Counting happiness from the individual level to the group level

Beja Jr, Edsel and Yap, David B.

Ateneo de Manila University, Asian Institute of Management

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EDSEL L. BEJA JR. AND DAVID B. YAP

Abstract

The development of a reliable procedure for the aggregation of individual level happiness leads to a proper understanding of group level happiness. Such a procedure is indispensable for a more responsive public policy-making. However, individual self-reports on happiness must meet the dual requirements of cardinality and relative interpersonal comparability in order that aggregation is not problematic and the resulting measure not only makes sense but also useful for group level interventions. The paper demonstrates the procedure for obtaining group level happiness using data from the Philippines.

Keywords: Cardinality; relative interpersonal comparability; aggregation; happiness

JEL Codes: C80; D60; I30

1. INTRODUCTION

The premise in happiness research is that the happiness of a person is known by asking the person a direct question about it because another person's experience of happiness cannot substitute for one's personal experience of happiness. Moreover, the person is generally truthful in making such a response and, thus, self-reports can be taken seriously. Queries like "How satisfied are you with your life on the whole?" and "Do you consider yourself happy?" elicit the information directly

from the person.[1] Cantril (1967), Bradburn (1969), Andrews and Withey (1976), Campbell et al. (1976), Kamman (1979), Kamman and Flett (1983), Diener et al. (1985), Watson et al. (1988), Lyubomirsky and Lepper (1999), Kahneman (2000), and Kahneman et al. (2004) are, therefore, trailblazers in this regard.

Nonetheless, individual level happiness is different from group level happiness. The first issue to consider when inquiring about group level happiness is whether the individual self-reports are comparable across persons. If the comparability of self-reports is a non-issue, then the next issue to think about concerns the aggregation of self-reports itself. Is the aggregation from individual level happiness to group level happiness a straightforward procedure as adding up values then getting the average rating for the group? How can the aggregation be carried out such that the resulting aggregate measure includes and contains the important dimensions of each individual's happiness and, at the same time, it is meaningful and useful for analysis and policy intervention? In short, when the analysis is raised from the individual level to the group level, the desired measure for the latter has to be the product of a distillation of the different facets of the former. The conventional approach of using an external proxy like price or money is inadequate simply because the non-pecuniary facets of happiness are not included in the calculation.

These issues are becoming more important today because of the emergence of happiness as a key determinant of public policy. Compelling arguments on the links betweens happiness and public policy are available in Layard (1980), Diener (2000), Pavot and Diener (2004), Helliwell (2006), Layard (2006), Dolan and White (2007), Dolan and Peasgood (2008), Diener et al. (2009), Frey

[1] "Happiness" and "subjective well-being" are considered synonyms. Positive and negative feelings and judgment of one's life comprise subjective well-being. Kahneman and Deaton (2010) propose the notion of "emotional well-being" to cover both types of feelings. Note that positive feeling is closer to the everyday notion of happiness. Thus, subjective well-being is a broader concept than happiness in everyday language.

and Stutzer (2010, 2011), and Helliwell et al. (2012)—there is no need to rehearse the arguments here. It is easy to argue though that public policy leads to the creation of opportunities for both individuals and the group to achieve happiness. That public policy can affect individual level happiness seems to be a given. If, however, it is not meaningful to put the different instances of individual happiness together as a group level measure of happiness, then it might be impossible to determine the impact or even appreciate the relevance of public policy to society as a whole. Yet, a procedure for determining group level happiness is essential in the pursuit of the so-called "happy society." Instead of the average happiness of a group, community, or society, group level happiness is the proportion of people in a group, community, or society who consider themselves happy and exceed a certain threshold of happiness.[2]

This paper shows that under certain conditions individual level happiness can be aggregated into group level happiness. Such aggregation relies on the assumption that individual level happiness exhibits the properties of cardinality and *relative* interpersonal comparability. The methodology—weaving three strands of research into a procedure that meets the requirements for obtaining group level happiness—is presented in Part 2. Data (described in Part 3) were collected with the goal of demonstrating the steps of the aggregation. Then, the results and discussion are presented in Part 4. The last part concludes.

2. METHODOLOGY

Subjective well-being (SWB) is the consideration of a person's own state of being. By definition, SWB is an expression of the direct knowledge of one's happiness and underpinned by a person's "true" state of being (SWB*). As shown elsewhere, $SWB^* - SWB = e$, where e is an error term.

[2] The extant literature takes the average of self-reports as a measure of group level happiness (e.g., Dolan and White 2007; Inglehart et al. 2009; Diener et al. 2009; Oishi 2012).

Still, if *e* is homoscedastic and not due to a change in the valence but merely from the "accuracy" of self-reports, then the law of large numbers makes it possible to approximate $SWB \equiv SWB^*$. If the objective is to obtain group level happiness, though, *SWB* needs to be a cardinal measure (and not just an ordinal measure with the associated cardinal value) and interpersonally comparable (see below).[3] Still, Ferrer-i-Carbonell and Frijters (2004) argue that the empirical results are going to be qualitatively the same regardless of the assumption on the numerical quotations. Frey et al. (2010) argue the cardinality of SWB is not even necessary for some of the applications of SWB—that is, the ordinality of SWB is good enough to perform analysis that is consistent with utility theory.

Here, *SWB* is interpreted as judgment and measured as life satisfaction. The relative stability of satisfaction-type measures makes them good proxies for analyzing long-term well-being. As such, life satisfaction is not a problematic indicator to use because it does not bring excessive and/or unspecified volatility that produces spurious findings (c.f., Sandvik et al. 1993; Ehrhardt et al. 2000; Schimmack and Oishi 2005; Krueger and Schkade 2008). In addition, life satisfaction is also good predictor of future behavior (Wirtz et al. 2003; Oishi and Sullivan 2006; Lyubomirsky 2005).

