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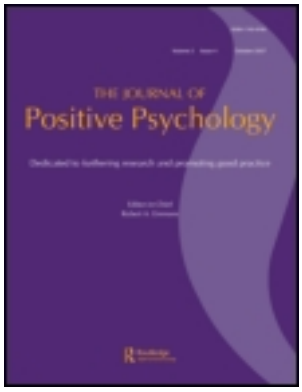

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Predictors of rapid versus thoughtful judgments of meaning in life

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Predictors of rapid versus thoughtful judgments of meaning in life

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As with other measures of subjective well-being, self-reports of meaning in life (MIL) can be influenced by transient, contextual factors. Further, the sources of information used in judging MIL can vary depending on their relevance and cognitive accessibility. This study examined the effects of differing instructions on the sources of information used to judge MIL. Participants ($N = 103$) completed measures of positive affect (PA), religious commitment, and the satisfaction of the needs for competency, autonomy, and relatedness and then were randomly assigned to complete a measure of MIL rapidly, thoughtfully, or using typical instructions. Results showed that condition moderated reliance on PA, autonomy and social relatedness need satisfaction: PA was a stronger predictor of MIL in the thoughtful condition while autonomy and relatedness were more strongly related to MIL in the rapid condition. Implications for our understanding of MIL and future directions are discussed.

Keywords: meaning; mood; social cognition; subjective well-being

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Introduction

Meaning in life (MIL) is a central concern of human existence (Frankl, 1963/1984) and a vital component of well-being. Self-reported MIL is associated with a range of indicators of psychological and physical health (Mascaro & Rosen, 2005; Reker, Peacock, & Wong, 1987; Ryff, 1989; Ryff & Singer, 1998; Steger & Frazier, 2005; Wong & Fry, 1998; Zika & Chamberlain, 1987, 1992). A full understanding of this longstanding cornerstone of well-being requires attention to the nuances that underlie subjective judgments of MIL (Hicks, Schlegel, & King, 2010), addressing the question, what sources of information are used in rendering ratings of items, such as 'My life is very purposeful and meaningful'?

As with other well-being judgments (Oishi, Schimmack, & Colcombe, 2003; Schimmack & Oishi, 2005), social cognitive variables influence the sources of information[1] on which MIL judgments are based. The relations of sources of information to MIL vary as a function of their relevance, cognitive accessibility, and the valence of the answer they provide (Hicks & King, 2008). For instance, primes of positive social relationships enhance the relationship of social relatedness to MIL (Hicks & King, 2009), while subliminal primes related to hell reduce the relationship between religious commitment and MIL (Hicks & King, 2008). More recently, primes of loneliness have been shown to reduce reliance on social relatedness and enhance reliance on positive mood in MIL judgments (Hicks et al., 2010). The influence of such manipulations on the sources of information that are used in rating MIL might suggest that these judgments reflect less than mindful responses. Considering this emerging body of research, we might ask, on what sources of information would individuals base their MIL judgments if they were asked to take their time and reflect carefully on those judgments?

This study aimed to answer this very question. Participants first completed measures of constructs associated with MIL, including positive mood (King, Hicks, Krull, & Del Gaiso, 2006), religious commitment (Hicks & King, 2008; Steger & Frazier, 2005), and the satisfaction of organismic needs for competence, autonomy, and relatedness (Ryan & Deci, 2000, 2001; Steger, Kashdan, Sullivan, & Lorentz, 2008) and then rendered judgments of MIL, rapidly, thoughtfully, or using typical instructions. These data allowed us to address the intriguing question of what makes life meaningful when one renders the judgments rapidly or ponders it more thoughtfully.

Rapid versus thoughtful assessments of MIL

Considering the difference between rapid versus thoughtful approaches to MIL judgments promises to

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reveal important information about the sources of information used in those assessments. Quick judgments of MIL may be assumed to rely on what comes to mind first when making the judgment. Rapid judgments of MIL, then, may be most influenced by immediately accessible and subjectively relevant information. Alternatively, in the absence of time to think about the judgment, individuals might rely on heuristic cues (i.e., mental shortcuts) for this quick assessment. Such heuristics may reflect readily accessible information or stereotypical beliefs about the construct being judged. Thus, sources of information that relate strongly to rapid judgments of MIL might be viewed, alternately, as most central to the judgment (because they are most immediately relevant) or as (perhaps less psychologically central) heuristics that guide that judgment. More thoughtful assessments of MIL likely rely on variables that are less immediately available but that nevertheless, ultimately, are felt to be relevant to the judgment. Thoughtful consideration of MIL may allow for the discounting of heuristic influences so that these judgments rely, instead, on more psychologically central aspects of life.

These issues are, perhaps, especially relevant to the relationship between positive affect (PA) and MIL. PA is strongly correlated with MIL (King et al., 2006) and induced PA leads to enhanced MIL (Hicks & King, 2008, 2009; Hicks, Trent, & King, under review; King et al., 2006). The role of PA in MIL judgments might be viewed as a result of a misattribution process (King et al., 2006), such that individuals judging MIL use mood-as-information (Schwarz, 2001; Schwarz & Clore, 1983, 1996, 2003). When pressed for time, individuals might consult mood as an answer to the question, 'How do I feel about this?' In this sense, while quickly scanning one's mental life, PA might represent a readily accessible 'headline' for rapid judgments of MIL. PA, then, might serve as a heuristic that is relied upon in making what is clearly an abstract judgment. If PA primarily functions as a heuristic for MIL judgments, then the relationship between PA and MIL should be particularly strong when individuals are pressed to make very quick assessments. The notion that PA is essentially a heuristic in MIL judgments would likely find support in eudaimonic perspectives on well-being.

