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Time frames and the distinction between affective and cognitive well-being

Maike Luhmann[a,*], **Louise C. Hawkley**[a], **Michael Eid**[b], and **John T. Cacioppo**[a]
[a]Department of Psychology, University of Chicago, United States
[b]Department of Education and Psychology, Freie Universität Berlin, Germany

Abstract

We examined whether the empirical differences between affective well-being (AWB) and cognitive well-being (CWB) might be due to (a) the use of different time frames in measures of AWB and CWB or (b) structural differences. In Study 1, a multitrait-multimethod (MTMM) analysis indicated that levels of different components are more similar but do not converge completely when the same time frame is used. In Study 2, we found that people are more likely to consider global life circumstances (as opposed to specific events and activities) when they evaluate their CWB, regardless of the specific time frame. In both studies, the time frame did not moderate the associations between AWB and CWB and important correlates (personality, life circumstances).

Keywords

Measurement of subjective well-being; Multitrait-multimethod (MTMM) modeling; Mood; Life satisfaction; Personality; Income; Life events

1. Introduction

Subjective well-being (SWB) is a multi-faceted construct comprising affective and cognitive components[1] (Busseri & Sadava, 2011; Diener, 1984; Lucas, Diener, & Suh, 1996; Schimmack, 2008). Affective well-being(AWB) refers to the frequency and intensity of positive and negative emotions and mood; cognitive well-being (CWB) refers to domain-specific and global evaluations of life such as marital satisfaction or global life satisfaction. A growing body of empirical studies indicates that AWB and CWB are related but separable constructs that differ in their temporal stability (e.g., Eid & Diener, 2004; Luhmann, Schimmack, & Eid, 2011) and have different predictors and consequences. For instance, AWB and CWB differ in their prospective effects on health and longevity (Diener & Chan, 2011; Wiest, Schüz, Webster, & Wurm, 2011). Furthermore, both AWB and CWB are related to personality characteristics such as emotional stability and extraversion, but these correlations are typically stronger for AWB (Jovanovic, 2011; Schimmack, Diener, & Oishi, 2002; Schimmack, Schupp, & Wagner, 2008; Steel, Schmidt, & Shultz, 2008). In contrast, external circumstances such as income, job status, or recent life events tend to have stronger

*Corresponding author. Address: Department of Psychology, University of Chicago, 940 E. 57th Street, Chicago, IL 60637, United States. luhmann@uchicago.edu (M. Luhmann).

[1]These terms are used loosely in the literature where SWB is sometimes equated with affect and sometimes equated with life satisfaction or cognitive well-being. According to the definition used in this paper, SWB is the overarching construct and affect and life satisfaction are specific components.

effects on CWB (Diener, Ng, Harter, & Arora, 2010; Schimmack et al., 2008). Finally, a recent meta-analysis found that life events such as bereavement, childbirth, or retirement have more persistent and consistent effects on CWB than on AWB (Luhmann, Hofmann, Eid, & Lucas, 2012).

Together, these studies suggest that AWB and CWB are related but structurally distinct components of SWB. This is also the predominant assumption in most structural models of SWB that are currently discussed (for a review, see Busseri & Sadava, 2011). Alternatively, however, the empirical differences between AWB and CWB might be caused by the use of different time periods over which respondents are considering their well-being. Measures of AWB such as the Positive Affect Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) typically assess the frequency of positive and negative affect that people have experienced over a specified period of time. In contrast, measures of CWB such as the Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) typically assess life satisfaction overall without providing a specific time frame. In the meta-analysis on life events (Luhmann et al., 2012), 79.1% of the AWB measures used a specific time frame such as the past week or the past month, and 19.8% of the AWB measures assessed momentary well-being. In contrast, 91.1% of the CWB measures did not specify any time frame. This means that many studies confounded structural differences between AWB and CWB (reflected, for instance, in the use of affective adjectives in AWB scales and broad evaluative statements in CWB scales) and the time frame over which well-being is gauged. Almost two decades ago, Diener (1994, p. 139) noted that “researchers should be aware that the time frame of their measures is likely to influence the correlations of SWB they uncover”. Despite this early call, however, the effects of time frames have not been properly examined. The bulk of previous research is therefore inconclusive with respect to the structure of SWB and the presumed unique correlates of AWB versus CWB.

In the present paper, we contrast two fundamentally different hypotheses about the association between CWB and AWB. The first hypothesis is that the differences between AWB and CWB are driven by the different time frames used in most previous studies. This hypothesis is related to the time-sequential model of SWB according to which CWB ratings are based on the AWB that was experienced over a specific period of time (Kim-Prieto, Diener, Tamir, Scollon, & Diener, 2005). Specifically, these authors propose that people recall their affective reactions to specific events and activities when asked to make a global evaluation of their current well-being. More generally, our first hypothesis assumes that AWB reflects momentary well-being which is based on concrete and specific experiences whereas CWB reflects long-term well-being which is more global and abstract. In the current research, we decomposed this hypothesis to test the extent to which: (a) AWB is based on specific events and activities whereas CWB is based on global influences, and (b) these differences reflect the time frames over which AWB and CWB are gauged rather than structural (i.e., inherent psychological) differences between AWB and CWB. If this hypothesis is correct, then the empirical distinction between AWB and CWB should disappear or at least be reduced significantly when both constructs are gauged over the same time frame.

The second hypothesis assumes structural differences between AWB and CWB (e.g., Diener, Lucas, & Scollon, 2006; Diener, Suh, Lucas, & Smith, 1999) that remain even after controlling for the time frame. Some support for this second hypothesis comes from a recent study by Schimmack et al. (2008) who found empirical differences between AWB and CWB although these variables were assessed over similar (but not identical) time frames (last year for AWB, overall for CWB). We test these alternative hypotheses in three ways. First, we examine the convergence of AWB and CWB across different time frames in a multitrait-multimethod (MTMM) design (Study 1). Second, we examine whether the sources of

information people use in their SWB judgments differ between the components and across different time frames (Study 2). Finally, we test whether the use of similar time frames affects the associations between the SWB components and important correlates such as personality, income, and life events (Study 1 and 2).

1.1. Convergence of AWB and CWB across different time frames

The influence of the time frame on the convergent validity of SWB ratings has not been of much interest in the past. In his evaluation of different measures of AWB including the PANAS (Watson et al., 1988), Watson (1988) used a between-subject design to compare six different time frames. Two main results ensued: First, the factorial structure of the AWB scales did not vary significantly across different time frames; second, the strength of the correlations between positive affect and negative affect as measured by the PANAS tended to increase with increasing time frame. For instance, the correlation was −.14 for momentary AWB and −.26 for general AWB. However, this effect was not replicated using two alternative measures of AWB (Watson et al., 1988). Similarly, a recent study found that measures of depressive symptoms using different time frames do not differ in their temporal stability (Schmitt, Heckmann, & Fabian-Krause, in preparation).

As reported above, CWB measures are usually administered without providing any specific time frames, which may account for the paucity of research on the effect of time frames in this context. One notable exception is the Temporal Satisfaction With Life Scale (TSWLS; Pavot, Diener, & Suh, 1998) that measures life satisfaction in the past, present, and future. In confirmatory factor analyses, these three temporal dimensions of life satisfaction loaded on three distinct but highly correlated latent factors (McIntosh, 2001). This finding can be interpreted as preliminary evidence for the convergence of different time frames for CWB measures; however, it is important to note that neither the instruction nor the TSWLS items themselves mention a specific time frame. Instead, the items are worded in either past tense, present tense, or future tense. Thus, the effect of different time frames on CWB ratings is not known.