One measure of life satisfaction is the global or overall self-report about one's life. A standard procedure is to use single-item query with a lineup scale format and integer values.[4] Consider the German Socio-Economic Panel survey that uses an 11-point lineup format:

> *We would like to ask you about your satisfaction with your life in general. Please answer according to the following scale: 0 means 'completely dissatisfied', 10 means 'completely*

[3] The extant literature takes the numerical quotations of *SWB* as fulfilling the cardinality requirement, albeit cardinality and numerical quotations are two different concepts.

[4] An alternative to the lineup format is the ladder format (Cantril 1965) used in the Gallup World Polls.

satisfied'. How satisfied are you with your life, all things considered?

☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
0	1	2	3	4	5	6	7	8	9	10

Completely Dissatisfied — *Completely Satisfied*

Diagram 1

Or, consider the World Values Survey that uses a 10-point lineup format:

All things considered, how satisfied are you with your life as a whole these days? Using this card on which 1 means you are "completely dissatisfied" and 10 means you are "completely satisfied" where would you put your satisfaction with your life as a whole?

1	2	3	4	5	6	7	8	9	10

Completely Dissatisfied — *Completely Satisfied*

Diagram 2

There is also a "short" version of the life satisfaction query that is used in the British Household Panel survey:

Using the [ ] scale[,] how dissatisfied or satisfied are you with your life overall?

1	*2*	*3*	*4*	*5*	*6*	*7*

Not satisfied at all — *Completely satisfied*

Diagram 3

From Stevens (1946), it is known that a constant increment between two consecutive measures is the minimum requirement for a cardinal measure. In the above examples, however, cardinality is presumed since the design of the scales inevitably results in constant increments.

The comparability of self-reports is minimum requirement to make the aggregation of self-reports sensible. Gilbert (2006) describes the condition as the absence of squishing or stretching of values on the scale (c.f., Kahneman and Miller 1986; Frederick and Loewenstein 1999). In the above

examples, comparability is presumed because the visual representation of a lineup scale suggests to the individual that the measurement uses a fixed dimension with pre-determined intervals.

Cardinality and comparability may not be needed if the analysis remains at the individual level, but both are fundamental requirements if the aim of measurement and analysis is to obtain group level happiness. To such end, the paper makes two suggestions. The first is to qualify the end-points of the scale. In particular, the proposal is to put "0%" with 0 and "100%" with 10. Second, use the 11-point lineup scale to fit the 0% to 100% range. Taking the World Values Survey query for convenience, the revised format looks as follows:

All things considered, how satisfied are you with your life as a whole these days? Using this card on which 0 or 0% means you are "completely dissatisfied," and 10 or 100% means you are "completely satisfied" where would you put your satisfaction with your life as a whole?

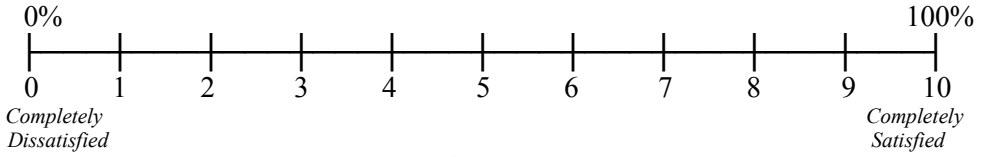

Diagram 4

Thus, cardinality and relative interpersonal comparability are demonstrated in words. Putting "0%" and "100%" at the end-points of the scale induces a cognitive process that sees the intervals as worth 10% each. Thus, the cardinality requirement is satisfied. Minimal effort is exerted to recognize that the series on the scale is 0-10-20-30-40-50-60-70-80-90-100 percent. In turn, the placement of "0%" and "100%" at the end-points of the scale makes Diagram 4 equivalent to an "attainment scale" that renders personal goals and current achievements salient. It not only allows the measurement of difficult life domains (e.g., being a good parent, neighbor, citizen, etc.) but also makes for a "standardized" measurement. Both "0%" and "100%" are thus indispensable for obtaining self-reports that are *relatively* comparable across persons. In turn, the aggregation of self-reports is made relatively easy to accomplish. What needs emphasizing though is that

comparability in this context is not whether the actual positions of people are the same in an absolute sense but, rather, the assessments of actual positions are equivalent in the relative sense.[5]

Of course, earlier work by Andrews and Withey (1976) and Campbell et al. (1976) pointed out that behind each self-report is a personal weighing of the gaps between aspirations and actual achievements. Indeed, the notion of attainment introduced in above setup (Diagram 4) is consistent with such view.

Michalos (1985) extends the basic framework on gaps to the simultaneous consideration of well-being across different life domains like school, home, office, etc. (see also Rice et al. 1985; Cummins 1996; van Praag et al. 2003; Easterlin and Sawangfa 2009). Meanwhile, the weighing of the gaps across different life domains is not immune to inter-person differences with respect to the achievements of the proximate and/or relevant reference group (Festinger 1954; Merton 1957).[6] The assertion here is that the interpersonal comparisons must also be personal evaluations

[5] Suppose the person declares a 5 or 50%. Such self-report is deemed similar to an evaluation of a glass that is 50% full (or 50% empty)—meaning to say, a 50% full glass is seen as 50% full regardless of its size or location, the time of day when it was evaluated, or the demographic and socio-economic profile of the person making the appraisal. In short, half-full glass assessments are interpersonally comparable. Self-reports of 50% in one instance or location, etc., are by extension comparable to self-reports of 50% in another instance or location, etc. The same applies for other valuations. Note that absolute interpersonal comparability is not required—it is also impossible to achieve.

