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Psychometric properties of measures of hedonic and eudaimonic orientations in Japan: The HEMA scale

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Abstract

The Hedonic and Eudaimonic Motives for Activities (HEMA) scale measures well-being as a series of orientations. We investigated the HEMA scale's psychometric properties among two Japanese samples in longitudinal studies over periods of one month ($N = 385$) and two months ($N = 224$). Exploratory and confirmatory factor analyses identified three subscales of the HEMA scale: hedonic pleasure orientation, hedonic relaxation orientation, and eudaimonic orientation. On average, at a given point in time, the correlations between subscales were $r = .58$ for the hedonic pleasure and hedonic relaxation orientations; $r = .56$ for the hedonic pleasure and eudaimonic orientations; and $r = .26$ for the hedonic relaxation and eudaimonic orientations—while the internal consistencies were $\alpha s > .80$ for all subscales. In both studies, the three HEMA subscales had test-retest correlations averaging $r s = .51$, which suggests that these orientations are temporally quite stable, yet they are also amenable to change. Longitudinal analyses showed correlations between the HEMA scale and external criteria: hedonic pleasure orientation was associated with life satisfaction, positive affect, personal growth, purpose in life, and sense of meaning; hedonic relaxation orientation was associated with life satisfaction, positive affect, calm affect, and personal growth; and eudaimonic orientation was associated with life satisfaction, positive affect, personal growth, purpose in life, and sense of meaning. Implications for future research on the HEMA scale are discussed.

Keywords Well-being · Hedonia · Eudaimonia · Motives · Psychometric properties

Well-being tends to be construed in either a hedonic sense or an eudaimonic sense (Ryan and Deci 2001; Ryan et al. 2008). The hedonic view focuses on experiencing pleasant and comfortable mental states, whereas the eudaimonic view focuses on ways of life that promote living well. Huta and Ryan (2010) developed the Hedonic and Eudaimonic Motives for Activities (HEMA) scale as a measure of well-being from these perspectives, comprising hedonic pleasure orientation, hedonic relaxation

orientation, and eudaimonic orientation (Bujacz et al. 2014; Asano et al. 2014, for a Japanese version). While these well-being orientations as assessed by the HEMA scale may be predicted a variety of well-being outcomes (Huta 2016; Huta and Waterman 2014),[1] the validity of its three subscales has not been fully established. This study applies longitudinal data from two Japanese samples to investigate the HEMA scale's psychometric properties, particularly its factor structure, temporal stability, and predictive power for well-being outcomes as external criteria.

Definitions of Well-Being

A large body of psychological research has examined concepts of well-being in relation to philosophical perspectives (Kesebir and Diener 2008; Raibley 2012), cultural contexts (Joshanloo 2014; Uchida et al. 2004), and historical changes (Oishi et al. 2013). Among these studies, one significant clarification on well-being is the distinction between hedonic and eudaimonic approaches

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[1] We distinguish "well-being orientations" assessed with the HEMA scale from "well-being outcomes" measured with existing scales, including life satisfaction, positive affect, negative affect, calm affect, personal growth, purpose in life, and sense of meaning.

(Ryan and Deci 2001; Ryan et al. 2008). The hedonic view refers to a conception of well-being in which people primarily seek to experience pleasure and comfort (Kahneman et al. 1999). This perspective has usually been operationalized in terms of subjective well-being, which consists of positive affect, lack of negative affect, and cognitive evaluation of life satisfaction (Diener et al. 2003, 1999). In contrast, the eudaimonic view, proposed by the Ancient Greek philosopher Aristotle, refers to a state in which people consider the personal qualities required to live a good life and how to live a well-functioning life (Waterman 1993). This approach is often operationalized in terms of psychological well-being, which comprises personal growth, purpose in life, autonomy, self-acceptance, environmental mastery, and positive relations with others (Ryff 1989; Ryff and Keyes 1995). Among these six components of psychological well-being, personal growth and purpose in life have been suggested to most clearly reflect eudaimonic aspects (Ryff and Singer 2008). Exploratory and confirmatory factor analytic evidence has differentiated subjective well-being as pursued from the hedonic view from psychological well-being as conceived in the eudaimonic view (Joshanloo 2016; Joshanloo and Niknam 2017; Linley et al. 2009). Thus, concepts of well-being can be both theoretically and empirically separated into the hedonic and eudaimonic senses.

However, conceptualizations of well-being from the hedonic and eudaimonic approaches remain open to debate. The hedonic view concerns an outcome, while the eudemonic view reflects the processes engaged in living well (Ryan et al. 2008). Huta and Waterman (2014) argued that previous research paradigms of the hedonic and eudaimonic perspectives caused confusion because these studies used different "categories of analysis." They proposed that definitions of well-being from these perspectives can be classified into four categories of analysis, namely *orientations*, *behaviors*, *experiences*, and *functioning*. Subjective well-being derived from the hedonic view relates to experiences, whereas psychological well-being derived from the eudaimonic view relates to functioning. Of the four categories, orientations include motives, values, and priorities. As compared to experiences and functioning, orientations stem more from personal choice, which can be altered or rearranged if desired or necessary. Orientations organize the direction of a person's actions and are thus a more fundamental category than behaviors (Huta 2016; Huta and Waterman 2014). Accordingly, the current research conceptualizes well-being orientations from both the hedonic and eudaimonic views.

