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Positive Affect, Meaning in Life, and Future Time Perspective: An Application of Socioemotional Selectivity Theory

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Four studies tested the prediction that positive affect (PA) would relate more strongly to meaning in life (MIL) as a function of perceived time limitations. In Study 1 ($N = 360$), adults completed measures of PA and MIL. As predicted, PA related more strongly to MIL for older, compared to younger, participants. In Studies 2 and 3, adults ($N = 514$) indicated their current position in their life span, and rated their MIL. PA, whether naturally occurring (Study 2) or induced (Study 3), was a stronger predictor of MIL for individuals who perceived themselves as having a limited amount of time left to live. Finally, in Study 4 ($N = 98$) students completed a measure of PA, MIL, and future time perspective (FTP). Results showed that PA was more strongly linked to MIL for those who believed they had fewer opportunities left to pursue their goals. Overall, these findings suggest that the experience of PA becomes increasingly associated with the experience of MIL as the perception of future time becomes limited. The contribution of age related processes to judgments of well-being are discussed.

Keywords: meaning in life, positive affect, future time perspective

Meaning in life (MIL) is typically defined as having a strong sense of purpose, pursuing personally valued goals, or possessing a clear system of values that guide one's behavior (e.g., Crumbaugh & Maholick, 1964; Krause, 2007). Empirical evidence demonstrates that the experience of MIL is strongly related to psychological well-being, both concurrently and longitudinally (see Steger, 2010, for a review), as well as to quality of life and health, especially with age (e.g., Krause, 2007; Krause & Shaw, 2003). Recent evidence attests to the very strong relationship between the experience of positive affect (PA) and MIL (e.g., Hicks & King, 2007, 2008; King, Hicks, Krull, & Del Gaiso, 2006). Drawing on socioemotional selectivity theory (SST; e.g., Carstensen, 2006; Carstensen, Fung, & Charles, 2003; Carstensen, Isaacowitz, & Charles, 1999), in the present studies we test the prediction that PA and MIL become increasingly intertwined with the perception of limited time. Before presenting the studies, we briefly review research on the relationship between PA and MIL, SST, and the rationale behind our prediction.

PA and MIL

Typically, PA and MIL have been separated in the scientific conversation about human functioning (King & Hicks, in press).

Drawing on Aristotle's (trans. 1998) distinction between hedonism and eudaemonia, the well-being literature is often divided into two camps, hedonic and eudaemonic well-being (Keyes, Shmotkin, & Ryff, 2002; Ryan & Deci, 2001; Steger, Kashdan, & Oishi, 2008; Waterman, 2007). Hedonic well-being is defined as the experience of PA relative to negative affect (NA), in combination with a cognitive judgment of satisfaction with life (Diener, Suh, Lucas, & Smith, 1999). In contrast, *eudaemonic well-being* is typically defined as actualizing one's potential, living a life of meaning, or dedication to intrinsic values and virtue (Ryan & Deci, 2001). Theoretical conceptions of eudaemonia acknowledge that meaningful pursuits are associated with positive hedonic feelings, but these pleasant feelings are viewed as a consequence or byproduct of eudaemonic activity, not an end in themselves (Ryan & Deci, 2001). Thus, PA and MIL arguably represent prototypes of these two sides of well-being.

Nevertheless, research has uncovered substantial correlations between these variables in both college and community adult samples (King et al., 2006). Moreover, experimentally induced PA leads to heightened MIL (Hicks & King, 2008, 2009; King et al., 2006). In addition, priming college students and community adults with threats to meaning enhances the relationship between PA and MIL (Hicks, Schlegel, & King, 2010). From perspectives on psychological well-being, the strong relationship between PA and MIL might be viewed as a challenge to the distinction between hedonics and eudaemonia (Biswas-Diener, Kashdan, & King, 2009; Kashdan, Biswas-Diener, & King, 2008; King & Hicks, in press). However, from the perspective of SST, as we shall see, this relationship can be viewed as not only expected but likely to increase with perceptions of limited time.

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SST

As a life span theory of motivation, SST ties the selection and pursuit of goals to the individual's perception of time (Carstensen, 2006). From this perspective, selections of goals, activities, and preferences are intricately tied to the person's subjective time horizon. The theory asserts that with the perception of limited time come changing priorities. For younger adults, optimizing the future is the focus, whereas for older adults, focus shifts to the maximization of meaningful activities in the present (Charles & Carstensen, 2010). More important, these patterns are thought to reflect not age, *per se*, but rather the perception of limited time. As the person's time horizon shrinks, fulfillment emerges not out of long-term goal pursuits but the regulation of affect in the present (Carstensen, 2006; Fung & Carstensen, 2004; Löckenhoff & Carstensen, 2004). In this investigation, we tested what is, perhaps, the most obvious prediction emerging from this theory: With the perception that time is limited, the experience of PA should become increasingly associated with the experience of MIL. If the regulation of affect becomes a central goal of life when time is perceived as constrained, then it makes sense that success at this goal would feed into subjective judgments of the experience of MIL. That is, because mood regulation is the forum for meaningful activity (e.g., Csikszentmihalyi, 1990), PA should be increasingly related to MIL with the perception of time limitations. In a sense, SST suggests that the meaning of PA itself may change depending on one's time perspective. Perspectives on self-regulation generally view mood as feedback that informs individuals on their progress in valued life domains (Carver & Scheier, 1990). In the context of the variety of goals that those with relatively unlimited time are likely pursuing, PA may not always indicate that life, itself, is meaningful. However, for those who perceive time as limited, the experience of PA may less unambiguously suggest progress on the central preoccupation of life. Thus, we predicted the PA and MIL will be more strongly related when time is perceived as limited.