Eudaimonic approaches to well-being generally downplay the role of PA in the meaningful life (Ryan & Deci, 2001; Ryff & Singer, 1998, 2008; Seligman, 2002). From these perspectives, well-being is best understood as emerging from eudaimonic activity (i.e., activity that expresses the authentic self, Waterman, 1993, 2007; Waterman, Schwartz, & Conti, 2008; actualizes one's potential, Ryff & Singer, 1998, 2008; or serves basic organismic needs, Ryan & Deci, 2001). From this perspective, positive feelings are a likely *outcome* of such activity but they are not afforded a substantial role in meaningful living. This approach contrasts with hedonic well-being, which focuses on how a person feels about his or her life (Kahneman, Diener & Schwarz, 1999; Ryan & Deci, 2001). From a eudaimonic perspective, we might expect that while rapidly rendered MIL judgments might well rely on PA, when careful thought is applied to these judgments, individuals should rely on more enduring sources of meaning, such as the satisfaction of organismic needs (Ryan & Deci, 2001). That is, with time and reflection, individuals ought to discount mood and render their MIL judgments based on more eudaimonic variables, such as the satisfaction of organismic needs for competence, relatedness, and autonomy (Ryan & Deci, 2001).

A different perspective is also possible, however. There are good reasons to expect PA to be relevant to *thoughtful* assessments of MIL. Importantly, mood-as-information may demonstrate not simply misattribution processes, but also a person's subjective sense of the relevance of mood to well-being judgments (Schwarz & Strack, 1999). In describing what makes life meaningful, people often mention sources related to pleasure and happiness (Ebersole, 1998) and a recent study of undergraduates found happiness ranked second only to family in terms of its subjective relevance to MIL (Lambert et al., in press). Thus, PA might play a role in thoughtful assessments of MIL to the extent that mood is perceived as relevant to the judgment.

Moreover, models of self-regulation generally present mood as important feedback about how one is progressing in important life domains, with PA reflecting good or better than expected progress in valued goals (Carver & Scheier, 2008). In this sense, PA might serve as a summary indicator of one's overarching goal progress and be quite relevant to thoughtful evaluations of life as purposeful and meaningful. Similarly, Schwarz and Strack (1999) note that mood may be perceived as providing an integrative assessment of all of an individual's experiences in judging well-being. As such, current PA may provide a general sense of how life is going, overall, and again, have a role to play in thoughtful assessments of MIL.

Finally, PA may be a vital piece of information for thoughtful assessments of the meaningfulness of one's life because how a person feels may well be a central component of well-being, as suggested by the hedonic approach to well-being (Diener, 2009). Consider that upon reflection on the question of life's meaningfulness, individuals might make a pointed accounting of their lives, posing the question, 'I have friends, family, success, religious faith, etc., *but am I happy*?' Such reflection might well lead to enhanced reliance on PA as a source of information about MIL. We propose that, in this sense, PA represents the likely 'bottom line'

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of one's mental accounting sheet for MIL, and should, therefore, strongly relate to thoughtful assessments of MIL.

Applying this line of reasoning to the other sources of information for MIL judgments included in this study (i.e., religious commitment, competence, autonomy, and relatedness), although these variables may be more theoretically recognized as important to meaningful living, they may not serve the same 'bottom line' function as PA. Upon reflection, more putatively meaningful sources of information for MIL judgments might be weighed in terms of their capacity to engender positive feelings. From this perspective, PA would not be a mere byproduct of eudaimonic pursuits, but, in a sense, a final subjective arbiter of the ultimate relevance of these pursuits to the experience of MIL. Thus, these seemingly 'deeper' sources of MIL, because of their immediate relevance, might relate most strongly to rapid judgments of MIL. However, if these sources of information are not reflected in PA, they are unlikely to be related to thoughtful assessments of MIL.

Overview and predictions

These provocative ideas were tested in a rather simple study. Participants completed self-report measures of sources of information for MIL judgments and then were randomly assigned to judge their MIL rapidly, thoughtfully, or in a control condition. Although it is possible that thoughtful reflection on MIL might lead to lower levels of this variable, it seems equally likely that, upon reflection, individuals might come to recognize how very meaningful their lives are. As such, no predictions were made with regard to the main effect of condition on levels of MIL. Rather, we were most interested in examining whether and how the conditions influenced reliance on various sources of information for MIL judgments. Thus, we tested the moderation of the relations of these sources of information to MIL judgments by condition, examining the following (opposing) predictions.

If PA is primarily a mental 'headline' or heuristic that drives judgments of MIL, we would predict PA to be most strongly related to MIL in the fast condition and less related to MIL in the thoughtful condition. However, if, as we have argued above, PA is perceived as subjectively relevant to MIL, and PA serves as a 'bottom line' assessment of how one's life is going, PA should be most strongly related to MIL judgments in the thoughtful condition.

With regard to religious commitment and psychological need satisfaction, from the eudaimonic approach to well-being, we might predict these sources of information about MIL to be relevant regardless of the conditions. That is, we would expect that these sources of information should relate strongly to MIL judgments whether rendered rapidly or thoughtfully, because they are centrally relevant to meaningful living. However, if, as we have suggested above, these sources of MIL are immediately relevant to MIL (or serve primarily as heuristics in MIL judgments), they should be most relevant in the rapid condition and, controlling for PA, relatively less relevant to thoughtful assessments.

Method

Participants

One hundred and three (73 women) undergraduates from a General Psychology course participated in fulfillment of a research requirement. Represented ethnicities included 80 European American, 13 African Americans, 1 Hispanic, and 6 Asians. Participants enrolled in the study on a secure website and came to the lab for the assessment.