Operationalization of Well-Being Orientations

The HEMA scale operationalizes hedonic and eudaimonic orientations (Huta 2016; Huta and Ryan 2010). Subsequent studies have demonstrated that hedonic orientation can be divided into two distinct components, and the HEMA scale thus consists of the three dimensions of hedonic pleasure orientation, hedonic relaxation orientation, and eudaimonic orientation (Asano et al. 2014; Bujacz et al. 2014). Hedonic pleasure and relaxation orientations respectively refer to seeking enjoyment and comfort for oneself. This distinction is consistent with past studies on the taxonomy of positive affect in terms of high and low arousal levels (Russell 1980; Watson and Tellegen 1985). Past findings have reported that low-arousal positive affect was valued more in Eastern cultures than in Western cultures (Kitayama et al. 2000; Tsai et al. 2006; Uchida and Kitayama 2009); therefore, it may be reasonable to consider that hedonic relaxation orientation is conceptualized more distinctively from hedonic pleasure orientation in Eastern countries, including Japan. Eudaimonic orientation, in contrast, refers to seeking to develop knowledge and skill, to act in accord with one's values and principles, and to strive for higher quality in one's behavior and performance. This definition of eudaimonic orientation includes the three overlapping elements of growth, authenticity, and excellence (Huta 2016).

Our study extends beyond previous research on the three HEMA subscales in two ways. One way in which we sought to advance knowledge in this field was by conducting longitudinal studies. Previous investigations of the three-factor model of the HEMA scale used cross-sectional designs (Asano et al. 2014; Bujacz et al. 2014), thus leaving questions of the temporal stability of the scale's three components unresolved. Research on other well-being orientations scales has generally shown relatively high temporal stability over periods of one or two months (r = .71–.78; e.g., Deci and Ryan 1985; Robitschek 1998); however, Huta (2016) reported that the two-factor model of the HEMA scale had slightly weaker temporal stability over a duration of two months than was reported in these past studies (rs = .62 and .64 for hedonic orientation and eudaimonic orientation, respectively). We thus anticipated that the three HEMA subscales would obtain moderate temporal stability, i.e., r = .40–.70. It also remains unclear how well the HEMA scale's three dimensions predict external criteria at later points in time. Past studies on the two- or three-factor model of the HEMA scale explored cross-sectional associations with hedonic outcomes, including life satisfaction, positive affect, negative affect, and calm affect, and eudaimonic outcomes, specifically personal growth, purpose in life, and sense of meaning (Asano et al. 2014; Huta and Ryan 2010; see also Huta 2016). Asano et al. (2014) found that hedonic pleasure orientation was linked to greater life satisfaction, positive affect, calm affect, and personal growth. These results indicate that hedonic pleasure orientation might be associated with hedonic as well as eudaimonic outcomes over time. Based on findings that have related hedonic relaxation orientation to higher levels of calm affect (Asano et al.

2014), this orientation could also be associated with hedonic outcomes over time. Previous findings demonstrated links between eudaimonic orientation and personal growth, purpose in life, sense of meaning, life satisfaction, and positive affect (Asano et al. 2014; Huta and Ryan 2010). Accordingly, eudaimonic orientation might be associated not only with eudaimonic outcomes over time but also with hedonic outcomes. Based on these goals, we assessed the HEMA scale using a longitudinal study design to examine the psychometric properties in terms of factor structure, temporal stability, and predictive power for a variety of well-being outcomes.

Another contribution of the present research is that we recruited participants from Japan, where the hedonic and eudaimonic orientations have yet to be studied widely. To date, findings based on research in Western countries have dominated the definitions of well-being outcomes, and these have tended to emphasize a hedonic perspective, while studies based on Eastern countries have tended to focus on well-being outcomes from an eudaimonic perspective (Joshanloo 2014). Moreover, simultaneous measurement of the hedonic and eudaimonic orientations with the HEMA scale has been mainly conducted in North American and European countries (e.g., Germany, Italy, and Poland; Huta 2016), and only one study has thus far been completed in Japan (Asano et al. 2014). To our knowledge, we provide the first English-language report involving Japanese samples that examines psychometric properties for the three HEMA subscales.

The Current Studies

We designed two longitudinal surveys among Japanese university students to investigate whether the HEMA scale demonstrated adequate psychometric properties. Study 1 was conducted a two-wave (one-month interval) survey assessing well-being orientations with the HEMA scale at Time 1 and Time 2, along with hedonic (life satisfaction, positive affect, negative affect, and calm affect) and eudaimonic outcomes (personal growth and purpose in life) at Time 2. Study 2 was conducted with a two-month interval between Time 1 and Time 2 and assessed hedonic (the three affects) and eudainomic outcomes (sense of meaning). We hypothesized that the HEMA scale would comprise three factors (i.e., hedonic pleasure orientation, hedonic relaxation orientation, and eudaimonic orientation) and that all of the subscales would be moderately associated between Times 1 and 2 ($r = .40$–.70). We also examined whether hedonic pleasure orientation was associated with hedonic and eudaimonic outcomes over time; hedonic relaxation orientation was associated with hedonic outcomes over time; and eudaimonic orientation was associated with eudaimonic and hedonic outcomes over time.

Study 1

Method

Participants We originally recruited 385 students (124 males, 261 females) from two universities in Nagoya, Japan. Respondents were compensated for their participation with partial course credit for their introductory psychology courses. The males' mean age was 19.1 years ($SD = 0.83$, range = 18–22); the females' mean age was 18.6 years ($SD = 0.72$, range = 18–22). Among the participants, 321 students (83.4%; 109 males, 212 females) completed the Time 2 questionnaire. Time 1 measures of calm affect for participants who dropped out of the study at Time 2 were significantly lower than those for participants who completed the study ($M = 20.27$ vs. $M = 21.50$, $p = .036$, $d = 0.29$).

