




# Pursuing Pleasure or Meaning: A Cross-Lagged Analysis of Happiness Motives and Well-being in Adolescents

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## Abstract

Hedonic and eudaimonic motives have been shown to have different effects on well-being, but most prior studies concentrated on hedonic well-being. To further verify the predictive associations between happiness motives (i.e., hedonic and eudaimonic motives) and well-being, especially eudaimonic well-being, we used a two-wave cross-lagged longitudinal design in a sample of 419 teenagers (mean age = 15.17 years, SD = 0.43 years) with an interval of eight months. The results showed that eudaimonic motives significantly predicted later hedonic and eudaimonic well-being, while only eudaimonic well-being, in turn, predicted later eudaimonic motives. There were no predictive associations between hedonic motives and two dimensions of well-being. After controlling the effects of age, gender, and subjective socioeconomic status, these results remained significant. Furthermore, after adding the lagged paths between two types of well-being, only eudaimonic well-being predicted eudaimonic motives, while eudaimonic motives could not predict hedonic and eudaimonic well-being. Besides, eudaimonic well-being significantly predicted hedonic well-being, while negative affect rather than positive affect of hedonic well-being could predict eudaimonic well-being. These results provide further evidence for the directionality of the links between happiness motives and well-being, especially eudaimonic well-being in adolescents.

**Keywords** Hedonic and eudaimonic motives · Well-being · Cross-lagged analyses · Adolescents

## 1 Introduction

With positive psychology flourishing, an impressive number of research have explored how people pursue their well-being. Originated in ancient Greece, ways of pursuing well-being have generally been separated into the two types, hedonia and eudaimonia (Ryan & Deci,

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2001). Specifically, Aristippus proposed that happiness could be achieved through pursuing enjoyment, while Aristotle argued that we should strive for profound purposes of life (McKeon, 2001). Extensive discussions continued around hedonia and eudaimonia, and the definitions of different researchers fell into four somewhat distinct categories (Huta, 2016). Orientations include motives and goals behind individuals' chosen behaviors. Behaviors refer to individuals' specific behavior they engage in. Experiences involve subjective emotion and feelings, such as positive affect. Functioning contains abilities, accomplishments and healthy habits, such as flourishing. The last two terms are often outcomes of ways of living and are associated with the term "well-being" (Huta, 2016).

From the perspective of orientations, some researchers have further defined hedonia and eudaimonia as motives for activities (Huta, 2012; Huta & Ryan, 2010; Jia et al., 2021; Ortner et al., 2018). Hedonic motives were characterized as pursuing enjoyment, pleasure, comfort and painlessness (Huta, 2016; Huta & Ryan, 2010), whereas eudaimonic motives were defined as striving for developing oneself to excellence (Huta & Ryan, 2010). Prior studies have found that hedonic motives are moderately correlated with eudaimonic motives (Huta & Ryan, 2010; Lin & Chan, 2020; Saunders et al., 2018), suggesting that these two kinds of motives are related but distinct constructs (Giuntoli et al., 2021; Huta & Waterman, 2014).

Empirical evidence has been steadily accumulating to indicate that hedonic and eudaimonic motives have beneficial effects on well-being (Gentzler et al., 2021; Huta, 2016; Huta & Ryan, 2010; Joshanloo, 2016; Lin & Chan, 2020), but the majority of the existing studies utilized a cross-sectional design. Thus, less is known about the temporal directionality of the link between them. Besides, previous studies preferred to examine this link in adults (Huta, 2016; Huta & Ryan, 2010; Joshanloo, 2016; Lin & Chan, 2020), so it is unclear how happiness motives relate to well-being in adolescents from a developmental perspective. In contrast to adulthood, adolescence is a critical developmental period, with rapid biological and social changes and various challenges (Ciarrochi et al., 2015). Adolescents are susceptible to emotional or behavioral disorders during this period, which may influence their health and well-being (Kjell et al., 2013). In addition, adolescents are at the peak stage of sensation seeking (Harden & Tucker-Drob, 2011), so they are more likely to engage in hedonic activities (e.g., addiction behavior). What is worse, adolescents have a low level of self-control abilities (Duckworth & Steinberg, 2015), so it may be difficult for them to engage in meaningful activities which cannot bring them immediate pleasure and comfort (Gentzler et al., 2021). Therefore, examining happiness motives in adolescents and their relationships with well-being may be especially essential for youths' positive development and contribute to developing appropriate interventions that improve well-being during this vulnerable developmental period.