Materials and procedures

Participants first completed measures of three sources of MIL, including PA (measured first), then, religious commitment, and finally basic need satisfaction. The order of administration was the same across all conditions. All measures were completed on a computer in a private cubicle and all were rated on a scale from 1 (not at all) to 7 (extremely).

State PA

Participants rated four positive mood adjectives (happy, pleased, enjoyment/fun, and joyful; based on Diener & Emmons, 1984; Diener, Smith, & Fujita, 1995), in terms of how they were feeling right now ($M = 4.25$, $SD = 1.78$, $\alpha = 0.76$).

Religious commitment

The Religious Commitment Inventory-10 (Worthington et al., 2003), a 10-item scale assesses religious commitment ($M = 3.51$, $SD = 1.48$, $\alpha = 0.95$). A sample item includes, 'My religious beliefs lie behind my whole approach to life'.

Basic need satisfaction

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' ($M = 5.31$, $SD = 0.78$, $\alpha = 0.65$). A sample item

Table 1. Correlations among sources of information for MIL judgments.

Source	Positive affect	Relatedness	Competence	Autonomy	Religious commitment
PA	–				
RNS	0.34**	–			
CNS	0.35**	0.51**	–		
ANS	0.46**	0.53**	0.47**	–	
Religious commitment	−0.04	0.03	0.04	−0.11	–
MIL	0.34**	0.40**	0.52**	0.42**	0.30*

Notes: $N = 103$; MIL scores are collapsed across conditions.
**$p < 0.001$, *$p < 0.01$.

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assessing autonomy is, 'I feel like I am free to decide for myself how to live my life' ($M = 4.62$, SD = 0.78). The autonomy need satisfaction (ANS) scale showed low reliability ($\alpha = 0.47$). Removing items from the scale did not appreciably increase the reliability. Given the prominence of the need for autonomy as one of the three needs recognized by self-determination theory (Ryan & Deci, 2001), we retained the scale for analyses, however results for this variable should be viewed with caution. An example item assessing relatedness is, 'People in my life care about me.' ($M = 5.91$, SD = 0.67, $\alpha = 0.71$).

After completing the measures, to separate the measurement of the predictors from the dependent measure, participants completed a distracter lexical decision task for approximately 2 min. Participants were then randomly assigned to one of three conditions.

In the *fast* condition ($n = 35$) they read, '... please read each of the following items and ANSWER AS QUICKLY AS POSSIBLE! But make sure you read the entire statement before answering though! This section will be timed'. In the *thoughtful* condition ($n = 44$) they read, 'Please read each of the following items very carefully. Take your time and really think about each question and indicate how true it is for you. Try your best to give the most accurate answer possible that is the best indication of who you really are.' In the *control* condition ($n = 24$), they read, 'Please read each of the following items and indicate how true it is for you'.

Meaning in life

Participants then completed the 8-item MIL measure developed by Krause (2004; $M = 5.29$, SD = 0.87, $\alpha = 0.76$). This measure has been used in a number of studies of MIL (Krause, 2007a, 2007b) and includes items similar to other MIL measures (e.g., 'I have a system of values and beliefs that guide my daily activities'; 'I feel I have found a really significant meaning in my life'; 'In my life, I have clear goals and aims'). During these ratings, reaction times (RTs) were recorded to provide a manipulation check.

Results

Preliminary analyses

Table 1 presents the correlations among the variables measured in this study. All of the sources of information for MIL judgments were positively correlated with MIL (collapsed across conditions) and, with the exception of religious commitment, to each other as well.

The manipulation did not influence levels of MIL, $F(2,100) = 0.47$, $p = 0.62$. The means (SDs) for control, thoughtful, and fast conditions were: 5.31 (0.82), 5.20 (0.83), and 5.39 (0.95), respectively. To insure that the instructions did not lead to unreliability or haphazard responding in the MIL judgments, we calculated reliabilities for the Krause measure within each condition. Results showed the scale to be similarly reliable across conditions ($\alpha = 0.72$, 0.77, and 0.78 for control, thoughtful, and fast conditions, respectively). Moreover, Levene's test for equality of error variance was not significant ($F(2) = 0.16$, $p = 0.86$), suggesting that the manipulation did not produce heterogeneity of variance in MIL judgments.

Manipulation check

A one-way analysis of variance on RTs averaged across the MIL items indicated that the conditions differed significantly: for control, $M = 3275$ ms (SD = 793); for thoughtful, $M = 3604$ ms (SD = 1598); and for fast, $M = 2876$ ms (SD = 912); $F(2,100) = 3.85$, $p = 0.038$. Planned contrasts showed that the fast group (−1) was significantly faster than the thoughtful (0.5) and control (0.5) groups $t(100) = 2.16$, $p = 0.033$, $d = 0.43$ and the thoughtful group (+1) was significantly slower than the other two (weighted −0.5 each) $t(100) = 2.15$, $p = 0.036$, $d = 0.43$.

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Primary analyses

In order to examine the effects of condition on the sources used to judge MIL, all of the continuous variables were transformed into mean deviation scores (Aiken & West, 1991). Two dummy variables were created to represent the three conditions. The first dummy ('fast') contrasted the fast condition (coded 1) with the other two conditions (coded 0). The second dummy ('thoughtful') contrasted the thoughtful condition (coded 1) with the other two (coded 0), leaving the control group as the 0–0 baseline. The product of the continuous variables with these dummies represented the interaction of condition × sources of information. For each analysis, MIL was hierarchically regressed on the main effects in the first step, followed by the two two-way interactions entered on the second step. The potential interactions of sources of information with the two dummy variables are the key tests for the predictions. Comparing the relative contributions of each source across conditions tells us whether a source is particularly relevant to fast or more thoughtful assessments of MIL.

