The Journal of Happiness & Well-Being, 2016, 4(1), 101-114

Affective states and the notion of happiness

Duygu durumlari ve mutluluk kavrami

Heinz Welsch[1], Jan Kühling[2]

Abstract

Social surveys have increasingly elicited citizen's happiness and life satisfaction, but the content of these notions is vague. This paper uses correlation and regression analysis of survey data from a student sample (N = 144) to explore how reports of happiness and life satisfaction are related to measures of positive affect (PA) and negative affect (NA). Major findings are the following: (1) PA and NA levels jointly predict happiness better than they predict life satisfaction. (2) PA levels predict happiness better than do NA levels. (3) NA levels predict life satisfaction better than do PA levels. (4) The PA items that predict happiness include those that predict life satisfaction (but not vice versa). (5) The NA items that predict happiness are distinct from those that predict life satisfaction. The study contributes to the literature by characterizing reported happiness and life satisfaction in terms of the specific positive and negative affects involved, thus clarifying their respective affective state content. Finding (4) is consistent with the mediator model of affective and cognitive well-being, according to which people in part directly rely on the affective component to judge life satisfaction. Given the nature and size of our sample, the results are indicative, and the study should inspire future research that strives to validate our findings in different contexts.

Keywords: Happiness, life satisfaction, positive affect, negative affect, social welfare

Özet

Sosyal araştırmalar giderek artan bir şekilde vatandaşların mutluluk ve yaşam doyumlarını ortaya koyuyor, fakat bu kavramlarım içerikleri belirsiz. Bu çalışma, mutluluk ve yaşam doyumunun pozitif duygu (PD) ve negatif duygunun (ND) ölçümüyle nasıl ilişkili olduklarını göstermek için, öğrencilerden oluşan örneklemde (N = 144) korelasyon ve regresyon analizi kullanılarak gerçekleştirilmiştir. Başlıca bulgular şunlardır: (1) PD ve ND birlikte mutluluğu, yaşam doyumundan daha iyi bir şekilde yordamaktadır (2) PD mutluluğu ND'den daha iyi bir şekilde yordamaktadır. (3) ND yaşam doyumunu PD'den daha yüksek düzeyde yordamaktadır. (4) Mutluluğu yordayan PD maddeleri yaşam doyumunu yordayanları da içermekle birlikte tersi geçerli değildir. (5) Mutluluğu yordayan ND maddeleri yaşam doyumunu yordayanlardan farklıdır. Bu çalışma bildirilmiş mutluluk ve yaşam doyumunu, belirli pozitif ve negatif duygular açısından nitelendirerek ve böylelikle alakalı duygusal durum içeriklerini açıklığa kavuşturarak literatüre katkıda bulunmaktadır. Bulgu (4) duygusal ve bilişsel iyi oluş, insanların yaşam doyumunu değerlendirmede bir oranda direkt olarak itibar ettikleri duygusal bileşen olan arabulucu modeli ile tutarlılık gösterir. Örneklemimizin doğası ve büyüklüğü göz önüne alındığında sonuçlar dikkat çekicidir ve çalışma farklı bağlamlarda sonuçlarımızı onaylamak için çaba gösteren gelecek araştırmalara ilham verebilir.

Anahtar Kelimeler: Mutluluk, yaşam doyumu, pozitif duygulanım, negatif duygulanım, sosyal refah

Introduction

Happiness, understood as a popular label for subjective well-being (SWB), is increasingly recognized as a measure of social welfare in both the social sciences and in public policy (Stiglitz, Sen, & Fitoussi, 2009). Consistent with this trend, SWB questions are included in practically all

[1] University of Oldenburg Department of Economics Oldenburg, Germany. E-mail:welsch@uni-oldenburg.de

[2] University of Oldenburg Department of Economics Oldenburg, Germany

Received: 12.05.2015 Accepted: 14.01.2016

large-scale social surveys around the world. These questions usually take the form of simple single-item life satisfaction questions ("How satisfied are you with your life?") and/or happiness questions ("How happy are you?"). These types of question correspond to the SWB components cognitive well-being (CWB) and affective well-being (AWB), which are based on subjective evaluation theories of well-being and on hedonic theories of well-being, respectively (Sumner, 1996).

The relation between CWB and AWB (and likewise their empirical counterparts, reported life satisfaction and reported happiness) is of considerable importance for the scientific study of well-being and for the use of well-being for public policy purposes. In particular, if AWB and CWB are distinct types of well-being, it is unclear which one might be (more) relevant for public policy (Schimmack, Schupp, & Wagner, 2008).

Despite its importance, the evidence concerning the relation between cognitive and affective well-being is limited. While they correlate positively with each other, their determinants seem to differ (Schimmack, 2007). Specifically, AWB is better predicted by personality (e.g. neuroticism) than is CWB, whereas CWB is better explained by external factors (e.g. unemployment) than is AWB (Schimmack et al., 2008). A theoretical explanation of the relationship between CWB and AWB is the mediator model according to which people in part directly rely on the affective component to judge life satisfaction (Suh, Diener, & Oishi, 1998). Consistent with the mediator model of the AWB-CWB relationship, Schimmack, Diener and Oishi (2002) proposed that personality traits, especially extraversion and neuroticism, primarily influence the affective component, having an effect on the cognitive component only indirectly to the extent that AWB influences CWB.

