p < .001.

Table 2

Pattern Matrix Factor Loadings (Hed and Eud), Communalities (h^2), Eigenvalues, Explained Covariance for a Non-Rotated Factor Model and Factor Correlations for Three Exploratory Factor Anayses With Three Measures of Basic Emotions

	Life overall			Whole day			Daydreaming		
	Hed	Eud	h^2	Hed	Eud	h^2	Hed	Eud	h^2
Pleasure	**.87**	.01	.77	**.89**	.01	.80	**.78**	.16	.79
Happiness	**.84**	.04	.74	**.80**	.07	.71	**.67**	.21	.66
Satisfaction	**.70**	.17	.64	**.85**	.05	.77	**.81**	.12	.79
Interest	-.07	**.96**	.87	-.02	**.92**	.83	-.10	**.92**	.74
Engagement	-.09	**.92**	.78	-.06	**.91**	.77	-.15	**.99**	.82
Immersion	.08	**.63**	.45	.03	**.72**	.54	-.02	**.79**	.61
Anger	**-.41**	.24	.12	**-.40**	.06	.13	**-.51**	.16	.19
Sadness	-.28	-.02	.08	**-.50**	-.06	.29	**-.55**	.05	.28
Fear	-.19	.00	.04	**-.36**	.07	.11	**-.54**	.21	.20
Eigenvalues	3.74	1.73		4.42	1.51		4.37	1.85	
Covariance (%)	36.96	12.86		45.16	9.86		44.38	12.01	
Factor correlations Hed	1.00			1.00			1.00		
Factor correlations Eud	.52	1.00		.63	1.00		.61	1.00	

Note. Maximum likelihood extraction with promax rotation (kappa = 4). Factor loadings > .30 in bold. Hed = Hedonic emotions, Eud = Eudaimonic emotions.

Table 3

Pattern Matrix Factor Loadings (HWB and EWB), Communalities (h^2), Eigenvalues, Explained Covariance for a Non-Rotated Factor Model and Factor Correlations for an Exploratory Factor Analysis for the Eight Wellbeing Indicators

	HWB	EWB	h^2
Life satisfaction	**.86**	-.05	.70
Trait pleasure	**.90**	-.02	.78
Trait negative	**-.38**	.05	.13
PG curiosity	-.06	**.65**	.39
PG absorption	-.20	**.65**	.34
PG complexity	-.05	**.41**	.15
PG competence	.12	**.57**	.41
Trait interest	.23	**.63**	.59
Eigenvalues	3.03	1.42	
Covariance (%)	45.16	9.86	
Factor correlations HWB	1.00		
Factor correlations EWB	.49	1.00	

Note. Maximum likelihood extraction with promax rotation (kappa = 4). Factor loadings > .30 in bold. HWB = Hedonic wellbeing, EWB = Eudaimonic wellbeing.

Table 4

Goodness-of-Fit Statistics For Four Confirmatory Factor Models

Model		Life overall[a)]	Whole day	Daydream	Wellbeing[b)]
Two facors	χ^2	711	239	469	293
	df	26	52	52	19
	CFI	.86	.93	.86	.90
	RMSEA	.15	.06	.09	.11
	SRMR	.09			.05
	Within		.06	.09	
	Between		.11	.16	
Three factors	χ^2	302	91	101	
	df	24	48	48	
	CFI	.94	.99	.98	
	RMSEA	.10	.03	.03	
	SRMR	.05			
	Within		.04	.03	
	Between		.05	.07	
Three factors modified[1)]	χ^2	209			125
	df	23			12
	CFI	.97			.96
	RMSEA	.08			.09
	SRMR	.05			.04

Note. χ^2 = chi-square, df = degrees of freedom, CFI = comparative fit index, RMSEA = root mean square of approximation, SRMR = standardized root mean square residual.
a) = Modified by letting the error terms between happiness and pleasure correlate.
b) = Modified by letting all the error terms among the personal growth subscales correlate with each other, and by letting the error terms for pleasure and negative emotions correlate.
1) = For the wellbeing indicators, a 2-factors model was modified
*p*s < .001 for all chi-square tests.

Table 5

Unstandardized Regression Coefficients, Their Standard Errors and p-values from Multilevel Models with Daydream Pleasure or Daydream Interest as Dependent Variables, and Time, Gender, Age, Experimental Condition and Effort as Independent Variables

	Pleasure						Interest					
	Model 1			Model 2			Model 1			Model 2		
Predictor	B	SE(B)	*p*	B	SE(B)	*p*	B	SE(B)	*p*	B	SE(B)	p
Intercept	0.13	0.21	.530	0.09	0.19	.627	-0.11	0.20	.600	-0.17	0.19	.419
Time	0.01	0.01	.770	0.01	0.01	.374	-0.02	0.01	.079	**-0.03**	**0.01**	**.043**
Gender	-0.11	0.01	.502	-0.09	0.16	.575	-0.01	0.17	.941	0.01	0.16	.970
Age	0.00	0.01	.518	0.00	0.01	.465	0.01	0.01	.197	0.01	0.00	.089
MC	**-0.35**	**0.17**	**.039**	-0.26	0.16	.102	-0.11	0.16	.525	-0.10	0.15	.502
PS	**-0.33**	**0.16**	**.034**	**-0.29**	**0.15**	**.047**	-0.26	0.15	.094	-0.22	0.14	.116
Effort_W				**0.19**	**0.04**	**.000**				**0.22**	**0.04**	**.000**
Effort_B				**0.43**	**0.09**	**.000**				**0.54**	**0.09**	**.000**

Note. MC = Dummy coded variable for membership in the mental contrast group, PS = Dummy coded variable for membership in the process simulation group. The standardized effort variable was divided into a within (Effort_W) and between (Effort_B) participants component. P-values were calculated using the Satterthwaite method.

Table 6

Unstandardized Regression Coefficients, Their Standard Errors and p-values from Multilevel Models with Whole Day Pleasure or Whole Day Interest as Dependent Variables, and Time, Gender, Age, Experimental Condition and Effort as Independent Variables

	Pleasure						Interest					
	Model 1			Model 2			Model 1			Model 2		
Predictor	B	SE(B)	*p*	B	SE(B)	*p*	B	SE(B)	*p*	B	SE(B)	*p*
Intercept	0.14	0.19	.467	0.15	0.19	.432	-0.11	0.20	.595	-0.11	0.19	.572
Time	**0.04**	**0.02**	**.015**	**0.04**	**0.02**	**.028**	0.01	0.01	.589	0.00	0.01	.918
Gender	-0.10	0.16	.522	-0.08	0.16	.634	-0.09	0.17	.593	0.01	0.17	.935
Age	-0.00	0.01	.626	-0.00	0.00	.517	0.01	0.01	.262	0.01	0.01	.320
MC	-0.14	0.16	.389	-0.12	0.15	.457	0.00	0.16	.997	-0.03	0.16	.843
PS	-0.04	0.15	.786	0.07	0.14	.615	-0.19	0.15	.206	-0.14	0.15	.336
Effort_W				**0.10**	**0.04**	**.013**				**0.23**	**0.04**	**.000**
Effort_B				**0.34**	**0.09**	**.000**				**0.41**	**0.09**	**.000**

Note. MC = Dummy coded variable for membership in the mental contrast group, PS = Dummy coded variable for membership in the process simulation group. The standardized effort variable was divided into a within (Effort_W) and between (Effort_B) participants component. P-values were calculated using the Satterthwaite method.