PA, Affect Regulation, and Future Time Perspective

In the present studies we focus primarily on PA as a definitive feature of affect regulation. This focus is justified, to some extent, by research showing the regulation of PA is particularly distinctive of age-related differences in affect regulation. Research has demonstrated, for instance, that older adults differ from adolescents and younger adults in terms of their efforts to maintain (but not necessarily enhance) PA in daily life (Riediger, Schmiedek, Wagner, & Lindenberger, 2009). This motivation to maintain (but not enhance) PA is also in keeping with our focus on measures of what might be called garden variety positive mood. These measures include items such as "happy" and "pleased," and were selected with the intention of tapping into everyday positive mood. Although the relationship between PA and age is somewhat controversial (Kessler & Staudinger, 2009), some research has shown that high arousal affect is most likely to decrease with age (Pinquart, 2001; Stacey, & Gatz, 1991), whereas general happiness, increases with age (Gross et al., 1997; Kessler & Staudinger, 2009; Mroczek & Kolarz, 1998; Mroczek & Spiro, 2005; Reidiger & Freund, 2008; see Charles, 2010, for a review). More important, from the perspective of SST, the perception of limited time, rather

than age *per se*, is thought to underlie these motivational changes. Although the subjective sense of time is associated with age, this perception, of course, can also be extremely malleable (Carstensen, 2006). Therefore, Studies 2 to 4 specifically focus on the contribution of perceived time limitations to the relationship PA and MIL.

Overview of the Present Studies

In the four studies, we tested the prediction that when time is perceived as limited, PA becomes increasingly associated with MIL. As an initial test of our ideas, Study 1 examined the proposed moderating role of age on the relationship between PA and MIL. In Studies 2 and 3, we directly assessed perceived time limitations by having participants complete a life expectancy rating. Finally, in Study 4, we assessed time perception, using the Future Time Perspective scale (FTP; Carstensen & Lang, 1996). Overall, we predicted that the perception of limited time (either assessed by making age salient, perceived life expectancy, or FTP) would strengthen the relationship between one's positive feelings and the subjective experience of meaningfulness in one's life.

In Study 1 we examined whether age influences the relationship between PA and MIL. In addition to measures of PA and MIL, Study 1 included measures of negative affect (NA) as well as the self-determination theory (SDT; Ryan & Deci, 2001) needs. SDT describes three universal organismic needs (competence, autonomy, and relatedness), the satisfaction of which is thought to be central to well-being. SDT considers PA to be a byproduct of need satisfaction, but not a meaningful experience in and of itself (Ryan & Deci, 2001). In Study 1, we predicted PA would interact with age to predict MIL even controlling for these motivational variables.

Study 1

Method

Participants. The participants were 285 University of Missouri employees (221 women) who participated in an online study in return for a chance to win a gift certificate at a local mall. Participants were recruited using a mass system wide email. In addition, a sample of undergraduates enrolled in introductory psychology courses ($n = 75$) completed the same online survey for course credit. These participants were enrolled for the study through an online website. For the entire sample, ages ranged from 18 to 66 ($M = 35.51$, $SD = 13.51$).

Materials and procedure. Participants first entered demographic information before completing measures of state mood, MIL, and psychological need satisfaction. Participants rated six positive (e.g., "happy," "cheerful," "pleased") mood adjectives to measure of PA ($M = 4.94$, $SD = 1.35$, $\alpha = .82$), and six negative (e.g., "anxious," "blue," "frustrated") mood adjectives to measure of NA ($M = 2.16$, $SD = 1.11$, $\alpha = .79$; after Diener, Smith, & Fujita, 1995). Participants rated how much they felt each emotion "right now."

To measure MIL, participants completed an eight-item measure developed by Krause (2004; $M = 5.13$, $SD = 1.03$, $\alpha = .71$). This measure assesses four dimensions of MIL (two items each) including personal values (e.g., "I have a system of values and beliefs

that guide my daily activities”), purpose in life (e.g., “I feel I have found a really significant meaning in my life”), life goals (e.g., “In my life, I have clear goals and aims), and reconciliation of the past (e.g., “I am at peace with my past”).

To measure psychological need satisfaction, participants completed the 21-item Basic Psychological Needs Scale (BNS; Gagné, 2003). The BNS assesses the extent to which participants’ needs for competence, relatedness, and autonomy are currently satisfied. An example item assessing competence includes, “Most days I feel a sense of accomplishment from what I do” ($M = 5.31, SD = .91, \alpha = .81$). An example item assessing relatedness is, “People in my life care about me” ($M = 5.56, SD = .85, \alpha = .82$). A sample item assessing autonomy is, “I feel like I am free to decide for myself how to live my life” ($M = 5.00, SD = .90, \alpha = .75$). Items for all measures were rated on a 1 (*strongly disagree*) to 7 (*strongly agree*) scale.

Results and Discussion

Preliminary analyses. MIL, PA, and all three need satisfaction variables were significantly positively associated with each other ($r_s > .41$, all $p_s < .01$). NA was significantly negatively associated with MIL, PA, and all three need satisfaction variables ($r_s > .28$, all $p_s < .01$). Age was modestly but significantly associated with MIL ($r = .12$), autonomy ($r = .12$), and competence ($r = .18$; all $p_s < .05$).

Primary analyses. A hierarchical regression was computed to assess whether age and PA interacted to predict MIL controlling for need satisfaction. Age and PA were converted to mean deviation scores to represent the main effects. The product of these scores served as the interaction term (Aiken & West, 1991). Autonomy, competence, and relatedness were entered on the first step as control variables, contributing significantly (R^2 change = .32, $p < .001$); with competence ($\beta = .40, p < .01$) and relatedness ($\beta = .17, p < .01$) predicting MIL. Age and PA were entered on the second step, contributing significantly (R^2 change = .11, $p < .001$); with PA ($\beta = .39, p < .01$) predicting MIL. As predicted, this main effect was qualified by a significant Age \times PA interaction ($\beta = .15, p < .05$), entered on the third step (R^2 change = .02, $p < .05$). Generated means for individuals plus or minus standard deviations from the mean on age are shown in Figure 1. As predicted, PA was more strongly related to MIL for older adults compared to younger adults. This interaction remained significant ($\beta = .17, p < .001$) when NA was entered into the equation as a covariate.

These data suggest that, as predicted, age moderates the relationship between PA and MIL. It is particularly interesting that PA interacted with age to predict MIL even controlling for organismic need satisfaction. PA is often portrayed as playing a role in the Good Life only to the extent that it derives from the satisfaction of these tendencies (Ryan & Deci, 2001). Here, we found that independent of its association with these variables, PA related to MIL and this relationship increased with age.