In addition to the relation between CWB and AWB, an important issue relates to the widespread practice of measuring AWB in terms of a simple single-item question. While this practice, which is common in general purpose social surveys, may be defended by considerations of parsimony, it has been vigorously criticized for the vagueness and ambiguity involved in asking people how happy they are : "… asking people how happy they are is a nonstarter" (Haybron, 2013). This is different with life satisfaction: "Seeking reports of life satisfaction in unambiguous language is a way to let people judge their lives by their own standards. But handling people a question of obscure meaning and letting them sort out before answering whatever they guessed the query to be is a rather different project …" (Haybron, 2013). Instead of asking people how happy they are, Haybron (2013) recommends using measures of affective state.

One way of exploring the meaning of "happiness" is to ask people about their definition of this notion. Following such an approach, Delle Fave, Brdar, Freire, Vella-Brodrick and Wissing (2011) found in a multi-country study that people's definition of happiness most frequently fell into the category of psychological balance and harmony, followed by the category of positive feelings and emotions. The latter is broadly consistent with an "affective state theory of happiness" (Haybron, 2000), which emphasizes "non-trivial" affective or emotional conditions (as opposed to mere pleasure) as the defining ingredient of the notion of happiness.

Present Study

The present paper addresses both of the issues discussed above: (a) the meaning of happiness, operationalized as the answer to the question "Taking all things together, how happy are you in general?" and (b) the relation of happiness (operationalized this way) to life satisfaction, operationalized as the answer to the question "Taking all things together, how satisfied are you with your life in general?" Motivated by the affective state conception of happiness (Haybron, 2000), it does so by studying how the two variables are related to common measures of affective

state from the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988).[3] Specific research questions addressed this way are the following:

-What are the contributions of positive affect (PA) and negative affect (NA) to happiness and life satisfaction, respectively?
-What are the specific affective states involved in happiness and life satisfaction?
-What are the implications (if any) for theories of the CWB-AWB relationship?

To address these questions we used data collected among undergraduate students in Germany (N = 144) to determine the sign, significance and strength of the association between happiness/life satisfaction and affective states, using both correlation and regression analysis. Our main findings can be summarized as follows: (1) PA and NA levels jointly predict happiness better than they predict life satisfaction. (2) PA levels predict happiness better than do NA levels. (3) NA levels predict life satisfaction better than do PA levels. (4) The PA items that predict happiness include those that predict life satisfaction (but not vice versa). (5) The NA items that predict happiness are distinct from those that predict life satisfaction.

Our paper seems to be the first that investigates the differential relation between positive and negative affect and commonly used measures of happiness and life satisfaction within a single study. It is similar and complementary to studies which measure the relationship between internal (personality) and external (environmental) factors on the one hand and affective and cognitive well-being on the other (Schimmack et al., 2002, 2008). The study contributes to the literature by characterizing reported happiness and life satisfaction in terms of the specific positive and negative affects involved, thus clarifying their respective affective state content. Our findings regarding positive affect are broadly consistent with the mediator model of affective and cognitive well-being, in the sense that the positive affective states that are relevant for the former include those that are relevant for the latter. By contrast, the negative affective states that are relevant for affective well-being are distinct from those that are relevant for cognitive well-being.

We acknowledge that the size of our study group is relatively small. In the light of this, the paper should be considered to be a first pass at an issue not previously studied, and the results should be taken as indicative. Future research should strive to validate our findings using larger and more representative samples.

Method

Study Group

Studying the relation between reported happiness and life satisfaction on the one hand and measures of positive and negative affect on the other requires that happiness questions and life satisfaction questions have a common format and that measures of positive and negative affect are available alongside measures of happiness and life satisfaction. Since such data are unavailable in common social surveys, we collected appropriate data among undergraduate students at the University of Oldenburg, Germany.

The data were gathered in May 2014 from undergraduates enrolled in a microeconomics course. A total of 144 participants aged 18 to 39 completed a questionnaire handed out within the course. Two otherwise identical versions of the questionnaire were used, of which one included a single-item “happiness” question, whereas the other included a single-item “life satisfaction”

[3] Following Bradburn (1969), affective well-being can be differentiated into positive affect (PA) and negative affect (NA). PA items exhibit positive correlations with each other, as do NA items, whereas correlations between PA and NA are close to zero (Schimmack, 2007). Correlations close to zero are referred to as structural independence of PA and NA. In addition, PA and NA tend to be characterized by causal independence, that is, they are influenced by different causes.

question.[4] The two versions were allocated to respondents on a random basis, yielding a "happiness" subsample ($N = 73$) and a "life satisfaction" subsample ($N = 71$).