Positive affect

Table 2 shows the results of the hierarchical regression equation predicting MIL from PA, condition, and their interactions. As can be seen in the table, the main effect of PA was qualified by a significant PA × *thoughtful* dummy interaction. This interaction was probed by examining the prediction of MIL from PA within each level of the thoughtful dummy variable. Results showed that PA was a weaker predictor of MIL in the fast/control conditions ($\beta = 0.21$, $p = 0.11$) compared to the thoughtful condition ($\beta = 0.59$, $p = 0.0001$) and these regression weights were significantly different from each other, $z = 2.29$, $p = 0.011$. Rather than being especially relevant in the fast condition, PA was most strongly related to MIL in the thoughtful condition. Figure 1 shows the generated regression lines for each level of the dummy variable for those low and high (±1 SD from the mean) on PA. As can be seen in the figure, PA was strongly associated with MIL in the thoughtful condition. Perhaps most interestingly, when those who considered their answers thoughtfully were low on PA, life was judged as less meaningful.

Religious commitment

In the hierarchical regression equation predicting MIL from religious commitment and the conditions, only the main effect of religious commitment, entered on the first step (R^2 change = 0.09, $p = 0.021$) was significant ($\beta = 0.29$, $p = 0.003$). Neither interaction was significant (both β's ~ 0.01, p's > 0.92). Thus, the relevance of religious commitment to MIL did not vary as function of condition.

Table 2. Multiple regression predicting MIL from PA and condition.

	Main effects only, β	Full model, β
Main Effects R^2 change = 0.13; $p = 0.003$		
Positive affect	0.36**	0.01
Dummy variable/fast	−0.02	0.03
Dummy variable/thoughtful	−0.14	−0.10
Interactions R^2 change = 0.06; $p = 0.033$		
PA × fast		0.21
PA × thoughtful		0.37**

Notes: For the full model, Multiple $R^2 = 0.19$, $F(5,97) = 4.60$, $p = 0.001$.
**$p = 0.009$.

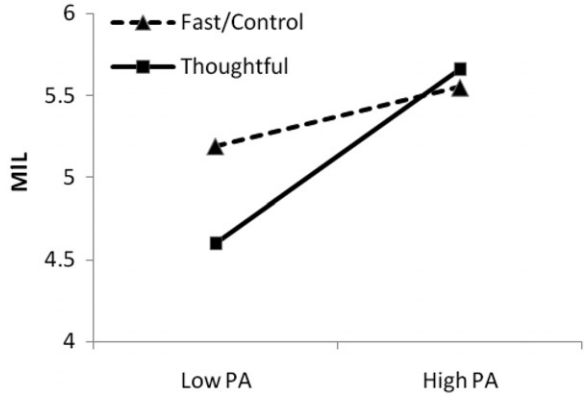

Figure 1. MIL judgments as a function of PA and condition.

Basic need satisfaction

Hierarchical regression analyses were computed for each of the three need satisfaction variables. For competence, the main effect step was significant (R^2 change = 0.26, $p = 0.0001$) with competence need satisfaction predicting MIL ($\beta = 0.52$, $p = 0.001$) and no significant interactions emerged (for the competence × fast dummy interaction, $\beta = 0.21$, $p = 0.17$; for the competence × slow dummy, $\beta = 0.14$, $p = 0.30$). Like religious commitment, the relevance of competence to MIL did not differ by condition.

Results for ANS are presented in Table 3. As can be seen in the table, the main effect of ANS was qualified by a significant ANS × fast dummy interaction. To decompose this interaction, regressions were computed within each level of the fast dummy variable. Results showed that although ANS was significantly

Table 3. Multiple regression predicting MIL from autonomy and condition.

	Main effects only, β	Full model, β
Main Effects R^2 change = 0.19; $p = 0.001$		
ANS	0.43**	0.14
Dummy variable/fast	−0.01	0.01
Dummy variable/thoughtful	−0.12	−0.09
Interactions R^2 change = 0.07; $p = 0.017$		
ANS × fast		0.33*
ANS × thoughtful		0.21

Notes: For the full model, multiple $R^2 = 0.24$, $F(5,97) = 6.69$, $p = 0.0001$.
**$p = 0.001$, *$p = 0.005$.

Table 4. Multiple regression predicting MIL from relatedness and condition.

	Main effects only, β	Full model, β
Main Effects R^2 change = 0.16; $p = 0.001$		
Relatedness need satisfaction	0.39**	−0.05
Dummy variable/fast	0.02	−0.02
Dummy variable/thoughtful	−0.02	−0.03
Interactions R^2 change = 0.09; $p = 0.005$		
RNS × fast		0.45**
RNS × thoughtful		0.28*

Notes: For the full model, multiple $R^2 = 0.24$, $F(5,97) = 6.25$, $p = 0.0001$.
**$p = 0.001$, *$p = 0.053$.

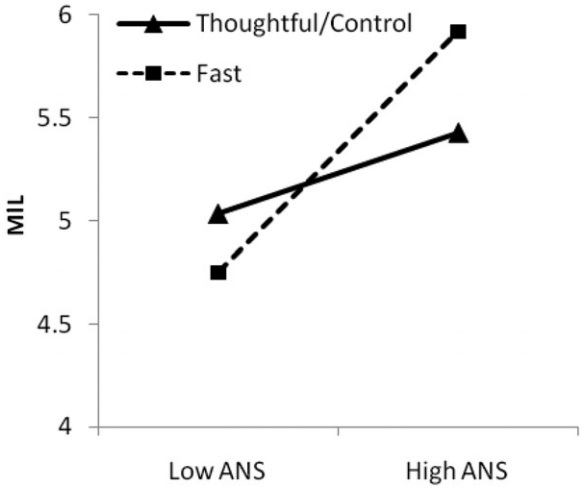

Figure 2. MIL judgments as a function of ANS and condition.

