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The Role of Perceived Discrepancy in Satisfaction Evaluation

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Abstract This study investigates if satisfaction measures involve an implicit have-want comparison by examining the relationships between direct have-want discrepancy, amount, and satisfaction, which vary in their degree of explicitness. The have-want discrepancy measure explicitly asks respondents to rate the discrepancy between what they have and what they want. The amount measure requires respondents to think about the amount of discrepancy between what one has and what one wants, but does not explicitly ask about that. Finally, the satisfaction measure is assumed to incorporate a component of the have-want comparison but does not ask respondents to consider such a comparison in the question. Three hundred and thirty undergraduate students at National Taiwan University participated in this study. Correlation analysis showed that satisfaction has a closer relation with amount than have-want discrepancy. In addition, a mediation model in which have-want discrepancy influence amount, which then influences satisfaction, was generally supported in conventional mediation analysis and multilevel path analysis. In brief, this study showed that satisfaction measures involve an implicit have-want comparison.

Keywords Have-want discrepancy · Satisfaction · Mediation analysis · Multilevel path analysis

1 Introduction

Satisfaction is regarded as a function of the discrepancy between what people have and what they want. This definition is widely accepted in several fields, including quality of life research (e.g., Campbell et al. 1976; Calman 1984; Diener et al. 1985; Michalos 1985; Shin and Johnson 1978), job satisfaction research (e.g., Ilgen 1971; Locke 1969, 1976; Solberg et al. 2002), consumer satisfaction research (e.g., Locker and Dunt 1978; Oliver 1980), and self-evaluation research (e.g., Higgins 1987).

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A number of empirical studies have suggested that a large discrepancy between have and wanted life status is associated with lower life satisfaction (e.g., Cohen 2000; Schulz 1995; Vermunt et al. 1989; Welham et al. 2001). For example, in a study by Cohen (2000), participants were asked to 'consider your present life in comparison to your wants and aspirations' and to 'rate your own life right now in terms of your life approaching what you want'—both for life in general and for eleven area-specific items, including Health, Finances, Family Relations, Paid Employment, Friendships, Housing, Life Partner, Recreational Activity, Religion, Transportation, and Education. Participants also rated their satisfaction (1 = terrible to 7 = delighted) in these areas. Have-want discrepancy scores were positively correlated with satisfaction scores for life in general as well as for the specific eleven items. The correlations ranged from .51 to .79. Similar findings were also reported in studies using survey methods (e.g., Oliver, 1980; Schulz 1995; Vermunt et al. 1989; Welham et al. 2001; Wu and Yao 2006).

This "discrepancy perspective" on satisfaction is also supported by experimental evidence. For example, two studies by Solberg et al. (2002) showed that satisfaction is predicted by the degree of discrepancy between the things people have and the things they desire. In the first study, participants were asked to imagine that they were a 30-year-old middle-income citizen. They were then given a vignette describing some of the items that wealthy people possess. One (randomly assigned) group of participants received vignettes containing more desirable items, and the other received vignettes with less desirable items. The participants who received the vignette with more desirable items reported lower income satisfaction than those who received the vignette with less desirable items. This suggests that given the same income resources, desirability (an indicator of want) has a negative relationship with satisfaction. In a second study, participants completed a future desires survey (to assess their actual material desires), estimated their projected income (based on their intended occupation), and rated their income satisfaction. Then they were randomly given feedback regarding the projected cost of their desirable life—some participants received a high-cost version of the feedback, others a low-cost version—and were asked to rate their income satisfaction again. Income satisfaction before the feedback was not significantly different between the high-cost and low-cost groups, but after the feedback, income satisfaction was significantly higher in the low-cost groups. This suggests that the attainability of desired goods plays an important role in determining satisfaction.

Similarly, Wu and Yao (2007) found that the gap between desire and reality is associated with satisfaction. They used four scenarios to describe two people who have the same desire for the same objects, which were defined along two dimensions. For instance, in one scenario both A and B wanted "a large house in a convenient location"; this was the ideal object as defined by the two dimensions size and location. The proposed houses included (a) a small house in the city center, (b) a large house in the city center, (c) a small house in the suburbs, and (d) a large house located in the suburbs. Of these, the large house in the city center is least discrepant with the ideal. Participants were told that A and B stress different dimensions (A stresses size, B location) and asked to rate their satisfaction for these houses from the perspective of each. Although the main purpose of the study was to test Locke's (1969, 1976) range-of-affect hypothesis by examining the effect of perspective taking, they found that objects that were more discrepant from the ideal had lower satisfaction ratings.