Instrument

The "happiness" questionnaire begins with the question "Taking all things together, how happy are you in general?" An 11-point scale is offered, ranging from 0 = extremely unhappy to 10 = extremely happy. The "life satisfaction" questionnaire begins with the question "Taking all things together, how satisfied are you with your life in general?" An 11-point scale is offered, ranging from 0 = extremely dissatisfied to 10 = extremely satisfied. These formulations are in line with those used, e.g., in the European Social Surveys.

The happiness or life satisfaction questions are followed by questions assessing positive and negative affect and by questions concerning age, sex, the amount of monthly wage income (if any) and the amount of monthly non-wage income, such as scholarships or support by family (if any). Assessment of positive and negative affect uses a German version of the Positive and Negative Affect Schedule (Krohne, Egloff, Kohlmann, & Tausch, 1996).[5] As in the original version (Watson et al., 1988), respondents are offered a 5-point scale of affect intensities for each of the 10 PA and NA items, comprising 1 = very slightly or not at all, 2 = a little, 3 = moderately, 4 = quite a bit, and 5 = extremely. Consistent with the formulations of the happiness and life satisfaction questions, the temporal instruction is "Indicate to what extent you generally feel this way, that is, how you feel on the average." Affect items are listed in the following order: active, distressed, interested, enthusiastic, upset, strong, guilty, scared, hostile, inspired, proud, irritable, excited, ashamed, alert, nervous, determined, attentive, jittery, afraid. PA and NA levels were computed by adding across the individual PA and NA items, respectively; they can take values between 10 and 50.

Table 1 reports the descriptive statistics of the data. Mean happiness and life satisfaction levels are 7.5 and 7.8, respectively. Mean PA levels in the "happiness" and "life satisfaction" subsamples are 33.4 and 34.4, respectively. They are not statistically different from each other at conventional significance levels. Mean NA levels in the "happiness" and "life satisfaction" subsamples are 17.6 and 17.7, respectively. They are also not statistically different from each other, as are age, sex, wage income and non-wage income.

Mean PA is significantly greater than mean NA in both subsamples, and their levels are similar as in Watson et al. (1988) and Krohne et al. (1996).[6] Concerning internal consistency, Cronbach's alpha for PA is 0.78. All PA items are positively correlated with each other. Correlations greater than 0.4 (but not greater than 0.5) exist between the pairs excited-enthusiastic, strong-proud, strong-determined, proud-enthusiastic, and proud-determined. Cronbach's Alpha for NA is 0.83. All NA items are positively correlated with each other. Correlations greater than 0.4 (but not greater than 0.5) exist between the pairs upset-irritable, guilty-jittery, scared-ashamed,

[4] Using two separate questionnaires rather than including both questions in one questionnaire serves to avoid that answers to one question bias the answers to the other.

[5] Watson et al. (1988) proposed the Positive and Negative Affect Schedule (PANAS) as a brief measure of PA and NA. PANAS is widely used because it exhibits the structural relations between PA and NA mentioned in footnote 1 while measuring PA and NA in a parsimonious way, in terms of as few as 10 items each. The PA items are: attentive, interested, alert, excited, enthusiastic, inspired, proud, determined, strong and active. The NA items are: distressed, upset, hostile, irritable, scared, afraid, ashamed, guilty, nervous and jittery. The intensity of each affect is measured on a five-step scale, reaching from "very slightly or not at all" to "extremely". The overall PA and NA scores thus have a range from 10 to 50. PANAS can be administered with different temporal instructions, including "at the present moment", "today", "during the past few days", "during the past week", "during the past few weeks", "during the past year", and "generally, on the average".

[6] In Watson et al. (1988) mean PA and mean NA are 35.0 and 18.1 for the temporal instruction "generally". In Krohne et al. (1996) the respective values are 32.9 and 18.4.

hostile-irritable, irritable-nervous, irritable-jittery, guilty-nervous, and scared-afraid. The PA and NA levels are insignificantly correlated with each other (r = -0.12).

Table 1. *Summary statistics*

	Happiness subsample		Life satisfaction subsample	
Variable	Mean	*SD*	Mean	*SD*
Happiness	7.52	1.99		
Life satisfaction			7.77	1.58
Positive affect	33.41	5.18	34.42	4.83
Negative affect	17.60	5.89	17.72	5.29
Age	23.86	4.17	23.28	3.75
Female	.56	.50	.53	.50
Wage income	151.13	272.36	212.14	370.29
Non-wage income	493.08	406.48	453.08	435.57

In sum, the two subsamples are not statistically different with respect to PA, NA, age, sex, wage income and non-wage income. Life satisfaction is somewhat greater than happiness, and PA is significantly greater than NA (in both subsamples). The psychometric properties of the PA and NA data correspond to those in larger American and German samples (Watson et al., 1988, Krohne et al., 1996) both qualitatively (internal consistency and independence of PA and NA) and quantitatively (mean levels of PA and NA).

Procedure

Our empirical analysis involved several steps. We first investigated the relationship between happiness and life satisfaction on the one hand and levels of PA and NA on the other hand, using correlation and (multivariate) regression analysis. Second, we investigated the relationship between happiness/life satisfaction and the individual PA and NA items. This involved correlations between happiness/life satisfaction and these items, and multivariate regressions.

