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Processes Underlying Links to Subjective Well-being: Material Concerns, Autonomy, and Personality

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Abstract This study explored the mediating processes underlying the associations between autonomy and subjective well-being (SWB), and those between personality and affective well-being. Using the World Values Survey dataset from Singapore, the results showed that autonomy and financial satisfaction were the strongest predictors of life satisfaction and happiness, whereas personality traits were the strongest predictors of positive feelings. Both personality and material concerns predicted negative feelings to some extent. Mediation analyses showed that the associations between autonomy and SWB, and those between personality and positive and negative emotions were mediated by material concerns. Thus, this study illustrates the process models of different SWB facets (life satisfaction, happiness, positive and negative emotions) and highlights that dispositional factors (extraversion, neuroticism, agreeableness, and autonomy) can exert both direct and indirect effects (via material factors) on SWB.

Keywords Autonomy · Mediating effects · Subjective well-being · Personality · Financial satisfaction · Material concerns

1 Introduction

The concept of well-being has generated immense interest in recent years, not only amongst psychologists, but also amongst the citizenry across the world. This widespread interest has spurred research in the field of subjective well-being (SWB), helping to address many interesting issues relating to SWB. For instance, previous research has examined what the predictors of SWB are, and whether SWB is a single-dimension or multi-faceted construct. The perennial question of whether money is important to happiness has also been studied extensively. Another topic that has been the focus of many research studies is

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whether personality determines individual differences in SWB. Answers to many of these issues have emerged; for example, researchers now know that SWB is a multi-faceted construct, comprising components such as life satisfaction, positive affect, and negative affect (Diener 2000). Past research has also revealed that factors such as material wealth, personality, and psychological needs are important predictors of SWB (DeNeve and Cooper 1998; Kahneman and Deaton 2010; Tay and Diener 2011). Increasingly, researchers are now turning their attention to investigate the processes that underlie how these predictors influence SWB.

2 Key Predictors of SWB: Material Wealth, Needs, and Personality

Extant research underscores that material wealth is one of the integral factors influencing well-being. Income, a commonly used proxy of wealth, is strongly related to life evaluation; wealth seems to be beneficial to well-being as people with higher incomes are more satisfied with their lives (Diener et al. 2010). Indeed, converging evidence from various large-scale surveys (e.g., World Values Survey, Gallup World Poll) involving nations across the world conclude that the richer are happier than the poor (Diener et al. 2010; Kahneman and Deaton 2010; Lucas and Schimmack 2009). Rich people earning high incomes are much higher in life satisfaction, and experience more positive feelings and less negative feelings than poor people. Similar findings have been obtained with subjective indicators of material wealth, such as satisfaction with standard of living and financial satisfaction. These measures, which are reflective of people's material concerns, demonstrate similar associations with well-being as income, though they are not indicators of actual wealth. For instance, satisfaction with standard of living and financial satisfaction were found to be the strongest predictors for life evaluation. Specifically, those who were more satisfied with their standard of living or financial state also had higher life evaluation (Diener et al. 2010; Ng and Diener 2014).

Pecuniary factors however, are not the sole determinants of SWB. Psychological variables such as personality, needs, and values, are also documented to be closely related to SWB, especially emotional well-being. Positive and negative feelings are strongly related to the fulfillment of psychological needs such as social support, respect, and autonomy, and are only weakly predicted by income (Diener et al. 2010; Tay and Diener 2011). Autonomy/agency, as defined by the feeling of free choice and control over one's life, is also related to life satisfaction across cultures, and also explained substantial variance in the change in happiness and life satisfaction over time (Inglehart et al. 2008; Welzel and Inglehart 2010). Studies examining the relative importance of materialist versus post-materialist values have also found that post-materialist values (e.g., autonomy) matter considerably to happiness, especially in affluent nations (Delhey 2010).

Post-materialist values such as autonomy are posited to be more important to happiness than materialist factors (e.g., income or financial satisfaction) in economically developed countries, whereas materialist factors are presumed to be more central in poor nations (Delhey 2010; Inglehart et al. 2008). This could be because material wealth is essential for fulfilling survival needs (e.g., food and shelter); presumably more so at lower income levels (Howell and Howell 2008). However, recent evidence highlights a more complex relationship. Both autonomy and financial satisfaction are important to happiness across the world, in nations of varying affluence (Ng and Diener 2014). Furthermore, recent findings even suggest that income and financial satisfaction exert a greater impact on life satisfaction in richer nations than in poorer nations (Diener et al. 2013, Ng and Diener

2014). Thus, it appears that material factors are vital to well-being, whether at high or low income levels, or in affluent or poor nations.

Psychological variables like personality traits are also important predictors of SWB (Lucas and Diener 2000). The conceptualization of the constructs of neuroticism and extraversion is very similar to that of the constructs of positive and negative affect—two components of SWB. Some of the items used to measure negative and positive affect are similar to the terms that are used to describe neuroticism and extraversion, and empirical studies have shown that measures of affect and neuroticism/extraversion overlap (e.g., Watson and Clark 1992). Besides the strong theoretical bases linking personality and SWB, recent neurobiological evidence suggests that the biological underpinnings of neuroticism and extraversion and SWB overlap considerably (see Steel et al. 2008 for a review). The temperament perspective posits that neuroticism is linked to higher negative affect, and extraversion to higher positive affect because these traits share common biological influences as affect (Depue and Collins 1999; Gray 1981). Indeed, substantial evidence from previous research documents that neuroticism and extraversion are paramount predictors of negative and positive affect respectively (e.g., DeNeve and Cooper 1998; Lucas and Fujita 2000; Watson and Clark 1992). This may be one reason why personality is one of the principal predictors of SWB.