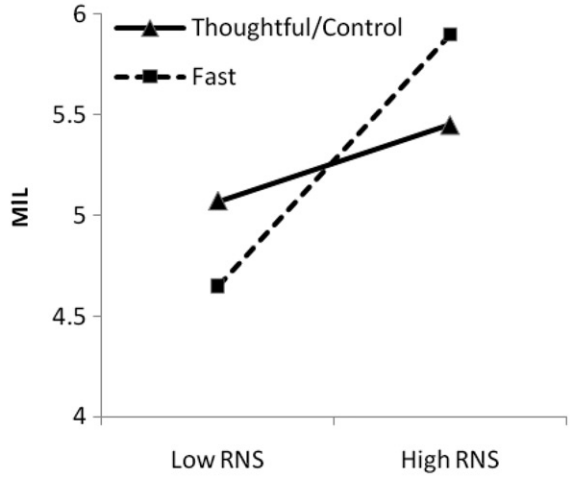

Figure 3. MIL judgments as a function of RNS and condition.

related to MIL in the thoughtful/control conditions ($\beta = 0.32$, $p = 0.007$), the relationship was significantly stronger in the fast condition ($\beta = 0.63$, $p = 0.0001$; $z = 2.42$, $p = 0.016$). Figure 2 shows the generated regression lines for each level of the fast dummy variable for those low and high on ANS. As can be seen in the figure, autonomy was very strongly related to MIL judgments for those who made rapid judgments, and somewhat less so for those in the thoughtful/control conditions.[2] These results are intriguing but they provide only tentative evidence for the role of organismic needs in rapid judgments of MIL, given the very low reliability of the ANS scale.

Results for relatedness need satisfaction (RNS) are presented in Table 4. As can be seen in the table, RNS, like ANS, significantly interacted with the fast dummy to predict MIL. Regressing MIL on RNS within each level of the fast dummy variable showed that RNS was marginally related to MIL in the thoughtful/control conditions ($\beta = 0.23$, $p = 0.065$), and was significantly more strongly related to MIL in the fast condition ($\beta = 0.66$, $p = 0.0001$; $z = 2.62$, $p = 0.005$). Figure 3 shows the generated regression lines for each level of the fast dummy variable for those low and high on RNS. The patterns of relations across Figures 2 and 3 are remarkably similar, indicating that autonomy and social relationship functioning are either quite centrally relevant to MIL judgments or key 'short cuts' for rapid assessments of MIL.[3]

Finally, because the RNS × thoughtful dummy interaction fell just short of significance (Table 4) and PA and RNS were significantly correlated (Table 1), we examined the independence of the interactions between the dummy variables and PA and RNS. In these analyses, we regressed MIL on each predictor and the conditions, while controlling for the other. Predicting MIL from PA and condition, controlling for

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Table 5. Exploratory analyses of predictors of thoughtful judgments of MIL.

Predictor	β entered together	β predicting MIL, entered alone[a]	β for mediator and predictor[a]	Sobel's test for mediation of PA by need satisfaction	Sobel's test for mediation of need satisfaction by PA
Competence	0.29*	0.49	0.61		2.32, $p = 0.02$
PA	0.47**	0.59		1.27, $p = 0.20$	
Autonomy	0.25	0.46	0.43		2.33, $p = 0.02$
PA	0.49**	0.59		1.60, $p = 0.11$	
Relatedness	0.19	0.39	0.64		2.15, $p = 0.03$
PA	0.52**	0.59		1.26, $p = 0.20$	

Notes: $N = 44$.
[a]All coefficients in the column are significant, $p < 0.005$.
**$p < 0.001$, *$p < 0.05$.

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RNS as a covariate ($\beta = 0.29$, $p = 0.003$), showed that the PA × thoughtful dummy interaction remained significant ($\beta = 0.35$, $p = 0.011$) while the PA × fast dummy did not contribute to the equation ($\beta = 0.01$, $p = 0.94$). Controlling for PA ($\beta = 0.23$, $p = 0.016$), the RNS × fast dummy interaction remained significant ($\beta = 0.43$, $p = 0.001$), while the RNS × thoughtful dummy did not contribute significantly ($\beta = -0.02$, $p = 0.92$). Thus, the marginal moderation of RNS by the thoughtful dummy condition (reported in Table 3) was fully mediated by PA (Sobel's test = 2.17, $p = 0.03$). In sum, it appears that social relationships (and perhaps autonomy) are especially relevant when making quick assessments of MIL, while PA is more distinctively relevant to thoughtful assessments.

Exploratory analysis of thoughtful assessments of MIL

Next, we embarked on exploratory analyses, focusing on the data in the thoughtful condition only. These analyses addressed the predictors of thoughtful assessments of MIL and the potential mediational relationships among the predictors, to explore the possibility that PA serves as a bottom line for thoughtful judgments of MIL.