The fact that both Solberg et al. (2002) and Wu and Yao (2007) find that satisfaction is related to have-want discrepancy may imply that people implicitly gauge the amount of this discrepancy when marking a satisfaction evaluation. But does a satisfaction evaluation really involve an implicit comparison between "have status" and "want status"? The main

purpose of this study is to examine this issue by investigating the relationship between three measures of have-want discrepancy: direct *have-want discrepancy*, *amount*, and *satisfaction*. These measures vary in their degree of explicitness. The *have-want discrepancy* measure explicitly asks respondents to rate the discrepancy between what they have and what they want. The *amount* measure, proposed by Locke and Latham (1990), is less direct, usually consisting of questions like "How much opportunity for promotion do you have on your job?" Responding this question requires thinking about the amount of discrepancy between what one has and what one wants, but does not explicitly ask about that. It is therefore argued to be conceptually equivalent to the direct *have-want discrepancy* measure, but is less explicit. Finally, the *satisfaction* measure incorporates a component of the have-want comparison but does not ask respondents to consider such a comparison in the question.

This study investigates if satisfaction measures involve an implicit have-want comparison by examining the relationships between direct *have-want discrepancy*, *amount*, and *satisfaction*. If a satisfaction evaluation involves an implicit have-want comparison, then we hypothesize that *satisfaction* should have a closer relation with *amount* than *have-want discrepancy* because they are more similar along the direct-implicit dimension. Correlations among these three measures are therefore examined in order to see if *satisfaction* has a higher correlation with *amount* than *have-want discrepancy*. In addition, a mediation model is proposed in order to determine if there is a sequential relationship among these three measures that mirrors their properties along the direct-implicit dimension: does *have-want discrepancy* influence *amount*, which then influences *satisfaction*? The mediation model describes the transformation of have-want status comparison (i.e., the *have-want discrepancy* measure) into *satisfaction* through an intermediate stage (*amount* measure) in which have-want status comparison is made indirectly. The model illustrates the nature of satisfaction in have-want status comparison.

In this study 12 life facets are selected and two methods are applied in order to investigate the relationship between *have-want discrepancy*, *amount*, and *satisfaction* with respect to those facets. The first method is the conventional meditation analysis proposed by Baron and Kenny (1986), which evaluates the mean scores of *have-want discrepancy*, *amount*, and *satisfaction* across the 12 life facets. The second method is a multilevel path analysis in which the 12 facets are regarded as nested within each individual, resulting in a two-level data structure (i.e., with facet and individual levels). Multilevel path analysis simultaneously examines the relationship between *have-want discrepancy*, *amount*, and *satisfaction* at both the facet (within-individual) level and the individual (between-individual) level. Multilevel path analysis is superior to conventional meditation analysis here because conventional meditation analysis only uses summary scores of the variables across the 12 facets, whereas multilevel path analysis can examine relationships between the three measures for facets at the facet level and for respondents at the individual level. It thus facilitates the investigation of the relationship between the three measures at different levels.

2 Method

2.1 Data

Three hundred and thirty undergraduate students (63.0% female (n = 208) and 36.1% male (n = 119), 0.9% unknown (n = 3)) at National Taiwan University participated in this study

(mean age: 19.81 years (*SD* = 1.98)). Participants completed a QOL questionnaire, which contains 12 life facets including (1) energy and fatigue, (2) sleep and rest, (3) work capacity (with learning), (4) social support, (5) physical safety and security, (6) financial resources, (7) health and social care (accessibility and quality), (8) opportunities for acquiring new information and skills, (9) physical environment, (10) home environment, (11) transportation, and (12) participation in and opportunities for recreation/leisure.