Meta-analyses examining the associations between the Big Five personality dimensions and well-being confirmed that they are closely associated with various SWB measures such as happiness, life satisfaction, positive and negative affect, and quality of life (Steel et al. 2008). Although extraversion and neuroticism show the strongest associations with positive and negative affect, other Big Five personality traits like agreeabless and conscientiousness are also moderately related to SWB. However, openness to experience tends to be less consistently associated with SWB (DeNeve and Cooper 1998; Steel et al. 2008). In sum, findings from large-scale studies and meta-analyses substantiate the conclusion that in addition to monetary factors, psychological variables (e.g., respect, autonomy, and personality) are also key predictors of well-being, especially for affective well-being (Inglehart et al. 2008; Ng and Diener 2014; Steel et al. 2008; Tay and Diener 2011).

3 Top-Down Versus Bottom-Up Influences on SWB

The differential relations with SWB predictors may partly be due to the different conceptualizations of various SWB dimensions. Life satisfaction/evaluation refers to a global, cognitive evaluation of one's life, whereas positive and negative affect refer to the feelings/emotions that one experiences. The happiness construct, can either be operationalized as an experiential measure (i.e., a positive emotion), or an evaluative measure (i.e., an overall evaluation). Evaluative measures may be influenced more by cognitive and external/situational factors, whereas experiential measures may be influenced more by dispositional factors.

The various SWB predictors—objective wealth indicators, material concerns, needs, and personality can be considered as bottom-up or top-down influences (Diener et al. 1999). Bottom-up models posit that objective life circumstances and demographic factors like income and education influence life satisfaction, although earlier research found that demographic factors accounted for little variance in SWB. In contrast, the top-down approach focuses on the influences of internal factors (e.g., attitudes, beliefs, and especially dispositional traits) on SWB. Behavior-genetic twin studies have indicated that genes account for substantial variance in stable SWB (Steel et al. 2008). These biological

differences can be largely traced to personality differences, especially in neuroticism and extraversion. The implication of differences in well-being being partly due to biological differences is that bottom-up processes cannot completely explain all the variance in SWB.

However, recent meta-analyses showing that domain satisfactions (e.g., job satisfaction, health satisfaction) were strongly linked to life satisfaction suggested that bottom-up processes can still substantially influence SWB (Heller et al. 2004). Because domain satisfaction is closely related to objective situational factors, an association between domain satisfaction and life satisfaction would imply that objective factors influence life satisfaction. Yet, as domain satisfaction reflects people's subjective evaluation of a particular situation/context, it may also be influenced by dispositional factors. Therefore, an integrative model that examines the influences of both top-down and bottom-up factors may more accurately elucidate the mechanisms underlying the links between personality, objective factors, and SWB (Heller et al. 2004).

4 The Present Research

The merits of utilizing the Singapore dataset from the World Values Survey (WVS) stem from the additional measures included in the Singapore version of the WVS questionnaire. First, most previous studies focus only on life satisfaction, and although the standard WVS includes a measure of happiness in addition to life satisfaction, affective well-being is not assessed. The Singapore version however, also included measures of affect (positive and negative affect). Thus, this study extends on previous research by examining multiple components of well-being—life satisfaction, happiness, positive and negative affect. Second, large-scale surveys on well-being (such as the Gallup World Poll and WVS) usually focus on material wealth indicators, economic indicators, and societal characteristics and values, and do not examine personality, as research focusing on personality and SWB proceeds in a separate domain. However, this study includes measures of material concerns, values, and personality, allowing one to simultaneously compare the importance of personality for SWB with other key predictors.

In light of previous findings indicating that material factors and post-materialist needs (e.g., autonomy) are important predictors of well-being, the first aim of this study was to clarify the associations between material and psychological factors and the various SWB components. Despite their strong associations with life satisfaction, material factors such as income show weaker associations with affective well-being. Instead, positive and negative feelings are more closely associated with psychological factors such as personality and needs (Steel et al. 2008; Tay and Diener 2011). Hence, I predicted that material concerns would show stronger associations with life satisfaction, whereas personality would show stronger associations with affective well-being.

The second aim of the present research was to explore the mechanisms underlying the links between material factors, psychological factors, and the different types of well-being. The observed differential relations suggest that the influences of these determinants on SWB likely act via different processes. Situational (i.e., bottom-up) factors such as income and material concerns are more likely to impact life satisfaction, whereas dispositional (i.e., top-down) factors such as the Big Five traits and autonomy are more likely to influence affect. But instead of a model that allows for solely top-down or bottom-up influences, an integrative approach that incorporates both is possible, as shown by meta-analytic findings. Heller et al. (2004) found that personality factors influenced life satisfaction, but domain satisfaction also influenced life satisfaction. Previous research also

revealed evidence that material concerns and autonomy might play a mediating role; Johnson and Krueger (2006) found that perceived financial situation and autonomy completely mediated the associations between measures of actual wealth (income and assets) and life satisfaction. Hence, it seems pertinent to further investigate the mediating processes that account for the associations between material concerns, personality, and SWB.