The glass analogy may be problematic for a 100% full glass if the glass is not calibrated. An experiment using college sophomores (N = 357; male = 183) finds that 5% of the students drew a "100% full glass" as a glass that is filled *below* the brim when they are not given an instruction or pointers to calibrate the glass accordingly. Still, there is no correlation between figuring out the 10% increments on the scale and drawing a "100% full glass" as a glass filled below the brim ($F(1, 355) = 1.888$, $p = 0.171$)). Another interpretation of the drawings looks at the maximizer and satisficer behavior (Beja 2012).

[6] The mean valuation of a life domain or another aggregate measure often serves as proxy for the reference group effect (c.f., Clark and Oswald 1996; Luttmer 2005; Clark and Senik 2010). Notice, though, that such information is an external metric—it is not therefore consistent with a personal assessment on one's status

given that self-reports are personal evaluations.[7] What is thus being proposed is to embed the interpersonal comparisons within the elicitation of self-reports, such as:

Compared to people you know within your age group (i.e., friends, schoolmates, etc.), how do you describe your happiness with life on the whole?

1 More happy
2 Just the same
3 Less happy

What would you rather be?

1 More happy
2 Just the same
3 Less happy
4 I do not know

All things considered, how happy are you with your life as a whole these days? In the scale below, 0 or 0% means you are "completely unhappy," and 10 or 100% means you are "completely happy".

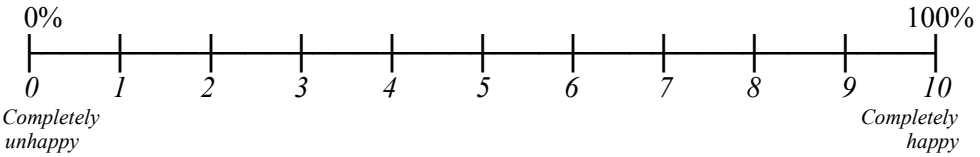

Diagram 5

To obtain self-reports on various life domains, simply replace "life" in the query with, say, health, school, home, etc., adjusting the phasing of the query to fit the relevant context.[8] For life domains

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relative to the status of the reference group for a relevant life domain. The introduction of the mean rating of status, domain, etc. might conflate the social reference and social context effects (Grice 1975)

[7] Indicators of socio-economic status are generally weakly related with subjective well-being. Diener et al. (1999) and Lyubomirsky et al. (2005) find that individual circumstances can account for about 10% of the variance in subjective well-being. Studies of Anderson et al. (2012), Keltner et al. (2003), and Anderson et al. (2001), among others, find that indicators for sociometric status are better than individual circumstances because they are defined locally (i.e., there is proximity) and, of course, defined by the person. Inter-person comparisons can be internalized in the elicitation of self-reports through the introduction of preliminary queries on sociometric status.

[8] The dataset used in this study includes a standard single-item query on SWB (i.e., without the comparison items above Diagram 5) and the full set of queries on SWB (i.e., with the comparison items above Diagram 5). Mean analysis between the former and the latter is -0.03 with $t(819) = -0.769$ and $p = 0.442$. Such result may be consistent with the findings of Schwarz and Clore (1984).

like school that can have two or more dimensions (e.g., teachers, classmates, etc.), the queries need to be framed such that they are also appropriate to the context.

The next consideration is the aggregation of self-reports to obtain group level happiness. What is important to remember in such exercise is that the outcome must be a type of distillation of self-reports so that it is a useful metric for analysis.

To that end, Alkire and Foster (2011a, 2011b) present an approach that fits quite well with the aggregation objective in this paper.[9] Their procedure can be summarized in three broad stages in the context of group level happiness. First, suppose there are n persons and m life domains. Each life domain can be a single dimension or comprised of multiple dimensions. In case of the latter, the combination of multiple dimensions into a single life domain measure that is in turn expressed as an element in the person-domains matrix requires predetermined weights, and these may be based on either revealed individual rankings or an external imposition of rankings.

Accordingly, define $y = [y_{ij}]$ as the matrix of subjective well-beings of person $i = 1...n$ (row) for the life domain $j = 1...m$ (column), $10 > y_{ij} > 0$, and y_{ij} is an integer. The row expression $(y_{i1}, y_{i2}... y_{im})$ is person i's self-report for life domains 1 to j; the column expression $(y_{1j}, y_{2j}... y_{nj})^T$ contains $1...n$ persons' self-reports for a specific life domain j.

The first step in the Alkire-Foster procedure is to define a threshold value for each life domain as $10 > y_j^* > 0$. Let life domains have equal weight for simplicity. Then, $g_{ij} = 1$ iff $y_{ij} > y_j^*$ and $g_{ij} = 0$ otherwise to obtain $g = [g_{ij}]$ as a matrix composed of 1 or 0 elements representing the instances

[9] The Alkire-Foster procedure was introduced as an alternative approach for the counting of the poor people in a society. Recent applications include Alkire and Seth (2008), Batana (2008), Santos and Ura (2008), Battiston et al. (2009), Alkire and Santos (2010).

that exceed the threshold. The second step is to obtain $\sum_{j=1}^{m} g_{ij}$ across life domains and form a vector $s = [s_i]$, where $m \geq s_i > 0$. Each element in s represents the total number of life domains of person i that exceed the threshold. The last step is the identification of the happy person. The Alkire-Foster procedure is to censor s. Define $h = [h_i]$ as the censored vector s with $h_i = 1$ iff $s_i \geq d$ and $h_j = 0$ otherwise. The number of life domains, d, is likewise predetermined.