Again, from the perspective of SST, the perception of limited time, rather than age, per se, is the key to these effects. Therefore, in Study 2, we examined the relationship of PA to MIL as a function of perceived time left to live. To operationalize this perception, participants were presented with a line that represented the human life span from beginning to end. They were asked to

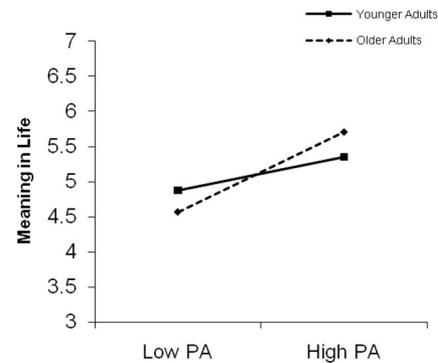


Figure 1. Generated regression lines predicting meaning in life (MIL) from positive affect (PA), for individuals $\pm 1 SD$ from the mean on age, controlling for basic need satisfaction.

mark an X on the spot that represented their current temporal position in life immediately prior to completing MIL measures. The perception of limited time was operationalized in two ways. First, participants were randomly assigned to view a short or long line. The rationale behind this manipulation was that the shorter line would represent a relatively shorter life (and therefore more limited time). Second, we measured the placement of the X on the line as a measure of nearness to the end of life. Thus, Study 2 examined the prediction that MIL would be more strongly related to PA for those who perceived themselves as having a relatively short (vs. long) life (the manipulation) or to be closer to the end of life (the measurement).

Study 2

Method

Participants. There were 93 adults (56 women, 8 not reporting) who were approached in public places on a university campus and participated in the study in return for a piece of candy. To reduce the salience of chronological age, at the top of the page, we asked participants to provide their date of birth, rather than their age. Ages ranged from 18 to 57 ($M = 21.45, SD = 5.81$).

Materials and procedure. Participants were approached and asked to complete a short questionnaire. They were first instructed to “imagine that the line on [the] sheet represents the human life span from beginning to end,” and their task was to “mark an ‘X’ on the line” where they thought they were located right now in life. Below the statement was a horizontal line, either 3.75 cm or 13.75 cm (distributed randomly). Participants then completed the measures of PA ($M = 4.50, SD = 1.05$), NA ($M = 2.86, SD = 1.11, \alpha = .79$), and the Krause MIL measure ($M = 5.08, SD = .93$) from Study 1. In addition, participants rated four items (e.g., “My personal existence is very purposeful and meaningful”) from the Purpose in Life scale (PIL; Crumbaugh & Maholick, 1964; $M = 5.20, SD = 1.14, \alpha = .90$). These items were selected because they have been shown to be relatively focused on the experience of meaning and not simply PA (McGregor & Little, 1998). These items also have been used in a number of studies of MIL (e.g., Hicks & King, 2009; King et al., 2006). After the data were

collected, the placement of the X on the line was measured as an indicator of perceived life expectancy.

Results and Discussion

Preliminary analyses. Our attempt to manipulate the perception of limited time was unsuccessful. Participants randomly assigned to short versus long lines did not differ on any of the measures administered (all t s < 1.0, p s > .50). As such, we standardized the measures of the placement of the X on the lines within condition, with higher scores indicating less time left on the line. We refer to this variable from this point forward as perceived life expectancy.

Examination of the correlations among measures indicated that PA was correlated with both MIL measures (r s = .34, .24, p s = .001, .022 for Krause and PIL measures, respectively). NA was significantly related only to PA (r = -.37, p = .001). Age and perceived life expectancy were marginally related (r = .20, p = .06), indicating, not surprisingly, that older participants tended to think they had less time to live. Age and perceived life expectancy did not relate to any of the other variables. Because the two MIL measures were strongly correlated (r = .77, p = .001), they were averaged to create a composite MIL variable (M = 5.14, SD = .97).

Primary analyses. To examine the main prediction of the study, the MIL composite was hierarchically regressed on (centered) PA and perceived life expectancy, and the interaction term. On the first step, the main effects contributed significantly (R^2 change = .09, p = .014), with PA significantly predicting MIL (β = .31, p = .004). This main effect was qualified by the predicted PA \times Perceived Life Expectancy interaction (R^2 change = .07, β = .27, p = .009). Figure 2 shows the generated means for those who marked themselves ± 1 SD from the mean on perceived life expectancy. As can be seen in the figure, when a great deal of life was perceived as remaining to be lived, PA was essentially irrelevant to MIL. However, when the end of life was viewed as relatively near, PA was strongly related to MIL.

This interaction remained significant (β = .28, p = .009) controlling for age (β for age = .04, p = .71) and NA (β for NA = .01, p = .90), and when each measure of MIL was regressed on the

predictors separately (β s = .31, .21, p s = .002, .05, for Krause and PIL measures, respectively). In a final regression equation, the MIL composite was regressed on PA, age, and perceived life expectancy, all possible two-way, and the three-way interaction. A main effect for PA (β = .33, p = .002), was qualified by a PA \times Perceived Life Expectancy interaction (β = .27, p = .018). The interaction of actual age and PA did not reach significance (β = .20, p = .10). The three-way interaction was not significant.

The results of Study 2 suggest that subjective estimates of time left to live influence the relationship between PA and MIL. In line with SST, participants who rated themselves as closer to the end of life were more likely to rely on PA as a source of information about MIL compared to participants who perceived themselves as having more time left to live. A limitation of Studies 1 and 2 is the correlational nature of the designs. That is, the alternative causal direction is certainly tenable: With limited time, the experience of MIL itself may be more likely to be reflected in positive mood. As already noted, mood is often viewed as feedback about goal progress (Carver & Scheier, 1990). For adults who perceive themselves as relatively near the end of life, this might mean that success in the pursuit of meaning is particularly associated with PA. Study 3 aimed to address this limitation by using a mood manipulation. This study examined the prediction that with limited time, even very simple, mundane, and relatively meaningless pleasure, such as that instigated by a subtle mood booster, might influence the experience of life as meaningful.

Study 3

Method

Participants. There were 403 University of Missouri employees (384 women) who participated in an online study in return for a chance to win a visa gift card. Participants were recruited similarly as they were in Study 1. To ensure that older adults were represented in the sample, only participants 30 years or older were recruited. Ages ranged from 30 to 70 (M = 44.33, SD = 9.37).