Procedure Time 1 participants were instructed to complete a web-based questionnaire addressing well-being within the next week either at the university or at their homes. One month later (Time 2), they were asked to complete another questionnaire, again within one week from instruction. We administered both surveys using the Qualtrics online platform.

Measures At Time 1, we administered the Japanese version of the 11-item HEMA scale (Asano et al. 2014). The original nine items, which were developed by Huta and Ryan (2010; see also Huta 2016), were translated into Japanese and back-translated by Asano et al. (2014, Study 1). Furthermore, two items were added for a variety of items (Asano et al. 2014, Study 2; see Table 2). Using cross-validation with independent samples, Asano et al. (2014) reported that both the original 9-item version and the Japanese 11-item version of the HEMA scale comprised three subscales (i.e., hedonic pleasure, hedonic relaxation, and eudaimonic orientations). Hedonic pleasure orientation contained the following three items: "seeking pleasure"; "seeking enjoyment"; and "seeking fun." Hedonic relaxation orientation contained the following four items: "seeking relaxation"; "seeking to take it easy"; "seeking calmness"; and "seeking to feel laid-back." Eudaimonic orientation contained the following four items: "seeking to develop a skill, learn, or gain insight into something"; "seeking to do what you believe in"; "seeking to pursue excellence or a personal ideal"; and "seeking to use the best in yourself." Participants reported the degree to which each statement applied to their typical motives for daily activities using a 7-point scale ranging from 1 = strongly disagree to 7 = strongly agree.

At Time 2, we assessed four hedonic outcomes (i.e., life satisfaction, positive affect, negative affect, and calm affect) and two eudaimonic outcomes (i.e., personal growth and purpose in life) as external criteria besides the 11-item HEMA scale. Past research in Japan investigating associations with

the HEMA scale reported that the above scales showed high internal consistency (αs = .83–.88; Asano et al. 2014). First, life satisfaction was measured with the Satisfaction with Life Scale (SWLS; Diener et al. 1985), a well-validated five-item scale that Oishi (2009) translated into Japanese. Examples of items included "in most ways, my life is close to my ideal," and "the conditions of my life are excellent," and participants reported the degree to which each statement applied to them using a 7-point scale ranging from 1 = *strongly disagree* to 7 = *strongly agree*. Responses were summed to yield a life satisfaction score for each participant, whereby higher scores indicated greater levels of life satisfaction.

Second, affects were measured using the General Affect Scale (Ogawa et al. 2000), which was developed and validated in Japan and contained items relating to positive affect, negative affect, and calm affect (eight items each). Examples of positive affect items included "enjoying," "satisfied," and "cheerful"; examples of negative affect items included "nervous," "upset," and "fearful"; and examples of calm affect items included "peaceful," "at rest," and "calm." Participants reported the degree to which each affect applied to them within the last 2–3 days using a 4-point scale ranging from 1 = *not at all* to 4 = *very much*. Responses were summed for each dimension to yield affect scores for each participant, whereby higher scores indicated greater levels of each affect.

Third, psychological well-being was assessed using Nishita's (2000) scale, which was developed and validated in Japan based on Ryff's research (Ryff 1989; Ryff and Keyes 1995), and from which we extracted personal growth and purpose in life subscales (eight items each). Examples of personal growth items included "I think that I have a feeling of continued development of various aspects in the future," and "I think that I do not need any newer experiences and knowledge" (reverse item), while examples of purpose in life items included "I always maintain goals in life," and "I cannot find a sense of meaning in my life" (reverse item). Participants reported the degree to which each statement applied to them using a 6-point scale ranging from 1 = *strongly disagree* to 6 = *strongly agree*. Responses were averaged to yield personal growth and purpose in life scores for each participant, whereby higher scores indicated greater levels of each component.

Analysis Plan To examine the factor structure of the HEMA scale, we used an exploratory factor analysis (EFA) using the generalized least squares method with an oblimin rotation at Time 1 and a confirmatory factor analysis (CFA) using maximum likelihood robust estimation at Time 2. The Akaike's information criterion (AIC), the Bayesian information criterion (BIC), the sample-size adjusted BIC (SSA-BIC), and the root mean square error of approximation (RMSEA) were considered in the EFA. Besides these indices, the chi-square difference test, the comparative fit index (CFI), and the standardized root mean square residual (SRMR) were considered in the CFA. A significant decrease in the Satorra-Bentler scaled chi-square and lower values of the AIC, BIC, and SSA-BIC as model selection criteria for three-factor solutions were interpreted as indicating a better fitted model compared to one- and two-factor solutions. Values of the CFI > .95, RMSEA < .06, and SRMR < .08 were evaluated as indicators of good fit (Hu and Bentler 1999; West et al. 2012).

Next, we tested the temporal stability of the HEMA scale factors between times using Pearson correlation analysis, and we then estimated correlation coefficients to investigate the HEMA scale factors' predictive power as assessed at Time 1 for well-being outcomes at Time 2.

R 3.5.0 (R Core Team 2018) was used for the EFA and correlation analyses, and Mplus 8 (Muthén and Muthén 1998–2017) was used for the CFA.

