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Optimal Condition of Happiness:
Application of Taguchi Robust Parameter Design on Evidences from India

Prabhat Pankaj and Roma Mitra Debnath

Abstract

The present empirical paper attempts to quantify the optimal condition of happiness, measured in terms of subjective wellbeing (SWB), by using Taguchi Robust Parameter Design. The study uses evidences from survey conducted in New Delhi across various segment of people covering 193 respondents. Responses on a total of 25 sources of happiness pertaining to three broad facets- domain satisfaction, lifetime pursuits and global experiences have been obtained. Taguchi orthogonal array design has been used separately on sources of happiness for these three broad facets at 3 and 5 levels. The optimization results suggest that among domain facet, a marginal change in good family life & wellbeing, good inter-personal relationship and good employment & job satisfaction would cause a large change in happiness. While for lifetime pursuit of happiness, most important sources are yoga & meditation, principles & responsibility, and cultural participation. Among the extra-domain sources pertaining to global experiences, factors such as responsible political leadership and low inflation have been found most important. The paper suggests that a prudent public policy could address these factors and also account for ways to improve them for achieving greater happiness for greater number of people.

Keywords: *Subjective Wellbeing, Facets of Happiness, Taguchi Orthogonal Design, Optimal Scaling, Public Policy, India.*

I. Introduction

The growing stock of knowledge on happiness research suggests that self-reported happiness is a real scalar variable and hence its quantification and the inter-personal comparison are possible. The recent work by Centre of Bhutan Studies (2007) provides the first evidence of a comprehensive applied research on happiness, measured in terms of subjective wellbeing (SWB). It takes into account a holistic approach and applies non-parametric tests to ascertain the relationship between conditions of happiness and self-reported happiness per se. Factor analysis has been used extensively and the findings could establish the underlying factors being contributed by an array of conditions of happiness. However, a pertinent question still remains to be answered is- which array of conditions make into an optimal condition for happiness. Once such array possibly can be arrived, the public policy focus may be tuned to enhance country's happiness.

The econometrics and non-parametric measures fail to answer this question as they mainly are designed to establish cause-and-effect relation between variables. But, in order to obtain a total solution, it is imperative that optimal condition is looked into. Taguchi Robust Parameter Design provides the basis for obtaining an orthogonal array of conditions out of the given conditions which would explain the optimal situation. With this method, the impact of a marginal change in an individual aspect of happiness can be assessed and thereby such results may hold key to mould public policy for achieving greater happiness. The robustness of Taguchi approach over other methods is that it does not exclude the noise factors and consider them as part of the design. This is significant for happiness study as conditions of happiness has been reported to be as significant as conditions of unhappiness. The present study uses evidences from survey conducted in New Delhi, India across various segment of people.

The study is divided into six sections. Section I introduces the study and outlines the objectives and purpose of undertaking the study. Section II reviews relevant literature on happiness studies with a view of deriving a proper framework support for the present study. Section III describes the data collection process and size of sample for the present study. It also describes the methodology used in empirical estimation. Section IV outlines the results derived on the socio-economic characteristics of sample and their relationship with happiness. Section V provides the output of empirical results on optimal scaling. The last section is devoted to discussion of results and conclusion.

II. Review of literature

There has been a phenomenal growth in happiness research since 1960s with over 3000 published studies explored this subject in a variety of ways [visit, www.authentichappiness.sas.upenn.edu). As more and more has been discovered, there is also a growing realization among scholars that more needs to be explored. Like the subject of happiness itself, the convergence of opinion on its research is far from the sight. Happiness research hasn't been more about understanding it as perfectly as possible but it has been more about how the research can help individuals and societies to become as happy as possible. This makes research more relevant on a subject as elusive as happiness. There is a shift in domain of happiness research from psychology to that of applied psychology wherein the focus is on happiness increase research. The contribution of gross national happiness (GNH) in enhancing the status the happiness research is enormous. In fact, GNH has provided an alternative world view which will go a long way in securing the greatest happiness for greatest mass.

The literature on subjective wellbeing or happiness is fast growing and a comprehensive review of these literature can be found in Veenhoven (in press); many attempting to seek interventions to increase happiness (Fava 1999; Fava and Ruini 2003). Studies have

pointed out clearly the distinction between the two components of "satisfaction" (happiness); "life (global) satisfactions" and "domain (work, family, self, etc.) satisfactions." The leading researcher and authority on happiness Rutt Veenhoven visualized happiness as the degree to which an individual judges the overall quality of life-as-a-whole favourably. Psychologist Jonathan Freeman pointed out that people may pursue happiness differently, but by and large it is the same happiness for everyone. Therefore, happiness can be viewed and discussed both as a global as well as individual concept.