In Study 1, we estimated the convergent and discriminant validity of different time frames in an MTMM design (Campbell & Fiske, 1959). With MTMM models, it is possible to examine the extent to which (a) measures of the same SWB component converge across different time frames (*monotrait-heteromethod correlations*), (b) measures using the same time frame converge across different SWB components (*heterotrait-monomethod correlations*), and (c) measures using different time frames discriminate between different SWB components (*heterotrait-heteromethod correlations*). If the time frame accounts for convergent validity across different SWB components, the heterotrait-monomethod correlations should be significantly higher than the heterotrait-heteromethod correlations. This pattern would support the hypothesis that AWB and CWB are different temporal facets of the same general construct. If, in contrast, the item content rather than the time frame accounts for the discriminant validity of AWB and CWB measures, the heterotrait-monomethod correlations should be similar to the heterotrait-heteromethod correlations. Such a finding would support the hypothesis of AWB and CWB as related but structurally distinct constructs. Finally, the monotrait-heteromethod correlations are of interest because they reflect the degree to which the measurement of each SWB component is affected by the time frame. Low or moderate correlations would imply that people respond differently to the same items if instructed to consider different time frames.

1.2. Sources of information in SWB ratings

SWB ratings are the result of a judgmental process where people use different kinds of heuristics or sources of information (Schwarz & Strack, 1999). According to Schimmack et

al. (2002), SWB judgments are mainly based on two types of chronically accessible sources of information: Variable sources comprise specific events, activities, or emotional states whereas stable sources comprise global life domains and general life circumstances. Stable sources seem to be more relevant in CWB ratings (Schimmack & Oishi, 2005). The two hypotheses tested in this paper lead to alternative predictions regarding the use of specific (variable) and global (stable) sources in SWB ratings. If AWB and CWB are different temporal facets of SWB, we would expect that the relative preference for global versus specific sources depends mainly on the time frame over which SWB is gauged. Specifically, the relevance of stable SWB sources referring to general life circumstances should increase with increasing time frames, and the relevance of variable sources referring to specific events and activities should decrease with increasing time frames for both AWB and CWB (Diener, 1994; Schimmack et al., 2002). If, in contrast, AWB and CWB are structurally different, we would expect that this preference differs between AWB and CWB judgments but not across different time frames.

1.3. Correlates and autoregressive effects of SWB

The third goal of this paper is to examine the extent to which the time frame over which well-being is considered affects the stability of SWB (in terms of the autoregressive effect of prior SWB on subsequent SWB) and the associations between SWB and important correlates such as personality and life circumstances. With respect to personality, we focus on emotional stability (or neuroticism) and extraversion because these personality traits have consistently been found to correlate with both AWB and CWB (DeNeve & Cooper, 1998; Steel et al., 2008). With respect to life circumstances, we examine income and negative work-related events. Income is positively correlated with SWB (Diener & Biswas-Diener, 2002; Diener et al., 2010), whereas negative work-related events such as getting fired are negatively correlated with SWB (Luhmann et al., 2012).

If we find that the time frame moderates the association between SWB and its correlates, we generally expect the respective regression slope to be higher for longer time frames. As we have reasoned above, we expect stable sources to be more salient for longer time frames. The slope of the regression of SWB on personality should be higher for longer time frames because by definition, personality traits refer to consistent patterns in mental processes and behavior across many different situations (e.g., Funder, 2008). Income and, to a lesser extent, major life events can also be regarded as stable sources of SWB judgments (Luhmann et al., 2011; Schimmack et al., 2002). Finally, because both personality and life circumstances are stable predictors of SWB, we expect the autoregressive effect of SWB to be stronger for longer time frames. This hypothesis was examined in Study 1. The effects of different time frames on the associations between SWB and its correlates were examined in Studies 1 and 2.

2. Study 1

2.1. Method

2.1.1. Sample and procedure—We analyzed data from the Chicago Health, Aging, and Social Relations Study (CHASRS; Cacioppo, Hughes, Waite, Hawkley, & Thisted, 2006; Hawkley, Masi, Berry, & Cacioppo, 2006), a population-based longitudinal study first implemented in 2002. In the first year, the sample size was $N = 229$ (52.4% female). All participants were born between 1933 and 1951; the average age in Wave 1 was 57.4 years ($SD = 4.45$). The sample was ethnically diverse, with 82 White participants (35.8%), 81 Black participants (35.4%), and 66 Hispanic participants (28.8%). After 5 years, 66 participants (28.8%) had left the study. The 5-year drop-out rate was highest for Hispanics (37.8%) and lowest for Whites (20.7%), $\chi^2 (2) = 5.28$, $p = .071$. There were no significant

differences between participants who dropped out and participants who stayed in the study with respect to gender, age, income, personality, life events, or any of the SWB measures.

Once a year, the participants were invited to spend a day in the laboratory where they completed several psychological and physiological tests. During the morning lab session, participants indicated their CWB using the Satisfaction With Life Scale (SWLS; Diener et al., 1985) and their AWB in the past week using a battery of affective adjectives. At the end of the lab day, they completed a short questionnaire about their well-being in the past 2 months using selected items from the longer SWB measures. In the week following the laboratory session, they were asked to complete a daily diary on each evening of three consecutive days (Sunday through Tuesday) that included the same SWB items as the 2-month questionnaire. In the present study, we only analyzed the diary data collected on Tuesday.[2]

2.1.2. Measures

2.1.2.1. Cognitive well-being: Cognitive well-being was assessed with two items from the SWLS (Diener et al., 1985). The participants indicated the degree to which they felt satisfied with their lives and the degree to which they viewed the conditions of their lives as excellent. In the 2-month questionnaire and in the daily diary, these items were rated on a 5-point scale ranging from 1 (*not at all*) to 5 (*very much*). In the morning lab session, the full 5-item version of the SWLS was administered, and items were rated on a 7-point response scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). In the present study, we used only those two items from the full scale that were also used in the diary versions. In addition, we transformed the 7-point scale into a 5-point scale so that all scales were on the same metric.[3] The items were analyzed separately in the MTMM analysis and averaged within each time frame for the subsequent analyses.

2.1.2.2. Affective well-being: Affective well-being was assessed with two adjectives representing *depressed mood* (*sad* and *lonely*) and two adjectives representing *positive affectivity* (*lively* and *energetic*). In the 2-month questionnaire, participants indicated the extent to which they experienced these affective states in the past 2 months. In the daily diary, they were asked to indicate the extent to which they experienced these affective states on that specific day. In the morning lab session, participants were asked to rate the extent to which they experienced these affective states in the past week. The response format was the same for all time frames, ranging from 1 (*not at all*) to 5 (*very much*). The answers to the depressed mood items were reversed such that across all scales, more positive values reflected higher well-being. As for life satisfaction, the items were analyzed separately in the MTMM analysis and averaged within each time frame for the subsequent analyses.