Because previous evidence has documented that four of the Big Five show substantial associations with SWB, whereas openness to experience has consistently shown weak or null relations with SWB, I examined only extraversion, neuroticism, conscientiousness, and agreeableness. Additionally, as objective indicators of actual wealth (e.g., income or material possessions) have been extensively studied, the present study focused on material concerns, which reflected people's subjective evaluations of their financial situation and could be considered as a facet of material wealth. Although material concerns are intended to be objective material factors, they are not purely an objective assessment (or evaluation) of one's financial situation. They are also subjective evaluations because they can be influenced by internal factors like personality and values. On the other hand, personality traits have genetic influences and are strongly determined by neurobiological bases. Although personality traits are not immutable and can change over time, a person's personality traits do not fluctuate from situation-to-situation due to changes in external circumstances, as traits demonstrate relative stability (McCrae and Costa 2008), unlike evaluations of financial situation (which can be easily influenced by external factors). That is, dispositional factors are more likely to influence evaluations of material desires/wealth, as opposed to the reverse direction of causation.

Therefore, the second aim of the study was to examine how dispositional factors influence people's subjective evaluations of financial situation, and explore whether an integrative (rather than a purely top-down or bottom-up) model is at play. Specifically, in addition to directly influencing SWB, do dispositional factors (e.g., personality or values) influence bottom-up factors (e.g., financial satisfaction), and impact SWB indirectly via these bottom-up factors? As personality is more closely associated with affective well-being rather than life satisfaction or overall happiness, the second hypothesis examined whether material concerns would mediate the associations between personality and affective well-being (i.e., positive and negative feelings). Specific predictions were made only for extraversion and neuroticism because they are the two traits that consistently show the most robust associations with positive and negative affect respectively (e.g., Diener and Lucas 1999; Larsen and Ketelaar 1991). Thus, the second prediction was that material concerns would mediate the association between extraversion and positive feelings, as well as that between neuroticism and negative feelings. As autonomy is an innate psychological need that may be satisfied or expressed differently due to different cultural values, goals, and norms (Deci and Ryan 2000), a similar prediction was made for this dispositional variable. That is, how much control a person feels that he has over his life can influence how he evaluates his financial situation; thus autonomy can influence SWB both directly and indirectly (via material concerns).

5 Methods

5.1 Sample and Procedure

The present study is based on the data from Singapore, collected in the latest wave of the WVS (wave 6) in 2012. The WVS is one of the largest surveys that investigate values and

cultural changes in nations across the world. The WVS questionnaire was administered to 1,972 respondents (55 % female and 45 % male) in Singapore. Representative sampling of the resident population was undertaken, and face-to-face surveys were conducted. Respondents were all Singapore citizens, 18 years of age and older (mean age = 41.88; SD = 16.61; age unreported for 33 respondents), with 49 % who had at least a high-school diploma (high-school/polytechnic diploma, some university-level education, or university degree).

5.2 Measures

5.2.1 SWB Indicators

As SWB comprises affective and cognitive components, and the various happiness/well-being indicators yield differential relations with key predictors, multiple measures of well-being were assessed in this study. The cognitive component of SWB, life satisfaction, was measured by asking respondents to consider how satisfied they were with their lives as a whole, using a 10-point scale ranging from 1 (*completely dissatisfied*) to 10 (*completely satisfied*). Overall happiness was assessed by asking respondents to indicate how happy they were, using four categories, where scores ranged from 1 (*not at all happy*) to 4 (*very happy*). Affective SWB was assessed by two measures—positive feelings (happiness, enjoyment, love, and contentment) and negative feelings (worry, anger, depression, and sadness). Respondents indicated on a 5-point scale the extent to which they had felt this way in the previous day (*1 = very slightly or not at all; 3 = moderately; 5 = extremely*). Ratings to the four positive emotion items were averaged into a positive feelings score (Cronbach's $\alpha = .86$), while the negative feelings score was calculated by averaging the ratings of the four negative emotion items (Cronbach's $\alpha = .85$).

5.2.2 Indicators of Material Concerns

Three different indicators of material concerns and desires were assessed. Financial satisfaction was addressed by an item from the survey that asked respondents how satisfied they were with the financial situation of their household on a 10-point scale (*1 = completely dissatisfied; 10 = completely satisfied*). "Satisfaction with standard of living" was measured on a dichotomous scale and assessed whether the respondents were satisfied with their standard of living (*1 = satisfied, 0 = dissatisfied*). The last item asked respondents to indicate which income group their household was in on a 10-point scale, with *1 = lowest income group*, and *10 = highest income group*, and this indicator reflected the respondent's perceived income status. These three measures assessed the extent to which respondents had their material concerns and desires fulfilled and were satisfied with their material wealth.