Myths about happiness

Despite a phenomenal growth on happiness research by social scientists across the globe in recent time, the generally held myths about happiness still continues. This seems more influenced by the lack of clinical research on happiness and in general on positive emotions. Understandably, clinical research on human emotions has tended to focus more on negative emotions. It has been observed that about 83% of research in psychology has dealt with negative feelings. However, theorists like Abraham Maslow, Carl Rodgers and others started focusing on positive emotions and initiated research into areas such as peak experience, optimal mental health, self-actualization, love etc. Partly, the lack of objective research on happiness is also contributed by a sort of mystical and philosophical view about it, which says that happiness is all that we are looking for but it is all pervasive. The more we think about it, the more distant it becomes. Therefore the myth about happiness continues that it is unexplainable because it is something that just happens. More so, the situation assumes a dark proposition when added by the myth that it is not advisable to talk about happiness (any good thing that happens to you) because if any one tries do so, he/she would tend to loose it. Happiness sharing therefore is a big no-no!

Three facets of happiness to break the myth

Studies have pointed out that happiness is to be understood in its various facets. Three of such facets for a better understanding of happiness could be when we look at it from domain, lifetime and global experiences point of view. Happiness is good emotional feeling in the first place and our domain experiences add to it. This results in happy mood, largely contributed by our family, workplace, living conditions, access to basic facilities etc. But "I am in happy mood" is a different response in comparison to "I am a happy person" response. In the second response, individual counts on past experiences and weighed on lifetime experiences on whole. Such experience would entail extra-domain factors which the individual has derived from society and world at large. Happiness, in this sense, is a generalization that has been made about life. It becomes an index of satisfaction with life. The larger the time frame considered for such evaluation of life, the greater the chances of its being influenced by extra-domain factors. Therefore, when we ask: "How are you these days?" The response evaluates domain plus lifetime pursuits of happiness. Similarly, when we ask: "How happy are you keeping your whole life into account, overall?" The response most likely is based on the evaluation of domain along with lifetime and global (external/societal) pursuits.

Happiness, in this sense, has three facets. All three are similar as they explain positive emotional feeling and they are inter-related too. Shorter the period of evaluation, greater it tends to be mood based. Larger the span of evaluation, greater it tends to be experience based. Therefore, macro and societal factors are truly significant for a lifetime based evaluation of happy experience. More importantly, against the commonly held myth, happiness becomes explainable!

Determinants of happiness

Bentham provided one of the earliest accounts of the calculus of pain and pleasure while bringing the discussion on utility to the forefront in England in 1789 (Stigler 1965). Bentham's thirty-two circumstances explained pleasure and pain. However, discussion in economics thereafter centered on discovering and rediscovering the principles of marginal utility and later on their measurement. Utility is akin to welfare. An enhancement in welfare can be measured in terms of changes in utility. More income brings enhanced consumption which increases utility and hence welfare (happiness). The object of public policy would be to maximize the sum of happiness in society. Since marginal utility of money is more for poor, it makes sense to focus on the redistribution of income. Studies have confirmed that happiness, not income, constitutes the ultimate goal of most individuals (Easterlin 1995, 2001; Oswald 1997; Ng 1997). Easterlin provided one of the earliest empirical works about self reported happiness. The decade of 1990s witnessed increased awareness on the subject and economists have shown that happiness is not an entirely personalized phenomenon; rather, it also depends on conditions like unemployment, inflation and income (Clark and Oswald 1994; Oswald 1997; Easterlin 2001). Some scholars have also tried to quantify the effect of variables such as freedom (Frey and Stutzer 2002), air pollution (visit: www.authentichappiness.sas.upenn.edu), aircraft noise (Praag and Baarsma 2001) and climate (Rehdanz and Maddison).

A good deal of discussion on this subject can be found in Layard (2003) which emphasized that GDP is a hopeless measure of welfare demonstrated by the fact that despite several fold increase in per capita GDP the happiness of the population tended to stagnate. Layard points out that Pareto optimality lends us to a situation where no one could be happier without someone else being less happy. Even if we account for problems such as asymmetric information, short-sightedness, externalities and diseconomies of scale, it only can suggest that higher real wage

will make population happier. It fails to realize that our wants once we are above subsistence level, are largely derived from society and they are major factors affecting happiness. Karl Marx said-"A house may be large or small; as long as the surrounding houses are equally small, it satisfies all social demands for a dwelling. But if a palace rises beside the little house, the little house shrinks into a hut." (quoted in Layard 2003). Layard concludes that rational policy-making is possible since happiness is a real scalar variable and can be compared between people.