2.1.2.3. Personality: *Emotional stability* and *extraversion* were assessed with 20 adjectives from Goldberg's (1992) Big Five Inventory. Participants rated the extent to which each item described them accurately on a 9-point scale ranging from 1 (*extremely inaccurate*) to 9 (*extremely accurate*). For each subscale, the items were appropriately recoded and averaged.

2.1.2.4. Income: Personal income before taxes was assessed using twelve categories ranging from 1 (*less than US$ 5000*) to 12 (*US$ 200,000 or more*). In our analyses, income was treated as a continuous variable.

[2]Tuesday was chosen because mood tends to be lower on Mondays and higher on Sundays (Larsen & Kasimatis, 1990).
[3]The 1–7 range can be transformed into a 1–5 range using the following formula: $(LS - 1) \cdot 4/6 + 1$.

2.1.2.5. Work-related life events: Due to the relatively small sample size, it was not possible to examine the effects of specific life events. Therefore, we selected several similar events from one life domain (work) and coded whether the person had experienced any of these events in the past year (0 = none of these events had occurred, 1 = at least one of these events had occurred). The following events were included: got fired, discriminated or harassed at work, demoted at work, employer or team was downsized.

2.1.3. Data analysis

2.1.3.1. MTMM analysis: To estimate the convergence of different time frames, we applied a structural equation model for MTMM data (Eid, Lischetzke, & Nussbeck, 2006) to the first wave of data. For our purposes, the different SWB components correspond to different traits, and the different time frames correspond to different methods. Each trait was assessed using the respective standard method (i.e., time frame): *overall* for life satisfaction and *last week* for depressed mood and positive affectivity. In addition, each of these three traits was measured using two non-standard methods (*past 2 months* and *today*). Thus, we measured three traits (life satisfaction, depressed mood, positive affectivity) with four different methods (overall, past 2 months, past week, today) that were unbalanced across the SWB components. This particularity has to be considered in the analysis of the data.

In the structural equation model, we defined latent factors for each method-trait unit (see Fig. 1) and examined the correlations among these latent factors.[4] This correlation matrix corresponds to the classic MTMM matrix proposed by Campbell and Fiske (1959) except that the estimates are not distorted by measurement error (Eid et al., 2006). For each latent factor, two single items served as indicators. The models were estimated using the weighted least squares approach. This approach is more appropriate than the more commonly used maximum likelihood estimation method when the indicators are not metric but ordinal (Flora & Curran, 2004). The analyses were run in Mplus 5 (Muthén & Muthén, 2007). The Mplus input is provided in the Supplemental material (Fig. S1).

MTMM correlation matrices are interpreted by comparing the different types of correlations with each other. We were particularly interested in comparing the heterotrait-monomethod correlation coefficients with the heterotrait-heteromethod correlation coefficients (see above). Instead of comparing these coefficients in multiple pairwise tests and thereby inflating the Type-I-error rate, we chose a more economic approach. Specifically, for each combination of traits (i.e., life satisfaction with positive affectivity, life satisfaction with depressed mood, and positive affectivity with depressed mood), we compared two different models with a χ^2 test. In Model A, all heterotrait-monomethod and all heterotrait-heteromethod correlations were fixed to be equal. This very restrictive model was then compared to the less restrictive Model B where the heterotrait-monomethod correlations were allowed to differ from the heterotrait-heteromethod correlations. In both models, the heterotrait-monomethod correlations were fixed to be equal and the heterotrait-heteromethod correlations were fixed to be equal, respectively; hence, the model comparison essentially tests whether the average heterotrait-monomethod correlation differs significantly from the average heterotrait-heteromethod correlation within each combination of traits. A significant χ^2 test indicates that Model B fits significantly better than Model A which means that the heterotrait-monomethod and heterotrait-heteromethod correlations are significantly different.

[4]In addition to this simple model, there exist a number of more complex confirmatory factor analysis models for MTMM data (for an overview, see Eid et al., 2006). These complex models are appropriate if one is interested in relating trait or method factors to other variables or examining them over time. To answer our research question, however, it is sufficient to examine the correlations between the latent factors.

2.1.3.2. Autoregressive effect of SWB: We examined the differential autoregressive effect of SWB over a 2-year period. Specifically, SWB in Wave 3 was regressed on SWB in Wave 1 (lagged SWB).[5] For instance, life satisfaction today in Wave 3 was regressed on life satisfaction today in Wave 1; positive affectivity in the last week in Wave 3 was regressed on positive affectivity in the last week in Wave 1, and so forth. The slope coefficient reflects the temporal stability over this 2-year period. Since every person has multiple SWB scores, the data have a multilevel structure where SWB scores are nested within individuals. Hence, we used multilevel models to analyze the data. To distinguish between different components (life satisfaction, positive affectivity, depressed mood) or time frames (overall, past 2 months, past week, today), we included corresponding dummy variables on Level 1. The time frame was dummy-coded with *today* as reference category. By examining the Level-1 interaction effects between these dummy variables and (grand-mean centered) lagged SWB, we were able to establish whether the autoregressive effect of SWB differs across components and time frames. Note that this model roughly corresponds to a two-factorial repeated measures ANOVA where one of the within-person variables is not a factor but a continuous variable. Since the time frame and the SWB component were not completely balanced (see above), we estimated four separate models. In Model 1, we examined differences in the autoregressive effects between the three SWB components. In Models 2–4, we examined the autoregressive effect across the different time frames for positive affectivity, depressed mood, and life satisfaction, respectively. Depressed mood was reverse-coded such that higher scores reflect more positive well-being.

2.1.3.3. Correlates of SWB: To examine whether the time frame moderates the associations between personality traits, income, and life events and SWB, we examined the two-way interaction between the time frame and the respective correlate. To increase the statistical power of these models, we used data from those years when the diary data were collected (2002, 2004, 2005, 2006). These data had a three-level hierarchical structure with the different SWB ratings on Level 1, the year of data collection on Level 2, and the person on Level 3. Again, we used dummy variables on Level 1 with *today* as reference category in order to distinguish between different time frames. The interaction of interest is between these dummy variables and the annually assessed correlate (e.g., income) on Level 2. Continuous Level-2 variables were centered on the grand mean. Since the time frame and the SWB component were not completely balanced (see above), we estimated separate models for life satisfaction, positive affectivity, and (reversed) depressed mood.

2.2. Results

Descriptive statistics for the SWB items used in the MTMM analysis and for all aggregated variables used in the second part of the analyses are reported in Tables S1 and S2 in the supplemental material.

2.2.1. MTMM analysis—We first estimated the correlations among the trait-method unit factors (Table 1). Note that since these factors are latent factors, the correlations are not distorted by measurement error. In preliminary analyses, we tested whether a model with imposed equality constraints on the factor loadings (i.e., for each latent variable, the loadings of the two indicators are fixed to (1) differed significantly from a model where the factor loadings were allowed to differ between the indicators. The fit of the model with equality constraints was significantly worse than the fit of the model without these constraints, χ^2 (9) = 30.06, $p < .001$. We therefore present the results for the unconstrained model. The fit of this model was acceptable with χ^2 (99) = 210.32, $p < .001$, CFI = 0.950,

[5]There were two reasons why we examined these particular waves. First, the sample size is larger if earlier waves are considered. Second, the diary data were not assessed in Wave 2 which is why we examined the two-year stability between Wave 1 and Wave 3.