5.2.3 Values and Personality

To examine whether people valued or perceived that they had autonomy, I utilized the item asking respondents to indicate how much freedom of choice and control they felt they had over the way their lives turned out. This measure of autonomy was assessed on a 10-point scale ranging from 1 (*no choice at all*) to 10 (*a great deal of choice*). As an indicator of

materialism,[1] respondents indicated whether it was important to them to be rich and have a lot of money and expensive things (*1 = not at all like me; 3 = a little like me; 6 = very much like me*).

The Big Five personality traits were measured using an abbreviated version of the Big Five Inventory (BFI). This personality scale (BFI-10) consisted of 10 items, rated on a 5-point scale (*1 = disagree strongly; 3 = neither agree nor disagree; 5 = agree strongly*) (Rammstedt and John 2007). Each of the five personality traits was measured with only two items. Examples of items used to measure extraversion and neuroticism respectively are: "I see myself as someone who '…is outgoing, sociable' and '…gets nervous easily'." Given the brevity of the 2-item measures, the reliabilities were not high (extraversion: $\alpha = .21$; neuroticism: $\alpha = .09$; conscientiousness: $\alpha = .17$; agreeableness: $\alpha = .12$); however, the reliabilities and validities of this abbreviated scale had been established (see Rammstedt and John 2007 for a full discussion).

6 Results

6.1 Descriptive Statistics

The basic descriptive statistics (means and standard deviations) for the different well-being components and the predictors are presented in Table 1. As shown, the average person in Singapore was rather happy and satisfied with his life and experienced positive feelings to a moderate extent and only little negative feelings. The average respondent felt that he had quite a bit of free choice and control over his life, but was also somewhat materialistic. He was also slightly satisfied with his current financial state. Most respondents (85 %) were satisfied with their standard of living.

Table 2 presents the correlations between the key variables. Material concerns were strong predictors of SWB. Having higher financial satisfaction and satisfaction with standard of living were linked to higher SWB, i.e., greater happiness, higher life satisfaction, more positive feelings, and lower negative feelings. Individuals who were higher in income status were also higher in SWB, though they were not lower in negative emotions. Psychological variables were also closely linked to SWB—having greater autonomy was associated with higher SWB on all measures. In contrast, those who were more materialistic were lower in life satisfaction and positive feelings, although they were also happier. Personality traits were also important predictors of SWB. People higher in extraversion, agreeableness, and conscientiousness, and lower in neuroticism had higher life satisfaction and experienced more positive feelings and less negative feelings.

6.2 Strength of Different Types of Predictors for Different Measures of Well-being

Hierarchical linear regression analyses were conducted separately for each of the four measures of well-being. Table 3 shows the amount of variance accounted for as each set of predictors was added to the linear model, and the total amount of variance explained at

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[1] Material concerns can be represented by indicators such as financial satisfaction and satisfaction with standard of living. Fulfilling/meeting one's material concerns is associated with higher life satisfaction (e.g., Delhey 2010; Diener et al. 2010). In contrast, materialism reflects the prioritization of the pursuit and acquisition of wealth and material goods. It is inversely associated with SWB (Diener and Oishi 2000; Kashdan and Breen 2007). Hence, materialism should not be equated with material concerns.

Table 1 Descriptive statistics of key variables for the entire sample

Measure	M	SD
Happiness	3.30	0.61
Life satisfaction	6.97	1.60
Positive feelings	2.96	.97
Negative feelings	2.00	.90
Financial satisfaction	6.41	1.76
Autonomy	6.78	1.67
Materialism	3.58	1.38
Satisfaction with standard of living	.85	.36
Perceived income status	5.70	1.52
Extraversion	3.16	.77
Neuroticism	2.82	.71
Agreeableness	3.52	.75
Conscientiousness	3.37	.74

Satisfaction with standard of living refers to the average proportion of people who are satisfied with their standard of living

each step. To determine whether bottom-up factors accounted for any variance in addition to that explained by top-down factors,[2] personality variables were added in the first step (because they are strongly determined by biological bases). Next, values (autonomy and materialism), which are dispositional factors that are shaped by cultural and social influences, were added in the second step. Finally, bottom-up factors—indicators of material concerns (financial satisfaction, satisfaction with standard of living, and perceived income status) were added in the last step.

As shown, adding personality variables accounted for little variance in happiness or life satisfaction; instead most of their explained variance can be attributed to values and material concerns. In contrast, for positive feelings, personality traits accounted for most of its explained variance, while values and material concerns explained minimal additional variance. For negative feelings, personality traits and material concerns both accounted for some amount of variance.

Next, for each of the four types of well-being, regression analyses with all the key predictors entered simultaneously were conducted. Material concerns and values were included as predictors for all four types of well-being, while personality traits were included only for affective well-being (positive and negative feelings) because personality accounted for minimal variance in happiness and life satisfaction. Fulfilling material concerns (i.e., having high financial satisfaction and satisfaction with standard of living)

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[2] Additional hierarchical linear regression analyses were also conducted, for which the order was reversed, i.e., indicators of material concerns were added in the first step, values were added in the second, and personality variables were added in the last step. This ordering however, is less ideal than the original main analyses, because bottom-up factors (e.g., material indicators) can be influenced by dispositional factors like personality. The main analyses (by examining personality factors first and bottom-up factors in the last step) can address whether material indicators (by themselves) still explain any additional variance after accounting for personality. However, in these supplementary analyses, the variance explained by material indicators (in the first step) can be due to objective material circumstances, as well as personality influences on the evaluation of the financial situation, which suggests that the impact of the material factors may be overinflated. Overall, both the main and supplementary analyses yielded similar patterns of results—material concerns and values explained most of the variance in life satisfaction and happiness, whereas personality accounted for most of the variance in positive emotions.