Results and Discussion

We conducted the EFA to examine whether the HEMA scale comprised the hedonic pleasure orientation, hedonic relaxation orientation, and eudaimonic orientation subscales at Time 1. As shown in Table 1, the three model selection criteria and RMSEA suggested that the three-factor solution improved on the one- and two-factor solutions. The CFA at Time 2 also indicated that the three-factor solution (χ^2 (41) = 98.36, p < .001, AIC = 10,345.3, BIC = 10,481.1, SSA-BIC = 10,366.9, CFI = .955, RMSEA = .066, SRMR = .044) was better fitted than the two-factor solution (χ^2 (43) = 160.15, p < .001, Satorra-Bentler χ^2 (2) = 47.49, p < .001, AIC = 10,439.4, BIC = 10,567.7, SSA-BIC = 10,459.8, CFI = .909,

Table 1 Exploratory factor analyses for the hedonic and eudaimonic motives for activities scale at Time 1

	Study 1 (N = 385)					Study 2 (N = 224)				
	Eigenvalue	AIC	BIC	SSA-BIC	RMSEA	Eigenvalue	AIC	BIC	SSA-BIC	RMSEA
1-factor solution	4.97	473.2	299.3	438.9	.176	4.36	468.0	317.9	457.3	.231
2-factor solution	1.85	91.1	−43.3	64.6	.099	2.43	55.9	−60.1	47.6	.111
3-factor solution	0.77	−4.3	−103.2	−23.9	.047	0.87	−2.6	−87.9	−8.6	.065

AIC, Akaike information criterion; *BIC*, Bayesian information criterion; *SSA-BIC*, Sample-size adjusted BIC; *RMSEA*, root mean square error of approximation

RMSEA = .092, SRMR = .060). Table 2 presents factor loadings and inter-factor correlations for the three-factor solution at each time. Cronbach's α coefficients were .77–.86 and .81–.89 at Times 1 and 2, respectively (Table 3), thus indicating high internal consistency of the three subscales. These findings demonstrate that the three-factor model was reasonable for the HEMA scale (see Table S1 for descriptive statistics and inter-item correlations for each item at each time). Therefore, responses for the HEMA scale were averaged to yield hedonic pleasure orientation, hedonic relaxation orientation, and eudaimonic orientation scores for each participant, whereby higher scores indicated greater levels of each well-being orientation.

Next, we calculated correlation coefficients to investigate whether the HEMA scale was temporally stable between Times 1 and 2. As seen in Table 3, all three factors were moderately correlated between times: hedonic pleasure orientation ($r = .56$, 95% CI [.48, .63], $p < .001$); hedonic relaxation orientation ($r = .49$, 95% CI [.41, .57], $p < .001$); and eudaimonic orientation ($r = .48$, 95% CI [.39, .56], $p < .001$). These results indicated that the three HEMA subscales were moderately stable during the study period.

We then conducted correlation analysis to investigate whether the HEMA scale at Time 1 was associated with well-being outcomes at Time 2 (Table 3). As expected, hedonic pleasure orientation was associated with life satisfaction ($r = .46$, 95% CI [.37, .54], $p < .001$), positive affect ($r = .34$, 95% CI [.24, .44], $p < .001$), personal growth ($r = .28$, 95% CI [.18, .38], $p < .001$), and purpose in life ($r = .12$, 95% CI [.01, .23], $p = .033$), thus indicating that the greater the degree of hedonic pleasure orientation participants reported at Time 1, the more life satisfaction, positive affect, personal growth, and purpose in life they reported at Time 2. Hedonic relaxation orientation was correlated with life satisfaction ($r = .40$, 95% CI [.31, .49], $p < .001$), positive affect ($r = .12$, 95% CI [.01, .23], $p = .031$), calm affect ($r = .17$, 95% CI [.07, .28], $p = .002$), and personal growth ($r = .13$, 95% CI [.02, .24], $p = .017$), thus showing that the greater the degree of hedonic relaxation orientation participants reported at Time 1, the more life satisfaction, positive affect, calm affect, and personal growth they reported at Time 2. Moreover, as expected, eudaimonic orientation was associated with life satisfaction ($r = .36$, 95% CI [.26, .45], $p < .001$), positive affect ($r = .15$, 95% CI [.04, .25], $p = .009$), personal growth ($r = .35$, 95% CI [.25, .44], $p < .001$), and purpose in life ($r = .19$, 95% CI [.08, .29], $p = .001$), thus indicating that the greater the degree of eudaimonic orientation participants reported at Time 1, the more life satisfaction, positive affect, personal growth, and purpose in life they reported at Time 2.

In short, we demonstrated the HEMA scale's psychometric properties, including factor structure, temporal stability, and predictive power with two-wave longitudinal data over one month in Japan. Results showed that the HEMA scale comprised three dimensions, namely the hedonic pleasure, hedonic relaxation, and eudaimonic orientations. As expected, the three subscales were moderately stable over a period of one month. Furthermore, hedonic pleasure orientation was moderately associated with greater life satisfaction but weakly correlated with greater positive affect, personal growth, and purpose in life one month later. Hedonic relaxation orientation was moderately associated with greater life satisfaction but weakly correlated with greater positive affect, calm affect, and personal growth one month later. The unexpected association between hedonic relaxation orientation and one eudaimonic outcome, i.e., personal growth, can be explained on the basis of cultural differences in well-being. Because East Asians have been found to be more likely to emphasize low-arousal positive affect when compared with North Americans (Kitayama et al. 2000; Tsai et al. 2006; Uchida and Kitayama 2009), individuals in Japan with greater hedonic relaxation orientation might exhibit higher personal growth. Eudaimonic orientation was weakly associated with greater life satisfaction, positive affect, personal growth, and purpose in life one month later. Taken together, these results suggest that the HEMA scale demonstrates adequate psychometric properties among our Japanese student sample.