Group level happiness is therefore the proportion of the happy people in the relevant population; that is, $\frac{\sum h}{n}$ with $\sum h$ as the number of individuals that fulfill the cutoff number of life domains. If more people exceed the threshold and/or life domains cutoff is lowered, then $\sum h \rightarrow n$ and so $\frac{\sum h}{n} \rightarrow 1$. As Alkire and Forster explain, the procedure can be used to analyze a particular group or sub-group of people in a community or society.

3. DATA

Data were collected through a survey of college students at a private university in the Philippines as part of the *First Filipino College Students' Well-Being Survey* (administered by the lead author of this paper). The survey was uploaded to the Internet and responses were accepted for a period of one month. Access to the survey was limited to the keying of a valid university ID number.

The total number of respondents is 820, or 10% of the student population of the private university at the time of the survey (male = 279 (36.2%), $age_{ave.820}$ = 18.7, range = 15 to 22 years). Respondents are evenly distributed across the four year levels (first = 210 (25.6%), second = 201 (24.5%), third = 210 (25.6%), and fourth = 199 (24.3%)). The gender distribution is unvarying across the year levels ($male_{first}$ = 73, $age_{ave.210}$ = 16.7; $male_{second}$ = 77, $age_{ave.201}$ = 17.8; $male_{third}$ =

73, $age_{ave.210}$ = 18.9; and $male_{fourth}$ = 74, $age_{ave.199}$ = 20.0).

Self-reports cover five life domains: self, relations, performance, finance, and time. Each has two to four dimensions. These life domains capture most of the relevant aspects that make college life worthwhile and, thus, happy. They are not immutable aspects of college life but can be modified when necessary to fit social realities. Appendix 1 lists the survey questions for the life domains.

The dimensions of a particular life domain get equal weights unless specified otherwise. For instance, happiness with one's own body and health comprise the "self" domain (Cronbach's alpha, $\alpha = 0.89$). Happiness with one's relations with friends in school and teachers as well as the perceived happiness of one's parents comprise the "relations" domain ($\alpha = 0.80$). Note that the perceived happiness of father and mother comprise the dimension of "happiness of parents" with each item getting equal weight (i.e., each effectively gets a 16.7% weight). Happiness with the amount of schoolwork one gets in school, the lessons one gets in school, and the grades one gets in school comprise the "performance" domain ($\alpha = 0.86$). Then, happiness with one's weekly allowance and family finances comprise the "finance" domain ($\alpha = 0.89$). Because the respondent has "full" control of "weekly allowance," it is given a bigger weight of 0.75 and "perceived family finances" gets the balance of 0.25. Lastly, happiness with the actual time spent for school-related work and activities as well as that for not school-related work and activities comprise the "time" domain ($\alpha = 0.92$). Descriptive statistics are presented in Table 1, and the correlation results are shown in Table 2.

[Insert Table 1]

[Insert Table 2]

4. RESULTS AND DISCUSSION

Figure 1 presents the averages for the five domains across four-year levels. There is a perceptible U-shape pattern in the satisfaction of self, performance, and time, albeit satisfaction of self is less quadratic than the other two. In essence, the first and fourth year students have more forward-looking outlooks while in college. That is, the first year students look forward to an exciting college life but the seniors look forward to an exciting career after college. In either case, such forward-looking outlook pulls up the satisfaction of self, performance, and time (c.f., Molinger et al. 2011). The second and third year students, in contrast, are more inclined to the present outlooks in part because they are positioned in the middle of college life and because they face heightened curricular and extra-curricular demands on their time. Thus, this period comprise the most challenging years for a college student. This present outlook explains why satisfaction in the three domains is lowest in the second and third years (c.f., Molinger et al. 2011).

[Insert Figure 1]

Figure 1 further shows a downward trend in the satisfaction of relations and finance, albeit only satisfaction of finance shows a clear declining trend. In the case of relations, the pattern is perhaps a reflection of the anxiety between student and parents rather than between student and friends or teachers. Expectations are heightened in the fourth year because of the need to find employment that not only meets the expectations of parents like job reputation and salary that is commensurate to what may be called an "acceptable" investment return on the cost of education at a private university.

Meanwhile, it is possible that the downward trend in satisfaction of finance stems from the prospect of assuming financial responsibility arising with "independence" after college. Perhaps,

too, the reality of finding work, working, and earning a living for oneself in the near future makes students appreciate money in general and the amount they receive from their family in particular while they are still in college, thus pulling down their satisfaction of finance. While job search is not extremely challenging for the students of the private university, finding a job that matches the expectations of parents as well as fulfills the student's expectations can be specially demanding. Thus, looking for that "ideal" job contributes to the decline in satisfaction relations with parents and finance (c.f., Iyengar et al. 2006).