### 1.1 Antecedent Model

From the perspective of outcomes, it is widely acknowledged that well-being can be studied in two ways, namely hedonic well-being (HWB) and eudaimonic well-being (EWB). The former mainly refers to pleasures versus pains (Kahneman et al., 1999), and pays more attention to immediately emotional experience (Waterman, 1993). In contrast, the latter concentrates on living a life that fulfills individuals' potential (Ryff, 1989). Furthermore, evidence from confirmatory factor analysis (CFA) has demonstrated that HWB and EWB are

two related but distinct constructs (Joshani, 2016). In addition, HWB and EWB have been found to engage distinct gene regulatory programs (Fredrickson et al., 2013) and involve different neural mechanisms (Tanzer & Weyandt, 2020; Urry et al., 2004). Thus, it is essential to investigate two types of well-being simultaneously in a study.

The engine model of well-being seems to support the effects of happiness motives on well-being (Jayawickreme et al., 2012). The model assumes that internal psychological factors which influence individuals' choices can contribute to individuals' well-being. Thus, as one of the internal factors, happiness motives might drive people to engage in different activities, which in turn contributes to their well-being. Moreover, empirical studies seem to support the effects of happiness motives on well-being. For one thing, happiness motives have been found to correlate with HWB in adults (Asano et al., 2020; Huta & Ryan, 2010; Tonicic & Anic, 2015; Zeng & Chen, 2020) and adolescents (Gentzler et al., 2021; Jia et al., 2021). For another, several studies have also revealed that the happiness motives were related to EWB in adults (Asano et al., 2020; Huta & Ryan, 2010; Lin & Chan, 2020; Zeng & Chen, 2020).

However, most studies mentioned above were cross-sectional, which cannot examine the temporal directionality of the relation. As far as we know, only one longitudinal study has examined the directionality of the link between happiness motives and well-being and found that eudaimonic motives, not hedonic ones, could predict adolescents' HWB two months later (Jia et al., 2021). Nonetheless, several issues still merit further investigation. First, the scale adopted in this study was the 9-item Hedonic and Eudaimonic Motives of Activities Scale (Huta & Ryan, 2010). After reconsidering the definition of eudaimonia, Huta & Waterman (2014) added an item of "Seeking to contribute to others or the surrounding world" in the scale, which is better to reveal the connotation of eudaimonic motives. Second, this study utilized an interval of merely two months, which is relatively short for a longitudinal study. Third, this study explored only the hedonic dimension of well-being, but it is still unclear about the relationships between happiness motives and EWB. It must be noted that individuals with high levels of EWB are more likely to engage in activities that are intrinsically beneficial and achieve long-term and enduring happiness (McMahan & Estes, 2011; Steger et al., 2008). Thus, it is necessary to test the association between happiness motives and EWB in order to have a more comprehensive understanding of the relationships between happiness motives and well-being.

The self-determination theory seems to provide a framework to support the effects of happiness motives on well-being. According to the theory, people have three intrinsic psychological needs (i.e., autonomy, competence and relatedness needs), which constitutes the essentials of their motives, behaviors, and psychological well-being (Ryan & Deci, 2000). Satisfaction of these psychological needs reflects the experiences and feelings from their daily activities and events, and thus may act as links between daily activities and well-being (Martela & Sheldon, 2019; Deci & Ryan, 2013) also indicated that "eudaimonic living fosters well-being because it provides satisfaction of individuals' most fundamental need" (p. 135). Thus, eudaimonic motives may drive individuals to participate in eudaimonic activities that can lead a eudaimonic living, which could further satisfy their fundamental needs and benefit their well-being. Consistent with this, Lin & Chan (2020) found that need satisfaction could mediate the effects of eudaimonic motives on well-being. Besides, empirical studies have shown that eudaimonic motives rather than hedonic ones were associated with greater academic performance (Kryza-Lacombe et al., 2019) and more prosocial behaviors

(Pearce et al., 2021), which is beneficial for well-being. Thus, eudaimonic motives may prompt people to improve themselves through fulfilling their psychological needs and further enhance their well-being (Lin & Chan, 2020). Therefore, we posited the first hypothesis that happiness motives, especially eudaimonic motives could predict well-being.

## 1.2 Consequence Model

As mentioned earlier, one longitudinal study has illustrated that happiness motives can predict HWB (Jia et al., 2021), but it failed to identify the reverse link between happiness motives and HWB. Nevertheless, the influence of HWB on happiness motives might also exist based on the broaden-and-build theory (Fredrickson, 2001). Specifically, positive emotions (e.g., pleasure and joy) could benefit individuals to broaden their thought-action repertoires, widening the array of the thoughts and actions that come to mind (Fredrickson, 2001). In addition, some empirical studies have shown that positive emotions broaden attentional scope (Gasper & Clore, 2002) and foster behavioral flexibility (Johnson et al., 2010). Thus, individuals in a positive state may generate more thoughts about how to pursue their goals and choose the activities (e.g., those for pursuing pleasure and meaning) more effectively. Besides, longitudinal and experimental evidence has supported that the positive affect influences individuals' motivation processes (Chang, 2002; Pomerantz & Qin, 2014). Thus, HWB, representing the existence of positive affect and the absence of negative affect (Kahneman et al., 1999), might broaden individuals' minds to have stronger motives for hedonic and eudaimonic activities. Therefore, we hypothesized that HWB could predict happiness motives.