Table 2 Zero-order correlations between types of well-being and predictors

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Happiness												
2. Life satisfaction	.31***											
3. Positive feelings	.01	.13***										
4. Negative feelings	−.14***	−.22***	.12***									
5. Financial satisfaction	.25***	.39***	.05*	−.20***								
6. Autonomy	.26***	.37***	.07**	−.19***	.34***							
7. Materialism	.09***	−.07**	−.13***	−.02	.05*	−.05*						
8. Satisfaction with standard of living	.19***	.28***	.05*	−.25***	.33***	.20***	.007					
9. Perceived income status	.14***	.19***	.12***	.006	.29***	.13***	.17***	.18***				
10. Extraversion	.07**	.09***	.13***	−.11***	.03	.11***	−.03	.04	.06**			
11. Neuroticism	−.01	−.12***	−.14***	.14***	−.08***	−.11***	.14***	−.08**	−.02	−.19***		
12. Agreeableness	−.004	.12***	.20***	−.14***	.05*	.11***	−.22***	.07**	−.02	−.003	−.26***	
13. Conscientiousness	.06*	.10***	.08**	−.12***	.05*	.12***	−.10***	.04	.08***	.11***	−.17***	.21***

Significance levels: * $p < .05$; ** $p < .01$; *** $p < .001$

Table 3 Hierarchical regression analyses with personality traits, values, and material concerns

Predictors	Happiness		Life satisfaction		Positive feelings		Negative feelings	
	R^2	ΔR^2	R^2	ΔR^2	R^2	ΔR^2	R^2	ΔR^2
Step 1: personality traits	.004	.004	.028	.028	.063	.063	.046	.046
Step 2: values	.074	.070	.148	.12	.068	.005	.072	.026
Step 3: material concerns	.112	.038	.248	.10	.086	.018	.13	.058

R^2 values are adjusted for the number of predictors. Significance level: $p < .001$ for all

Step 1: Personality traits include the predictors—extraversion, neuroticism, conscientiousness, and agreeableness

Step 2: Values include the predictors—autonomy and materialism

Step 3: Material concerns include the predictors—financial satisfaction, satisfaction with standard of living, and perceived income status

predicted greater happiness and life satisfaction, and lower negative feelings (see Table 4). High-income status people were also happier, more satisfied with their lives, and experienced more positive feelings, though they also experienced more negative feelings (see Ng et al. 2009 for an explanation concerning how affluence leads to stress and increases negative affect). Having more autonomy also predicted greater happiness and life satisfaction, and less negative feelings. Indeed, autonomy was the strongest predictor of happiness and life satisfaction. In contrast, materialism predicted lower life satisfaction and less positive feelings, but at the same time, more materialistic people were also happier and felt less negative. Personality traits also predicted affective well-being. People who were high in agreeableness and extraversion and low in neuroticism felt more positive emotions and less negative emotions. Those who were more conscientious also experienced less negative feelings.

6.3 Mediators of the Effects of Key Predictors of Well-being

Mediation analyses were conducted to investigate the mechanisms underlying the relations between material concerns, psychological factors (values and personality), and well-being. The bootstrapping approach (bias-corrected and accelerated) for estimating the indirect effects of mediators was used, based on the SPSS macro created by Preacher and Hayes (2008), and the resampling number was set to 5,000. First, I examined whether material concerns mediated the links between personality and affective well-being. For positive emotions, the analysis[3] showed that income status (indirect effect $= .008$, bias corrected and accelerated 95 % CI [.002, .017], $z = 2.33$, $SE = .004$, $p = .02$) was a significant mediator of the effect of extraversion. The mediation analysis[4] for negative emotions showed that

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[3] All three indicators of material concerns were included in the preliminary mediation analyses that separately examined extraversion, agreeableness, and neuroticism. However, as the other two indicators of material concerns (financial satisfaction or satisfaction with standard of living) were not significant predictors of positive feelings, the final analysis that examined only the mediating effect of income status was reported. Also, agreeableness and neuroticism were not significantly associated with income status, thus only the final analysis for extraversion was reported.

[4] All three indicators of material concerns were included in the preliminary mediation analyses that separately examined extraversion, neuroticism, conscientiousness, and agreeableness. The analyses for extraversion and conscientiousness found no significant mediating effects of material concerns. As neuroticism and agreeableness were not significantly associated with income status, their final analyses included only the other two material concerns indicators.