With regards to the latter, we addressed the problem of collinearity by applying Klein's Rule of Thumb (Gujarati, 2003). This amounts to eliminating those regressors as redundant which are better explained by all other regressors than the dependent variable of interest is explained by the entire set of regressors. Technically, auxiliary regressions are run with each explanatory variable of the main regression being regressed on the set of all other explanatory variables. A candidate explanatory variable for the main regression is excluded if the goodness of fit (explained variance) of the respective auxiliary regression is greater than the goodness of fit of the main regression with all candidate explanatory variables included. This way, only those explanatory variables are retained which make an independent contribution to the variable of interest (happiness or life satisfaction).

Results

Happiness, Life Satisfaction, and the Levels of Positive and Negative Affect

This subsection reports results concerning the relationship between happiness and life satisfaction on the one hand and the levels of PA and NA on the other, whereas the next subsection focuses on individual PA and NA items.

Table 2 reports the correlations of happiness and life satisfaction to positive and negative affect. Happiness and life satisfaction are significantly positively correlated with PA, the correlation being twice as strong with happiness (r = 0.60) as with life satisfaction (r = 0.30). They are significantly negatively correlated with NA, the magnitudes being similar for happiness and life satisfaction (r = -0.36 and r = -0.33, respectively). Thus, happiness is much more strongly correlated (in absolute terms) with PA than with NA, whereas life satisfaction is slightly more strongly correlated with NA than with PA. The correlations suggest that there is more "affective content" in happiness than in life satisfaction and that the difference in affective content is mainly driven by the PA rather than the NA component.

Table 2. *Correlations of main variables*

Variables	Happiness	Life satisfaction
Positive affect	.60*	.30*
Negative affect	-.36*	-.33*

** $p < .05$*

Table 3 reports regressions of happiness on PA and NA and a set of socio-demographic controls. Regression A includes PA as the only regressor, yielding a positive and highly significant coefficient ($p < 0.01$) and an explanatory power (R^2) of 14 percent. Regression B includes NA as the only regressor, yielding a negative and marginally significant coefficient (p = 0.10) and R^2 = 11 percent. Including PA and NA jointly (regression C) yields significant coefficients of the expected sign on both variables and R^2 = 25 percent. The explanatory power of PA and NA with respect to happiness is thus additive in the two components, consistent with the absence of a significant correlation between the two that was found in the basic data analysis. The coefficients in the simple regressions (A and B) and the multivariate regression (C) are indistinguishable from each other. In absolute terms, the coefficient on PA is about 50 percent greater than the coefficient on NA.

Table 3. *Happiness regressions*

Variable	A	B	C	D
Positive affect	.11***		.11***	.12***
	(.04)		(.04)	(.04)
Negative affect		-.07*	-.07*	-.08**
		(.04)	(.04)	(.04)
Age				.02
				(.07)
Female				-.74**
				(.29)
Wage income				.0013
				(.0010)
Non-wage income				.0002
				(.005)
Constant	4.23***	9.27***	5.54***	5.17**
	(1.42)	(.74)	(1.44)	(2.25)
Observations	55	55	55	55
R^2	.14	.11	.25	.38

*Note. Robust standard errors in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$*

Regression D augments regression C by including age, sex, wage income and non-wage income. This has a negligible effect on the coefficients of PA and NA but raises the explanatory power (from 25 percent) to 38 percent. Out of the socio-demographic controls, the income variables have positive but insignificant coefficients, as has the age variable. Being female has a significant negative coefficient, amounting to 0.74 points on the 11-point happiness scale. The difference in explanatory power between regressions C and D is thus largely due to the inclusion of sex in regression D.

Table 4 reports similar regressions as Table 3 with life satisfaction as the dependent variable. Including PA as the only regressor (regression A) yields a positive and marginally significant coefficient ($p = 0.07$) and $R^2 = 8$ percent. Regression B includes NA as the only regressor, yielding a negative and highly significant coefficient ($p < 0.01$) and $R^2 = 14$ percent. Including PA and NA jointly (regression C) yields coefficients of the expected sign on both variables (with $p = 0.10$ for PA and $p < 0.01$ for NA). The explanatory power is $R^2 = 20$ percent, which is approximately additive in PA and NA. The coefficients in the simple regressions (A and B) and the multivariate regression (C) are similar though not identical to each other. In absolute terms, the coefficient on NA is about 20 percent greater than the coefficient on PA.

Table 4. *Life satisfaction regressions*

Variable	A	B	C	D
Positive affect	.09*		.08*	.08*
	(.05)		(.05)	(.05)
Negative affect		-.11***	-.11***	-.12***
		(.03)	(.03)	(.04)
Age				-.04
				(.05)
Female				-.51
				(.39)
Wage income				-.0003
				(.0004)
Non-wage income				.0003
				(.003)
Constant	4.58***	9.75***	6.84***	8.06***
	(1.65)	(0.64)	(1.66)	(2.05)
Observations	59	59	59	59
R^2	.08	.14	.20	.25

*Note. Robust standard errors in parentheses. * p < .1, ** p < .05, *** p < .01*

Regression D augments regression C by including the socio-demographic controls. As in the case of happiness being the dependent variable (Table 3), this has little effect on the coefficients of PA and NA; it raises the explanatory power (from 20 percent) to 25 percent. However, all socio-demographic controls are insignificant.