Materials and procedure. Participants completed a short online questionnaire. To manipulate mood, participants rated eight different comic strips on various dimensions (adapted from Strack, Martin, & Stepper, 1988). In the positive mood condition (n = 201), participants viewed the comic strips in their original form. In the neutral condition (n = 202), the comics were edited such that the conversations between the characters appeared trivial. Participants were randomly assigned to conditions and were told that their ratings would be helpful for future research.

Next, participants completed a short survey about their "life and goals." As a manipulation check, they first completed three-items ("happy," "pleased," and "cheerful") assessing the extent to which they were experiencing PA, on a 1 (*not at all*) to 11 (*very much*) scale (M = 7.61, SD = 2.11).

Participants then completed a perceived life expectancy task modeled after Study 2. Participants were shown a line with the letters A through Z displayed equidistantly below it. Participants were asked to reflect on their life and indicate what letter best represented their position in the life span (on average, participants marked themselves between the letters M and N; M = 13.59, SD = 3.71, converted to numerical form). Immediately following this rating, participants rated one item, "Overall, how meaningful is

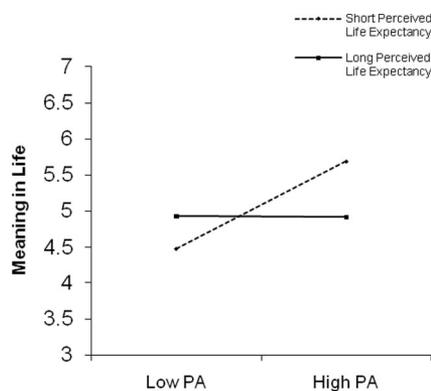


Figure 2. Generated regression lines predicting meaning in life (MIL) from positive affect (PA) for individuals ± 1 SD from the mean on perceived life expectancy.

your life?" on a 1 (*not at all meaningful*) to 11 (*very meaningful*) scale, to assess global feelings of MIL ($M = 7.31, SD = 1.76$).¹

Results

Preliminary analyses. The mood manipulation was successful. Participants in the positive mood condition reported significantly greater PA ($M = 7.82, SD = 2.01$) compared to participants in the neutral mood condition ($M = 7.40, SD = 2.18$) $t(402) = 2.03, p = .035; d = .21$. The mood groups did not differ on age, $t(402) < .50, p = .65$, or perceived life expectancy, $t(402) = 1.30, p = .17$. In this sample, age was significantly correlated with perceived life expectancy ($r = .58, p = .001$). Finally, as in past research, manipulated mood led to higher levels of MIL; M s (SD) = 7.14 (1.69) versus 7.53 (1.75) for neutral and positive mood respectively, $t(395) = 2.23, p = .026. d = .23$.

Primary analyses. Next, the MIL rating was hierarchically regressed on mood condition (0 = *neutral*, 1 = *positive*), (*centered*) perceived life expectancy, and the interaction of these two variables. On the first step, the main effects did not contribute significantly to R^2 (R^2 change = .01, $p = .08$), though the effect of condition was significant ($\beta = .11, p = .025$). The predicted Condition \times Perceived Life Expectancy interaction, entered on the second step, was significant (R^2 change = .03, $p < .01$; $\beta = .18, p = .012$). Figure 3 shows the generated means for those who had high versus low perceived life expectancy. As can be seen in the figure, manipulated mood was irrelevant to MIL for those who saw themselves as far from the end of life. However, when the end of life was viewed as relatively near, those in the positive mood condition were more likely to report high levels of MIL compared to participants in the neutral condition. This interaction remained ($\beta = .22, p = .01$) controlling for chronological age (β for age = .11, $p = .052$). In addition, the interaction of chronological age with condition was not significant ($p = .30$).

Results of this study suggest that even very simple pleasures, such as those arising from the mundane act of reading comics in the morning newspaper, can contribute to the experience of MIL. This association, however, depended on perceptions of time. Among individuals for whom life was perceived as stretching far into the time horizon, the mood manipulation had no effect on MIL. However, for those who perceived themselves as closer to the end of life, the manipulation influenced MIL.

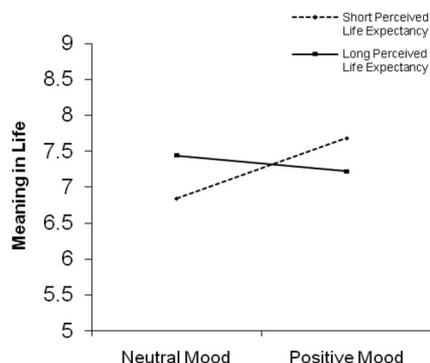


Figure 3. Generated regression lines predicting meaning in life (MIL) from induced mood for individuals $\pm 1 SD$ from the mean on perceived life expectancy, controlling for basic need satisfaction.

We find it interesting that the interaction between age and PA was not significant, this null findings is inconsistent with the results of Study 1. A likely possibility is that age was made accessible closer to the assessment of the MIL in Study 1 (see Schwarz & Strack, 1991, 1999, for a review of how accessible information biases judgments of well-being). This was not the case for the current study. In this case, demographics were assessed prior to the mood manipulation. Participants were then asked to reflect on their life expectancy before completing the MIL item. That is, perceptions of life expectancy were made accessible immediately before the MIL ratings.

Study 4 addressed two important limitations. First, the line measure of life expectancy used in Studies 2 and 3 is a single item of unknown reliability. Clearly, an established multi-item scale would be preferred to this single rating. In Study 4, FTP was measured using just such a measure. Second, as previously discussed, in all of the studies thus far, the moderator of the relationship between PA and MIL was assessed immediately prior to MIL. In Study 4 the predicted moderation of the relationship between PA and MIL by time perspective was tested when time perspective itself was measured after MIL ratings. Thus, Study 4 examined whether future time perspective would moderate the relationship between PA and MIL even when time perspective had not been made salient to participants.

Study 4

Method

Participants. There were 98 undergraduates (52 female) enrolled in introductory psychology courses at Texas A&M University who completed an online survey for partial course credit. Ages ranged from 18 to 21 years ($M = 18.83, SD = .813$).