The left panel of Table 2 presents the overall picture of the proportion of happy college students at the private university who exceed the predetermined threshold for *all* of the five life domains.[10] The results show that less than half (45.49%) of the college students at the private university can be considered happy across all five life domains and a threshold of six (i.e., $y_j^* > 6$). The right panel of Table 2 also presents the proportion of the sufficiently happy college students, defined as the proportion of the students who are not counted as happy if the criterion is all of the five life domains but who still exceed the threshold in *any* of four life domains. Combining the information for a threshold of six (i.e., $y_j^* > 6$) obtains 59% as the overall proportion of the college students at the private university who can be considered happy (i.e., $45.49 + (100 - 45.49) * 25.00 = 59.12$). If the threshold is raised to seven (i.e., $y_j^* > 7$), then the overall proportion of happy students at the private university drops to about half, or 39% (i.e., $21.95 + (100 - 21.95) * 21.34 = 38.61$). Using the same data, very few students at the private university can be considered as "deeply" happy (i.e., $y_{ij} > 8$).

[Insert Figure 2]

[10] The cutoff is equivalent to the low-end of the Gallup World Poll happiness category of "thriving."

[Insert Table 3]

The gender distribution of the happy college students at the private university across all the year levels for the different cutoff values are also shown in Table 3. The results for threshold six (both five and four life domains) are summarized in Figure 2. The trend appears to be U-shaped. Notice, however, that the overall proportion of happy fourth year students does not reach the same level as that of the first year students. Of course, the data are cross-sectional and stronger conclusions are not possible but the pattern appears to indicate that a fall in the overall proportion of happy students during the second and third years is not completely reversed in the fourth year.

In summary, the findings show a mixed picture of the state of being of college students at the private university. At least half can be considered thriving and the other half not thriving. Much more can be done by all stakeholders to improve the size of the happy college students. But the group that is not thriving is therefore of special concern. If the private university is a leader in the education of the youth and producer of the future leaders of the Philippines, then the perpetuation of the unhappy group could lead to the creation of unhappy leaders who would produce unhappy policy that, in turn, result in sub-optimal outcomes for society.

While the above findings are specific to the college students in a specific private university, the flexibility of the procedure for aggregating individual level happiness to group level happiness allow similar analyses to be performed on larger and more complex social organizations. In fact, the Alkire-Foster procedure is applicable regardless of the level of aggregation (e.g., national, regional, provincial, community, group, etc.) and the number of life domains and the number of dimensions for each of the domain included in the study. Recently, the procedure has been used to count the number poor children (Alkire and Roche 2011), identify the potential recipients of conditional cash transfers (Acevedo and Robles 2010), and determine the happy people in a

society (Ura et al. 2012a; Ura et al. 2012b).

It can be assumed that the configurations and cleavages found within student populations may parallel those found in significantly larger and more complex social organizations. The recognition of such similarities thus allows the view that students at a private university form a microcosm of the larger societal context. Put simply, the procedure for counting the happy people in a society context is the same procedure demonstrated in this paper for counting the happy people at a private university. As such, the transition from counting the number of happy students to counting the number of happy people in a society would simply require the collection of more information from a representative sample from a heterogeneous population. Moreover, given the greater variability and realities of a larger population, there would be more life domains and dimensions to be covered in the analysis.

Given that the Alkire-Foster procedure allows the calibration of cutoffs for different life domains, it can be extended to accommodate both the subjective and objective measures of well-being in one study. In other words, it can be used to obtain an aggregate measure of happiness even if the cutoffs for subjective measures such as satisfaction with work are different from the cutoffs of objective measures such as income from work. It also guarantees that analyses similar to what was performed in this paper can be performed on larger and more complex populations even with the introduction of a more diverse selection of questions regarding happiness.

Using the same notations in Section 2, an expanded procedure can thus be outline. Let $y = [y_{ij,subj}|y_{ik,obj}]$ as an augmented matrix for person $i = 1...n$ (row), subjective life domain $j = 1...m$ (column), and objective life domain $k = 1...m$ (column). Note the number of columns for the subjective and objective life domains may differ, and what gets considered in the life domains are defined by society. In this case, $Y > y_{ik} > 0$, y_{ik} is either an integer (e.g., years of schooling) or a

continuous number (e.g., life expectancy at birth or income) with Y as the maximum value for the specific objective life domain. It is clear that the thresholds for $y_{ij,subj}$ and $y_{ik,obj}$ are separately defined; that is, $10 > y_j^* > 0$ and $Y > y_k^* > 0$. As before, $g_{ij} = 1$ iff $y_{ij} > y_j^*$ and $g_{ij} = 0$ otherwise and $g_{ik} = 1$ iff $y_{ik} > y_k^*$ and $g_{ik} = 0$ otherwise to thus obtain $g = [g_{ij}|g_{ik}]$ as an augmented matrix representing all the instances that exceed the threshold values. In the same fashion as Section 2 earlier, $\sum_{j=1}^{m} g_{ij}$ and $\sum_{k=1}^{m} g_{ik}$ to obtain $s = [s_i|z_i]$ as an augmented vector where $m \geq s_i > 0$ and $m \geq z_i > 0$. Lastly, define $h = [h_i]$ as the censored augmented vector s with $h_i = 1$ iff *both* $s_i \geq d_{subj}$ and $z_i \geq d_{obj}$ and $h_j = 0$ otherwise. Such is the condition that is consistent with the notion of flourishing—that is, subjective reports represent the self-evaluations of one's own objective achievements. For instance, people might have access to basic health services and facilities but their personal experiences with the health services and facilities are not satisfactory. These aspects of happiness need to be brought together in determining the happy people with both subjective and objective life domains. From the censored vector h, the proportion of happy people is therefore $\frac{\sum h}{n}$ with $\sum h$ as the number of individuals that fulfill the cutoff of both subjective and objective life domains.