Comparing regression C in Table 3 with regression C in Table 4, it can be concluded that positive and negative affects jointly explain happiness better than they explain life satisfaction. Positive and negative affect explain happiness and life satisfaction in an additive fashion, but happiness is better explained by positive affect than by negative affect, whereas the opposite applies to life satisfaction. In the happiness regression, the coefficient on PA is greater than the coefficient on NA (in absolute terms), whereas the opposite is the case in the life satisfaction regression. In addition, being female (negatively) contributes to happiness, but not to life

satisfaction. The results from regression analysis confirm and extend those obtained on the basis of simple correlations.

The findings from this subsection can be summarized as follows:

Finding 1. PA and NA levels jointly predict happiness better than they predict life satisfaction.

Finding 2. PA levels predict happiness better than do NA levels.

Finding 3. NA levels predict life satisfaction better than do PA levels.

Happiness, Life Satisfaction, and Positive and Negative Affect Items

In this subsection we consider the relation between happiness, life satisfaction, and individual items from the positive and negative affect schedule. We start with correlations, as reported in Table 5. It is seen that happiness is positively and significantly correlated with the positive affect items active, interested, exited, strong, proud, enthusiastic, alert and determined. Happiness is negatively and significantly correlated with the negative affect items upset, scared, irritable, ashamed, nervous and afraid. There is no significant correlation of happiness to inspired, attentive, distressed, guilty, hostile and jittery. Hence, 8 out of the 10 positive affect items and 6 out of the 10 negative affect items are significantly correlated with happiness, and all significant correlations have the expected sign.

Table 5. *Correlations with positive and negative affect items*

	Happiness			Life satisfaction		
Variable	Coefficient	*SD*	*N*	Coefficient	*SD*	*N*
Active	.51***	.00	72	.27**	.02	71
Interested	.30***	.01	73	-.03	.82	71
Exited	.52***	.00	72	.24**	.01	70
Strong	.38***	.00	71	.12	.31	71
Inspired	.06	.60	71	.07	.55	67
Proud	.49***	.00	73	.32***	.01	70
Enthusiastic	.33***	.00	73	.26**	.03	71
Alert	.39***	.00	73	.00	.98	71
Determined	.51***	.00	73	.17	.16	71
Attentive	.10	.42	72	.15	.22	70
Distressed	.16	.17	71	-.36***	.00	70
Upset	-.37***	.01	73	-.33***	.01	71
Guilty	.07	.57	72	-.44***	.00	71
Scared	-.32***	.01	71	-.11	.39	70
Hostile	-.14	.24	72	-.21*	.084	70
Irritable	-.29**	.012	73	.01	.93	69
Ashamed	-.29**	.014	73	-.18	.15	69
Nervous	-.34***	.00	73	.11	.38	71
Jittery	-.16	.18	72	-.31***	.01	71
Afraid	-.41***	.00	72	-.17	.15	71

*Note. * p < .1, ** p < .05, *** p < .01*

Turning to life satisfaction, Table 5 shows that it is positively and significantly correlated with the positive affect items active, exited, proud, and enthusiastic. Life satisfaction is negatively and significantly correlated with the negative affect items distressed, upset, guilty, hostile and jittery. There is no significant correlation of life satisfaction to interested, strong, inspired, alert, determined, attentive, scared, irritable, ashamed, nervous, and afraid. Hence, 4 out of the 10 positive affect items and 5 out of the 10 negative affect items are significantly correlated with life satisfaction, and all significant correlations have the expected sign.

When comparing happiness with life satisfaction, it can be stated that the set of positive affect items that are significantly correlated with happiness includes the set of positive affect items that are significantly correlated with life satisfaction. The set of negative affect items that are significantly correlated with happiness is distinct from the set of negative affect items that are significantly correlated with life satisfaction except for the item upset.

The correlations discussed so far are a first indication of how happiness and life satisfaction are related to PA and NA items. Because of the correlations among those items, it is not clear if and to what extent any one item makes an independent contribution to happiness/life satisfaction or rather represents influences of other items. To investigate this issue, we ran multivariate regressions of happiness and life satisfaction on the PA and NA items.