These 12 facets were selected from the World Health Organization Quality of Life questionnaire (WHOQOL-100; the WHOQOL Group 1998, the WHOQOL-Taiwan Group 1999) because some of their items were expressed as queries about the amount of that facet (e.g., "Do you have enough energy for everyday life?" for the facet of energy and fatigue) and as queries about satisfaction. Items for direct *have-want discrepancy* judgments of these facets were constructed by Wu and Yao (2006) and were used in Wu's (in press) study; they thus provide desirable psychometrics and hypothesis-consistent results. Hence, the 12 facets with items in *amount*, *satisfaction*, and *have-want discrepancy* were chosen for this research.

In the first section of the survey, participants rated their satisfaction with each of the 12 facets on a five-point Likert scale ranging from 1 (very dissatisfied) to 5 (very satisfied). They also rated the amount of each facet on a similar five-point scale; the descriptor of each item was different according to its original version on the WHOQOL-100 Finally, participants rated the *have-want discrepancy* for each facet on a five-point Likert-type scale ranging from −4 (large discrepancy from the want status) to 0 (the same as the want status). In order for higher values to indicate a smaller discrepancy, scores were recoded from 1 to 5. The internal consistency reliability (coefficient α) for *have-want discrepancy*, *amount*, and *satisfaction* across facets is .78, .82, and .77, respectively.

2.2 Analysis

Two methods are applied in order to investigate the relationship among have-want discrepancy, amount, and satisfaction. The first is the conventional meditation analysis proposed by Baron and Kenny (1986). The mean scores of *have-want discrepancy*, *amount*, and *satisfaction* across the 12 life facets are calculated and then a series regression analysis is performed in order to examine the mediation models. In the first model (M1), *satisfaction* is predicted by *have-want discrepancy*. In the second model (M2), satisfaction is predicted by *have-want discrepancy*, with *amount* as mediator. The mediation effect is reflected in the gap between the unstandardized regression coefficients for *have-want discrepancy* in M1 and M2. The significance of the mediation effect is tested using Sobel's (1982) test. The same procedure is applied to each facet.

The second method is a multilevel path analysis in which the three measures for the 12 facets are regarded as nested within individuals. Hence, the two levels of multilevel path analysis are the facet level (sample size of 3,960 (330 × 12)) and the individual level (sample size of 330). The four-step procedure suggested by Muthén (1989) was conducted before performing the full multilevel path analysis (see also Cheung and Au 2005; Dyer et al. 2005). In the first step, a conventional path analysis of the total sample covariance matrix is conducted in order to determine if there is any obvious misspecification of the research model. Because the multilevel nested data structure is ignored in this step, the goodness of fit of the model is not interpreted here.

In the second step, between-individual variation is estimated in order to evaluate whether there is a substantial between-individual effect. The intraclass correlation (ICC,

the proportion of between-individual variance to total variance) for each indicator can be used to detect the between-individual effect. The ICC ranges from 0 to 1, with higher values indicating greater proportions of between-level variance. If the between-individual effect is not substantial (i.e., ICCs are less than .05; Dyer et al. 2005), conventional path analysis is adequate.

As a third step, the pooled within-individual structure using the pooled within-individual covariance matrix is estimated to examine the appropriateness of the proposed model for the pooled within-individual structure. For the fourth step, the between-structure model is analyzed with the between-individual covariance matrix. Although variables can have different meanings (and different models can be specified) at different levels (Chan 1998; Dyer et al. 2005; Klein and Kozlowski 2000; Muthén 1994), here the same model is specified for both between- and within-individual levels.

These four steps clarify whether there is a substantial between-individual effect, as well as what are the appropriate models for within- and between-individual structures. The final step is to perform the multilevel path model for within- and between-individual models simultaneously. Because the skew and kurtosis of all variables lie between −1 and + 1, a maximum likelihood estimator is a suitable choice for data analysis (Muthén and Kaplan 1985). Multilevel path analysis is therefore performed using a maximum likelihood estimator with Mplus (Muthén and Muthén 2007).