Materials and procedure. To assess state mood, participants first rated six positive mood adjectives to measure PA ($M = 4.98, SD = .96, \alpha = .86$), and six negative mood adjectives to measure NA ($M = 3.66, SD = .85, \alpha = .67$; after Diener et al., 1995). Participants rated the extent to which they felt each emotion "right now" on a 7-point scale ranging from 1 (*not at all*) to 7 (*extremely*).

Next, to measure MIL, participants completed the five-item presence subscale of the Meaning in Life Questionnaire (Steger, Frazier, Oishi, & Kaler, 2006; $M = 5.16, SD = 1.17, \alpha = .88$), which has demonstrated convergent and discriminant validity, as well as high test-retest reliability (Steger et al., 2006; Steger & Kashdan, 2007). Sample items are "I understand my life's meaning"; "My life has a clear sense of purpose." Participants indicated their agreement with each item based on a 1 (*absolutely untrue*) to 7 (*absolutely true*) scale. Following the MIL measure, participants completed 45-item filler items to help disguise the purpose of the study.

Finally, FTP was assessed using the 10-item FTP scale developed by Carstensen and Lang (1996; $M = 5.41, SD = .94, \alpha = .86$). The FTP scale assesses the extent to which individuals perceive their future time to be limited versus open ended, with higher scores indicating more open-ended perceptions (Lang &

¹ In an unpublished dataset ($n = 145$), this one item correlated strongly ($r = .66$) with the four-item measure administered in Study 2.

Carstensen, 2002). Sample items are “Many opportunities await me in the future,” and “My future is filled with possibilities.” Participants indicated their agreement with each item based on a 1 (*very untrue*) to 7 (*very true*) scale.

Results and Discussion

Preliminary analyses. MIL was significantly positively associated with PA ($r = .48, p = .001$) and FTP ($r = .32, p = .001$). PA and FTP also were significantly positively associated ($r = .48, p = .001$). NA was significantly negatively associated with MIL ($r = -.42, p = .001$), PA ($r = -.48, p = .001$), and FTP ($r = -.31, p = .001$).

Primary analyses. A hierarchical regression was computed to assess whether FTP and PA interacted to predict MIL. FTP and PA were converted to mean deviation scores to represent the main effects. The product of these scores served as the interaction term (Aiken & West, 1991). FTP and PA were entered on the first step, contributing significantly (R^2 change = .244, $p = .001$); with PA ($\beta = .43, p = .001$) predicting MIL. As predicted, this main effect was qualified by a significant FTP \times PA interaction ($\beta = -.27, p = .003$), entered on the second step (R^2 change = .067, $p = .003$). Generated means for individuals ± 1 SD from the mean on FTP are shown in Figure 4. As predicted, PA was more strongly related to MIL for participants who perceived their future time to be limited compared to individuals who perceived their time as more open ended. This interaction remained significant ($\beta = -.24, p = .01$) controlling for age (β for age = .04, $p = .67$) and NA (β for NA = .19, $p = .068$). These data suggest, as predicted, FTP moderates the relationship between PA and MIL.

Focusing on perceptions of limited versus open-ended future possibilities, the results further support the hypothesis that when time is perceived as limited, PA becomes a robust predictor of MIL. Conversely, when time is perceived as expansive, the link between PA and MIL is attenuated. More important, in Study 4 this moderation occurred even when FTP was measured after MIL, suggesting that, perhaps unlike age, FTP need not be made salient for it to influence the relation between PA and MIL.

Discussion

Results of four studies provide strong support for the hypothesis, derived from SST, that with the perception of limited time, PA

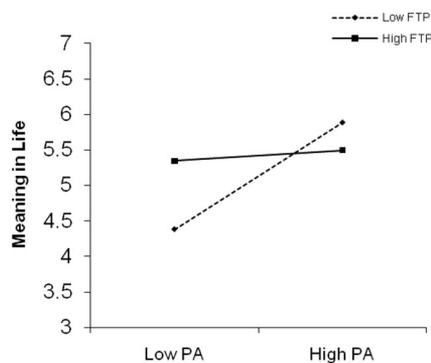


Figure 4. Generated regression lines predicting meaning in life (MIL) from positive affect (PA), for individuals ± 1 SD from the mean on future time perspective (FTP).

is more strongly related to the experience of MIL. These studies extend SST into the important domain of MIL, a variable that is widely considered a cornerstone of well-being. Past research has demonstrated that limited time perspective spurs differences in goal selection that reflect the differing motivational stances of those with less versus more life left to live. The findings of the four studies presented here provide converging evidence that limited time spurs not only goal selection, but reliance on PA as a source of MIL. These results suggest that in answering the question “What makes life meaningful?” those who perceive themselves as having less time left to live find the answer to this question in the experience of PA.

Mood-As-Information About MIL

An interesting question provoked by these data is the meaning of MIL judgments themselves for individuals who perceive themselves as having a limited amount of time left. If such individuals are more reliant on mood in making such judgments, it might be that they are using mood as a heuristic. Perhaps, when faced with the question of life’s meaningfulness, the perception of a limited amount of time causes individuals to be more likely to attend to their positive mood as a source of information for that judgment. Although judging one’s life as meaningful might seem a more pressing concern with limited time (Erikson, 1964), for these individuals this judgment may be less a conscious construction and, instead, a relatively simple decision, based on current affect. Research has shown that when judging abstract life domains, individuals often defer to mood as information for a guide to the judgment (e.g., Schwarz, 2001; Schwarz & Clore, 1996), and mood-as-information effects have been demonstrated for MIL judgments (King et al., 2006).

Mood-as-information effects are often demonstrated by providing an attributional cue for mood, allowing individuals to discount the relevance of current mood for later judgments. However, and more important, mood-as-information may reflect not only unconscious misattribution processes, but also a person’s subjective sense of the relevance of mood to the well-being judgment (Schwarz & Strack, 1999). An interesting follow-up to Study 3 might examine the effects of such a cue on the relationship of PA and MIL as a function of limited time. If the subjective relevance of momentary positive mood to MIL is heightened by perceived time limitations, those who perceive themselves as having little time left to live might be impervious to these attributional cues.