Although these Study 1 findings are important, some limitations must be addressed. First, the findings' robustness is limited because the time interval between surveys was only one month. Previous studies investigated the temporal stability of well-being at intervals of more than two months by measuring orientations (Deci and Ryan 1985; Robitschek 1998), experiences (Pavot and Diener 1993; Watson et al. 1988), and functioning (Ryff 1989). To more rigorously test temporal stability, further studies should assess the HEMA scale at longer intervals. Second, the HEMA scale's predictive power for well-being outcomes have yet to be fully investigated. Testing whether the three HEMA subscales predict external criteria over time is important, because the hedonic and eudaimonic orientations assessed with the scale represent predictors of well-being outcomes (Huta 2016; Huta and Ryan 2010).

To address these issues, we conducted another two-wave longitudinal survey in Japan, but this time there was a two-month interval between Time 1 and Time 2. Study 2 had three goals: (a) to investigate the HEMA scale's factor structure with a different sample of Japanese students; (b) to examine the HEMA scale's temporal stability two months after the initial assessment; and (c) to test whether the HEMA scale was linked to the well-being outcomes even after controlling for the initial HEMA subscales and well-being outcomes. In Study 2, in line with Huta and Ryan's (2010, Study 3) longitudinal research, we selected three hedonic outcomes (positive, negative, and calm affects) and one eudaimonic outcome (sense of meaning) as external criteria.

Table 2 Factor loadings and inter-factor correlation for the hedonic and eudaimonic motives for activities scale

	Study 1						Study 2					
	EFA at Time 1 (N = 385)			CFA at Time 2 (N = 321)			EFA at Time 1 (N = 224)			CFA at Time 2 (N = 191)		
	F1	F2	F3	F1	F2	F3	F1	F2	F3	F1	F2	F3
F1: Hedonic pleasure orientation												
4. Seeking pleasure (喜びを追求すること)	.57	.12	.28	.82			.55	.11	.23	.75		
6. Seeking enjoyment (楽しさを追求すること)	.94	.02	−.05	.85			.98	−.01	−.02	.81		
9. Seeking fun (面白さを追求すること)	.55	.09	.17	.74			.42	.14	.18	.68		
F2: Hedonic relaxation orientation												
1. Seeking relaxation (くつろぎを追求すること)	.12	.61	.09		.73		.07	.81	−.03		.86	
7. Seeking to take it easy (気楽さを追求すること)	.24	.54	−.04		.81		.06	.63	−.07		.74	
10. Seeking calmness[a] (やすらぎを追求すること)	.13	.72	.09		.91		−.10	.85	.10		.80	
11. Seeking to feel laid-back[a] (のんびりした気分を追求すること)	−.09	.97	−.05		.83		.04	.85	−.06		.89	
F3: Eudaimonic orientation												
2. Seeking to develop a skill, learn, or gain insight into something? (技術の向上、学習、あるいは事への洞察力の獲得を追求すること)	−.12	.04	.78			.72	.05	−.03	.72			.61
3. Seeking to do what you believe in (自分の信念に従った行動を追求すること)	.07	−.11	.63			.68	−.03	.09	.74			.78
5. Seeking to pursue excellence or a personal ideal (優秀さ、あるいは自分の理想を追求すること)	.06	.02	.63			.78	.08	−.05	.65			.72
8. Seeking to use the best in yourself (自分自身の力を最大限に生かす方法を追求すること)	.17	.03	.59			.70	.00	−.04	.81			.73
F2	.61	–		.86	–		.43	–		.59	–	
F3	.51	.26	–	.73	.55	–	.54	.16	–	.65	.18	–
Cumulative variance (%)	21.7	40.4	58.7	–	–	–	23.7	45.2	60.2	–	–	–

The Japanese translations are shown in parentheses

[a] Items were added for the Japanese version of the HEMA scale

EFA, exploratory factor analysis using oblimin rotation; *CFA*, confirmatory factor analysis

Table 3   Correlation coefficients and descriptive statistics among variables in Study 1 (N = 321–385)

	1	2	3	4	5	6	7	8	9	10	11	12
Time 1												
1. Hedonic pleasure orientation	–											
2. Hedonic relaxation orientation	.64***	–										
3. Eudaimonic orientation	.55***	.30***	–									
Time 2												
4. Hedonic pleasure orientation	**.56*****	.47***	.24***	–								
5. Hedonic relaxation orientation	.36***	**.49*****	.04	.76***	–							
6. Eudaimonic orientation	.40***	.30***	**.48*****	.62***	.47***	–						
7. Life satisfaction	.46***	.40***	.36***	.77***	.68***	.90***	–					
8. Positive affect	.34***	.12*	.15**	.33***	.20***	.19***	.26***	–				
9. Negative affect	−.01	.03	−.09	−.10	−.01	−.04	−.05	−.07**	–			
10. Calm affect	.11	.17**	−.02	.17**	.32***	.01	.12*	.40***	−.05	–		
11. Personal growth	.28***	.13*	.35***	.30***	.17**	.37***	.39***	.33***	−.18***	.12**	–	
12. Purpose in life	.12*	−.03	.19**	−.03	−.12*	.05	.02	.45***	−.13*	.05	.40***	–
M	5.57	5.30	4.94	5.39	5.30	4.88	25.46	20.52	16.74	21.18	4.54	3.47
SD	1.13	1.16	0.97	1.21	1.27	1.04	5.01	4.66	4.43	4.35	0.78	1.03
α	.84	.86	.77	.84	.89	.81	.86	.87	.85	.84	.84	.88