First, we computed a regression equation predicting thoughtful judgments of MIL from all five of the predictors ($R^2 = 0.46$, $F(5,38) = 6.45$, $p = 0.0001$). Results showed that only PA significantly predicted thoughtful assessments of MIL ($\beta = 0.38$, $p = 0.011$), controlling for the other predictors (for ANS, $\beta = 0.18$, $p = 0.29$; for RNS, $\beta = 0.04$, $p = 0.79$; for competence, $\beta = 0.19$, $p = 0.23$; and for religious commitment, $\beta = 0.17$, $p = 0.20$). Because the basic need satisfaction scales were correlated with each other, multicollinearity might explain their lack of independent effects. Tolerance levels were ≥ 0.55 for all predictors, suggesting that this was not the case. Nevertheless, to address this possibility, we regressed thoughtful MIL ratings on each predictor and PA simultaneously, in separate equations. For example, predicting thoughtful judgments of MIL from religious commitment ($\beta = 0.14$, $p = 0.29$) and PA, showed that PA ($\beta = 0.56$, $p = 0.001$) remained a significant predictor of thoughtful assessments of MIL.

Results of similar analyses for the three need satisfaction measures are shown in the first column of Table 5. While PA remained significantly associated with thoughtful assessments of MIL controlling for each of the measures of need satisfaction, controlling for PA substantially reduced the contributions of the need satisfaction variables to thoughtful MIL judgments. Finally, we tested for mediation of the relationships between the predictors and thoughtful assessments of MIL.

All the variables shown in Table 5 satisfy Baron and Kenny's (1986) prerequisites for tests of mediation: All were significantly associated with thoughtful assessments of MIL when entered into the equation alone and all three need satisfaction variables were significantly related to PA.[4] Thus, we tested whether the basic need satisfaction variables mediated the relationship between PA and MIL, and whether PA mediated the relationships of basic need satisfaction to MIL. As shown in Table 5, tests for mediation provided no evidence that the contribution of PA to thoughtful assessments of MIL was significantly mediated by psychological need satisfaction.[5] In contrast, PA fully mediated the relationships between both ANS and RNS and thoughtful assessments of MIL and partially (but significantly) mediated the relationship between competence and those judgments.

Discussion

This study examined the ways that rapid versus thoughtful instructions influenced the relationships

between various sources of information and MIL. Of the five sources measured, the relations of three to MIL were significantly moderated by condition: PA was most relevant to thoughtful assessments and autonomy and RNS were most relevant to quick assessments. The relations of religious commitment and competence to MIL were not influenced by the manipulations.

Before addressing the implications of these findings, it is important to note, at the outset, that all of the variables considered in this study can be seen as playing an important role in meaningful living. Judging one's life as meaningful is a key to healthy functioning and all of the predictors tested mattered to this judgment in various ways. Our purpose in this study was not to discount these associations, but rather to explore the nuances of the relationships of these various sources of information to judgments of MIL. With this caveat in mind, considering the implications of this study for our understanding MIL opens a variety of theoretical and empirical directions.

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Positive affect

Results demonstrate that rather than being a heuristic that is used in rapid assessments of MIL, PA serves as a source of information for thoughtful judgments of life's meaningfulness. The present results show no evidence that PA is discounted as a source of MIL as individuals thoughtfully considered this judgment. Results in Table 5 suggest that rather than thoughtfully parsing out PA from their judgments, participants appear to have landed on PA (even over and above organismic need satisfaction) as a source for MIL judgments *upon careful reflection*. These results support the notion that PA may, in fact, serve as a kind of summary 'bottom line' for thoughtful judgments of MIL.

Results for PA in the thoughtful condition are notable not only because they challenge previous notions of the relationship between affect and MIL but also because, in retrospect, seem so unlikely. Among the sources of information for MIL judgments tested, state PA is arguably the most unstable. Furthermore, state PA was measured at the beginning of the assessment, and it is possible that mood was influenced by the completion of the other measures. Thus, the measure of PA used in this study (essentially the affect participants brought with them into the lab) was arguably the least likely to relate to MIL judgments. If PA had been measured immediately prior to the MIL assessments, the relationship might well have been stronger.

It is intriguing that PA was not significantly related to MIL in the fast/control conditions. The pattern of results in Figure 1 is very similar to results from previous studies. In those studies, PA was unrelated to MIL for individuals who were high on religious commitment, primed with words related to heaven (Hicks & King, 2008) or positive social relationships (Hicks & King, 2009), or who were high on feelings of social relatedness (Hicks et al., 2010). Individuals in these groups showed the same relatively high levels of MIL across levels of PA. In contrast, in comparison groups of individuals low on religious commitment (Hicks & King, 2008), primed with control words (Hicks & King, 2008, 2009), or experiencing low levels of social connection (Hicks et al., 2010), PA was strongly related to MIL, with those reporting low PA showing the lowest levels of MIL (similar to our results for the thoughtful condition). Integrating the present findings with this past research suggest that in the fast/control conditions participants were, essentially, thinking of things other than mood when judging MIL.

In the thoughtful condition (and those comparison groups noted above) low PA was distinctively associated with lower MIL. This association suggests a potential link to depression. A distinguishing feature of depression (relative to anxiety) is low PA or anhedonia (Clark & Watson, 1991), and numerous studies have found an inverse relationship between MIL and depression (King & Hicks, 2009; Krause, 2007c; Mascaro & Rosen, 2008; O'Connor & Vallerand, 1998; Schnell, 2009; Steger, Kashdan, Sullivan, & Lorentz, 2008). It may be that PA underlies the strong (negative) link between depression and MIL: when one ponders life's meaning thoughtfully (as, perhaps, a depressed individual may be likely to do) and PA is low, life is likely to be viewed as less meaningful.