In some ways these results jibe with research showing that older adults become better able to manage central dilemmas of life (Charles, 2010; Grossmann et al., 2010). The present results suggest that the grand dilemma of finding meaning in one’s existence may be relatively simpler for those who perceive time as limited, who find the affirmative answer to this question in the mundane experience of positive mood. Future research might examine reaction times to MIL questions to see if individuals who perceive time as limited spend less time pondering these items.

On a related note, future research might examine the subjective sources that individuals feel make their lives meaningful. Taking into account the current results, we would suggest that, in line with SST, those who perceive a great deal of time left in their lives would probably derive meaning from activities not associated with immediate PA, such as long-term goals. Alternatively, people who

view time as limited would most likely list sources of meaning that are intricately associated with PA, such as interacting with close friends. These results suggest a blurring of hedonic and eudaimonic well-being with limited time. Based on the present results, we might note that age-related increases in PA may play a role in the grander experience of meaning in life.

Chronological Age Versus Perceptions of Time

Although age was associated, to varying degrees, with the perception of time as measured by the line procedures, as SST suggests, these variables are clearly not identical. As the theory states, it when the person perceives his or her time horizon to shrink that sources of fulfillment shift from long-term goal pursuits to the regulation of affect in the present (Carstensen, 2006; Fung & Carstensen, 2004; Löckenhoff & Carstensen, 2004).

Studies directly examining the effects of age on the relationship between PA and MIL have yielded mixed results. In one study, Steger, Oishi, and Kashdan (2009) examined this relationship using a large Internet sample. Analyses of PA and MIL over the different age groups did not reveal the kinds of differences we have predicted here (though the correlational trends were in the predicted direction). It is notable, however, that one measure of PA used in these studies was the Positive and Negative Affect Scales (PANAS; Watson, Clark, & Tellegen, 1988), which taps high arousal positive emotions (e.g., proud, alert; Kessler & Staudinger, 2009) but does not contain more garden variety positive affect descriptors such as “happy.” Using this type of measurement of PA, and controlling for basic psychological needs (e.g., competence; e.g., Ryan & Deci, 2001), Study 1 found evidence that PA does indeed bear more heavily on MIL rating for older adults compared to younger adults.

It is notable, however, that the Age \times PA interactions were not significant in subsequent studies. In Studies 2 and 4, this null effect is not surprising given the relative constraint in the age spectrum for the samples (i.e., they were young adults), and in Study 3, the relative cognitive accessibility of time limitations likely contributed to these null findings. As previously mentioned in this study, the line measure was administered immediately before the MIL measure. Scores of research findings have demonstrated that accessible information can influence levels and correlates of well-being judgments (see Schwarz & Strack, 1991, 1999). For instance, Strack, Martin, and Schwarz (1988) showed that answering questions about marital satisfaction before global life satisfaction increased the relation between the two variables. Similarly, subtle primes associated with “excitement” led participants to base their overall life satisfaction more heavily on their current level of excitement (Oishi, Schimmack, & Colcombe, 2003). Therefore, in Study 3 it is possible that any effect of age on the relationship between PA and MIL was attenuated due to the placement of the life-line measure. This lack of accessibility of age also may have contributed to the lack of moderation of the relationship between PA and MIL in the study reported by Steger et al. (2009). Future research might directly manipulate time perspective, the placement of the age measure, and assess different types of PA (e.g., high arousal vs. low arousal), to address this issue.

Despite the mixed findings for chronological age, the Studies 2 to 4 consistently show that the perception of time limitations moderated the association between PA and MIL. This effect was

evident regardless of whether perceived time limitation was made accessible prior to the assessment of MIL (Studies 2 and 3), or when perceived time limitation was administered after the MIL measure (Study 4). These findings raise the provocative possibility that future time perspective may be such a pressing concern that it is chronically accessible to the individual. Overall, these findings suggest that age researchers should consider the individual’s future time perspective, as well as variables (e.g., terminal illnesses, life transitions, etc.) that shift that perspective, when examining the processes the feed into judgments of well-being.

Similarly, it is interesting to consider the relationship between chronological age and perceived time, itself. Clearly, chronological age is an objective fact, whereas perceived life expectancy is likely affected by knowledge of factors such as family history, health behaviors, and risk taking. In Studies 2 and 4, the average age of participants was relatively young. For such individuals, a very strong association between PA and MIL may be maladaptive, suggesting, for instance, a focus on current affect rather than long term goals for the future as a source of MIL. SST asserts that for young adults, it makes sense to focus on long-term goals that prepare for the future (Charles & Carstensen, 2010). For a young person in good health, focusing on hedonistic pursuits to maximize pleasure may be an unfortunate consequence of limited time perception. Research has shown, for instance, that adolescents with limited time perceptions may be more likely to become involved in gangs (Liu & Fung, 2005). Sexual risk-taking and substance use might also be viewed as potential outcomes of focus on present pleasure as a means of experiencing MIL.

Limitations

One limitation of these studies was the reliance on wholly cross-sectional designs. Individual differences in perceptions of time are not necessarily the same as within-individual change. As is the case with most cross-sectional studies of well-being, it is not clear whether these individual differences reflect actual change or other issues. Further, because our adult samples in Studies 1 and 3 were drawn from university staff these results may not generalize to adults who are retired, unemployed, or in ill health. In a similar vein, the present study didn’t specifically target people of advanced old age (e.g., age 70 +). Thus, it is unclear whether, for these older adults, PA also strongly relates to the subjective experience of MIL. Moreover, future studies targeting older adults should directly assess FTP to untangle the potentially complex relationship between PA, FTP, age, and MIL. For instance, is it possible that the robust relationship between PA and MIL for those who perceive time as limited is even further amplified with age?

Future research might extend these findings beyond the cross-sectional designs used here. For instance, longitudinal research tracking individuals over time could examine the ebb and flow of various sources of MIL, as well as their relations to MIL, which would allow for a test of whether sources of meaning change within the lives of individuals as their perception of time dwindles. In addition, looking at daily mood, MIL, and time perceptions would certainly help to clarify the relations of PA to MIL. Finally, research should examine how other variables directly linked to aging (e.g., physical health and cognitive abilities) similarly influence individuals’ sources of meaning.