TLI = 0.923, RMSEA = .072, 95% CI [.058, .085], SRMR = .037. The correlations between factors measuring the same SWB component but using different time frames (*monotrait-heteromethod* correlations) were high for all traits (range: from $r = .51$ to $r = .89$), indicating high convergence across different time frames. The correlations of different SWB components measured with the same time frame (*heterotrait-monomethod* correlations) were not as strong as the monotrait-heteromethod correlations (range of absolute values: from $r = .22$ to $r = .63$), but still significantly different from zero. The magnitude of these correlations should be compared with the *heterotrait-heteromethod* correlations. If the heterotrait-monomethod correlations are significantly stronger than the heterotrait-heteromethod correlations, this means that the time frame accounts for some convergence across different SWB measures. In contrast, if there are no differences between these correlations, we can conclude that the time frame does not have strong effects on the SWB ratings. In fact, depending on the trait being evaluated, both of these patterns were found in our data.

For life satisfaction and positive affectivity, the heterotrait-monomethod correlations were significantly higher than the heterotrait-heteromethod correlations, $\chi^2 (1) = 30.38$, $p < .001$. For instance, the correlation between positive affectivity in the last 2 months and life satisfaction in the last 2 months ($r = .63$) was higher than the correlation of positive affectivity in the last 2 months with life satisfaction today ($r = .39$) and with life satisfaction overall ($r = .35$). A second finding for life satisfaction and positive affectivity was that the heterotrait-heteromethod correlations tend to be weaker for life satisfaction overall than for specific time frames. This is particularly notable because it implies that life satisfaction and positive affectivity are more strongly correlated and therefore less empirically distinct if similar time frames are used.

This pattern could not be completely replicated for the other combinations of traits. On average, the heterotrait-monomethod correlations for life satisfaction and depressed mood were not significantly different from the heterotrait-heteromethod correlations, $\chi^2 (1) = 1.22$, $p = .270$. Similarly, the heterotrait-monomethod correlations for positive affectivity and depressed mood were not significantly different from the respective heterotrait-heteromethod correlations, $\chi^2 (1) = 0.01$, $p = .944$. Here, the correlations tended to be stronger if at least one of the traits was measured with a today instruction, and the highest heterotrait-monomethod correlation was the one between (reverse-coded) depressed mood today and positive affectivity today ($r = .35$).

In summary, the MTMM analysis led to three central findings: (1) The monotrait-heteromethod correlations were stronger than any of the other correlations, indicating convergent validity of measures with different time frames within each SWB component. (2) The correlation between life satisfaction and positive affectivity is increased significantly when the same time frame is used. (3) In contrast, the correlations of positive affectivity and life satisfaction with depressed mood are not affected by the time frame.

2.2.2. Autoregressive effect of SWB—We first examined whether the three SWB components differed with respect to their 2-year autoregressive effects (Table 2). The interaction effects were not significant. This is contrary to previous findings according to which AWB tends to be less stable than CWB. For positive affectivity and depressed mood, the autoregressive effect was significantly stronger if these variables were assessed with respect to the last 2 months, relative to shorter time frames (Models 2 and 3). This is consistent with our expectation that the autoregressive effect increases with increasing time frames. However, this pattern could not be replicated for life satisfaction (Model 4). Here, the autoregressive effect for life satisfaction did not differ between the three time frames.

2.2.3. Correlates of SWB—The model results for all correlates of SWB are reported in Table 3. As expected, emotional stability, extraversion, and income had positive effects on all SWB components (including reverse-scored depressed mood). Recent work-related life events, however, had no significant effects on any of the components. How do these effects differ as a function of the time frame? For each component, only one significant interaction was detected, respectively. The effect of extraversion on life satisfaction tends to be stronger for life satisfaction overall than for life satisfaction today or in the last 2 months. Similarly, the effect of extraversion on positive affectivity tends to be stronger for positive affectivity in the past 2 months than for positive affectivity today. Finally, the effect of emotional stability on (reverse-coded) depressed mood tends to be stronger for depressed mood in the last 2 months than for depressed mood today. Hence, these interactions are consistent with the hypothesis that the effect of chronically accessible sources such as personality is stronger for longer time frames. Overall, however, the time frame does not seem to systematically affect the effects of most predictors on SWB, as most interaction effects were non-significant.

2.3. Discussion

In Study 1, we examined whether the empirical differences between AWB and CWB are driven by the time frames or by structural differences using two different approaches. First, we conducted an MTMM analysis where we examined the convergence of measures of life satisfaction, positive affectivity, and depressed mood across different time frames. Second, we examined whether the time frames moderated the associations between SWB and other variables.

The results of the MTMM analysis provide partial support for both of our experimental hypotheses. On the one hand, using the same time frames for different measures increased the convergence between life satisfaction and positive affectivity, which supports the importance of the time frames for these two variables. However, even when the same time frames were used, the measures remained empirically distinct. As an example, take the highest heterotrait-monomethod correlation we observed, which is the correlation between life satisfaction today and positive affectivity today. This correlation was $r = .63$, meaning that these measures share 39.7% of the total variance. Although this is clearly a strong effect, this figure also illustrates that the differences between life satisfaction and positive affectivity do not disappear completely if the same time frame is used.

On the other hand, using the same time frame did not increase the convergence between depressed mood and positive affectivity and life satisfaction, respectively. Rather, almost all correlations between depressed mood and other components (except life satisfaction overall) were highest for depressed mood today, regardless of the time frame for the other component. SWB ratings can be affected by current mood (for a review, see Schwarz & Strack, 1999), although subsequent authors have pointed out that this effect is not strong (Eid & Diener, 2004). Interpreted in this context, our findings suggest that ratings of SWB in a specific time frame might be influenced by momentary feelings of loneliness and sadness. The fact that this effect was only found for negative affective states (i.e., depressed mood), but not for positive affective states (i.e., positive affectivity), can be explained with their divergent motivational functions. Positive states should promote the status quo whereas negative states should promote changes. A person who is in a negative state is therefore more likely to focus on those aspects in life that are not optimal and should be changed. This negative focus is likely to influence ratings of other components of SWB. This reasoning is also consistent with the notion of the negativity bias (e.g., Cacioppo, Gardner, & Berntson, 1997) according to which the negative (e.g., momentary depressed mood) has more enduring and stronger effects than the positive (e.g., habitually high positive affectivity).

In sum, the MTMM analysis indicated that the use of different time frames might lead to an overestimation of the differences between CWB and at least the positive component of AWB. To determine the extent to which this overestimation may affect the associations between SWB and other variables, we examined whether the time frame moderates the associations between SWB and some of its most common correlates. The few significant interactions indicate that time frames do not systematically affect the associations between these correlates and SWB; but when they do, the effects of these correlates tend to be stronger for longer time frames.