In addition, the self-efficacy theory (Bandura, 1982) may support the effect of EWB on happiness motives. Based on this theory, mastery experience is a powerful source of self-efficacy beliefs of the extent to how we are capable of performing certain tasks, which determines how we feel, think, motivate ourselves, and behave (Bandura, 1982). It is well known that EWB reflects fulfillment of one's potential, so individuals with high EWB have more experience of autonomy, mastery, and purpose. Mastery experience may lead to higher levels of self-efficacy beliefs, which further improve happiness motives. In this way, EWB may influence individuals' happiness motives by affecting their self-efficacy beliefs. Thus, we hypothesized that well-being may predict hedonic and eudaimonic motives.

## 1.3 The Current Study

Totally speaking, the aim of the current study was to examine the longitudinal relationships between happiness motives and well-being in a sample of adolescents. Our study would expand this field in three ways. Firstly, preceding studies on happiness motives and well-being focused on the cross-sectional relationship, so the longitudinal design should be conducted to verify the temporal directionality of the link. Secondly, Jia et al., (2021)'s study utilized a relatively short-term longitudinal design (i.e., two months), so our study adopted a longer time interval (e.g., eight months) to verify the associations between happiness motives and HWB. Thirdly, most prior studies concentrated on HWB, so we further explored the predictive effects between happiness motives and EWB. In addition, some researchers have found that age, gender, and subjective socioeconomic status (SSS) were correlated with well-being (Huang et al., 2017; Li et al., 2015; Matranga et al., 2020; Momtaz et al.,

2011; Okun et al., 2006; Weich et al., 2011), as well as happiness motives (Gentzler et al., 2021; Matranga et al., 2020). Therefore, we also tested whether the relationships between happiness motives and well-being still exist when these variables are controlled for.

In summary, to address the problems above, the present study would use a two-wave 8-month longitudinal design in a sample of 419 adolescents. Previous studies on the adolescents have found that both HWB and EWB tend to fluctuate over a short period of time, such as a day (Fosco et al., 2021; Vandeleur et al., 2009; Wang et al., 2015), a week (Tashjian et al., 2021), and several months (Barendregt et al., 2016; Costa et al., 2020; Efstathopoulou & Bungay, 2021; Galla, 2016; Jia et al., 2021; King & Datu, 2017). Besides, hedonic and eudaimonic motives also tend to fluctuate daily (McMahan et al., 2013; Steger et al., 2008; Tonicic & Anic, 2015), over one month (Asano et al., 2021), and over three months (Kinoshita et al., 2021). Thus, we hypothesized that happiness motives and well-being would change during an interval of eight months.

For the two-wave data, it is widely accepted that the traditional cross-lagged panel model (CLPM), which can estimate the directional effect of one variable on another at two points in time, is the only appropriate approach to examine the cross-lagged relationships between variables (Orth et al., 2021). Besides, from the perspective of conceptual considerations, although the traditional CLPM does not distinguish within- and between-person variance, some researchers argued that this model that is based on between-person variance may answer questions that cannot be assessed with models that focus on within-person effects (Orth et al., 2021). Furthermore, if the main purpose is to test the potential effects that make some people different from others, the traditional CLPM should be preferred (Asendorpf, 2021; Orth et al., 2021). In addition, a great deal of recent empirical research have utilized the two-wave CLPM to identify the longitudinal relationships between variables (Buchan et al., 2021; Chen et al., 2021; Euteneuer et al., 2021; Hwang et al., 2021; Jia et al., 2021; Lai, 2022; Lu et al., 2021; Metrik et al., 2022; Roxas, 2022; Xu & Li, 2022). Thus, we used the two-wave CLPM to test the temporal directionality of the relationships between happiness motives and well-being. Based on the engine model of well-being (Jayawickreme et al., 2012) and the self-determination theory (Ryan & Deci, 2000), we hypothesized that higher happiness motives would predict higher HWB and EWB eight months later. Based on the broaden-and-build theory (Fredrickson, 2001) and the self-efficacy theory (Bandura, 1982), we hypothesized that two kinds of well-being would in turn predict happiness motives.