Conclusions

The results of these four studies support the prediction that with perceived limited time, the experience of PA, whether naturally occurring or induced, is more strongly related to MIL. From the perspective of SST, the press of time tunes people to both positive and meaningful aspects of life and as such it makes sense that these two variables are less likely to be distinct with the realization that time is limited. Instead, with the perception of limited time, the experience of PA is likely to be increasingly part and parcel of the experience of MIL. These results raise the possibility that, as one's time perspective shrinks, a number of potential sources of MIL may fall by the wayside: the pursuit of long term goals, social roles, and so forth. More important, the capacity to feel good, even when that capacity is demonstrated in the simple "kick" one might get from reading the comics, may become a powerful signal that life is meaningful.

References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Biswas-Diener, R., Kashdan, T., & King, L. A. (2009). Two traditions of happiness research, not two distinct types of happiness. *Journal of Positive Psychology, 4*, 208–211. doi:10.1080/17439760902844400
- Carstensen, L. L. (2006). The influence of a sense of time on human development. *Science, 312*, 1913–1915. doi:10.1126/science.1127488
- Carstensen, L. L., Fung, H., & Charles, S. (2003). Socioemotional selectivity theory and the regulation of emotion in the second half of life. *Motivation and Emotion, 27*, 103–123. doi:10.1023/A:1024569803230
- Carstensen, L. L., Isaacowitz, D., & Charles, S. T. (1999). Taking time seriously: A theory of socioemotional selectivity. *American Psychologist, 54*, 165–181. doi:10.1037/0003-066X.54.3.165
- Carstensen, L. L., & Lang, F. R. (1996). *Future Orientation Scale*. Unpublished manuscript, Stanford University, Stanford, CA.
- Carver, C. S., & Scheier, M. F. (1990). Origins and functions of positive and negative affect: A control-process view. *Psychological Bulletin, 97*, 19–35.
- Charles, S. T. (2010). Strength and vulnerability integration: A model of emotional well-being across adulthood. *Psychological Bulletin, 136*, 1068–1091. doi:10.1037/a0021232
- Charles, S. T., & Carstensen, L. L. (2010). Social and emotional aging. *Annual Review of Psychology, 61*, 383–409. doi:10.1146/annurev-psych.093008.100448
- Crumbaugh, J. C., & Maholick, L. T. (1964). An experimental study in existentialism: The psychometric approach to Frankl's concept of noogenic neurosis. *Journal of Clinical Psychology, 20*, 200–207. doi:10.1002/1097-4679(196404)20:2<200::AID-JCLP2270200203>3.0.CO;2-U
- Csikszentmihalyi, M. (1990). *Flow*. New York, NY: Harper & Row.
- Diener, E., Smith, H., & Fujita, F. (1995). The personality structure of affect. *Journal of Personality and Social Psychology, 69*, 130–141. doi:10.1037/0022-3514.69.1.130
- Diener, E., Suh, E., Lucas, R., & Smith, H. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin, 125*, 276–302. doi:10.1037/0033-2909.125.2.276
- Erikson, E. H. (1964). *Insight and responsibility*. New York, NY: Norton.
- Fung, H., & Carstensen, L. L. (2004). Motivational changes in response to blocked goals and foreshortened time: Testing alternatives to socioemotional selectivity theory. *Psychology and Aging, 19*, 68–78. doi:10.1037/0882-7974.19.1.68
- Gagné, M. (2003). The role of autonomy support and autonomy orientation in prosocial behavior engagement. *Motivation and Emotion, 27*, 199–223. doi:10.1023/A:1025007614869
- Gross, J. J., Carstensen, L. L., Pasupathi, M., Tsai, J., Skorpen, C., & Hsu, A. Y. (1997). Emotion and aging: Experience, expression, and control. *Psychology and Aging, 12*, 590–599. doi:10.1037/0882-7974.12.4.590
- Grossmann, I., Na, J., Varnuma, M. E., Park, D., Kitayama, S., & Nisbett, R. (2010). Reasoning about social conflicts improves into old age. *Proceedings of the National Academy of Sciences, USA, 107*, 7246–7250.
- Hicks, J. A., & King, L. A. (2007). Meaning in life and seeing the big picture: Positive affect and global focus. *Cognition and Emotion, 21*, 1577–1584. doi:10.1080/02699930701347304
- Hicks, J. A., & King, L. A. (2008). Positive mood and religious commitment as information about meaning in life. *Journal of Research in Personality, 42*, 43–57. doi:10.1016/j.jrp.2007.04.003
- Hicks, J. A., & King, L. A. (2009). Positive mood and social relatedness as information about meaning in life. *Journal of Positive Psychology, 4*, 471–482. doi:10.1080/17439760903271108
- Hicks, J. A., Schlegel, R. J., & King, L. A. (2010). Social threats, happiness, and the dynamics of meaning in life judgments. *Personality and Social Psychology Bulletin, 36*, 1305–1317. doi:10.1177/0146167210381650
- Kashdan, T. B., Biswas-Diener, R., & King, L. A. (2008). Reconsidering happiness: The costs of distinguishing between hedonics and eudaimonia. *Journal of Positive Psychology, 3*, 219–33. doi:10.1080/17439760802303044
- Kessler, E., & Staudinger, U. (2009). Affective experience in adulthood and old age: The role of affective arousal and perceived affect regulation. *Psychology and Aging, 24*, 349–362. doi:10.1037/a0015352
- Keyes, C. L. M., Shmotkin, D., & Ryff, C. D. (2002). Optimizing well-being: The empirical encounter of two traditions. *Journal of Personality and Social Psychology, 82*, 1007–1022. doi:10.1037/0022-3514.82.6.1007
- King, L. A., & Hicks, J. A. (in press). Positive affect and meaning in life: The intersection of hedonism and eudaimonia. In P. T. Wong & P. S. Fry (Eds.), *The human quest for meaning* (2nd ed.). Mahwah, NJ: Erlbaum.
- King, L. A., Hicks, J. A., Krull, J., & Del Gaiso, A. (2006). Positive affect and the experience of meaning in life. *Journal of Personality and Social Psychology, 90*, 179–196. doi:10.1037/0022-3514.90.1.179
- Krause, N. (2004). Stressors arising in highly valued roles, meaning in life, and the physical health status of older adults. *Journal of Gerontology, 59B*, S287–S287.
- Krause, N. (2007). Longitudinal study of social support and meaning in life. *Psychology and Aging, 22*, 456–469. doi:10.1037/0882-7974.22.3.456
- Krause, N., & Shaw, B. A. (2003). Role-specific control, personal meaning, and health in late life. *Research on Aging, 25*, 559–586. doi:10.1177/0164027503256695
- Lang, F. R., & Carstensen, L. L. (2002). Time counts: Future time perspective, goals, and social relationships. *Psychology and Aging, 17*, 125–139. doi:10.1037/0882-7974.17.1.125
- Liu, C. K. M., & Fung, H. H. (2005). Gang members' social network composition and psychological well-being: Extending socioemotional selectivity theory to the study of gang involvement. *Journal of Psychology in Chinese Societies, 6*, 89–108.
- Löckenhoff, C. E., & Carstensen, L. L. (2004). Socioemotional selectivity theory, aging, and health: The increasingly delicate balance between regulating emotions and making tough choices. *Journal of Personality, 72*, 1395–1424. doi:10.1111/j.1467-6494.2004.00301.x
- McGregor, I., & Little, B. R. (1998). Personal projects, happiness, and meaning: On doing well and being yourself. *Journal of Personality and Social Psychology, 74*, 494–512. doi:10.1037/0022-3514.74.2.494
- Mroczek, D. K., & Kolarz, C. M. (1998). The effect of age on positive and negative affect: A developmental perspective on happiness. *Journal of Personality and Social Psychology, 75*, 1333–1349. doi:10.1037/0022-3514.75.5.1333