The time interval was one month. Bold values represent temporal stability between times

$* p < .05. ** p < .01. *** p < .001$

Study 2

Method

Participants We originally recruited 224 students (19 males, 205 females) from two universities in Nagoya, Japan. Respondents expressed an interest in participating in the research to receive partial course credit in an introductory psychology course. The males' average age was 19.5 years (SD = 1.12, range = 18–22); the females' average age was 19.1 years (SD = 0.65, range = 18–22). Of the initial participants, 191 students (85.2%, 16 males, 175 females) completed a questionnaire at Time 2. There were no significant differences in well-being orientations and outcomes between participants who dropped out of the study and those who remained at Time 2 (ps ≥ .145, ds ≤ 0.28).

Procedure As in Study 1, participants received instructions to complete a web-based questionnaire measuring well-being at Time 1 within the next week either at the university or at their home. Two months later (Time 2), they were asked to complete another questionnaire, again within one week. We administered both surveys using the Qualtrics platform.

Measures At Times 1 and 2, we administered the HEMA scale's Japanese version with 11 items (Asano et al. 2014), and as external criteria, we also administered three hedonic outcomes (positive affect, negative affect, and calm affect) and one eudaimonic outcome (sense of meaning) at both times. First, as

in Study 1, affects were measured using Ogawa et al.'s (2000) scale. Responses were summed to yield three subscale scores for each participant at Time 1 and Time 2.

Next, sense of meaning was assessed using Huta and Ryan's (2010) scale with 12 items, which were translated into Japanese for the purposes of this study. Examples of items included "meaningful," "full of significance," and "making a lot of sense to me." Participants reported the degree to which each statement applied to them using a 7-point scale ranging from 1 = *not at all* to 7 = *very much*. Responses were averaged to yield a sense of meaning score for each participant, whereby higher scores indicated greater levels of sense of meaning.

Analysis Plan First, to investigate the factor structure of the HEMA scale, we followed the same steps as in Study 1 in using an EFA with the generalized least squares method and an oblimin rotation at Time 1 and a CFA with maximum likelihood robust estimation at Time 2. We considered model comparison indices (change in the Satorra-Bentler chi-square, AIC, BIC, and SSA-BIC) and model fit indices (CFI, RMSEA, and SRMR). Next, we examined the temporal stability of the HEMA scale's three subscales using correlation analyses, and we then tested the HEMA scale's predictive power for well-being outcomes using a series of multiple regression analyses. We estimated the path coefficients from each HEMA subscale at Time 2 to each well-being outcome at Time 2, considering each HEMA subscale and well-being outcome at Time 1. Mplus 8 (Muthén and Muthén 1998–2017) was used for the CFA, and R 3.5.0 (R Core Team 2018) was used for the other analyses.

Results and Discussion

We conducted the EFA to examine whether the HEMA scale comprised the hedonic pleasure orientation, hedonic relaxation orientation, and eudaimonic orientation factors at Time 1. As shown in Table 1, the three model selection criteria and RMSEA indicated that the three-factor solution improved on the one- and two-factor solutions. Moreover, the CFA at Time 2 demonstrated that the three-factor solution (χ^2 (41) = 56.25, $p = .057$, AIC = 6237.3, BIC = 6354.4, SSA-BIC = 6240.3, CFI = .979, RMSEA = .044, SRMR = .046) was better fitted than the two-factor solution (χ^2 (43) = 180.17, $p < .001$, Satorra-Bentler χ^2 (2) = 116.73, $p < .001$, AIC = 6386.7, BIC = 6497.2, SSA-BIC = 6389.5, CFI = .810, RMSEA = .129, SRMR = .127). Table 2 shows the factor loadings and inter-factor correlations for the three-factor solution at each time. The α coefficients were .79–.87 and were .79–.89 at Times 1 and 2, respectively (Table 4), thus showing acceptable internal consistency of the three subscales. These results suggest that the three-factor model was appropriate for the HEMA scale (see Table S2 for descriptive statistics and inter-item correlations for each item at each time). Therefore, responses for the scale were averaged to yield hedonic pleasure orientation, hedonic relaxation orientation, and eudaimonic orientation scores for each participant, whereby higher scores indicated greater levels of each well-being orientation.

We next estimated the correlation coefficients between Time 1 and Time 2 to test the HEMA scale's temporal stability. Table 4 shows that all three factors were moderately correlated between times: hedonic pleasure orientation ($r = .53$, 95% CI [.41, .62], $p < .001$); hedonic relaxation orientation ($r = .46$, 95% CI [.34, .56], $p < .001$); and eudaimonic orientation ($r = .53$, 95% CI [.42, .62], $p < .001$). These results indicate that all of the HEMA subscales were moderately stable during the study period.