## 2 Method

### 2.1 Participants and Procedure

First, we carried out a power analysis to determine the sample size using  $G \times \text{Power}$  3.0 (Faul et al., 2007). The power analysis found that we need at least 319 individuals to exhibit a small to medium correlation ( $r = .20$ ,  $\alpha = 0.05$ ,  $1 - \beta = 0.95$ ). In our study, at time 1 (T1), 481 students were recruited from one senior high school in the southwest of China using convenience sampling. Eight months later (T2), all of them were invited to complete the same measures as T1. Only 419 participants continued to join in our study, including 199 boys and 220 girls. Participants' mean age was 15.17 years old ( $SD = 0.43$ ), ranging from 14 to 17 years old. Attrition analyses indicated that the participant who left at T2 (12.9%)

were not significantly different from those who participated in two waves (87.1%) based on demographic data and studied variables.

The data were collected for the current study in October, 2020. First, every student volunteered to participate in the current study and signed informed consent. Besides, we also obtained written consent from their parents prior to the study. Then, the students were provided with written and verbal instructions explaining the procedure and the items on the questionnaires. All students completed the measures containing happiness motives and well-being at an online website (<https://www.wjx.cn/>). Our study was approved by the Shaanxi Normal University committee.

## 2.2 Measures

### 2.2.1 Hedonic and Eudaimonic Motives

To measure happiness motives, we used the revised Hedonic and Eudaimonic Motives for Activities Scale (HEMA-R) (Huta, 2016), which includes two subscales. Participants are asked to what degree they typically approach their activities with hedonic or eudaimonic intentions. Hedonic motives subscale contains five items, like “Seeking enjoyment?”, while eudaimonic motives subscale also has five items, for instance, “Seeking to do what you believe in?”. Each item is answered with a 7-point Likert scale ranging from 1 (not at all) to 7 (very much). The Chinese version of this scale has satisfactory reliability and validity (Li et al., 2021). In the present study, the Cronbach’s alpha coefficients of hedonic motives and eudaimonic motives subscales were 0.90 and 0.87 at T1 and 0.92, 0.97 at T2, respectively.

### 2.2.2 Positive and Negative Affect

Generally, positive affect and negative affect are often considered as indicators of HWB, so we measured positive and negative affect utilizing the Scale of Positive and Negative Experience (SPANE) (Diener et al., 2010). The questionnaire contains 12 items: 6 items in positive experiences (e.g., joyful) and 6 items in negative experiences (e.g., sad). Participants are asked to report how often in the past four weeks they have experienced each affect with a 5-point Likert scale ranging from 1 (never) to 5 (almost always). Its Chinese version has satisfactory reliability and validity (Jia et al., 2021; Kong et al., 2021; Li et al., 2013; Yang et al., 2020). In the current study, the Cronbach’s alpha coefficients of positive affect and negative affect subscales were 0.92 and 0.86 at T1, and 0.93, 0.87 at T2, respectively.

### 2.2.3 Eudaimonic well-being

To measure EWB, we utilized the Flourishing Scale (FS) (Diener et al., 2010). The scale includes eight items (e.g., “I lead a purposeful and meaningful life”), focusing on the important aspects of human functioning such as positive relationships, feelings of competence, meaning and purpose in life. Participants are asked to indicate their degree of agreement for each item with a 7-point Likert scale ranging from 1 (strong disagreement) to 7 (strong agreement). Its Chinese version has satisfactory reliability and validity (Duan & Xie, 2019; Tan et al., 2021; Liu et al., 2020). In this study, the Cronbach’s alpha coefficients were 0.93 at T1 and 0.93 at T2.

## 2.2.4 Controlling Variable

Subjective socioeconomic status was assessed via the MacArthur Scale of Subjective Social Status developed by Adler et al., (2000). This is a chart with 10 steps, with the top step representing the highest socioeconomic position in Chinese families. This scale has been generally utilized (Chen et al., 2014; Hu et al., 2012; Yan et al., 2022; Yan et al., 2020) and has acceptable test-retest reliability (test-retest reliability=0.76) (Hu et al., 2012).

## 2.3 Data Analyses

Mplus 7.4 was used in this study to analyze data with maximum likelihood estimation with robust standard errors (MLR). The items for each measure were used to create latent variables.

Firstly, we tested the CFA model. We utilized some indices to assess the fit of the models: comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR) (Hu & Bentler, 1999). Furthermore, the model would fit well if  $RMSEA < 0.08$ ,  $SRMR < 0.10$ , and  $CFI > 0.90$ . Smaller values of Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) indicate better fit.

After that, the metric and scalar invariance across time were tested to establish measurement reliability (Selig & Little, 2012). For the metric invariance, factor loadings across different times were constrained to be equal. For the scalar invariance, both intercepts and factor loadings across time were controlled. The index of Changes of CFI ( $\Delta CFI$ ) was used to reflect whether the measurement properties of the latent variables are stable over time, and  $\Delta CFI < 0.01$  was acceptable (Cheung & Rensvold, 2002).