- Mroczek, D. K., & Spiro, A. III. (2005). Change in life satisfaction during adulthood: Findings from the Veterans Affairs normative aging study. *Journal of Personality and Social Psychology, 88*, 189–202. doi:10.1037/0022-3514.88.1.189
- Oishi, S., Schimmack, U., & Colcombe, S. (2003). The contextual and systematic nature of life satisfaction judgments. *Journal of Experimental Social Psychology, 39*, 232–247. doi:10.1016/S0022-1031(03)00016-7
- Pinquart, M. (2001). Age differences in perceived positive affect, negative affect, and affect balance in middle and old age. *Journal of Happiness Studies, 2*, 375–405. doi:10.1023/A:1013938001116
- Riediger, M., & Freund, A. M. (2008). Me against myself: Motivational conflict and emotional development in adulthood. *Psychology and Aging, 23*, 479–494. doi:10.1037/a0013302
- Riediger, M., Schmiedek, F., Wagner, G. G., & Lindenberger, U. (2009). Seeking pleasure and seeking pain: Differences in prohedonic and contra-hedonic motivation from adolescence to old age. *Psychological Science, 20*, 1529–1535. doi:10.1111/j.1467-9280.2009.02473.x
- Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. In S. Fiske (Ed.), *Annual review of psychology* (Vol. 52, pp. 141–166). Palo Alto, CA: Annual Reviews.
- Schwarz, N. (2001). Feelings as information: Implications for affective influences on information processing. In L. L. Martin & G. L. Clore (Eds.), *Theories of mood and cognition: A user's handbook* (pp. 159–176). Mahwah, NJ: Erlbaum.
- Schwarz, N., & Clore, G. L. (1996). Feelings as phenomenal experiences. In E. T. Higgins & A. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 433–465). New York, NY: Guilford Press.
- Schwarz, N., & Strack, F. (1991). Evaluating one's life: A judgment model of subjective well-being. In F. Strack, M. Argyle, & N. Schwarz (Eds.), *Subjective well-being. An interdisciplinary perspective* (pp. 27–47). Oxford, England: Pergamon Press.
- Schwarz, N., & Strack, F. (1999). Reports of subjective well-being: Judgmental processes and their methodological implications. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 61–84). New York, NY: Sage Foundation.
- Stacey, C. A., & Gatz, M. (1991). Cross-sectional age differences and longitudinal change on the Bradburn Affect Balance Scale. *The Journal of Gerontology, 46*(2), 76–78.
- Steger, M. F. (in press). Experiencing meaning in life: Optimal functioning at the nexus of spirituality, psychopathology, and well-being. In P. T. P. Wong & P. S. Fry (Eds.), *The human quest for meaning* (2nd ed.). Mahwah, NJ: Erlbaum.
- Steger, M. F., Frazier, P., Oishi, S., & Kaler, M. (2006). The Meaning in Life Questionnaire: Assessing the presence of and search for meaning in life. *Journal of Counseling Psychology, 53*, 80–93. doi:10.1037/0022-0167.53.1.80
- Steger, M. F., & Kashdan, T. B. (2007). Stability and specificity of meaning in life and life satisfaction over one year: Implications for outcome assessment. *Journal of Happiness Studies, 8*, 161–179. doi:10.1007/s10902-006-9011-8
- Steger, M. F., Kashdan, T. B., & Oishi, S. (2008). Being good by doing good: Daily eudaimonic activity and well-being. *Journal of Research in Personality, 42*, 22–42. doi:10.1016/j.jrp.2007.03.004
- Steger, M. F., Oishi, S., & Kashdan, T. B. (2009). Meaning in life across the lifespan: Levels and correlates of meaning in life from emerging adulthood to older adulthood. *Journal of Positive Psychology, 4*, 43–52. doi:10.1080/17439760802303127
- Strack, F., Martin, L. L., & Schwarz, N. (1988). Priming and communication: The social determinants of information use in judgments of life-satisfaction. *European Journal of Social Psychology, 18*, 429–442. doi:10.1002/ejsp.2420180505
- Strack, F., Martin, L. L., & Stepper, S. (1988). Inhibiting and facilitating conditions of the human smile: A nonobtrusive test of the facial feedback hypothesis. *Journal of Personality and Social Psychology, 54*, 768–777. doi:10.1037/0022-3514.54.5.768
- Waterman, A. S. (2007). On the importance of distinguishing hedonia and eudaimonia when considering the hedonic treadmill. *American Psychologist, 62*, 612–613. doi:10.1037/0003-066X62.6.612
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*, 1063–1070. doi:10.1037/0022-3514.54.6.1063

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