3 Results

3.1 Descriptive Statistics

Table 1 presents the mean and standard deviation for the three measures on each facet, as well as the mean scores across facets. Table 2 presents correlations among the three measures for each facet and the mean scores across facets. Although all three measures

Table 1 Description statistics for have-want discrepancy, amount, and satisfaction measures for each facets (n = 330)

Facets	Discrepancy		Amount		Satisfaction	
	Mean	SD	Mean	SD	Mean	SD
(1) Energy and fatigue	3.01	1.04	2.88	.85	3.10	.91
(2) Sleep and rest	3.00	1.22	2.62	.96	2.81	1.01
(3) Work capacity	3.20	1.14	3.00	.77	3.12	.93
(4) Social support	3.97	1.12	3.45	.95	3.62	.94
(5) Physical safety and security	3.74	1.00	3.21	.79	3.40	.79
(6) Financial resources	3.56	1.19	3.14	.93	3.15	.98
(7) Health and social care	4.07	.90	3.41	.81	3.44	.76
(8) New information and skills	4.14	.92	3.50	.80	3.54	.81
(9) Physical environment	2.78	1.14	2.51	.84	2.53	.82
(10) Home environment	3.32	1.11	2.90	.90	3.13	.94
(11) Transportation	3.69	1.03	3.25	.86	3.22	.89
(12) Recreation/leisure	3.48	1.07	3.30	.87	3.17	.89
Mean score across 12 facets	3.50	.58	3.10	.50	3.18	.48

Table 2 Correlations among have-want discrepancy, amount, and satisfaction for each facets (n = 330)

Facets	SAT & Amount	SAT & Dis	Amount & Dis
(1) Energy and fatigue	.67	.54	.66
(2) Sleep and rest	.71	.70	.70
(3) Work capacity	.68	.67	.63
(4) Social support[a]	.85	.73	.70
(5) Physical safety and security[a]	.70	.50	.53
(6) Financial resources[a]	.83	.74	.74
(7) Health and social care[a]	.73	.56	.51
(8) New information and skills[a]	.81	.61	.66
(9) Physical environment[a]	.74	.62	.62
(10) Home environment[a]	.79	.69	.72
(11) Transportation[a]	.83	.69	.67
(12) Recreation/leisure	.61	.59	.57
Mean score across 12 facets[a]	.88	.64	.67

All correlations were significant at $p < .001$; Dis means have-want discrepancy; SAT means satisfaction

[a] The correlation between SAT and Amount was significant larger than correlation the between SAT and Dis for that facets at $p < .001$

have high positive correlations, the relationship between *amount* and *satisfaction* is the strongest.

Results of dependent correlation comparison (Cohen and Cohen 1983) reveal that the correlation between mean *amount* and *satisfaction* is significantly higher than the correlation between mean *have-want discrepancy* and mean *satisfaction* (.88 vs. .64, $p < .001$). This is true for eight out of the 12 facets. This finding suggests that *amount* is more similar to *satisfaction* than *have-want discrepancy*.

3.2 Conventional Mediation Analysis

A series of regression analyses for mediation analysis is conducted using mean *have-want discrepancy*, *amount*, and *satisfaction* across all 12 facets. Results are presented in Table 3. In the first model (M1), *satisfaction* is predicted by *have-want discrepancy*, and in the second model (M2), *satisfaction* is predicted by *have-want discrepancy* and mediated by *amount*. We can measure the mediation effect of *amount* by examining the gap between the unstandardized regression coefficients of *have-want discrepancy* in M1 and M2 (.53–.08 = .45). This mediation effect is significant according to Sobel's (1982) test (z = 13.34, $p < .01$). Even so, *have-want discrepancy* is still significant when *amount* is included in the model.

In order to ensure that this result reflects the finding that *amount* truly occupies the mediation role, we evaluate the effect of regarding *have-want discrepancy* as the mediator. We can measure the mediation effect of *have-want discrepancy* by examining the gap between the unstandardized regression coefficients of *amount* in M2 and M3 (.84–.78 = .06). This mediation effect is also significant according to Sobel's (1982) test (z = 2.79, $p < .01$), but lower than the mediation effect of *amount*. These results suggest

Table 3 Mediation analysis for satisfaction (n = 330)

Predictor/criterion	Satisfaction		
Model	M1	M2	M3
Intercept	1.34	.50	.59
Have-want discrepancy	.53**	.08**	–
Amount	–	.78**	.84**
R^2	.42	.78	.72
Mediation effect	.45	–	.06

** $p < .01$

that *amount* is a more suitable mediator than *have-want discrepancy*. We find similar results when we apply the same procedure to each facet.