5. CONCLUSION

This paper presented a procedure for determining group level happiness, which is defined as the proportion of people in a group, community, or society who see themselves as happy and exceed a certain threshold of happiness. The procedure was shown to meet the dual requirements for such an aggregation to be done, namely cardinality and relative interpersonal comparability. Data from college students in the Philippines was used to demonstrate the procedure for obtaining group level happiness.

Even though the application and findings are specific to college students at a private university in the Philippines, the flexibility of the same aggregation procedure guarantees that similar studies can be made for larger and more complex social organizations. Indeed, one of the desirable attributes of the procedure is its adaptability for various levels of calculations and types of data. In particular, the procedure allows for the separate calibration of cutoffs for each of the life domains covered in a study and the aggregation of both objective and subjective measures of well-being into a single metric. Of course, the level of consideration is the society—that is, what matters is the collective and not what a person things to be important. Thus, what gets considered part of the objective and subjective well-being needs to be defined by society as a people. What thus results is measure for group level happiness is the product of a distillation of the different individual aspects of the life domains. Given that the procedure captures the different facets of individual happiness and creates a holistic metric for group-level happiness, it serves as a tool for policy-makers to formulate and implement policies that are more consistent with the needs of the public.

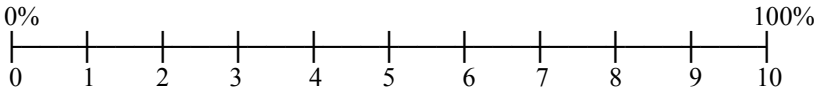
APPENDIX
Survey questions grouped by life domains

1. Self Domain

Compared to other people you know within your age group (i.e., friends, schoolmates, etc.), how do you describe your body?
1 Very thin
2 Thin
3 Just right
4 A little big
5 Very big

What would you rather be?
1 A little bigger
2 No change
3 A little thinner
4 I do not know

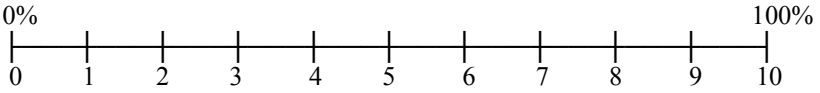
Mark the corresponding circle to indicate how happy you are with your own body on the whole. Note: 0 or 0% means completely unhappy; 10 or 100% means completely happy.



Compared to others you know within your age group (i.e., friends, schoolmates, etc.), how do you describe your health?
1 Better health
2 Just the same
3 Poorer health

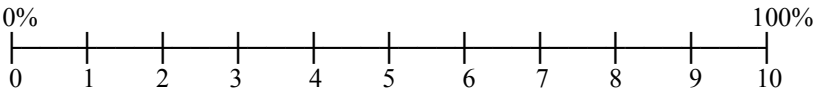
What would you rather be?
1 More healthy
2Just the same
3 Less healthy
4 I do not know

Mark the corresponding circle to indicate how happy you are with your own health on the whole? Note: 0 or 0% means completely unhappy; 10 or 100% means completely happy.



2. Relations Domain

Mark the corresponding circle to indicate how happy you are with your relationship with teachers in school on the whole. Note: 0 or 0% means completely unhappy; 10 or 100% means completely happy.



Mark the corresponding circle to indicate how happy you are with your relationship with friends in school on the whole. Note: 0 or 0% means completely unhappy; 10 or 100% means completely happy.

Mark the corresponding circle to indicate how happy your father is with his life on the whole? Note: 0 or 0% means completely unhappy; 10 or 100% means completely happy. If your father is deceased or you are estranged from your father, please leave blank.

Mark the corresponding circle to indicate how happy your mother is with her life on the whole? Note: 0 or 0% means completely unhappy; 10 or 100% means completely happy. If your mother is deceased or you are estranged from your mother, please leave blank.

3. Performance Domain

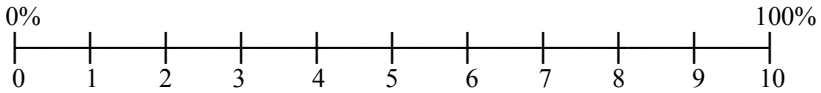
Compared to people you know within your age group (i.e., friends, schoolmates, etc.), how do you describe your total amount of schoolwork (i.e., readings, assignments, tests, quizzes, class projects, etc.)?

1 Easy enough
2 Just right
3 Challenging

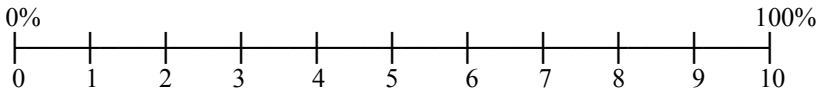
What would you rather have?

1 More work
2 No change
3 Less work
4 I do not know

Mark the corresponding circle to indicate how happy you are with your total amount of schoolwork on the whole? Note: 0 or 0% means completely unhappy; 10 or 100% means completely happy.



Mark the corresponding circle to indicate how happy you are with what you are learning in your classes on the whole? Note: 0 or 0% means completely unhappy; 10 or 100% means completely happy.



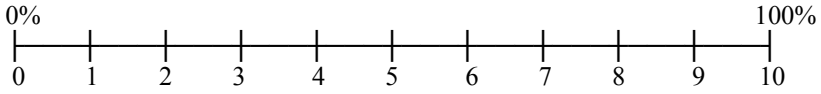
Compared to people you know within your age group (i.e., friends, schoolmates, etc.), how do you describe your overall academic or intellectual abilities?

1 Above average
2 Just the same
3 Below average

What would you rather be?