3. Study 2

We conducted an online experiment to replicate the main findings of Study 1 and to address two of its limitations. First, we used a completely balanced design, meaning that both AWB and CWB were assessed with all four time frames (overall, last 2 months, last week, today). Second, we assessed the sources of SWB ratings directly to examine whether the frequency of global versus specific sources differs between different time frames and between AWB and CWB ratings. In addition, we extended Schimmack et al.'s (2002) hypothesis that CWB judgments are mainly based on stable and variable chronically accessible sources of information. We expected that global (stable) sources are more likely to be accessed when making CWB ratings, and specific events and activities (variable sources) are more likely to be accessed when making AWB ratings. Specifically, we tested the extent to which the differences in the information participants reportedly considered when making their ratings are a function of the component of SWB that is being gauged, and the extent to which they are a function of the specified time frame. These are not mutually exclusive hypotheses, of course. Based on prior research (Diener, 1994; Schimmack et al., 2002), we hypothesized that the relevance of stable SWB sources referring to general life circumstances increases with increasing time frames, and the relevance of variable sources referring to specific events and activities decreases with increasing time frames for both AWB and CWB. In addition, based on the results of Study 1 showing that AWB and CWB are structurally different, we hypothesized that global sources of information are more likely to be considered when making judgments of CWB than AWB, whereas specific sources of information are more likely to be considered when making judgments of AWB than CWB.

3.1. Method

3.1.1. Sample—Participants were recruited through Amazon Mechanical Turk (MTurk). Upon agreeing to participate in the study, they were linked to an external online survey. After completing the survey, participants received a code that they could then use in MTurk to receive their compensation of US$ 1.00. The online survey was available over a period of two days (Saturday and Sunday). A total of 417 persons participated. One person did not consent to participate, and another person was excluded due to random data patterns.[6] Thus, the final sample size was $N = 415$ (63.9% female). The average age of the participants was 34.99 years ($SD = 12.54$, range from 18 to 79). The sample was predominantly composed of non-Hispanic Whites ($N = 318$, 76.6%; other ethnicities: Black/African American 5.3%, Hispanic 8.4%, Asian or Pacific Islander 6.7%, Other or Mixed 2.9%). Finally, 242 participants (58.3%) had received at least some college education.

3.1.2. Design—The study was advertised as a survey about personality and happiness. The online survey started with general information about the study's background. After giving

[6]Specifically, a number of indicators led to the decision to exclude this person: First, this person had inconsistent data on his or her level of education; reporting that he or she had completed four years of school but still had a college degree. Second, this person's reported year of birth was 1891. Finally, the survey was completed in less than four minutes whereas the average time of completion was 10 min.

informed consent, the participants completed a battery of questionnaires assessing variables such as extraversion and emotional stability. Next, they were randomly assigned to one of four time frames: *overall*, *last 2 months*, *last week*, or *today*. All participants completed CWB as well as AWB measures; however, the order was balanced within each group. After completing the first SWB scale, the participants were asked to note the things or events they had in mind when they answered the previous questions. Then, they completed the second SWB scale. The survey concluded with questions on recent life events and demographic characteristics (sex, age, ethnicity, income, education). After finishing the survey, the participants received an automatically generated code which they could then submit through MTurk to request their financial compensation.

3.1.3. Measures—Life satisfaction, positive affectivity, and depressed mood were assessed with the same items as in Study 1. The response format was consistent for all SWB components, ranging from 1 (*not at all*) to 5 (*very much*). Similarly to Study 1, depressed mood was reverse-scored such that higher scores reflected more positive well-being. To keep the survey economic, emotional stability and extraversion were assessed with the respective two-item subscales of the Big Five Inventory-Short Version (BFI-S; Rammstedt & John, 2007). The response format ranged from 1 (*disagree strongly*) to 7 (*agree strongly*). For life events and income, the same items as in Study 1 were used. Descriptive statistics for all variables are reported in Table S3 in the supplemental material.

3.1.4. Data analysis—To examine whether the time frame over which SWB is gauged affects the associations between SWB and its correlates, we analyzed a series of mixed models with SWB as an outcome (higher scores reflecting higher well-being) and three central predictors: time frame (dummy coded with *today* as reference category), component (dummy coded with *life satisfaction* as reference category and positive affectivity and depressed mood as dummy variables), and the respective correlate. The time frame and the correlate were between-subject variables whereas the SWB component was a within-subject variable. Model 1 contained only the main effects. In Models 2–4, we added the two-way interaction terms for time frame and component (Model 2), time frame and correlate (Model 3, see Study 1), and component and correlate (Model 4). Finally, we added the three-way interaction between these variables in Model 5. We conducted χ^2-based deviance tests to compare the relative fit of these models. For each correlate, we only report the results of the best-fitting model, that is, the model that is most parsimonious and yet includes all significant main or interaction effects. Similarly to Study 1, each correlate was examined in a separate series of models.

The sources of information were categorized as specific events and activities (e.g., “spent time with my kids”) versus global life domains (e.g., “my children”). For each participant, we calculated the proportion of global responses in this person’s total number of responses. This variable was analyzed with a 4 (time frame) × 2 (AWB vs. CWB) ANOVA.

3.2. Results

3.2.1. Associations between SWB components—Within each condition, we calculated the correlations between life satisfaction, depressed mood, and positive affectivity (Table 4). Moderated regression analyses indicated that the time frame did not interact with the component, meaning that the slopes did not differ significantly across the four time frame conditions.[7]

[7]The F values for the interaction effects were $F(3, 407) = 0.35$, $p = .792$ for life satisfaction and positive affectivity, $F(3, 407) = 1.36$, $p = .256$ for life satisfaction and depressed mood, and $F(3, 407) = 1.15$, $p = .329$ for positive affectivity and depressed mood. These effects did not change substantively after controlling for block order, sex, and age.

3.2.2. Correlates of SWB—For each correlate, we first compared the model fit (i.e., deviance) of the five hierarchical models to identify the model that is sufficiently explanatory and simultaneously as parsimonious as possible (see Table S4 in the supplemental material). The coefficients for these final models are reported in Table 5. Extraversion and income were both positively related to SWB, regardless of the SWB component or the specific time frame. Emotional stability was also positively related to SWB; however, this relation was stronger for depressed mood than for life satisfaction or positive affectivity. Moreover, the interaction between emotional stability and the overall time frame was positive and marginally significant ($p = .054$), indicating that emotional stability plays a greater role in SWB ratings when no specific time frame is provided. Work-related events were associated with decreased SWB. This effect was particularly strong for life satisfaction and depressed mood and significantly weaker for positive affectivity. Moreover, the effect of work-related events on SWB was weaker for SWB if no specific time frame was provided.

3.2.3. Specific versus global sources—Consistent with our experimental hypothesis, the proportion of global sources was significantly higher among participants who rated their CWB ($M = 0.62$, $SD = 0.42$) than among participants who rated their AWB ($M = 0.36$, $SD = 0.39$), $F(1, 406) = 37.59$, $p < .001$. The proportion of global sources also differed across the four time frames, $F(3, 406) = 7.33$, $p < .001$. Specifically, the proportion of global sources was higher when no specific time frame was provided ($M = 0.64$, $SD = 0.41$) than when the participants were instructed to consider the last 2 months ($M = 0.49$, $SD = 0.41$), the last week ($M = 0.39$, $SD = 0.43$), or today ($M = 0.45$, $SD = 0.43$). Importantly, the interaction between the time frame and the component was not significant, $F(3, 406) = 0.39$, $p = .761$.