Helliwel (2001), perhaps, is the only author who attempted to analyze international and inter-personal difference in subjective well-being while making use of data from three waves of the World Value Survey covering about fifty different countries. The study uses large international samples of data combining individual and societal level determinants of well-being. The study establishes the link among social capital, education, income and well-being. It also identifies the direct and indirect linkage between social capital and well-being. Happiness depends on a lot more than people's purchasing power. It depends on tastes which people acquire from environment and on the whole social context in which we all live. Therefore, situation such as pertaining to income, work, family, and health do contribute to happiness and they also account for the overall happiness rating/index. Layard's (2003) discussion also focuses on factors such as pertaining to freedom, religion, trust, and morality as important facets of life resulting in upward movement in happiness index.

Layard and Helliwell's study lends great deal of support to the presumption that establishing the link between individual and aggregate happiness is important, as both individual and societal factors determine the extent of rise or fall in well-being (happiness) index. But, an important questions still remains to be answered is- which combination of individual and societal factors would lead to greatest happiness. Answering this question would provide insight as to how public policy can address the issue of happiness.

A question still largely unanswered. This is here the present study makes headway and attempts to provide a framework for possible explanation.

III. Data and methodology

The pioneer work by the Center for Bhutan Studies (CBS) on *Gross National Happiness and Material Welfare in Bhutan and Japan* (2007) provides a comprehensive outline of domain, lifetime and global factors which are comprehended as important. The pilot survey for assessing psychological and subjective wellbeing of Bhutanese people outlined 14 such sources of wellbeing. These sources are a combination of domain, lifetime and global pursuits. The sources outlined are:

1. Financial security
2. Good family life and wellbeing of family
3. Good health
4. Resources for farm production
5. Access to basic facilities
6. Personal development and education
7. Faith and spiritual pursuits
8. Employment and job satisfaction
9. Good governance & welfare system
10. Good inter-personal relations
11. Principles and responsibility
12. Community vitality
13. Country's peace and security
14. Recreation

Based on the findings of CBS study and others (as reviewed earlier in this paper) and also keeping the situational analysis of Delhi as an urban mega city, the following sources of happiness under broad three facets of domain, lifetime and global have been incorporated in the study:

Domain	Lifetime Pursuits	Global Experiences

Satisfaction	Satisfaction	Satisfaction
Financial security	Cultural participation	Good governance and welfare system
Personal development & education	Cultural identity	Buoyant economy
Good health	Faith and spiritual pursuits(religiosity)	Responsive law and order
Employment & job satisfaction	Honesty & integrity	Responsive justice system
Own house	Principles and responsibility	Low inflation
Own vehicle and personal transport	Yoga and meditation	Responsive political leadership
Marriage		Pride in nationhood
Children		Global linkage (globalization)
Good family life and well-being of family		
Good interpersonal relations		
Leisure and recreation		

Data have been collected through a structured and pre-tested questionnaire. The five point scale is used for each response. The happiness question has been framed by using the most prescribed overall experience question on five point scale. The sample has been selected on random basis, using six employment categories as the purposive benchmark. No definite number for each category sample has been fixed. A total of 193 valid responses have been used for empirical analysis.

As stated earlier the method of Taguchi Robust Parameter Design has been used for estimating the optimal combination of factors separately among three broad facets. Taguchi estimation uses signal-to-noise as a metric designed to optimize the robustness of a factor. The method also provides rank orders of factors. Rank values tend to order the factors from the greatest effect (based in the delta values) to the least effect on the response characteristic.

Delta measures the size of the effect by taking the difference between the highest and lowest value for each response characteristic.

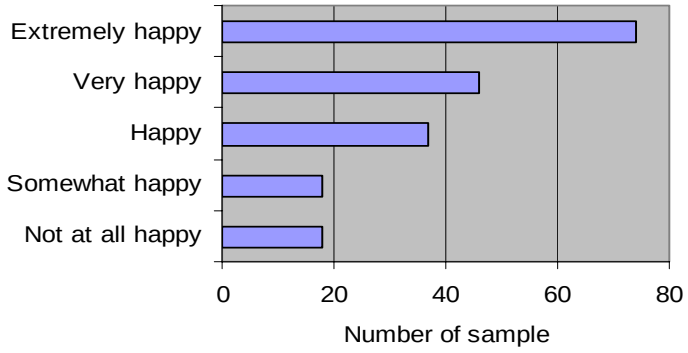
The empirical estimation with respect to Taguchi orthogonal array design has been done using MINITAB software. The other estimations in the paper have used SPSS software.