3.3 Multilevel Path Analysis

The items for the 12 life facets are regarded as nested within individuals, enabling us to perform a two-level path analysis (on both facet and individual levels) in order to examine the relationship between *have-want discrepancy*, *amount*, and *satisfaction*. The total covariance matrix for a conventional path analysis is displayed in Table 4 (observations are 3,960 items); as is evident, the correlation between *amount* and *satisfaction* is the strongest. In this step, we ignore the multilevel nested data structure: in this model, *have-want discrepancy* influences *amount*, which then influences *satisfaction*. The direct effect of *have-want discrepancy* on *satisfaction* is also added in order to determine if the mediation effect of amount is complete.

Because there are only three variables, the model is saturated: it has 0 degrees of freedom and a perfect fit. Although model selection is not a concern for saturated models because of their 0 degrees of freedom, the estimated parameters can still be revealing as to the appropriateness of the model. All estimates for this model are significant at $p < .01$ (see Table 5). The indirect effect of *have-want discrepancy* on *satisfaction* (equal to the mediation effect of *amount*) is significant as well (indirect effect = .32, $p < .01$). This suggests that *amount* has a significant effect—but does not completely mediate—the relationship between *have-want discrepancy* and *satisfaction*. However, because this model ignores nested data structure, these estimates should not be taken seriously.

Table 4 Total covariance matrix and ICC of variables in multilevel path analysis

Variables	Covariance matrix			Correlation matrix		
	1	2	3	1	2	3
1. Have-want discrepancy	1.340			–		
2. Amount	.725	.841		.68	–	
3. Satisfaction	.733	.658	.879	.68	.77	–
ICC	.188	.228	.181	–	–	–

Observations of this table were 3,960 items

Table 5 Parameter estimates in multilevel path analysis

Model and variables	Unstandardized estimates (stand error)		
	Discrepancy	Amount	Satisfaction
Conventional PA			
Amount	.54 (.01)	–	
Satisfaction	.23 (.01)	.58 (.01)	–
Within-structure PA			
Amount	.53 (.01)	–	
Satisfaction	.29 (.01)	.50 (.01)	–
Between-structure PA			
Amount	.60 (.04)	–	
Satisfaction	–	.87 (.02)	–
Full MPA			
Within-structure			
Amount	.53 (.01)	–	
Satisfaction	.29 (.01)	.50 (.02)	–
Between-structure			
Amount	.60 (.05)	–	
Satisfaction	–	.86 (.03)	–

All estimates were significant at $p < .01$. MPA is multilevel path analysis

In the next step, the ICCs of variables are estimated in order to explore whether there is substantial between-individual variation (see Table 4). Intraclass correlations of the three variables range from .181 to .228, meaning that 18.1–22.8% variance of the variables result from between-individual variation. This suggests that the multilevel nested data structure should be taken into account in modeling.

The proposed mediation model to the pooled-within covariance matrix (displayed in Table 6; observations are 3,960 items) is fitted in order to determine if the model is appropriate for the pooled-within structure. Table 6 presents the pooled-within correlation matrix; as before, the correlation between *amount* and *satisfaction* is still the larger than other correlations. Also as before, *have-want discrepancy* influences *amount* and which then influences *satisfaction*. A direct effect of *have-want discrepancy* on *satisfaction* also is also included in the analysis (as a saturated model). All estimates are significant at the $p < .01$ level (see Table 5), including the indirect effect of *have-want discrepancy* on *satisfaction* (indirect effect = .27, $p < .01$).

Table 6 also presents the between-individual covariance and correlation matrix. The between-individual correlation matrix also shows that the correlation between *amount* and *satisfaction* is the largest. The same model is applied to a between-individual structure with between-individual covariance matrix (see Table 6; observations are 330 persons), dropping the direct effect of *have-want discrepancy* on *satisfaction* because it is insignificant; this results in a model with one degree of freedom. Model fit indices are χ^2 (1) = .26, $p > .05$, CFI = 1.00, TLI = 1.00, RMSEA = .000, and SRMR = .003. All estimates are significant at $p < .01$ (see Table 5), including the indirect effect of *have-want discrepancy* on *satisfaction* (indirect effect = .51, $p < .01$). This suggests that at individual level, *amount* has a significant and complete mediation effect on the relationship between *have-want discrepancy* and *satisfaction*.