Table 4 Regression analyses for each type of well-being, with all key predictors entered simultaneously

Predictors	Happiness			Life satisfaction		
	B (SE)	Beta	t	B (SE)	Beta	t
Intercept	2.01 (.10)		21.14***	2.67 (.23)		11.69***
Financial satisfaction	.05 (.01)	.14	5.56***	.21 (.02)	.23	10.03***
Satisfaction with standard of living	.16 (.04)	.09	3.88***	.62 (.10)	.14	6.50***
Perceived income status	.02 (.01)	.05	2.10*	.10 (.02)	.09	4.22***
Materialism	.04 (.01)	.09	3.89***	−.10 (.02)	−.08	−4.08***
Autonomy	.07 (.01)	.18	7.79***	.24 (.02)	.25	11.38***
Adjusted R^2		.11			.24	
N		1,837			1,837	

Predictors	Positive feelings			Negative feelings		
	B (SE)	Beta	t	B (SE)	Beta	t
Intercept	1.66 (.26)		6.38***	4.09 (.23)		17.61***
Financial satisfaction	.00 (.01)	.001	.03	−.06 (.01)	−.12	−4.57***
Satisfaction with standard of living	.01 (.07)	.004	.16	−.48 (.06)	−.19	−8.21***
Perceived income status	.09 (.02)	.14	5.92***	.07 (.01)	.11	4.88***
Materialism	−.07 (.02)	−.10	−4.24***	−.05 (.02)	−.07	−3.17**
Autonomy	.00 (.01)	.001	.02	−.05 (.01)	−.09	−3.86***
Extraversion	.13 (.03)	.10	4.34***	−.10 (.03)	−.08	−3.65***
Neuroticism	−.08 (.03)	−.06	−2.31*	.09 (.03)	.08	3.18**
Conscientiousness	−.01 (.03)	−.01	−.33	−.10 (.03)	−.09	−3.75***
Agreeableness	.24 (.03)	.18	7.62***	−.10 (.03)	−.08	−3.47**
Adjusted R^2		.09			.13	
N		1,813			1,809	

Significance levels: * $p < .05$; ** $p < .01$; *** $p < .001$

material concerns—satisfaction with standard of living (indirect effect = −.020, bias corrected and accelerated 95 % CI [.007, .033], $z = 3.12$, $SE = .006$, $p = .002$) and financial satisfaction (indirect effect = .011, bias corrected and accelerated 95 % CI [.004, .022], $z = 2.60$, $SE = .004$, $p = .009$) also partly mediated the effects of neuroticism. Similarly, satisfaction with standard of living (indirect effect = −.017, bias corrected and accelerated 95 % CI [−.030, −.005], $z = −2.90$, $SE = .006$, $p = .004$), but not financial satisfaction, mediated the effect of agreeableness on negative emotions (see Fig. 1).

Next, I examined whether the links between autonomy and SWB were mediated by material concerns. Analyses showed that material concerns partially mediated the associations between autonomy and SWB. All three measures of material concerns (financial satisfaction, satisfaction with standard of living, and income status) mediated the associations between autonomy and each of the indicators[5] of SWB (happiness, life satisfaction, and negative feelings) (see Table 5). As an illustration, Fig. 1 shows the mediation model

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[5] Mediation analysis was not conducted for positive feelings because autonomy was not a significant predictor of positive feelings.
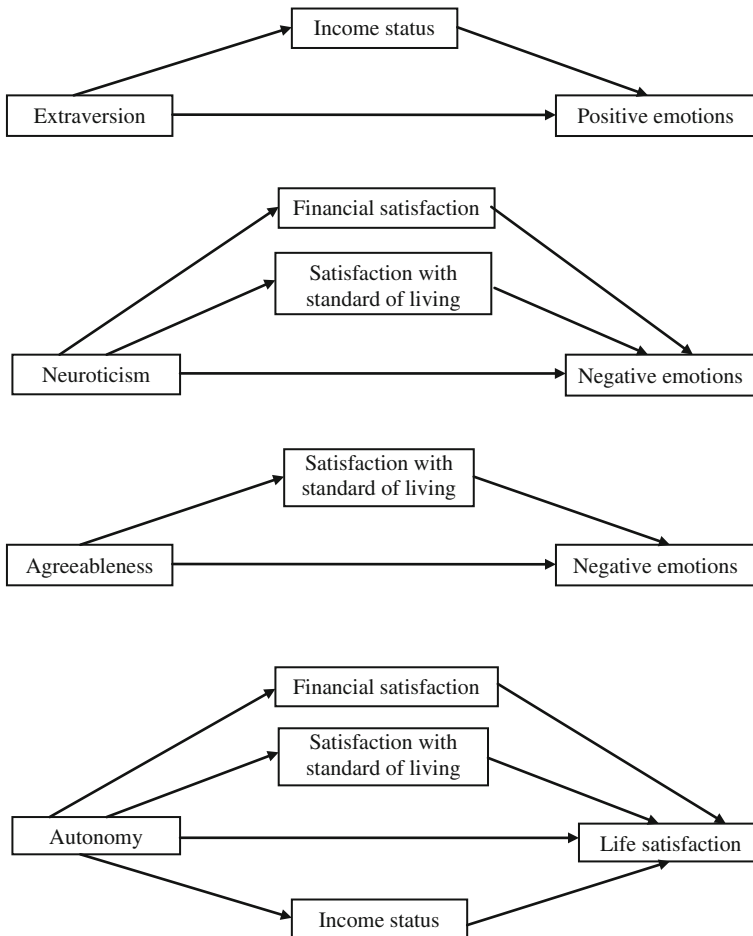
Fig. 1 Mediation models showing: (1) the effect of extraversion on positive emotions via income status; (2) effects of personality on negative emotions via material concerns; and (3) the effects of autonomy on life satisfaction via material concerns

for life satisfaction. Thus, individuals who had greater autonomy were happier, more satisfied with their lives, and felt less negative, partly because they were satisfied with their financial situation and standard of living, and had higher income status.