1 More smart
2 No change
3 Less smart
4 I do not know

Mark the corresponding circle to indicate how happy you are with your grades in school on the whole? Note: 0 or 0% means completely unhappy; 10 or 100% means completely happy.



4. Finance Domain

How much money do you get from your family or other sources each week for allowance? If you have no allowance, please put "0" in the space. (There is no need to put the peso sign.) [Amount]

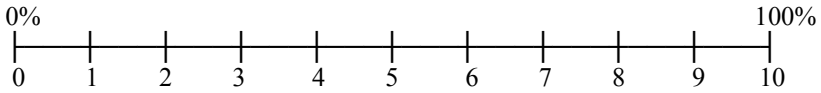
Compared to people you know within your age group (i.e., friends, schoolmates, etc.), how do you describe your weekly allowance?

1 Above average
2 Just right
3 Below average

What would you rather have?

1 More allowance
2 No change
3 Less allowance
4 I do not know

Mark the corresponding circle to indicate how happy you are on the whole with the weekly allowance you get from your family or other sources. Note: 0 or 0% means completely unhappy; 10 or 100% means completely happy.



Compared to other families in your neighborhood, how do you describe your own family's financial status?

1 Richer
2 Just the same
3 Poorer

What would you rather be?

1 Richer
2 Just the same
3 Poorer
4 I do not know

Compared to your relatives, how do you describe your own family's financial status?
1 Richer
2 Just the same
3 Poorer

What would you rather be?
1 Richer
2 Just the same
3 Poorer
4 I do not know

Mark the corresponding circle to indicate how happy you are on the whole with your own family's financial status? Note: 0 or 0% means completely unhappy; 10 or 100% means completely happy.

5. Time Domain

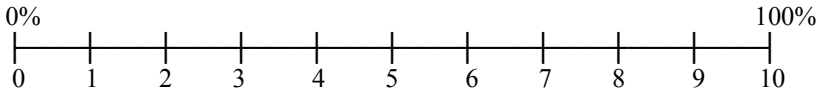
How many hours do you spend attending your classes during the regular school week? Please estimate the total hours each week. [Number]

How many hours do you spend studying for your classes (including doing the assigned readings and working on homework etc) during the regular school week? Please estimate the total hours each week. [Number]

How many hours do you spend watching TV and movies, etc., during the regular school week? Please estimate the total hours each week. [Number]

How many hours do you logon the Internet during the regular school week? Please estimate the total hours each week [Number].

Mark the corresponding circle to indicate how happy you are with how you are actually spending your time for all school-related work and activities during the week, including attending classes. Note: 0 or 0% means completely unhappy; 10 or 100% means completely happy.



How many hours do you spend studying for your classes (including doing the assigned readings and working on homework etc) during the regular school weekends? Please estimate the total hours each week. [Number]

How many hours do you spend watching TV and movies, etc., during the regular school weekends? Please estimate the total hours each week. [Number]

How many hours do you logon the Internet during the regular school weekends? Please estimate the total hours each week. [Number]

Mark the corresponding circle to indicate how happy you are with how you are actually spending your time for all not school-related work and activities during the weekends. Note: 0 or 0% means completely unhappy; 10 or 100% means completely happy.

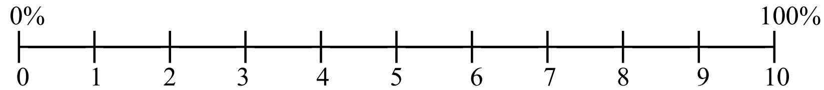

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Figure 1: *Domains satisfaction, averages*