Autonomy and social relatedness need satisfaction

The satisfaction of organismic needs for autonomy and social relatedness was most strongly related to MIL in the fast judgment condition. As noted previously, variables that have a strong effect on rapid assessments of MIL might be most central and immediately relevant to the construct, as these apparently are the first things that come to mind when faced with questions concerning life's meaning. In this sense, the present results suggest the centrality of needs for autonomy and relatedness to MIL. The relevance of these variables to rapid assessments of MIL might indicate that social relationships and independence are very central sources of information for MIL for college students which would fit with the life tasks faced by these emerging adults (Demir, 2010; Lamborn & Groh, 2009). Further, both autonomy and relatedness represent the relationship of the person to his or her social context. Autonomy refers, of course, to independence within that context and relatedness the connection to

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it. As such, results for autonomy and social relatedness may indicate that the interpersonal domain was especially salient in rendering rapid MIL judgments. These two areas of life may be particular issues with regard to the relationships of emerging adults with their families. As noted previously, research has demonstrated the strong relevance of family to MIL for college students (Lambert et al., in press). Although this line of reasoning is intuitively attractive, it must also be taken with a grain of salt, given the low reliability of the autonomy measure.

In contrast, it might that autonomy and RNS functioned, primarily, as heuristic cues to MIL.[6] That is, they might have simply provided less than mindful short cuts to these rapid judgments. The present results are ambiguous with regard to the validity of each of these interpretations of the roles of autonomy and social relatedness in rapid MIL judgments (i.e., as relatively central vs. heuristics). It is interesting to consider how these alternate interpretations might be applied if the present results for autonomy and relatedness were found, instead, for PA. We invite the reader to imagine the conclusions that would be drawn if PA had related most strongly to MIL in the rapid condition and its effects in the thoughtful condition were fully mediated by other variables. It seems likely that rather than being considered central to the judgment, a variable that distinctively relates to very rapid assessments of MIL (or any other object of evaluation) would be considered a heuristic (especially if that variable happened to be positive mood).

Religious commitment and competence need satisfaction

The relations of religious commitment and competence need satisfaction were unaffected by the manipulations. Both variables related positively to MIL but not as a function of condition. Although null results are always ambiguous, the present null findings (in the context of the other three moderation effects) suggest that these sources of information for MIL judgments are relatively impervious to the differences in instruction. We might say that religious commitment and competence served as all-purpose sources of MIL whether those judgments were rendered rapidly, thoughtfully, or with control instructions. What might set these sources of meaning apart from the others considered here? Religious commitment and competence do not include the clear social component mentioned above. It may be that these more intrapersonal experiences are less susceptible to contextual changes, relating to MIL regardless of the amount of thought given to the judgment. It is also worth noting that competence remained associated with thoughtful MIL, even controlling for PA. This suggests that the experience of mastery, of doing well, and of accomplishing goals is central to thoughtful judgments of MIL, even when those experiences are not associated with positive mood. These results suggest that competence is an especially important to the judgment of life as purposeful and meaningful.

Provocative questions and implications

Do rapid, thoughtful, and control ratings of MIL differ in terms of their validity? Future research might examine how MIL judgments rendered using these varying instructions relate to judgments of MIL rendered prior to these assessments or other aspects of well-being over time to illuminate this issue. With regard to the thoughtful assessments, we note that it is a likely hope of researchers who use self-report questionnaires that participants do apply some thought to these judgments. Clearly, a person could spend considerable time (even a lifetime) reflecting on what it is that makes life meaningful. It is important to note that although we have labeled the thoughtful condition 'thoughtful', in general, participants were not lost in thought over these items. After all, on average, they spent about 3.6 s reading the items and rendering their responses. Nevertheless, it is possible that thoughtful judgments of MIL were influenced by factors that were simply not available to those in the quick assessment condition. For instance, these thoughtful assessments may reflect naïve theories about what makes life meaningful. Although not allowing for a direct test of this possibility, the present results might suggest that PA (or experiences that are strongly related to PA) plays a more substantial role in intuitive theories of MIL than in psychological theories of the construct. These issues might be more directly examined in research using alternative ways of assessing MIL (for instance interviews or written narratives). Such data would permit an examination of what it is that makes life meaningful, when participants are asked for 'the first thing that comes to mind' versus being allowed to delve into the question more thoughtfully.

Earlier we set forth a rationale for the way that PA might come to be a strong predictor of thoughtful MIL judgments. Another possible explanation for the strong relationship between PA and thoughtful assessments of MIL is that PA promoted mood-congruent memory in the thoughtful judgment condition (Forgas & Ciarrocchi, 2001). It may be that those in the thoughtful condition responded to the items by thinking about specific experiences relevant to these questions. Positive mood might have influenced the valence of these memories, leading to the strong association between PA and MIL. Such an explanation would seem to be particularly likely if the thoughtful

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instructions were experienced by participants as unusual and calling for substantive processing (Forgas, 2002). Clearly, thought listing methods might be incorporated into studies using thoughtful judgments to examine the processes that give rise to thoughtful assessments of MIL.

Furthermore, it is worth considering that although the thoughtful assessments of MIL might represent valid measures, self-reports of basic need satisfaction may have been rendered relatively mindlessly. Future research could manipulate the instructions for those predictors to see if thoughtfully rendered judgments of need satisfaction are more likely to relate distinctively to thoughtful judgments of MIL.

This study has implications for the distinction between hedonic and eudaimonic well-being. This distinction has been criticized for imposing an artificial boundary between affective and other sources of well-being (Kashdan, Biswas-Diener, & King, 2008). Results suggest that PA plays a substantial role in thoughtful assessments of MIL that is not derivative of its relation to eudaimonic variables. Rather, PA may be the way that eudaimonic pursuits impinge on subjective awareness and may serve as a sign of the value of these pursuits in thoughtfully judging MIL. Importantly, eudaimonic goal pursuit is positively related to hedonic well-being (Sheldon et al., 2010). Drawing an analogue to the principles of operant conditioning, we might suggest that the consequences of behavior determine its meaning. Thus, the PA that results from eudaimonic endeavors may be a key way they contribute to a sense of MIL. Aristotle (350 BCE/1998 CE), himself, defined happiness as not only the best and noblest, but also 'the most pleasant' thing. We suggest that eudaimonic variables are most truly in keeping with Aristotle's conceptualization when they are experienced as pleasant (King & Hicks, in press).