Table 6. *Multivariate regressions on positive and negative affect items*

	Happiness			Life satisfaction		
Variable	Coefficient	*t*-value	*p*>|*t*|	Coefficient	*t*-value	*p*>|*t*|
Active	.26	1.12	.27	.36	1.55	0.13
Interested	-.07	-.21	.83	-.03	-.07	0.95
Excited	.41*	1.95	.06	.08	.31	0.76
Strong	-.06	-.26	.79	-.25	-.78	0.44
Inspired	-.15	-.69	.50	-.01	-.03	0.98
Proud	.31	1.12	.27	.21	.70	0.49
Enthusiastic	.09	.30	.76	.46*	1.99	0.05
Alert	.48**	2.47	.02	-.01	-.06	0.96
Determined	.00	.01	.99	.14	.64	0.53
Attentive	-.56	-1.61	.11	-.26	-.99	0.33
Distressed	-.04	-.22	.82	-.35	-1.39	0.17
Upset	.15	.65	.52	-.22	-.78	0.44
Guilty	.47	1.65	.11	-.20	-.61	0.55
Scared	-.47	-1.25	.22	.38	.82	0.42
Hostile	.22	1.13	.26	-.36	-1.15	0.26
Irritable	-.19	-.67	.51	.33	.92	0.36
Ashamed	-.26	-.69	.50	-.46	-.87	0.39
Nervous	.09	.47	.64	.16	.68	0.50
Jittery	-.22	-.98	.33	-.20	-1.19	0.24
Afraid	-.25	-.78	.44	-.23	-.65	0.52
Constant	6.51***	4.32	.00	7.25***	3.40	0.00
Observations		64			64	
R^2		.59			.48	

*Note. * p < .1, ** p < .05, *** p < .01*

Table 6 presents initial multivariate regression results for happiness and life satisfaction as the dependent variables. The PA and NA items jointly explain 59 percent of the variance in happiness, but they are all insignificant with just two exceptions, exited and alert, which enter the regression significantly positively. In the case of life satisfaction, the explanatory power amounts to 48 percent, and all coefficients are insignificant except that on enthusiastic.

Given the significance of many of the correlations between happiness/life satisfaction and the PA and NA items and the correlations among the latter, insignificance of the multivariate regression coefficients seems to be the result of collinearity. Collinearity arises if some regressors implicitly capture the influence of other regressors without making an independent contribution to the dependent variable. As discussed above Klein's Rule of Thumb aims at differentiating regressors that potentially make an independent contribution from those that do not. It amounts to eliminating from a multivariate regression those regressors that are better explained (in terms of R^2) by the respective set of all other regressors than the dependent variable of interest is explained by the set of all candidate regressors (Gujarati, 2003).

By running auxiliary regressions (not shown) with the PA and NA items as dependent variables and all the respective other PA and NA items as the explanatory variables, we identified those PA and NA items that potentially make an independent contribution to happiness and life satisfaction according to Klein's Rule. To be specific, we eliminated from the happiness regression and life satisfaction regression those PA and NA items for which the R^2 of the respective auxiliary regression exceeded 59 percent and 48 percent, respectively. As a result of this procedure, we obtained 10 PA items and 4 NA items potentially contributing to happiness, and 4 PA and 2 NA items potentially contributing to life satisfaction. From these sets of potential contributors we eliminated those items that turned out insignificant when running happiness and life satisfaction regressions on these sets of potential contributors.

Table 7. *Reduced multivariate regressions on positive and negative affect items*

	Happiness			Life satisfaction		
Variable	Coefficient	*t*-value	*p*>|*t*|	Coefficient	*t*-value	*p*>|*t*|
Active	.56***	2.79	.01	.63***	2.89	.01
Excited	.58***	2.84	.01	0.47**	2.07	.04
Alert	.36***	2.74	.01			
Distressed				-.56***	2.73	.01
Scared	-.71**	-2.51	.02			
Constant	3.68***	3.88	.00	5.04***	3.95	.00
Observations		69			69	
R^2		.49			.27	

*Note. * p < .1, ** p < .05, *** p < .01*

We ended up with happiness and life satisfaction regressions that contain only significant affective state items. They are reported in Table 7. With respect to happiness, the PA items active, excited and alert and the NA item scared together have an explanatory power of 49 percent, which is only 10 points less than when including all PA and NA items (Table 6). The largest coefficient

(in absolute terms) is the one on scared (-0.71). The coefficients on active and excited are similar to each other (0.56 and 0.58, respectively), whereas the one on alert is considerably smaller (0.36).

In the case of life satisfaction, the PA items active and excited and the NA item distressed together have an explanatory power of 27 percent, which is 21 points less than when including all PA and NA items (Table 6). The largest coefficient is the one on active (0.63), whereas the one on excited is considerably smaller (0.47). The magnitude of the coefficient on distressed (-0.56) is between that of the other two items.

In comparing the happiness and life satisfaction regressions with each other, a major result is that PA and NA items explain happiness better than they explain life satisfaction. This applies especially to the reduced set of PA and NA items (Table 7), but to a smaller extent to the complete set as well (Table 6). This is consistent with Finding 1 from the preceding subsection, according to which levels of PA and NA explain happiness better than they explain life satisfaction.

As regards the structure of affective states involved in happiness and life satisfaction, the set of PA items that explain happiness includes the set of PA items that explain life satisfaction, whereas the sets of NA items that explain happiness and life satisfaction are distinct from each other. Importantly, this result is robust to considering simple correlations (Table 5) and multivariate regressions (Table 7).