Next, we tested the CLPM (see Fig. 1) to assess the reciprocal longitudinal links between happiness motives and well-being. In the model, the autoregressive and cross-lagged paths were transformed into directional prediction paths. Finally, based on the CLPM model, we tested the control model in which the effects of age, gender, and SSS were controlled for.

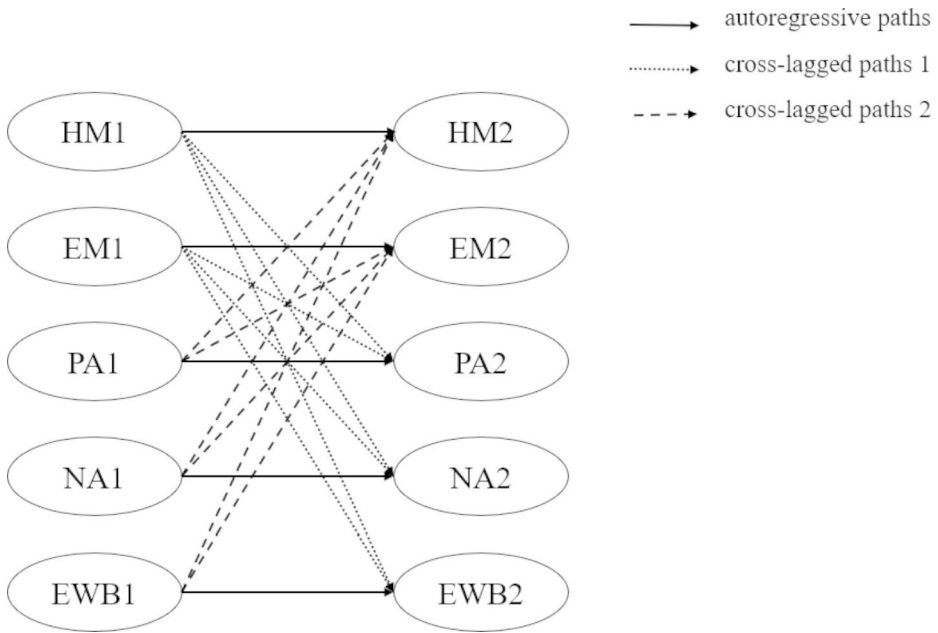
## 3 Results

### 3.1 Descriptive Analysis

The means, standard deviations, McDonald's omega coefficients, and correlations among hedonic motives, eudaimonic motives, and well-being were shown in Table 1. As anticipated, the results indicated that all variables were correlated with each other.

### 3.2 Model Results

Firstly, we conducted CFA to examine whether each variable can be represented by its indicators. The model (M1) showed an acceptable fit (Table 2). Then, the longitudinal measurement invariance was tested, and the metric invariance model (M2) fitted well ( $\Delta CFI = 0.001$ ). Besides, the results of the scalar invariance (M3) were also satisfactory ( $\Delta CFI = 0.006$ ). Under the same constraints, the autoregressive and cross-lagged paths were converted into



**Fig. 1** The autoregressive paths include the paths from variables at time 1 to the same of them at time 2. The cross-lagged paths 1 include the paths from happiness motives at time 1 to well-being at time 2. The cross-lagged paths 2 include the paths from well-being at time 1 to happiness motives at time 2. HM, hedonic motives; EM, eudaimonic motives; PA, positive affect; NA, negative affect; EWB; eudaimonic well-being; 1, variables at time 1; 2, variables at time 2

**Table 1** Pearson correlations, means and standard deviations

	1	2	3	4	5	6	7	8	9	10
1 HM1	1									
2 EM1	0.639	1								
3 PA1	0.442	0.503	1							
4 NA1	-0.156	-0.293	-0.474	1						
5 EWB1	0.364	0.621	0.675	-0.414	1					
6 HM2	0.408	0.260	0.281	-0.158	0.265	1				
7 EM2	0.319	0.521	0.371	-0.290	0.523	0.504	1			
8 PA2	0.367	0.435	0.574	-0.413	0.545	0.416	0.611	1		
9 NA2	-0.197	-0.272	-0.337	0.451	-0.349	-0.114	-0.327	-0.471	1	
10 EWB2	0.292	0.457	0.521	-0.438	0.639	0.336	0.690	0.767	-0.507	1
M	27.826	26.702	21.745	15.368	39.115	28.232	26.172	21.513	16.893	37.699
SD	6.397	6.119	4.694	4.597	10.144	6.051	5.880	4.376	4.446	9.883
omega	0.896	0.873	0.921	0.866	0.932	0.918	0.873	0.929	0.872	0.933

Note. HM, hedonic motives; EM, eudaimonic motives; PA, positive affect; NA, negative affect; EWB; eudaimonic well-being; 1, variables at time 1; 2, variables at time 2. All correlations were statistically significant at  $p < .01$

directional predictive paths, as exhibited in Fig. 1. This model (M4) provided a great fit to the data, and the parameter estimates of this model showed in Table 3.