We then performed multiple regression analyses to investigate whether the three HEMA subscales at Time 2 predicted well-being outcomes at Time 2, even after controlling for the HEMA subscales and well-being outcomes at Time 1 (Table 5; see Table 4 for zero-order correlations among variables). As expected, hedonic pleasure orientation at Time 2 was associated with positive affect ($b = 1.04$, 95% CI [0.44, 1.65], $p < .001$, $\beta = .27$) and sense of meaning at Time 2 ($b = 0.23$, 95% CI [0.05, 0.41], $p = .011$, $\beta = .20$). Eudaimonic orientation at Time 2 was also associated with positive affect ($b = 0.72$, 95% CI [0.09, 1.34], $p = .025$, $\beta = .18$) and sense of meaning at Time 2 ($b = 0.36$, 95% CI [0.18, 0.53], $p < .001$, $\beta = .31$). The results indicate that the increases in hedonic pleasure and eudaimonic orientations increased both positive affect and sense of meaning; however, changes in hedonic relaxation orientation predicted no changes in well-being outcomes.

Table 4 Correlation coefficients among variables in Study 2 (N = 191–224)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Time 1														
1. Hedonic pleasure orientation	–													
2. Hedonic relaxation orientation	.43***	–												
3. Eudaimonic orientation	.55***	.13	–											
4. Positive affect	.38***	.06	.29***	–										
5. Negative affect	.05	.13	.02	.14	–									
6. Calm affect	.18**	.24***	.07	.47***	.13	–								
7. Sense of meaning	.48***	.07	.53***	.52***	−.04	.25***	–							
Time 2														
8. Hedonic pleasure orientation	**.53***	.11	.33***	.33***	.11	.15*	.42***	–						
9. Hedonic relaxation orientation	.25**	**.46***	−.03	.14	.14	.25**	.19**	.50***	–					
10. Eudaimonic orientation	.32***	−.03	**.53***	.24**	−.02	.07	.38***	.50***	.15*	–				
11. Positive affect	.14*	.00	.11	**.37***	.21**	.27***	.22**	.31***	.08	.22**	–			
12. Negative affect	−.07	.12	−.12	.10	**.48***	.01	−.07	.03	.13	−.06	.22**	–		
13. Calm affect	.08	.04	.05	.24**	.17*	**.39***	.15*	.13	.14*	.06	.58***	−.01	–	
14. Sense of meaning	.25***	−.01	.30***	.22**	.02	.09	**.40***	.34***	.05	.42***	.52***	.04	.12	–
M	5.47	4.74	5.15	20.97	17.42	20.87	4.83	5.50	4.93	5.19	19.95	18.38	18.93	4.74
SD	1.05	1.28	1.13	4.20	4.05	4.05	1.25	1.03	1.28	1.01	4.02	3.64	5.28	1.17
α	.79	.87	.83	.79	.76	.87	.95	.79	.89	.81	.79	.79	.88	.94

The time interval was two months. Bold values represent temporal stability between times

* $p < .05$. ** $p < .01$. *** $p < .001$

Table 5 Multiple regression analyses predicting well-being outcomes at Time 2 by predictors at Times 1 and 2 in Study 2 (N = 191)

Predictors	Positive affect		Negative affect		Calm affect		Sense of meaning	
	b	β	b	β	b	β	b	β
Intercept	10.25***	—	11.49***	—	8.93***	—	1.95***	—
Hedonic pleasure orientation (T1)	−0.48	−.12	−0.31	−.09	−0.16	−.03	0.02	.02
Well-being outcome (T1)	0.32***	.33	0.44***	.47	0.40***	.38	0.29***	.30
Hedonic pleasure orientation (T2)	1.04***	.27	0.18	.05	0.49	.10	0.23*	.20
Intercept	12.28***	—	10.11***	—	10.45***	—	2.94***	—
Hedonic relaxation orientation (T1)	−0.06	−.02	0.07	.02	−0.33	−.08	0.02	.02
Well-being outcome (T1)	0.35***	.36	0.43***	.47	0.40***	.38	0.38***	.40
Hedonic relaxation orientation (T2)	0.12	.04	0.09	.03	0.35	.09	−0.03	−.03
Intercept	10.72***	—	12.13***	—	9.26***	—	1.55***	—
Eudaimonic orientation (T1)	−0.28	−.08	−0.45	−.14	0.21	.04	0.02	.02
Well-being outcome (T1)	0.33***	.34	0.44***	.48	0.40***	.39	0.26***	.27
Eudaimonic orientation (T2)	0.72*	.18	0.17	.05	0.04	.01	0.36***	.31

The time interval was two months

Variance inflation factor = 1.01–1.54

T1, Time 1; *T2*, Time 2

* p < .05. *** p < .001

General Discussion

In general, Study 2 examined the HEMA scale's psychometric properties including factor structure, temporal stability, and predictive power for well-being outcomes with two-wave longitudinal data over two months in Japan. As with Study 1, the HEMA scale comprised the hedonic pleasure, hedonic relaxation, and eudaimonic orientations. The three HEMA subscales showed moderate temporal stability over two months. In addition, the increase in hedonic pleasure orientation and eudaimonic orientation (but not hedonic relaxation orientation) weakly increased in positive affect and sense of meaning of two months later.