Table 6 Pooled-within and between-individual covariance matrices for multilevel path analysis

Variables	Covariance matrix			Correlation matrix		
	1	2	3	1	2	3
Pooled-within covariance matrix						
1. Have-want discrepancy	1.097			–		
2. Amount	.581	.649		.69	–	
3. Satisfaction	.607	.493	.714	.69	.72	–
Between-individual covariance matrix						
1. Have-want discrepancy	.242			–		
2. Amount	.166	.192		.67	–	
3. Satisfaction	.126	.144	.165	.63	.93	–

Note: Observations for pooled-within covariance matrix were 3,960 items and observations for between-individual covariance matrix were 330 persons

Finally, a multilevel path analysis is applied by analyzing the pooled-within and between-individual covariance matrices simultaneously. Values of fit indices for this model are: χ^2 (1) = .08, $p > .05$, CFI = 1.00, TLI = 1.00, RMSEA = .000, SRMR for between-individual covariance = .002 and SRMR for pooled-within covariance = .000. All estimates are significant at $p < .01$ (see Table 5). This model suggests that at the level of facets (i.e., the within-individual level), *amount* has a significant (but not complete) mediation effect on the relationship between *have-want discrepancy* and *satisfaction*—but at the level of individuals (i.e., the between-individual level in the model), *amount* has a significant *and* complete mediation effect. The indirect effect of *have-want discrepancy* on *satisfaction* is significant at the facet level (indirect effect = .27, $p < .01$). Figure 1 presents the final multilevel path analysis model with unstandardized estimates.

4 Discussion

This study examines the relationships between *have-want discrepancy*, *amount*, and *satisfaction* using a sequential mediation model in which the effect of the direct *have-want discrepancy* on *satisfaction* is mediated via *amount.* This demonstrates that satisfaction evaluation involves an implicit have-want comparison. Correlations between *have-want discrepancy*, *amount*, and *satisfaction* reveal that *satisfaction* has the strongest correlation with *amount*, and that this correlation is significantly higher than the correlation between *satisfaction* and *have-want discrepancy*. The same finding is observed in the pooled-within and between-individual correlation matrices in multilevel path analysis. All of these correlations reveal that the *satisfaction* measure is more similar to the *amount* measure than the *have-want discrepancy* measure.

A conventional mediation analysis with summary scores also suggests that the relationship between *have-want discrepancy* and *satisfaction* is mediated by *amount*, although not fully. However, when the different levels (i.e., the facet and individual levels) are separated, the relationships between *have-want discrepancy*, *amount*, and *satisfaction* are different. At the within-individual (facet) level, the relationship between *have-want discrepancy* and *satisfaction* is still partially mediated by *amount*. But at the between-individual (individual) level, *amount* completely mediates the relationship between *have-want*