**Table 2** Fit Indices

Model	$\chi^2$	df	CFI	AIC	BIC	SRMR	RMSEA	90% CI for RMSEA	
								Low	Up
M1	2754.513	1635	0.928	64851.242	65880.899	0.047	0.040	0.038	0.043
M2	2786.632	1660	0.927	64834.903	65763.613	0.049	0.040	0.038	0.043
M3	2916.520	1690	0.921	64916.325	65723.899	0.052	0.042	0.039	0.044
M4	2956.460	1698	0.919	64945.095	65720.366	0.064	0.042	0.040	0.045
M5	3170.662	1869	0.917	64923.702	65735.314	0.069	0.041	0.038	0.043
M6	2928.238	1694	0.920	64920.837	65712.260	0.054	0.042	0.039	0.044

Note. M1, CFA model; M2, Metric invariance model; M3, Scalar invariance model; M4, Cross-lagged model; M5, Control model; M6, added the lagged paths between HWB and EWB based on M4; CFI, comparative fit index; AIC, Akaike Information Criterion; BIC, Bayesian Information Criterion; SRMR, standardized root mean square residual; RMSEA, root mean square error of approximation

**Table 3** Standardized Estimates for the Cross-lagged Models (M4)

Autoregressive path	$\beta$	Cross-lagged path 1	$\beta$	Cross-lagged path 2	$\beta$
HM1→HM2	0.397***	HM1→PA2	0.020	PA1→HM2	0.061
EM1→EM2	0.465***	HM1→NA2	-0.041	NA1→HM2	-0.012
PA1→PA2	0.375***	HM1→EWB2	0.016	EWB1→HM2	0.043
NA1→NA2	0.312***	EM1→PA2	0.305***	PA1→EM2	-0.118
EWB1→EWB2	0.475***	EM1→NA2	-0.192*	NA1→EM2	0.036
		EM1→EWB2	0.190*	EWB1→EM2	0.300***

Note. HM, hedonic motives; EM, eudaimonic motives; PA, positive affect; NA, negative affect; EWB; eudaimonic well-being; 1, variables at time 1; 2, variables at time 2. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

As shown in Table 3, the five autoregressive paths were significant, implying that all variables were relatively stable across time. Then, we examined the predictive effects from happiness motives at T1 to well-being at T2 (cross-lagged path 1) and from well-being at T1 to happiness motives at T2 (cross-lagged path 2). There were significant and positive associations between eudaimonic motives at T1 and PA, NA, and EWB at T2. As for hedonic motives, all cross-lagged paths were not significant. For the effects of well-being at T1 on happiness motives at T2, only EWB at T1 was significantly associated with eudaimonic motives at T2, while the rest paths were not significant. At last, the control model (M5) was tested to rule out the effects of gender, age, and SSS. After controlling for these variables, our main findings were stable.

Furthermore, on the basis of previous studies reporting the longitudinal link between HWB and EWB (Joshnloo, 2018, 2019), we added the lagged paths between HWB and EWB to further explore the relationships between happiness motives and well-being. This model showed an acceptable fit (M6 in Table 2). The results indicated that the effects of EWB on eudaimonic motives remained significant ( $\beta = 0.366, p < .001$ ). However, the paths from eudaimonic motives to PA, NA and EWB were not significant ( $ps > 0.05$ ). In addition, for the relationships between HWB and EWB, it was shown that EWB significantly predicted PA and NA ( $\beta_{PA} = 0.283, p = .002$ ;  $\beta_{NA} = -0.223, p = .005$ ), and only NA predicted EWB ( $\beta_{NA} = -0.096, p = .029$ ).

## 4 Discussion

This research provided empirical evidence to uncover the directional link between hedonic and eudaimonic motives and well-being. The results of cross-lagged analyses showed that the two types of happiness motives had different relationships with well-being. Specifically, eudaimonic motives predicted HWB and EWB later, while only EWB predicted later eudaimonic motives. In contrast, hedonic motives did not predict any types of well-being, or vice versa. Besides, after we controlled for the effects of age, gender and SSS, all the results remained stable. Furthermore, after adding the paths between HWB and EWB, the effect of EWB on eudaimonic motives remained, while eudaimonic motives did not predict HWB and EWB. In addition, EWB could predict HWB eight months later, while NA rather than PA had a longitudinal influence on EWB.