IV. Socio-economic characteristics and Happiness

Happiness trends

Chart 1 provides the distribution of sample according to their responses on happiness status. The overall experiences of urban city people in Delhi looks fairly mixed with of course larger proportion of population reporting to be above average on five point scale. About 62% of the sample reported to be happier than average, while about 18.5% of them are lower than average. If we take the middle point in the scale representing a neutral position in happiness scale, about 19% of sample seems to have stuck over it.

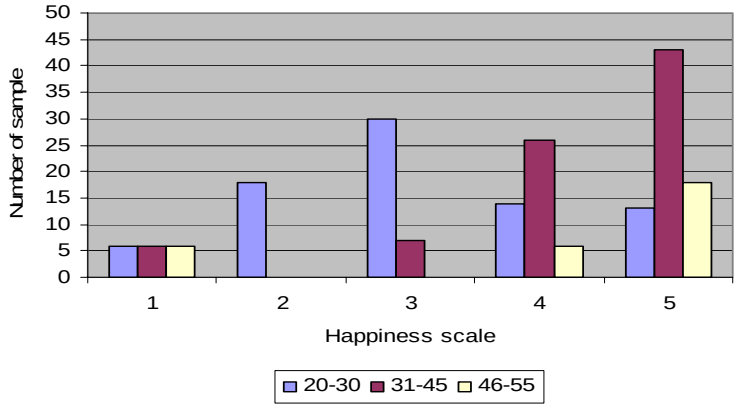
Chart 1: Overall Happiness



Age group and happiness

Age group seemingly contributes to happiness as the chi-square test on the sample is found significant. Any definite pattern in the relationship between age and happiness is difficult to discern, but the data seem to suggest that number of high and middle age group sample increases as we move up the scale in happiness. The lower age group sample demonstrates mixed pattern with a higher cluster on neutral point in happiness. Their number increase below the neutral point of happiness while it tends to decrease after this point.

Chart 2: Age*Happiness



Chi-Square Tests: Age Group and happiness

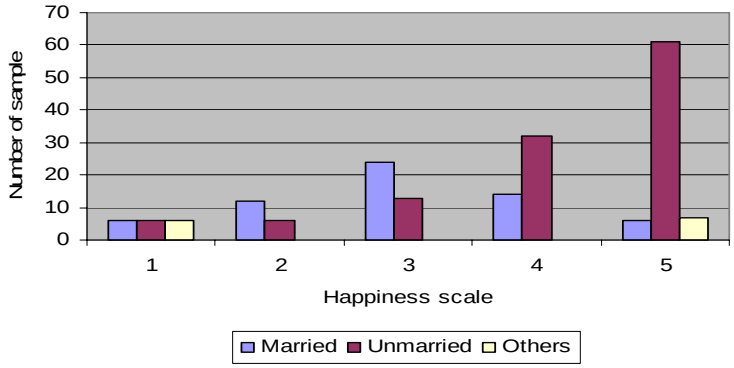
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	75.498a	8	.000
Likelihood Ratio	87.065	8	.000
N of Valid Cases	193		

a. 2 cells (13.3%) have expected count less than 5. The minimum expected count is 2.80.

Marital status and happiness

The chi-square test is significant, suggesting that marital status has a relationship with happiness. The distribution of sample depicted in Chart 2 suggests that more number of unmarried people tend to be happier as we move up the happiness scale. The reporting by married people seemingly gives the feeling that the distribution is bell-shaped with more number of people reporting to be just happy. The number tends to increase below this point while it tends to decrease above this point. The other category people are mostly widow and their size of sample is very low. Their reporting suggests that they are either extremely happy or not at all happy.

Chart 3: Marital Status*Happiness



Chi-Square Tests: Marital status and happiness

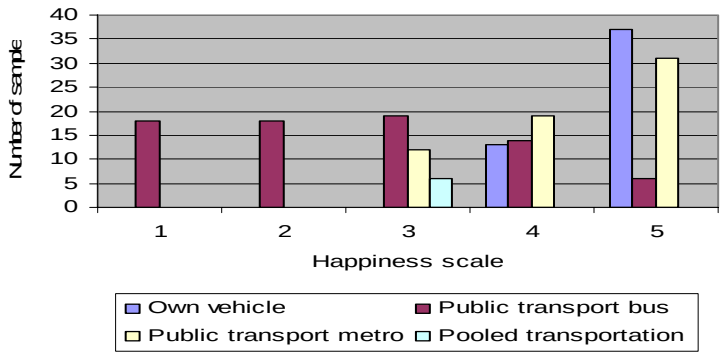
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	73.557a	8	.000
Likelihood Ratio	73.361	8	.000
Linear-by-Linear Association	11.734	1	.001
N of Valid Cases	193		

a. 5 cells (33.3%) have expected count less than 5. The minimum expected count is 1.21.