Limitations

Although the present results open up a variety of fascinating questions, it is important to consider the limits of this work. Of course, as this is a single study, future research is needed to replicate these intriguing results. Our measures were limited, as well, to self-report and single measures of the constructs investigated. The measure of ANS was notably low in reliability and it is possible that a more reliable instrument would have produced different results.

Another limitation of this study was the reliance on an undergraduate sample. However, the relations of PA to MIL have been demonstrated in adult samples (Hicks et al., 2010; Hicks et al., under review; King et al., 2006). Indeed, recent research drawing on socioemotional selectivity theory (Carstensen, 2006; Carstensen, Fung, & Charles, 2003; Carstensen, Isaacowitz, & Charles, 1999) has shown PA to play a *larger* role in people's MIL judgments as they age (Hicks et al., under review). Still, future research might seek to extend this research to non-college and more diverse samples.

In addition, our consideration of affect did not include negative affect (NA), which is generally included as a component of hedonic functioning. Past research has shown a significant (inverse) relationship between MIL and NA (Chamberlain & Zika, 1988; Keyes, Shmotkin, & Ryff, 2002; Steger, Kashdan, & Oishi, 2008) and exploring the role of NA in MIL judgments is certainly a goal for future research.

Finally, the results of this study are limited by the correlational aspects of the design. PA strongly related to thoughtful judgments of MIL but we do not know anything about the origins of that PA (see note 1). It might be that the variance in PA that related to thoughtful assessments of MIL was the product of dispositional individual differences such as extraversion (King et al., 2006), which were not measured in this study. The contribution of traits, relative to other variables, to thoughtful assessments of MIL is clearly an intriguing area for future research. Furthermore, a study including a positive mood induction and similar instructions would help to clarify if even induced PA would relate to thoughtful judgments of MIL. Although previous research has shown that specific instructions to discount mood wipe out the effect of PA on MIL (King et al., 2006), it would be interesting to examine whether simple instructions to be thoughtful, accurate, and true to oneself would have the same effect.

Conclusions

The present results challenge a variety of ideas about the relations of sources of information to MIL judgments. We found that more theoretically relevant variables (i.e., autonomy and social relatedness) were related to MIL especially strongly when MIL judgments were rendered quite rapidly. In contrast, PA was strongly associated with MIL judgments when those judgments were rendered thoughtfully. Although previously, PA was considered to play a role in MIL judgments for less than meaningful reasons, on second thought positive feelings matter to judgments of MIL, especially when these judgments are the product of thoughtful reflection.

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Notes

1. Throughout this article, we refer to the various predictor variables considered as 'sources of information' for MIL judgments. The use of this term is in keeping with the social cognitive approach to judgments of well-being. However, we acknowledge that these variables may be alternatively conceived as motivational or affective in nature. Particularly with regard to PA, although the influence of induced PA is commonly referred to as 'mood as information', because in this study mood was not manipulated, PA may serve as a proximal reflection of more distal sources of information (e.g., personal goals) about MIL.
2. In analyses predicting MIL from ANS and condition, controlling for PA ($\beta = 0.21$, $p = 0.045$), the ANS × fast dummy remained significant ($\beta = 0.33$, $p = 0.004$). Similarly, controlling for ANS ($\beta = 0.37$, $p = 0.001$), the PA × thoughtful dummy remained significant ($\beta = 0.42$, $p = 0.002$).
3. Because both autonomy and relatedness interacted with the fast dummy variable and these variables were significantly correlated with each other, we examined the independence of these interactions, controlling for each of these variables while predicting MIL from the other and its interactions with condition. Predicting MIL from ANS and condition, controlling for RNS as a covariate ($\beta = 0.18$, $p = 0.09$), showed that the ANS × fast dummy interaction remained significant ($\beta = 0.30$, $p = 0.002$). Controlling for ANS ($\beta = 0.33$, $p = 0.002$), the RNS × fast dummy interaction remained significant ($\beta = 0.47$, $p = 0.0001$).
4. Because religious commitment and PA were not related, no mediational analyses were conducted.
5. Note that Sobel's test is a relatively conservative test of mediation (Preacher & Hayes, 2004). It is possible that need satisfaction would mediate the relationship between PA and MIL using a less conservative test. Thus, to more fully address this issue, we also conducted tests of mediation using bootstrapping with 2000 resamplings. In all three analyses, PA remained significantly related to thoughtful MIL judgments, controlling for autonomy ($B = 0.47$, SE = 0.10, $p = 0.00001$), relatedness ($B = 0.40$, SE = 0.10, $p = 0.0003$), and competence ($B = 0.36$, SE = 0.10, $p = 0.001$).
6. Additionally, the particular relevance of autonomy and RNS in the rapid judgment condition might also be explained by priming effects. Recall that the basic needs were measured just prior to the manipulations. Although we had included a brief distracter task, these items might have been relatively more accessible because of the proximity in time to the measure of MIL. Previous research has shown that cognitive accessibility can influence the sources that are used in MIL judgments (Hicks & King, 2008, 2009; Hicks et al., 2010; Schlegel, Hicks, Arndt, & King, 2009). However this priming explanation would suggest that similar patterns of results should have emerged for competence, and they did not. Nevertheless, future research might seek to replicate the current study with the less transient source items (i.e., religious commitment and basic need satisfaction) assessed at a different time (rather than immediately prior to the MIL assessment).

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