As expected, the five autoregressive paths were significant, indicating that there was relative stability of all variables across eight months. However, the autoregressive path was stronger for eudaimonic motives than for hedonic motives, indicating that eudaimonic motives are more stable across time. An empirical study also revealed that the stability of eudaimonic motives was higher than hedonic motives (Jia et al., 2021). This may be because compared to eudaimonic motives, hedonic motives may drive people to pursue pleasure and comfort in a very short time (Ryan et al., 2006). Besides, the autoregressive path of EWB was more stable than PA and NA, which was similar to the study by Joshanloo (2019) showing that HWB was less stable than EWB across twenty years among adults. Li et al., (2022) also found this pattern of the result in adolescents with a time interval of three months. The higher stability of EWB may be because EWB focuses on enhancing skills and capacities which could benefit for a lifetime (Steger, 2016). In contrast, HWB is more vulnerable to emotional experience, which may change in a short time and decline stability (Diener, 2014).

In the cross-lagged path analysis, eudaimonic motives influenced HWB involving positive affect and negative affect when controlling for the autoregressive effect of HWB, which concurs with the study by Jia et al., (2021) reporting the predictive effect of eudaimonic motives on adolescents' HWB over two months. Besides, eudaimonic motives could also significantly predict later EWB, which extends previous research in this area. All these findings support the notion that eudaimonic motives are an antecedent to HWB and EWB. These results seem to be consistent with the engine model of well-being (Jayawickreme et al., 2012), according to which, psychological resources can facilitate individuals' well-being given that such resources promote internal psychological factors that influence individuals' decisions and behaviors. As internal psychological factors, happiness motives may help people to choose and engage in more eudaimonic activities, which further contribute to their well-being.

However, after adding the lagged paths between HWB and EWB, the effects of eudaimonic motives on HWB and EWB were no longer significant. Thus, eudaimonic motives could not influence HWB beyond EWB. Interestingly, we found that EWB could significantly predict HWB eight months later, which concurs with previous studies showing that EWB predicted changes in HWB over time (Joshanloo, 2018, 2019; Selcuk et al., 2016). This result seems to be explained by the self-determination theory, which claims that "certain activities and lifestyles, particularly those associated with eudaimonic living, supply the most reliable paths to happiness and positive affect" (DeHaan & Ryan, 2014, p. 40). Based

on the findings, we think that the nonsignificant effect of eudaimonic motives on HWB might be because EWB partly explained the effect of eudaimonic motives on HWB.

By comparison, hedonic motives did not predict HWB and EWB, which is partly consistent with the study by Jia et al., (2021), who reported no significant effect of hedonic motives on HWB two months later. Together with our findings on EWB, our results suggest that eudaimonic motives may have a greater influence on well-being than hedonic motives, which is conformed to the self-determination theory (Ryan & Deci, 2000). Eudaimonic motives may prompt people to engage in more eudaimonic activities, and thus satisfy inherent psychological needs, which in turn improve well-being. As for hedonic motives, the excessive pursuit of hedonia may bring some adverse outcomes, especially in adolescents. For instance, previous research has shown that hedonic motives are positively related to internet addictive behavior in adolescents (Yang et al., 2017) and smartphone addiction in late adolescents (Li et al., 2021). In addition, Ryan et al., (2006) pointed out that engaging in hedonic activities may be one way to obtain pleasure, particularly in a very short time. Consistent with this, a daily diary study showed that hedonic motives had a greater effect on well-being compared to eudaimonic motives (Toncic & Anic, 2015). Thus, the effects of hedonic motives on well-being are likely to decline with the interval of a long time, such as eight months.

For happiness motives as a consequence, we found that EWB could predict eudaimonic motives rather than hedonic motives. Importantly, the result remained significant after controlling for HWB, suggesting that EWB can independently influence eudaimonic motives, which is partly consistent with the self-efficacy theory which presumes that mastery experience could influence individuals' belief in self-efficacy (Bandura, 1982). When individuals have low levels of EWB, it is difficult to see themselves as functioning at an optimal and meaningful level, and thus they are more susceptible to low mastery experience, all of which may lead to low levels of self-efficacy beliefs. Furthermore, low levels of self-efficacy beliefs may prevent individuals from motivating themselves to participate in eudaimonic activities. For example, individuals with lower self-efficacy beliefs are less willing to engage in prosocial behaviors (Caprara & Steca, 2007; Mesurado et al., 2018).

However, we did not find evidence that HWB had predictive effects on hedonic and eudaimonic motives, which is not in accordance with the broaden-and-build theory (Fredrickson, 2001). This fits well with previous studies using cross-sectional (Gentzler et al., 2021) and cross-lagged longitudinal designs (Jia et al., 2021). For one thing, this might be because we measured positive and negative affect in the past four weeks which reflect state HWB. Future studies could utilize the trait measure of HWB to test the relationship between HWB and happiness motives. For another, individuals with higher HWB are more mindful about the emotional experience at the moment including pleasure and comfort (Huta & Waterman, 2014), which may be insufficient to stimulate their motives in the long term. Compared to EWB which pays much attention to long-term skill improvement and future goals (Joshani et al., 2021), HWB focuses more on short-term happiness outcomes, which may not influence individuals' beliefs and motives in a long time.