7 Discussion

This study examined the associations between material concerns, psychological factors, and SWB and the mechanisms underlying these links. First, material and psychological factors exhibited differential relations with the various components of well-being. Values and material concerns explained most of the variance in life satisfaction and happiness, whereas personality accounted for most of the explained variance in positive emotions. Specifically, autonomy and financial satisfaction were the strongest predictors of life satisfaction and happiness, while personality accounted for negligible variance in them. In

Table 5 Mediation analyses showing the effects of autonomy on well-being via material concerns

Mediators	Indirect effect	95 % CI	z	SE
DV: happiness				
Financial satisfaction	.018	[.011, .026]	5.31***	.004
Satisfaction with standard of living	.007	[.003, .011]	3.48***	.002
Income status	.003	[.001, .006]	2.51*	.001
DV: life satisfaction				
Financial satisfaction	.075	[.054, .098]	8.37***	.011
Satisfaction with standard of living	.027	[.017, .039]	5.20***	.006
Income status	.010	[.003, .018]	3.05**	.004
DV: negative feelings				
Financial satisfaction	−.021	[−.033, −.012]	−4.31***	.006
Satisfaction with standard of living	−.022	[−.030, −.015]	−6.09***	.004
Income status	.007	[.004, .013]	3.39***	.002

Significance levels: * $p < .05$; ** $p < .01$; *** $p < .001$

contrast, autonomy, financial satisfaction, and satisfaction with standard of living did not significantly predict positive feelings, which was instead most closely associated with personality. For negative emotions, both material concerns and personality were important predictors. These observed relations supported the first prediction—material concerns showed stronger associations with life satisfaction, whereas personality showed stronger associations with positive and negative feelings.

Second, the findings elucidated the mediating processes underlying the links between material and psychological factors and different SWB facets. Autonomy, an internal variable, together with material concerns (income status, financial satisfaction, and satisfaction with standard of living) were important predictors of life satisfaction and happiness. Mediation analyses found that personality (neuroticism and agreeableness) not only directly influenced negative emotions, but also exerted indirect effects via material concerns. Similarly, autonomy not only directly influenced SWB (happiness, life satisfaction, and negative feelings), but also exerted indirect effects via material concerns. The findings suggest that influences on these components of SWB—happiness, life satisfaction, and negative feelings—can be explained by an integrative model that takes into account both internal and external factors. In contrast, personality traits (extraversion, neuroticism, and agreeableness), but not material concerns, were strong predictors of positive emotions. With the exception of income status, the other indicators of material concerns did not mediate the relation between personality and positive emotions. This suggests that unlike for the other SWB components, the positive emotions component is predominantly determined by dispositional rather than external factors. In sum, the findings were consistent with the study's second and third predictions.

8 Differential Relations with SWB Facets and Their Underlying Mediating Processes

There are a few possible reasons for the obtained patterns of associations between SWB and its correlates. First, personality traits may only indirectly influence life satisfaction and

happiness, hence resulting in their weaker effects, as compared to their effects on positive and negative feelings. This explanation accords with what Schimmack et al. (2002) found—that the influences of extraversion and neuroticism on life satisfaction were largely mediated by hedonic balance (the difference between pleasant and unpleasant affect). Second, the stronger associations between material concerns and life satisfaction (and happiness) may partly arise from a focusing illusion (Kahneman et al. 2006). Unlike assessments of momentary affect, reports of global happiness/life satisfaction are susceptible to the focusing of attention on particular external/situational aspects. That is, respondents are likely to construct their answers to global happiness/life satisfaction on the spot, thus these answers could be influenced by what they focus their attention on, as well as by the evaluations of those individual domains/situations.

The mediation models illustrating how material concerns mediate the association between extraversion and positive feelings, and that between neuroticism and negative feelings are also consistent with previous research examining the influence of personality traits on work outcomes (Ozer and Benet-Martínez 2006). Roberts et al. (2003) found that adolescents who were higher in positive emotionality at age 18 subsequently had higher levels of occupational attainment and financial security in adulthood. Positive emotionality (as measured by the Multidimensional Personality Questionnaire, MPQ) shares many commonalities with the extraversion dimension measured by the Big Five. In other words, extraversion predicted greater earnings and financial security at a later age. Thus, the observed mediation model—that respondents who were more extraverted evaluated their income status more highly, and in turn experienced more positive feelings—is consistent with previous findings showing the links between extraversion and successful work outcomes. Similarly, negative emotionality at age 18 was related to lower levels of occupational attainment, less job satisfaction, and less financial security at age 26 (Roberts et al. 2003). The findings highlight that negative emotionality (which is assessed by the neuroticism dimension in the Big Five) was linked to less successful work outcomes in terms of earnings and financial security. In turn, this suggests that people who are higher in neuroticism would be less satisfied with their financial situation. Indeed, the present mediation model confirmed that people who were higher in neuroticism were lower in financial satisfaction and less satisfied with their standard of living, leading to greater negative feelings.