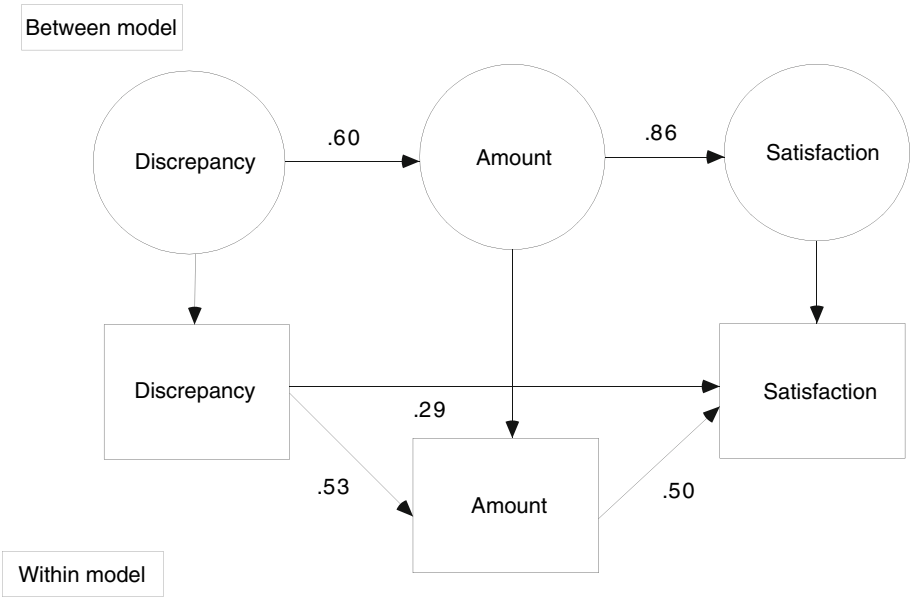

Fig. 1 Multilevel path analysis with unstandardized estimates

discrepancy and *satisfaction*. These results generally suggest that transformation of have-want status comparison (i.e., *have-want discrepancy*) into *satisfaction* evaluation occurs via an intermediate stage (*amount*) during which have-want status comparison is made indirectly. This is evidence for the discrepancy nature of satisfaction evaluation.

It is interesting that the three measures had different relationships on the facet and individual levels, especially with respect to the direct effect of *have-want discrepancy* on *satisfaction*. This difference illustrates that there is specific facet-level information that is not evident at the individual level. It suggests that *have-want discrepancy* and *amount* are not conceptually equivalent, as hypothesized by Locke and Latham (1990). If *have-want discrepancy* measures and *amount* measures are equivalent and *amount* is closer to *satisfaction*, then *amount* should convey more information than *have-want discrepancy* in terms of *satisfaction*. Thus, the overlapping information between *have-want discrepancy* and *satisfaction* should be totally explained by the effect of *amount*: there should be no direct effect of *have-want discrepancy* on *satisfaction*. Therefore, the results of the mediation model suggest that *have-want discrepancy* and *amount* are not fully equivalent at the facet level—that there is information conveyed by the *have-want discrepancy* measure that is not captured by the *amount* measure but that is related to satisfaction evaluation. However, it does seem that *have-want discrepancy* and *amount* are equivalent at the individual level. The difference between the facet and the individual level may indicate that the response process underlying *have-want discrepancy* and *amount* at the facet level is not as simple as Locke and Latham (1990) proposed—and that their relationship with satisfaction could be more complicated than has been assumed.

No existing theory or hypothesis can explain why, at the facet level, there is a significant direct effect of *have-want discrepancy* on *satisfaction* when the effect of *amount* is controlled. One speculation is that this result is due to the questionnaire format of each of the

have-want discrepancy, *amount*, and *satisfaction* measures. *Satisfaction* with each facet was rated on a five-point Likert scale ranging from 1 (very dissatisfied) to 5 (very satisfied), *amount* was rated on a five-point Likert scale using the original descriptors for each facet in the WHOQOL-100, and *have-want discrepancy* for each was rated on a five-point Likert-type scale ranging from -4 (large discrepancy from the want status) to 0 (the same as the want status) (See the Appendix for the measurement formats of each measure). The questionnaires for *satisfaction* and *have-want discrepancy* have a similar format, which is different from the format for *amount*. On the *satisfaction* and *have-want discrepancy* questionnaires, each facet was rated using five numerical values printed in a row and the same descriptors on the top. By contrast, in the *amount* questionnaire each facet was rated with five options with different ordinal descriptors.

The similar formats of the *satisfaction* and *have-want discrepancy* questionnaires might induce a common response set that might not be evident on the amount questionnaire because of its different format. Hence, at the facet level, the direct effect of *have-want discrepancy* on *satisfaction* that *amount* does not mediate may result from each individual's common response set for *satisfaction* and *have-want discrepancy*. But at the individual level, the effect of this response set might be reduced because different individuals would have different response sets. That is, each individual might have a particular response set, but would not have the same response set as other individuals. As a result, the common response set effect at the individual level would not be as strong as at the facet level. This might explain why there is a significant direct effect of *have-want discrepancy* on *satisfaction* at the facet level but not at the individual level when *amount* is controlled.