The current study investigated the psychometric properties of the HEMA scale measuring well-being orientations in Japan by using two longitudinal datasets over one- and two-month intervals. In Studies 1 and 2, we found that hedonic orientation was divided into two components, whereby the HEMA scale comprised hedonic pleasure orientation, hedonic relaxation orientation, and eudaimonic orientation. The three subscales showed moderate correlations between times in both Study 1 and Study 2. In addition, hedonic pleasure orientation was associated with greater life satisfaction, positive affect, personal growth, purpose in life, and sense of meaning (Studies 1 and 2); hedonic relaxation orientation was correlated with greater life satisfaction, positive affect, calm affect, and personal growth (Study 1); and eudaimonic orientation was associated with greater life satisfaction, positive affect, personal growth, purpose in life, and sense of meaning (Studies 1 and 2). The strengths of our findings include conducting a longitudinal study design over one or two months, showing a low attrition rate (< 20%) during the study period, and obtaining similar results in two separate studies in terms of the factor structure and temporal stability. Moreover, this paper is the first on the Japanese HEMA scale's psychometric properties to be written in English, and thus contributes to the literature while also showing that the hedonic and eudaimonic orientations lead to various well-being outcomes.[2]

We found that the HEMA scale indeed comprised the three components of hedonic pleasure orientation, hedonic relaxation orientation, and eudaimonic orientation. Across samples and measurement times, we found that the link between hedonic pleasure and eudaimonic orientations was moderate or strong and that the relationship between hedonic relaxation and eudaimonic orientations was relatively weak. The present results align with previous research indicating that motivation for living well, which is emphasized in the eudaimonic view, causes pleasure and happiness, which are the focus of the hedonic view (Ryan et al. 2008). Orientations to meaning have been found to be associated with orientations to pleasure (Peterson et al. 2005), and one of the scales representing a functioning category of analysis based on the eudaimonic view also includes a hedonic pleasure component (Waterman et al. 2010). Therefore, eudaimonic orientation may be more related to hedonic pleasure orientation than to hedonic relaxation orientation.

We also used different time intervals to investigate the three HEMA subscale's temporal stability and predictive power for

[2] The same patterns of results were observed when we analyzed the original 9-item HEMA scale.

well-being outcomes. As expected, all three HEMA subscales demonstrated moderate stability during the study period. The three HEMA subscales also produced theoretically meaningful associations with a variety of hedonic and eudaimonic outcomes at given time points. Our findings suggest that the HEMA scale can capture the hedonic and eudaimonic orientations in Japan, as well as in Western countries (Huta 2016).

The present study assessed the HEMA scale representing the orientations category of analysis. However, scholars interested in well-being should also pay attention to classifications concerning the trait or state "level of measurement" (Huta and Waterman 2014). Measurement at the trait level refers to the typical or average level of well-being over time and context, while measurement at the state level refers to fluctuations of well-being during specific situations and time periods. The HEMA scale can identify well-being orientations at the trait or state level, depending on the instructions provided prior to presentation of items (i.e., "typically" can be used when measuring at the trait level, as was done in this study, and "during the past day/week" can be used for the state level; Huta and Ryan 2010). Further investigation is needed to replicate our three-factor model of the HEMA scale not only at the trait level, but also at the state level.

This study further stimulates attention to new research topics related to the HEMA scale assessing well-being orientations. One possible topic to consider in future research is the predictors of hedonic pleasure orientation, hedonic relaxation orientation, and eudaimonic orientation. A number of studies have reported associations between well-being outcomes and socioeconomic status (e.g., age, education, income), personality traits, and interpersonal relationship characteristics (Diener et al. 2003; Feeney and Collins 2015; Ryff and Singer 2008; Steel et al. 2008). Investigating whether these factors known to be associated with well-being outcomes can predict the three orientations as assessed by the HEMA scale is critical.

Another topic for future investigation is identifying the consequences related to hedonic pleasure orientation, hedonic relaxation orientation, and eudaimonic orientation. Though most researchers have postulated links between well-being outcomes and positive life outcomes (Lyubomirsky et al. 2005), subjective well-being does not always lead to positive results. For instance, individuals with extremely high degrees of subjective well-being have been more closely associated with low rates of income and education later in life than those with moderate degrees of subjective well-being (Oishi et al. 2007). Paradoxically, there is even a possibility that pursuing happiness can have detrimental effects on well-being outcomes (Gruber et al. 2011; Ryan et al. 2008). Such findings further emphasize the importance of understanding the consequences of the three orientations as assessed by the HEMA scale.

Some limitations to the present study should be addressed in future research. First, as with previous studies on the HEMA scale (Asano et al. 2014; Huta and Ryan 2010), the generalizability of our results is circumscribed because we used only an undergraduate population with short intervals of one- and two-month follow-ups. Further studies should investigate the HEMA scale's psychometric properties with samples from a broader age range and at intervals extending over a longer period of time. Second, the expected effects of the hedonic relaxation orientation on well-being outcomes were not supported in Study 2. Future research is needed to conduct a more rigorous test of the HEMA scale's predictive power, including a latent growth curve analysis that requires three or more measurement times. Finally, we did not investigate cultural differences in the hedonic and eudaimonic orientations. Previous research suggests that North Americans tend to increase happiness by experiencing personal achievement and self-esteem, whereas East Asians generally increase happiness by experiencing social harmony and being "ordinary" (Uchida et al. 2004). It would be interesting to test how the three HEMA subscales predict well-being outcomes, including "interdependent happiness" (Hitokoto and Uchida 2015), among Eastern cultures.

Overall, this study examined the HEMA scale's psychometric properties using two longitudinal surveys conducted in Japan. Our findings suggest that the HEMA scale, comprising hedonic pleasure orientation, hedonic relaxation orientation, and eudaimonic orientation, capture degrees of well-being orientations adequately. We hope that future work in this area will illuminate predictors and consequences of the hedonic and eudaimonic orientations with the scale.

Compliance with Ethical Standards

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