Furthermore, we found that NA rather than PA negatively predicted EWB eight months later. This seems to be inconsistent with the broaden-and-build theory, according to which, positive emotions can build an individual's psychological resources (Fredrickson, 2004), and eudaimonia has been hypothesized to be one of the resources that positive emotions serve to build (Fredrickson, 2016). However, our findings fit well with the study by Joshani-

loo (2018) which found that HWB could not influence the changes of EWB over four years. These may be because intensive or long-term positive states of mind could interfere with mental functioning and formation of skills (Gruber et al., 2011; Joshanloo & Jarden, 2016). Some empirical studies have also suggested that positive emotion, especially those excessive and immoderate ones, have some adverse influences, such as compromised empathic performance (Devlin et al., 2014), superficial information processing, increased stereotype effects, and reduced ability to detect deception (Forgas, 2013). Thus, the longitudinal benefits of PA on EWB may be counteracted by the adverse aspects of PA. In addition, the negative effect of NA on EWB is in accordance with the study by Rush et al., (2019) which found that daily NA could significantly predict the level of EWB nine years later. These may be due to that the persistence of NA brings some adverse influences on individuals' mental health (Hamama & Levin-Dagan, 2022; Zhao & Zhou, 2020), such as depression and anxiety (Burns et al., 2011; Gencoz, 2002; Pang & Wu, 2021), which could further decrease the level of EWB (Friedman et al., 2017; Ruini & Cesetti, 2019; Ruini et al., 2009). Thus, NA has a negative influence on EWB.

## 5 Limitations and Future Research Directions

There are some limitations to this study. At first, although all the measurement scales have acceptable reliabilities, they are based on self-report that may be influenced by social desirability. In the future, other methods like peer assessment could be used. Secondly, our research focused on the teenagers, so whether the results could be applied to other groups like adults need further verification. Thirdly, although the two-wave CLPM could identify the longitudinal relationship to some extent, it failed to separate between-person and within-person levels of variables, and thus cannot make a distinction between over-time effects and between-person associations. Future research should collect more waves of data and utilize other analyses such as the random-intercept cross-lagged panel model (RI-CLPM) and the bivariate Stable Trait, Autoregressive Trait, State (STARTS) model recommended by Lucas (2022) to further examine the longitudinal relationships between happiness motives and well-being. At last, although happiness motives have been found to relate to well-being in different cultures, such as Chinese (Li et al., 2021; Lin & Chan, 2020), Japanese (Asano et al., 2018), American (Gentzler et al., 2021; Huta & Ryan, 2010) and Canadian (Ortner et al., 2018), prior research has shown that collectivistic culture such as Chinese culture emphasizes relationship harmony and interdependence, while individualistic culture such as western culture emphasizes the values of personnel initiative and achievement (Church, 2000; Lim, 2009; Liu et al., 2021; Triandis, 1989). Thus, further studies should explore whether there are culture-specific mediating effects that contributes to the links between happiness motives and well-being.

## 6 Conclusion

Existing research has indicated that happiness motives were associated with well-being in adolescents, but these findings were based on cross-sectional (e.g., (Gentzler et al., 2021) or short-term longitudinal designs (e.g., (Jia et al., 2021); research on the associations of hap-

piness motives with changes in well-being (i.e., HWB and EWB) over relatively longer time periods is much less. The current study contributes uniquely to the literature on happiness motives and well-being in adolescents from a developmental perspective by demonstrating the temporal directionality of the relations between happiness motives and well-being using the two-wave cross-lagged analysis. Results show that eudaimonic motives, rather than hedonic motives predicted HWB and EWB later which can be accounted for the engine model of well-being and the self-determination theory; EWB, not HWB predicted later eudaimonic motives even after controlling for the effects of age, gender and SSS, which is partly consistent with the self-efficacy theory. Besides, after adding the paths between HWB and EWB, the effect of EWB on eudaimonic motives remained, while eudaimonic motives did not predict HWB and EWB. Furthermore, EWB could predict HWB eight months later, while NA rather than PA had a longitudinal influence on EWB. The findings could inform practitioners who aim to enhance the well-being of adolescents. Optimal intervention design should involve strategies for boosting eudaimonic motives to enhance the levels of HWB and EWB. In addition, to boost eudaimonic motives, practitioners should design interventions aiming at enhancing EWB. However, because well-being could not predict hedonic motives, well-being interventions may not boost hedonic motives. Therefore, interventions might need to focus on other processes which are more directly linked to hedonic motives.

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## Declarations

**Ethic Statement** The study was approved by the Shaanxi Normal University committee.

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