3.2.4. Ancillary analyses—A common limitation of both studies is that very short scales were used to assess the three components of SWB. The correlations between these short scales and personality, income, and life events might differ from the correlations we would observe if the longer versions of these scales were used. We therefore replicated the moderation analyses with longer and more common versions of the scales: the full SWLS (Diener et al., 1985) for life satisfaction and the respective subscales of the PANAS for positive and negative affect (Watson et al., 1988). Using these longer scales did not affect the findings for income and work-related events. For emotional stability, the interaction between depressed mood and emotional stability was no longer significant, $b = 0.04$, $SE = 0.03$, $p = .233$. For extraversion, the final model now included the interactions of extraversion with the time frame and with the component, respectively. Specifically, the effect of extraversion on SWB was stronger for SWB overall than for the other time frames, $b = 0.12$, $SE = 0.06$, $p = .042$. Moreover, the effect of extraversion on SWB was significantly weaker if the negative affect subscale of the PANAS was examined, $b = -0.11$, $SE = 0.03$, $p < .001$. The full model results are available from the first author. Overall, these ancillary analyses show that similar results are obtained if the most common SWB scales are used.

3.3. Discussion

The moderator analysis indicated that the time frames had relatively weak effects on the relations between SWB and the four correlates. Significant interaction effects were only found for emotional stability and work-related events; in both cases, the association with SWB overall was different from the associations with the other three time frames. This finding suggests that providing a specific time frame influences what kinds of heuristics are used in SWB judgments. This hypothesis was further supported in our analyses of the sources of SWB judgments. Global sources were more frequently reported if no specific time frame was provided than for any of the three specific time frames. This analysis also

revealed important differences between AWB and CWB. Across all time frames, global sources were more frequently used for CWB judgments than for AWB judgments. Thus, the results of Study 2 suggest that, although the time frame might influence the nature of the sources that are accessed when making SWB judgments, this does not fully account for the conceptual differences between AWB and CWB. Instead, these differences seem to have a structural basis that is reflected in the use of different sources for AWB and CWB judgments.

4. General discussion

A number of recent studies have found that AWB and CWB are differentially affected by and related to personality (Schimmack et al., 2008), life events (Luhmann et al., 2012), and health and longevity (Diener & Chan, 2011; Wiest et al., 2011). In the present paper, we contrasted two alternative explanations for these effects. The first explanation assumed that the empirical differences are driven by the use of different time frames for measures of AWB and CWB. The second explanation postulated more structural differences between these constructs. Overall, the main findings of the two studies reported in this paper favor the second explanation over the first: (1) The MTMM analysis in Study 1 indicated that measures of life satisfaction, positive affectivity, and depressed mood are empirically distinct even if the same time frame is used. (2) With a few exceptions, the associations between SWB and important correlates such as personality and life circumstances did not differ across different time frames in both studies. (3) Study 2 indicated that the differences between AWB and CWB might be driven by the use of different sources. Specifically, global sources were more frequently reported for CWB judgments, and specific activities and events were more frequently reported for AWB judgments, across all time frames examined in this study. In the remainder of this section, we discuss the implications of these findings for the measurement of and structural differences between AWB and CWB, and conclude with limitations of our studies and directions for future research.

4.1. Measurement of AWB and CWB

In many existing data sets, AWB is gauged over a specific time frame whereas CWB is assessed more globally. Can these data sets be used to study the empirical differences between AWB and CWB? The MTMM analysis suggests that the empirical distinction between AWB and CWB tends to be overestimated if different time frames are used, but it holds even when the same time frame is employed. We therefore conclude that analyzing the differences between AWB and CWB with these kinds of data does not necessarily lead to invalid conclusions. However, Study 2 has also shown that the time frame has an independent effect on the information sources people report when gauging their SWB. Specifically, global sources were more frequently reported when no time frame was provided. For this reason, we strongly recommend that researchers equate the time frame across all measures of SWB to ensure that the empirical differences between these components reflect structural differences rather than the influence of different time frames on the information that is cognitively activated.

4.2. Structural differences between AWB and CWB

Our findings support the notion of structural differences between AWB and CWB. More specifically, some of our findings suggest that these structural differences may reflect different sources of AWB and CWB. Assuming that the self-reported sources of CWB and AWB in Study 2 are similar to the actual sources of CWB and AWB (an assumption that should be tested in future studies), CWB can be conceptualized as people's subjective evaluation of their global life circumstances whereas AWB can be conceptualized as people's subjective evaluation of recent activities and events. Activities and events are more

transient than the global life circumstances, which may explain why some studies (though not ours) found that CWB and AWB differ in their temporal stability (Eid & Diener, 2004; Luhmann et al., 2011) and in their sensitivity towards major life events (Luhmann et al., 2012). Major life events are of particular interest because they represent both a specific event and a long-term change in global life circumstances. The occurrence of major life events should therefore have immediate effects on both AWB and CWB. CWB should also be affected in the long term to the extent that the event changes a global life circumstance. The effects of the event on AWB, however, should wear off over time as more recent events and activities become more salient. Indeed, exactly these patterns were found in the meta-analysis on life events and SWB (Luhmann et al., 2012).

Our proposed conceptualization of AWB and CWB also has implications for the evaluation of interventions aimed at increasing SWB. Individual-level interventions often try to change people's behaviors and activities (Lyubomirsky, 2007) and should therefore be more likely to affect AWB. Public-policy interventions, in contrast, are often tailored to change people's life circumstances, for instance by increasing job opportunities and decreasing unemployment rates (Diener, Lucas, Schimmack, & Helliwell, 2009). These kinds of interventions should be more likely to affect CWB.

4.3. Limitations and future research

The main limitations of these two studies concern the generalizability of the results to other measures of SWB, other correlates, other time frames, and other populations. All SWB components were assessed with two-item measures. These short measures are not only limited in terms of reliability but also in terms of validity as they might not represent the full breadth of the constructs they are supposed to measure. For instance, depressed mood was measured with the items *sad* and *lonely*. It is unclear whether the effects of time frames differ for other negative emotions. The same may be true for the measures of positive affectivity and life satisfaction. In Study 2, we therefore conducted ancillary analyses where we replicated the moderated regression analyses with longer and more common SWB scales. The results of these analyses were similar to the ones obtained with the two-item measures.

A second limitation of our study concerns the selection of correlates. SWB is associated with many different variables that can broadly be classified as dispositional variables or as circumstantial/situational variables. In the present study, we selected two variables from each group. Our study has shown that the use of different time frames for CWB and AWB does not account for their differential associations with extraversion, emotional stability, income, and negative work-related events, but we do not know whether this finding generalizes to other correlates. Researchers interested in the differences between CWB and AWB should therefore use the same time frame for all SWB measures.

Furthermore, we restricted our analyses to four different time frames, three specific ones (today, last week, last 2 months) and one unspecified (overall). Although these time frames are representative of the ones typically used in SWB measures, we cannot conclude with certainty whether our findings generalize to other time frames. This raises some interesting questions for future studies. For instance, how are AWB and CWB related and which sources do people use if the time frame is "right now", as it is the case in many experience sampling studies? And at the other end of the time spectrum, do people always use more global sources when no time frame is specified than when a specific time frame is provided, even if this time frame is very long (e.g., several years)?

One strength of the two studies is that the samples are heterogeneous in terms of age, gender, and socio-economic status. Additional analyses where age and gender were controlled did not lead to different conclusions, indicating that the effects reported here

might generalize to a large population. We do not know, however, whether these effects can also be replicated in other countries. Given the cultural differences in SWB (e.g., Oishi, Diener, Choi, Kim-Prieto, & Choi, 2007; Oishi, Diener, Lucas, & Suh, 1999), it is possible that the effects of time frames on the self-reported sources of SWB and the SWB measures themselves may be different in other cultures.