The findings from this subsection can be summarized as follows:

Finding 4. The PA items that predict happiness include those that predict life satisfaction (but not vice versa).

Finding 5. The NA items that predict happiness are distinct from those that predict life satisfaction.

Discussion

Emotional Content of Happiness

Philosophers have proposed a variety of accounts of happiness. Among the various classifications proposed, the distinction between life satisfaction accounts and affective (or emotional) state accounts (Haybron, 2013) stands out for its congruence with the distinction between cognitive (subjective evaluation) and affective (hedonic) notions of well-being common in psychology (Sumner, 1996; Schimmack, 2007).

Following Haybron (2013), the life satisfaction and the affective state accounts differ with respect to the need of an explicit definition: While judging how satisfied they are with their lives is a task that people can reasonably perform by applying their own standards, a statement concerning one's level of happiness is deemed to be not meaningful unless the significance of the term "happiness" is specified.

By asking people about their personal definition of happiness, Delle Fave et al. (2011) found that "emotions and feelings" are an important component of people's happiness notion, broadly consistent with an affective state account of happiness (Haybron, 2000). It remains unclear, however, what precisely the relevant affective states are.

Using a different methodology than Delle Fave et al. (2011), the present study has confirmed that emotions and feelings are important ingredients of the notion of happiness and has clarified the affective states involved. In contrast to the view that asking people how happy they are is too vague to be meaningful (Haybron, 2013), our results suggest that the notion of happiness implicit in simple self-reports of happiness can thus be considered to be rather well-defined with respect to its emotional content.

Affective States and Affective and Cognitive Well-Being

In addition to the emotional content of "happiness", we investigated the relations of positive and negative affect to cognitive well-being, operationalized as life satisfaction. We found that affective

states are not only significantly related to reported happiness, but also to reported life satisfaction. This might be dismissed as being spurious, on the grounds that "… in matters of well-being, just about everything correlates decently with everything else" (Haybron, 2013). Yet explanations along such lines appear to be inadequate for two reasons. First, a small set of the affective state items are highly significant in a multivariate life satisfaction regression and account for no less than 27 percent of the variation in life satisfaction. Second, our findings are consistent with a theoretically and empirically attractive model of the relation between affective and cognitive well-being, the mediator model.

The mediator model of the AWB-CWB relationship maintains that people's evaluation of their lives partly relies on their prevailing affective states (Suh et al., 1998). This model implies that some factors that are related to AWB (happiness) are also – indirectly – related to CWB (life satisfaction). To be more specific, the model can be formulated as follows: life satisfaction = $f(x,h_1)$ and happiness = $h_1(y) + h_2(z) = h(y,z)$, where x denotes factors related to life satisfaction, but not to happiness, and z denotes factors related to happiness, but not life satisfaction. Factors denoted by y are related to life satisfaction in an indirect fashion, through their relation with happiness which, in turn, is related to life satisfaction: life satisfaction = $f(x,h_1(y)) =: g(x,y)$.

Focusing on affective states as factors for happiness and life satisfaction, the functions h(y,z) and g(x,y) correspond to the happiness and life satisfaction regressions reported in Table 7, where x = distressed, z = (alert, scared), and y = (active, excited). According to this interpretation, feeling active and excited would contribute to life satisfaction by raising happiness. Feeling distressed reduces life satisfaction but is unrelated to happiness. Feeling alert/scared raises/reduces happiness without having an influence on life satisfaction. Interestingly, the affective states that – according to this interpretation – contribute to life satisfaction in an indirect fashion, through happiness, are positive ones whereas those that differentiate happiness from life satisfaction are negative ones.

Our paper seems to be the first that has investigated the differential relation between positive and negative affect and commonly used measures of happiness and life satisfaction within a single study. One important insight obtained is that happiness and life satisfaction, as measured, share common positive affect components whereas the negative affect items involved are distinct. This finding is robust to the methodological strategy pursued (simple correlations and multivariate regressions).

We note that the wording used above (raise/reduce, influence) is not meant to indicate that PA and NA should be understood as the "cause" of happiness and life satisfaction. They should rather be taken as their affective (emotional) "content". This begs the question as to the causes of PA and NA and suggests that they may themselves be influenced by those internal (personality) and external factors that have been found to influence AWB and CWB. As discussed above, Schimmack et al. (2002) found that extraversion and neuroticism primarily influence AWB, having an effect on CWB only indirectly to the extent that AWB influences CWB. Our results suggest that these influences of personality may work through a tendency toward feeling more active and excited (extraversion) or less active and excited (neuroticism). Similarly, our finding that feeling distressed is negatively related to satisfaction with life, but not to happiness, can be linked to the finding of Schimmack et al. (2008) that being unemployed is a stronger predictor of CWB than AWB: Combining the two findings suggests that being unemployed affects life satisfaction through making people feel distressed.

An empirical investigation of these conjectures would require a data base that contains measures of AWB, CWB, PA and NA jointly with measures of personality traits and external factors of subjective well-being. Such an analysis is an obvious direction for future research. For the time being, however, the consistency of our findings with findings concerning the relation between AWB, CBW, personality and external factors lends support to the validity of our findings.