This explanation is reasonable because multilevel modeling can capture and deal with different information at different levels. Facet ratings within individual can easily introduce an individualized response set across ratings, especially when measurement formats are similar. If this speculation is correct, then, the observed direct effect of *have-want discrepancy* on *satisfaction* at the facet level might not be of theoretical concern: it may not have strong implications about the actual relationship between *have-want discrepancy*, *amount*, and *satisfaction*. However, because this is the only one study that examines the relationship between these three measures, our results should be cross-validated in future studies using different facets (e.g., different life or job facets). In addition, our speculative explanation involving hypothesized common response set effects should be tested by using the same format for all three measures; if response set is indeed the root of these results, we would expect the direct effect of *have-want discrepancy* on *satisfaction* at the facet level to vanish when amount is controlled. Our speculative explanation could also be tested by using a completely different format for each of the three measures: we would expect that the direct effect of *have-want discrepancy* on *satisfaction* at the facet level would be non-significant when amount is controlled because in this case, none of the three measures would share a common response set. In any case, a cross-validation study is needed to clarify our findings.

Besides its value in investigating the meaning of satisfaction in terms of the other two measures, an additional merit of this study is the introduction of multilevel path analysis. Although the most widely used technique of multilevel modeling in empirical study is multilevel regression analysis, multilevel modeling can be extended to path analysis and structural equation modeling (Muthén 1989). However, this technique is still not widely used in empirical studies. With the development of software for structural equation modeling, such as Mplus (Muthén and Muthén 2007), estimation of multilevel path analysis and structural equation modeling is very easy. Moreover, in many areas of quality of life research, data of individuals from different nations, regions, or institutes generally

has a multilevel nested structure, for which multilevel modeling technique is very suitable and appropriate. Not only can it deal with the non-independent observation problem associated with multilevel nested structures, multilevel modeling technique can also enable us to build different theories for different levels. Because variables can have different meanings at different levels, different models should be considered when a multilevel model is specified (e.g., Chan 1998; Dyer et al. 2005; Klein and Kozlowski 2000; Muthén 1994. Here we introduce Muthén's (1989, 1994) method of multilevel path analysis (and multilevel structural equation modeling)—a procedure that can be used for future quality of life studies when the data has a multilevel nested structure.

In summary, this study uses a sequential mediation model to investigate whether satisfaction evaluation involves an implicit have-want comparison. The model taps three measures—*have-want discrepancy*, *amount*, and *satisfaction*—which reflect have-want comparison on a continuum from direct to implicit. Using the techniques of correlation analysis, conventional mediation analysis and multilevel path analysis, we find that satisfaction evaluation involves an implicit have-want comparison: *satisfaction* is much more similar to *amount* than to *have-want discrepancy*, and *amount* has a mediation effect between *have-want discrepancy* and *satisfaction*. A sequential structure from *have-want discrepancy* to *amount* to *satisfaction* is evident. However, further studies are still needed to cross-validate and clarify these results.

Appendix

A. Example items and format for the satisfaction questionnaire

		Very dissatisfied				Very satisfied
1.	Are you satisfied with your energy?	1	2	3	4	5
:	:	:	:	:	:	:
9.	Are you satisfied with physical environment?	1	2	3	4	5
:	:	:	:	:	:	:
12.	Are you satisfied with the opportunity for leisure activities?	1	2	3	4	5

B. Example items and format for the amount questionnaire

1. Do you have enough energy for everyday life?

☐ Not at all ☐ A little ☐ moderately ☐ mostly ☐ completely

: :

9. How healthy is your physical environment?

☐ Not at all ☐ A little ☐ A moderate amount ☐ very much ☐ extremely

: :

12. To what extent do you have the opportunity for leisure activities?

☐ Not at all ☐ A little ☐ moderately ☐ mostly ☐ completely

C. Example items and format for the have-want discrepancy questionnaire

	Large discrepancy from want status				The same as want status
1. What is the difference between your energy level and the level you would like to have?	−4	−3	−2	−1	0
: :	:	:	:	:	:
9. What is the difference between your current physical environment and the environment you want to stay in?	−4	−3	−2	−1	0
: :	:	:	:	:	:
12. What is the difference between your current opportunities for leisure activities and the opportunities you would like to have?	−4	−3	−2	−1	0

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