In conclusion, the present paper contrasted two alternative explanations for the empirical differences between AWB and CWB. Our data suggest that the explanation according to which these differences are due to the use of different time frames in the measurement of AWB and CWB must be rejected. Instead, we found initial evidence for the nature of the structural differences between AWB and CWB.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Appendix A. Supplementary material

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.jrp.2012.04.004.

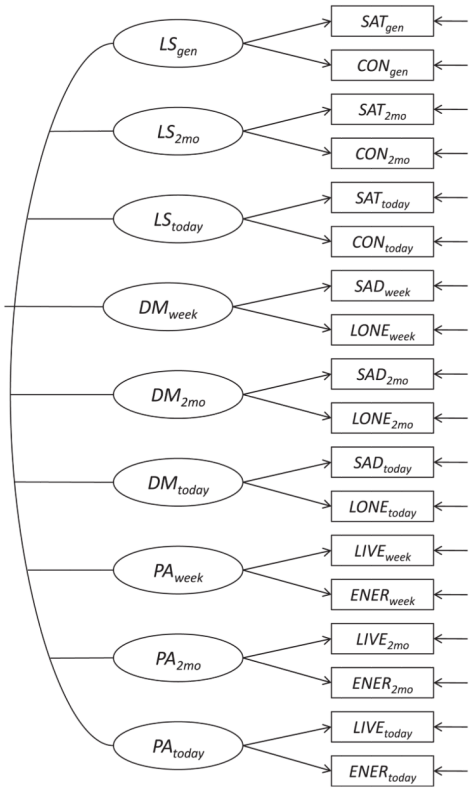

Fig. 1.

Structural equation model for the MTMM analysis. Each latent factor represents one method-trait unit. All bivariate correlations between the latent factors are estimated. *LS* = life satisfaction, *DM* = depressed mood, *PA* = positive affectivity, *2mo* = last 2 months, *gen* = general/overall, *week* = last week, *SAT* = satisfied, *CON* = content, *SAD* = sad, *LONE* = lonely, *LIVE* = lively, *ENER* = energetic.

Table 1

Latent multitrait-multimethod correlations (Study 1).

Trait-method unit	LS overall	LS 2 months	LS today	DM 2 months	DM last week	DM today	PA 2 months	PA last week	PA today
LS overall	–								
LS 2 months	**.64**	–							
LS today	**.63**	**.75**	–						
DM 2 months	.52	*.46*	.45	–					
DM last week	.43	.30	.37	**.89**	–				
DM today	.25	.47	*.43*	**.68**	**.64**	–			
PA 2 months	.35	*.63*	.39	*.31*	.20	.37	–		
PA last week	.30	.57	.38	.26	*.22*	.33	**.82**	–	
PA today	.33	.46	*.59*	.47	.37	*.35*	**.62**	**.51**	–

Notes. $p < .05$ for all correlation coefficients. *LS* = life satisfaction, *DM* = reversed-scored depressed mood, *PA* = Positive affectivity. Bold values are monotrait-heteromethod correlations. Italic and underlined values are heterotrait-monomethod correlations. All other values are heterotrait-heteromethod correlations.

Table 2

Autoregressive effects of SWB across different SWB components (Model 1) and different time frames (Models 2–4) in Study 1.

Predictor	Model 1: All SWB components				Model 2: Positive affectivity				Model 3: Depressed mood (reversed)				Model 4: Life satisfaction			
	b	*SE*	*t*	*p*	*b*	*SE*	*t*	*p*	*b*	*SE*	*t*	*p*	*b*	*SE*	*t*	*p*
(Intercept)	4.28	0.05	84.21	<.001	3.40	0.07	52.20	<.001	4.65	0.05	99.96	<.001	3.63	0.06	57.18	<.001
Lagged SWB	0.39	0.04	9.60	<.001	0.39	0.06	6.64	<.001	0.30	0.05	5.61	<.001	0.36	0.06	6.39	<.001
LS	−0.51	0.05	−9.98	<.001												
PA	−0.68	0.05	−12.74	<.001												
Lagged SWB × LS	0.00	0.05	0.03	.977												
Lagged SWB × PA	0.07	0.05	1.38	.168												
TF: General													0.05	0.06	0.81	.418
TF: Last 2 months					0.03	0.08	0.38	.707	−0.20	0.05	−3.89	<.001	0.06	0.06	0.98	.328
TF: Last week					−0.16	0.08	−2.06	.040	−0.03	0.05	−0.61	.542				
Lagged SWB × TF: General													−0.01	0.07	−0.15	.881
Lagged SWB × TF: last 2 months					0.16	0.08	2.03	.042	0.16	0.07	2.39	.017	−0.10	0.07	−1.55	.122
Lagged SWB × TF: last week					0.01	0.08	0.07	.943	0.07	0.07	1.00	.319				

Notes. TF = time frame, *LS* = life satisfaction, *PA* = positive affectivity. For all outcomes, the reference time frame is “today”. In Model 1, LS and PA were dummy coded and depressed mood is the reference category. Depressed mood was reversed such that higher scores reflect less depressed mood and higher SWB. Lagged SWB was mean-centered.

Table 3

Moderating effects of the time frame on the relation between SWB and emotional stability, extraversion, income, and work-related life events (Study 1).

Predictor	Life satisfaction				Positive affectivity				Depressed mood (reversed)			
	b	*SE*	*t*	*p*	*b*	*SE*	*t*	*p*	*b*	*SE*	*t*	*p*
Emotional stability												
(Intercept)	3.63	0.06	63.65	<.001	3.44	0.06	58.95	<.001	4.66	0.05	92.79	<.001
Emotional stability	0.17	0.03	5.32	<.001	0.14	0.03	3.94	<.001	0.13	0.03	4.67	<.001
TF: General	0.08	0.03	2.49	.013								
TF: last 2 months	0.03	0.03	0.83	.405	0.04	0.04	1.16	.245	−0.38	0.03	−13.20	<.001
TF: Last week					−0.24	0.04	−6.79	<.001	−0.04	0.03	−1.47	.142
Emotional stability × TF: General	−0.05	0.03	−1.39	.165								
Emotional stability × TF: last 2 months	0.00	0.03	−0.09	.929	0.04	0.04	1.06	.288	0.09	0.03	2.98	.003
Emotional stability × TF: last week					0.05	0.04	1.44	.151	0.03	0.03	1.01	.312
Extraversion												
(Intercept)	3.63	0.06	63.37	<.001	3.43	0.05	64.40	<.001	4.66	0.05	98.41	<.001
Extraversion	0.24	0.04	6.56	<.001	0.28	0.04	7.34	<.001	0.06	0.03	2.00	.046
TF: General	0.08	0.03	2.50	.013								
TF: last 2 months	0.03	0.03	0.80	.424	0.04	0.04	1.23	.220	−0.38	0.03	−12.98	<.001
TF: Last week					−0.23	0.04	−6.58	<.001	−0.04	0.03	−1.39	.166
Extraversion × TF: General	−0.09	0.03	−2.52	.012								
Extraversion × TF: last 2 months	0.00	0.03	−0.07	.942	0.08	0.04	2.23	.026	0.05	0.03	1.86	.063
Extraversion × TF: last week					0.05	0.04	1.53	.127	0.02	0.03	0.71	.475
Income												
(Intercept)	3.62	0.10	36.85	<.001	3.43	0.07	46.28	<.001	4.67	0.05	88.16	<.001
Income	0.13	0.05	2.55	.011	0.20	0.05	3.83	<.001	0.11	0.04	2.76	.006
TF: General	0.05	0.05	1.11	.266								
TF: last 2 months	0.00	0.05	−0.02	.982	0.00	0.05	0.01	.992	−0.32	0.04	−8.41	<.001
TF: Last week					−0.26	0.05	−5.35	<.001	−0.02	0.04	−0.54	.586
Income × TF: General	0.03	0.05	0.60	.549								
Income × TF: last 2 months	0.04	0.05	0.88	.378	0.08	0.05	1.52	.129	0.02	0.04	0.44	.657
Income × TF: last week					0.06	0.05	1.23	.219	0.00	0.04	−0.13	.899
Work-related events												