Relevance for Social Science and Public Policy

Questions on happiness and life satisfaction are included in many large-scale social surveys, and responses have been used in studying a variety of issues in the social sciences. Though the general results obtained in these studies typically do not depend on whether happiness or life satisfaction data are used, it is desirable to be clear about the nature and significance of reported happiness and life satisfaction. In particular, objections have been raised against using happiness rather than life satisfaction data by referring to the vagueness of simple happiness questions. In spite of such concerns, some social surveys refer to happiness only.

As noted above, self-reports of happiness can be considered to incorporate a well-defined notion of well-being in terms of a small set of affective states. This result may inform social scientists who use self-reports of happiness as to the nature and significance of the happiness measure.

With respect to public policy, it has been found in previous research that cognitive well-being (life satisfaction) is stronger related to external factors (such as unemployment) than is affective well-being (Schimmack et al., 2008). This suggests that public policy should target life satisfaction rather than happiness, as the latter is hard to influence by factors that public policy can control. Since the present study found that life satisfaction differs from happiness by life satisfaction being related to the negative affect of feeling distressed, it appears that public policy can influence life satisfaction mainly by reducing this particular affect. The other affects relevant for life satisfaction, feeling active and excited, likely are only indirect contributors to life satisfaction (mediator model), and arguably are less accessible to public policy influence than is a feeling of distress. One affect relevant for happiness however, feeling scared, might be influenced by public policy, for instance by crime prevention.

In conclusion, by clarifying the affective state content of happiness and life satisfaction this study can inform both social scientists and policy makers with respect to the nature and significance of alternative well-being measures frequently used.

Limitations and Future Directions

Limitations of this study relate to the size (N = 144) and structure of the data base (student sample). In the light of this, the results obtained should be regarded as indicative rather than definitive. It is therefore important that future research strives to validate those findings with larger, more representative samples.[7]

Ideally, such data bases would include not only information on happiness, life satisfaction, and positive and negative affect, but also on personality traits, along with information on socio-demographics (such as income and employment status). As discussed above, such a data base would permit studying structural relations among internal (personality) and external factors, affective states, and alternative measures of well-being (reported happiness and life satisfaction). One particular issue to be studied that way would be through which affective states personality and external factors influence happiness and life satisfaction and what that implies for the structural relation between affective and cognitive well-being.

[7] In contrast to the size and structure of our sample, we do not regard the use of single-item measures of life satisfaction and happiness as a limitation because it is exactly that type of measures that are included in social surveys and that are used in the social sciences as measures of social well-being. Our aim was to study the affective state content of measures actually used in social science research.

References

Bradburn, N.M. (1969). *The structure of psychological well-being.* Chicago, IL: Aldine.

Delle Fave, A., Brdar, I., Freire, T., Vella-Brodrick, D., & Wissing, M.P. (2011). The eudaimonic and hedonic components of happiness: Qualitative and quantitative findings. *Social Indicators Research 100*, 185-207.

Gujarati, D. (2003). *Basic econometrics* (4th ed.). London, England: McGraw Hill.

Haybron, D.M. (2000). Two philosophical problems in the study of happiness. *Journal of Happiness Studies 1*, 207-225.

Haybron, D.M. (2013). The nature and significance of happiness. In S. David, I. Boniwell & A. Conley Ayers (Eds.), *The Oxford handbook of happiness* (pp. 303-314). Oxford, England: Oxford University Press.

Krohne, H.W., Egloff, B., Kohlmann, C.-W., & Tausch, A. (1996). Untersuchungen mit einer deutschen Version der „positive and negative affect schedule“ (PANAS). *Diagnostica 42*, 139-156.

Schimmack, U. (2007). The structure of subjective well-being. In R.J. Larsen & M. Eid (Eds.), *Subjective well-being* (pp. 97-123). Oxford, England: Oxford University Press.

Schimmack, U., Diener, E., & Oishi, S. (2002). Life satisfaction is a momentary judgement and a stable personality characteristic: The use of chronically accessible and stable sources. *Journal of Personality 70*, 345-384.

Schimmack, U., Schupp, J., & Wagner, G.G. (2008). The influence of environment and personality on the affective and cognitive component of subjective well-being. *Social Indicators Research 89*, 41-60.

Stiglitz, J. E., Sen, A., & Fitoussi J.-P. (2009). Report by the Commission on the Measurement of Economic Performance and Social Progress (CMEPSP). Retrieved October 10, 2015, from http://www.stiglitz-sen-fitoussi.fr/en/documents.htm.

Suh, E., Diener, E., Oishi, S., & Triandis, H.C. (1998). The shifting basis of life satisfaction judgments across cultures: Emotions versus norms. *Journal of Personality and Social Psychology 74*, 482-493.

Sumner, W. (1996). *Welfare, happiness, and ethics*. Oxford, England: Claredon Press.

Watson, D., Clark, L.A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology 54*, 1063-1070.