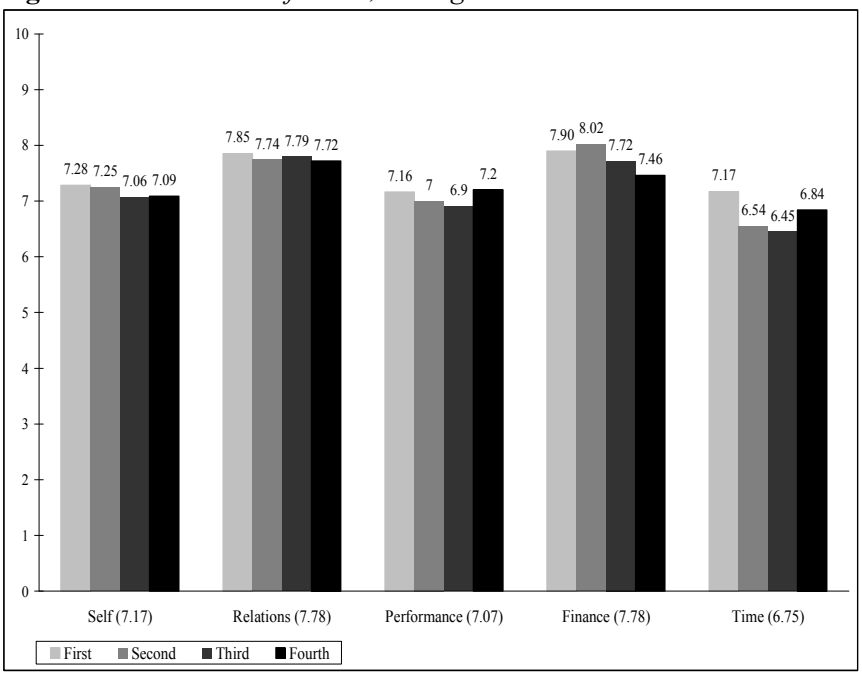

Figure 2: *Proportion of happy students, in percent*

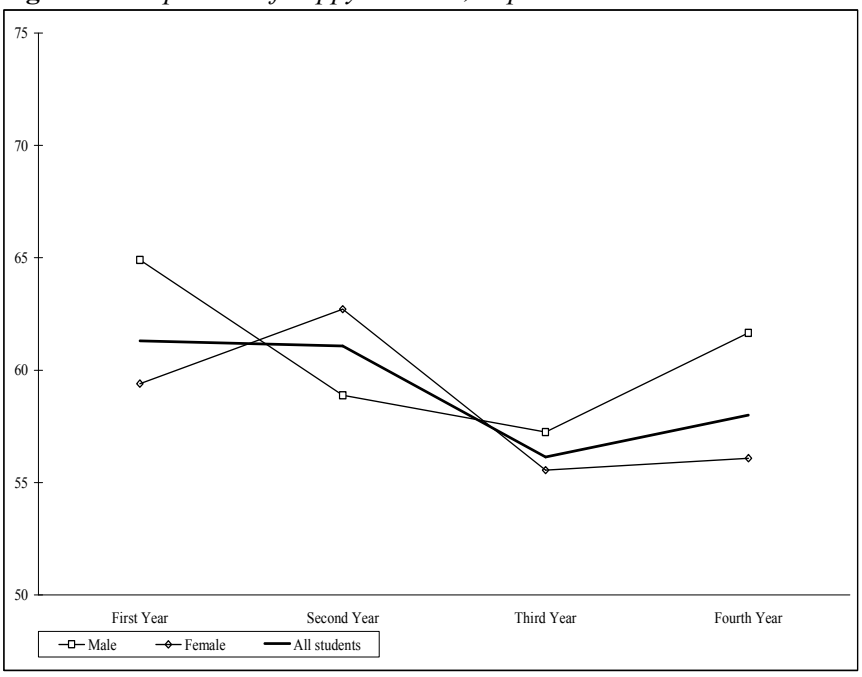

Table 1: *Descriptive statistics*

	Mean	Std. dev.	Min.	Max
Age	18.7	8.2	15	22
Self	7.1	1.5	0.50	10
Relations	7.7	1.1	0.99	10
Performance	7.0	1.5	0.66	10
Finance	7.7	1.7	0	10
Time	6.7	1.7	0	10

Note: Survey questions are listed in the Appendix.

Life domains are calculated as follows:

Self = 1/2 (body + health)

Relations = 1/3 [relationship with teachers + relationship with friends in school + 1/2 (perceived happiness of father + perceived happiness of mother)]

Performance = 1/3 (total amount of schoolwork + lessons in school + grades in school)

Finance = 3/4 (weakly allowance) + 1/4 (family's financial status)

Time = 1/2 (time for school-related work and activities + time for not school-related work and activities)

Table 2: *Correlation of life domains*

	Self	Relations	Performance	Finance	Time
Self		0.349**	0.384**	0.204**	0.363**
Relations			0.506**	0.360**	0.343**
Performance				0.207**	0.577**
Finance					0.180**
Time					

Note: ** $p < 0.01$; N = 820

Table 3: *Proportion of happy college students in private university*

	$y_{ij} > 6$ and $d = 5$			$y_{ij} > 6$ and $d = 4$		
	Male (%)	Female(%)	Total (%)	Male (%)	Female(%)	Total (%)
First Year	53.42%	45.99%	48.57%	24.66%	24.82%	24.76%
Second Year	40.26%	50.81%	46.77%	31.17%	24.19%	26.87%
Third Year	41.10%	40.88%	40.95%	27.40%	24.82%	25.71%
Fourth Year	52.70%	41.60%	45.73%	18.92%	24.80%	22.61%
Overall	46.80%	44.74%	45.49%	25.59%	24.67%	25.00%
	$y_{ij} > 7$ and $d = 5$			$y_{ij} > 7$ and $d = 4$		
	Male (%)	Female(%)	Total (%)	Male (%)	Female(%)	Total (%)
First Year	27.40%	24.82%	25.71%	28.77%	21.90%	24.29%
Second Year	20.78%	20.97%	20.90%	24.68%	20.16%	21.89%
Third Year	20.55%	17.52%	18.57%	19.18%	18.98%	19.05%
Fourth Year	25.68%	20.80%	22.61%	22.97%	18.40%	20.10%
Overall	23.57%	21.03%	21.95%	23.91%	19.89%	21.34%
	$y_{ij} > 8$ and $d = 5$			$y_{ij} > 8$ and $d = 4$		
	Male (%)	Female(%)	Total (%)	Male (%)	Female(%)	Total (%)
First Year	8.22%	5.84%	6.67%	5.48%	10.22%	8.57%
Second Year	0.00%	1.61%	1.00%	15.58%	7.26%	10.45%
Third Year	2.74%	3.65%	3.33%	9.59%	5.84%	7.14%
Fourth Year	5.41%	3.20%	4.02%	2.70%	5.60%	4.52%
Overall	4.04%	3.63%	3.78%	8.42%	7.27%	7.68%
	$y_{ij} > 9$ and $d = 5$			$y_{ij} > 9$ and $d = 4$		
	Male (%)	Female(%)	Total (%)	Male (%)	Female(%)	Total (%)
First Year	1.37%	0.73%	0.95%	0.00%	0.73%	0.48%
Second Year	0.00%	0.81%	0.50%	1.30%	0.81%	1.00%
Third Year	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Fourth Year	1.35%	0.00%	0.50%	0.00%	0.00%	0.00%
Overall	0.67%	0.38%	0.49%	0.34%	0.38%	0.37%