Predictor	Life satisfaction				Positive affectivity				Depressed mood (reversed)			
	b	*SE*	*t*	*p*	*b*	*SE*	*t*	*p*	*b*	*SE*	*t*	*p*
(Intercept)	3.65	0.06	57.08	<.001	3.45	0.07	51.40	<.001	4.65	0.05	96.94	<.001
Work-related events	−0.10	0.07	−1.45	.147	−0.06	0.07	−0.87	.382	0.08	0.06	1.37	.171
TF: General	0.08	0.04	2.15	.031								
TF: last 2 months	0.02	0.04	0.51	.613	0.03	0.04	0.69	.492	−0.37	0.03	−11.27	<.001
TF: Last week					−0.25	0.04	−6.34	<.001	−0.04	0.03	−1.11	.266
Work-related events × TF: General	−0.03	0.08	−0.41	.680								
Work-related events × TF: last 2 months	0.03	0.08	0.35	.724	0.05	0.09	0.62	.535	−0.08	0.07	−1.08	.279
Work-related events × TF: last week					0.07	0.09	0.78	.435	−0.03	0.07	−0.49	.625

Notes. TF = time frame. For all outcomes, the reference time frame is “today”. Depressed mood was reversed such that higher scores reflect less depressed mood and higher SWB. Continuous predictors were mean-centered.

Table 4

Correlations between SWB components as a function of the time frame (Study 2).

Time frame	LS with PA	LS with DM	PA with DM
Today	.46	.55	.31
Last week	.49	.62	.50
Last 2 months	.42	.69	.30
Overall	.54	.60	.44

Notes. LS = life satisfaction, *PA* = positive affectivity, *DM* = depressed mood. $p < .01$ for all coefficients. Sample sizes were $n = 104$ for the "Today", "Last week", and "Last 2 months" conditions and $n = 103$ for the "Overall" condition.

Table 5

Moderating effects of the temporal instruction on the relation between SWB and emotional stability, extraversion, income, and work-related life events (Study 2).

Variables	*b*	*SE*	*t*	*p*
Extraversion				
(Intercept)	3.04	0.11	26.47	<.001
TF: Last 2 months	0.01	0.16	0.05	.960
TF: Last week	−0.03	0.16	−0.19	.847
TF: Overall	0.15	0.16	0.95	.344
DM	0.74	0.12	6.22	<.001
PA	−0.20	0.12	−1.70	.090
Extraversion	0.12	0.06	1.97	.049
TF: Last 2 months × DM	−0.50	0.17	−2.95	.003
TF: Last week × DM	−0.13	0.17	−0.79	.429
TF: Overall × DM	0.00	0.17	0.03	.978
TF: Last 2 months × PA	0.47	0.17	2.81	.005
TF: Last week × PA	0.33	0.17	1.97	.049
TF: Overall × PA	−0.16	0.17	−0.93	.353
Emotional stability				
(Intercept)	3.07	0.11	27.85	<.001
TF: Last 2 months	−0.02	0.16	−0.13	.897
TF: Last week	−0.05	0.16	−0.31	.755
TF: Overall	0.06	0.16	0.38	.706
DM	0.78	0.12	6.56	<.001
PA	−0.20	0.12	−1.67	.095
Emotional stability	0.23	0.06	3.55	<.001
TF: Last 2 months × DM	−0.52	0.17	−3.09	.002
TF: Last week × DM	−0.19	0.17	−1.11	.267
TF: Overall × DM	−0.08	0.17	−0.47	.640
TF: Last 2 months × PA	0.47	0.17	2.81	.005
TF: Last week × PA	0.33	0.17	1.95	.052
TF: Overall × PA	−0.17	0.17	−0.97	.332
TF: Last 2 months × Emotional stability	−0.01	0.08	−0.08	.939
TF: Last week × Emotional stability	0.05	0.09	0.52	.600
TF: Overall × Emotional stability	0.16	0.08	1.93	.054
Emotional stability × DM	0.14	0.04	3.27	.001
Emotional stability × PA	0.01	0.04	0.29	.771
Income				
(Intercept)	3.02	0.12	25.77	<.001
TF: Last 2 months	0.00	0.17	0.00	.997
TF: Last week	0.01	0.17	0.05	.963
TF: Overall	0.24	0.17	1.42	.156

Variables	*b*	*SE*	*t*	*p*
DM	0.74	0.12	6.22	<.001
PA	−0.20	0.12	−1.70	.090
Income	0.06	0.02	3.51	.001
TF: Last 2 months × DM	−0.50	0.17	−2.95	.003
TF: Last week × DM	−0.13	0.17	−0.79	.429
TF: Overall × DM	0.00	0.17	0.03	.978
TF: Last 2 months × PA	0.47	0.17	2.81	.005
TF: Last week × PA	0.33	0.17	1.97	.049
TF: Overall × PA	−0.16	0.17	−0.93	.353
Work-related events				
(Intercept)	3.03	0.12	26.21	<.001
TF: Last 2 months	−0.03	0.16	−0.18	.854
TF: Last week	0.01	0.16	0.06	.953
TF: Overall	0.22	0.17	1.36	.175
DM	0.74	0.12	6.25	<.001
PA	−0.21	0.12	−1.77	.076
Work-related events	−0.49	0.12	−4.03	<.001
TF: Last 2 months × DM	−0.50	0.17	−2.98	.003
TF: Last week × DM	−0.14	0.17	−0.81	.418
TF: Overall × DM	0.00	0.17	0.02	.987
TF: Last 2 months × PA	0.49	0.17	2.91	.004
TF: Last week × PA	0.34	0.17	2.05	.041
TF: Overall × PA	−0.15	0.17	−0.89	.375
TF: Last 2 months × Work-related events	0.11	0.18	0.62	.533
TF: Last week × Work-related events	0.09	0.16	0.58	.562
TF: Overall × Work-related events	0.32	0.16	1.96	.050
Work-related events × DM	−0.04	0.08	−0.50	.617
Work-related events × PA	0.16	0.08	2.02	.043

Notes. All continuous predictors were centered on the grand mean. *LS* = life satisfaction, *PA* = positive affectivity, *DM* = depressed mood, *TF* = time frame.