The mediation processes underlying the autonomy-SWB associations can also be understood from personality research examining related traits. Autonomy as assessed in this study is similar to related constructs such as expectancy for control, self-efficacy, and personal control. Having control over how one's life turns out, that is, the belief that one has the ability to cause or influence outcomes, is a consistent correlate with well-being (Diener 1984; Peterson 1999). The converse of personal control—learned helplessness—has adverse effects on people, leading to stress, depression, and poor health (Peterson and Seligman 1984). Hence, some degree of autonomy may facilitate SWB, as people can create or influence the outcomes they desire, or make choices that would enhance the quality of their lives, thereby improving their satisfaction with their lives, and in turn increasing their SWB. In other words, having autonomy improves people's evaluation of their financial situation, which in turn enhances their SWB. However, although exercising personal control is beneficial to well-being, having too much freedom of choice may actually be detrimental to well-being. When there are too many choices, or when decisions are too complex and difficult, having freedom of choice may increase feelings of stress (Schwartz 2004).

The present findings build and extend on the existing literature, as they illustrate process models of different facets of SWB. Previous research has mostly focused on the theoretical models pertaining to life satisfaction (e.g., Diener et al. 1999), although Schimmack et al. (2002) tested an integrated mediator-moderator model that examined how the influence of personality on life satisfaction was mediated by hedonic balance, and in turn, how the influence of hedonic balance on life satisfaction was moderated by culture. This study examined other components beyond life satisfaction—positive affect, negative affect, and happiness, and illustrated the processes that explained the relations between material and psychological factors and various SWB facets.

9 Conclusions

A limitation of this study is that it relied on the dataset of a single country (Singapore). Thus, one is unable to conclude whether these process models of SWB will replicate across cultures, or if the observed relations and models are peculiar to economically developed, affluent societies like Singapore. However, as the observed relations with the various SWB components are consistent with findings based on datasets involving most of the nations across the world (e.g., Diener et al. 2010), it does not appear that the present findings are merely an artifact of the data from this country. Furthermore, as this dataset allows one to simultaneously compare the importance of personality, autonomy, and material concerns for multiple components of well-being (life satisfaction, happiness, and affect), and examine their underlying processes; aspects that have not been examined in previous research, it seems that the benefits do outweigh the limitation.

Another limitation is the relatively low variance explained in the regression models for PA and NA (9 and 13 % respectively). As discussed, the most important predictors of PA and NA are psychological needs like respect, autonomy, mastery, and social support (Tay and Diener 2011). Unfortunately, most of these psychological needs were not assessed in the WVS, and only one psychological need measure (autonomy) was included in the analyses. Not having these important predictors of well-being in the analyses may partly explain the low R^2 values in the PA and NA models. In contrast, the life satisfaction regression model accounted for considerable variance (24 %), likely because multiple measures of material concerns were included in the analyses. This accords with previous research showing that material factors are important predictors of life satisfaction (Diener et al. 2010).

It should be recognized that there are many other important predictors of SWB that are not examined in the present study. For example, health satisfaction (a measure included in the Gallup World Poll) was an important and significant predictor of life satisfaction (Deaton 2008). Similarly, satisfaction with other life domains also predicts overall life satisfaction. The variables—satisfaction with self, family, and friends—were moderately correlated with life satisfaction across nations (Diener and Diener 1995). Not examining these other relevant explanatory variables constrains the ability of the present study to comprehensively uncover the interplay amongst the different types of predictors (e.g., domain satisfaction versus dispositional factors). Hence, future research should address this, for example, other than financial satisfaction, future studies can include measures to assess satisfaction with various important life domains (health, family, friends, work).

Another important avenue for further research would be to examine whether the processes underlying the influences of SWB would apply to countries across the world. Future studies should include a wider range of well-being indicators in international surveys, and

also include multiple (objective and subjective) indicators of material wealth. Rather than focus on only one domain (e.g., societal values), it would be useful if measures of multiple SWB correlates that have exhibited strong influences (e.g., needs, personality traits, and values) could all be examined in the surveys, to enable researchers to compare their importance for different SWB facets. Furthermore, there is now evidence indicating that the importance of the predictors for SWB is contingent on national wealth. Specifically, the strength of association between financial satisfaction and SWB, and that between autonomy and SWB is moderated by societal affluence, with the associations being stronger in richer nations (Ng and Diener 2014). It is thus possible that the processes underlying the predictor-SWB associations may also vary due to societal wealth, or other cultural dimensions (e.g., individualism–collectivism). Hence, future studies should incorporate both moderating and mediating influences and examine an integrated mediator–moderator model. Understanding the pathways through which material and dispositional factors exert their complementary or competing influences on different SWB facets would be a useful step in aiding social scientists and policymakers in formulating strategies and policies targeted at improving people's well-being.

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