Mode of transportation and happiness

Mode of transportation in an urban city like Delhi matters a lot and it has significant relationship with happiness. The chi-square is reported to be significant. The pattern in happiness of those who own personal vehicle is either very happy or extremely happy. There seems to be an important difference in the pattern of happiness of those who uses buses and auto as public transport and those who uses metro. People are generally very happy using metro. Pooled transportation does not seem to add much happiness to people.

Chart 4: Mode of Transport*Happiness



*Chi-Square Tests: Mode of Transportation*Happiness*

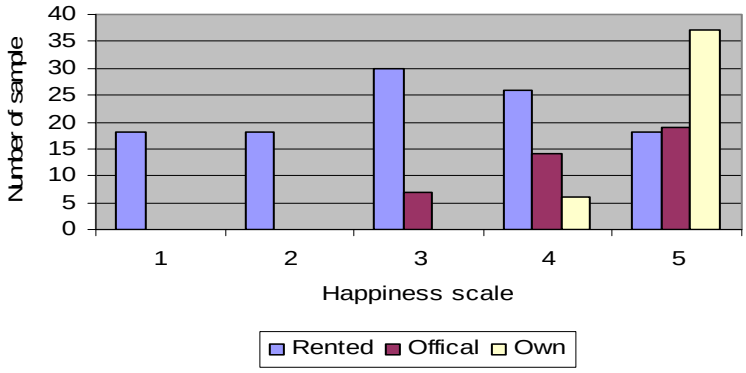
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	1.308E2a	12	.000
Likelihood Ratio	149.977	12	.000
Linear-by-Linear Association	2.394	1	.122
N of Valid Cases	193		

a. 7 cells (35.0%) have expected count less than 5. The minimum expected count is .56.

Accommodation type and happiness

Yet another significant factor contributing to happiness in a mega city like Delhi is the type of accommodation people live in. The significant chi-square suggests that accommodation type in not independent of happiness. Those who own house are happier in comparison to those who do not and are forced to live in rented accommodation. People in government and official accommodation are comparatively happy perhaps depending upon the type of accommodation and locality.

Chart 5: Accommodation Type*Happiness



*Chi-Square Tests: Accommodation Type*Happiness*

	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	83.342a	8	.000
Likelihood Ratio	101.555	8	.000
Linear-by-Linear Association	65.137	1	.000
N of Valid Cases	193		

a. 4 cells (26.7%) have expected count less than 5. The minimum expected count is 3.73.

V. Optimal Scaling: Empirical Results

The optimal scaling for finding out the best sources of happiness has been undertaken using Taguchi robust parameter design. This exercise is undertaken separately for the three facets of happiness as described earlier. The three facets are Domain Satisfaction, Lifetime Pursuits, and Global Experiences. There are 11 sources identified under domain facet of happiness. For the facet of lifetime pursuits of happiness, 6 sources have been listed while for global experiences facet of happiness 8 sources have been identified. The selection of sources are based on CBS study, other empirical and theoretical literature and finally the prevailing socio-economic condition of India and specially that of urban mega city like Delhi. For example, selection of transportation mode, accommodation type and yoga & meditation are primarily based on the prevailing socio-economic situation of Delhi city. Further discussion on these sources is undertaken in the next section.

Domain satisfaction and happiness

Domain satisfaction results are presented in Table I, II and III. Table I provides Taguchi's unique orthogonal array used for 11 sources on three level analyses. The response calculation has been done on the basis of given orthogonal structure, converting five level responses into three levels of low, medium and high. Table II presents the list of sources used for domain satisfaction analysis. Table III presents the results of robust parameter design. Delta measures the size of the effect by taking the difference between the highest and lowest value for each response characteristic. Based on three levels mean responses, the ranking of sources suggests that the top five sources which provide domain satisfaction to the largest extent are good family life & wellbeing of family, good inter-personal relationship, good employment & job satisfaction, and leisure & recreation. Financial security and children have emerged as the least important source of domain happiness. Rank orders the factors from the greatest effect (based in the delta values) to the least effect on the response characteristic.

Table I: Orthogonal array (L_{27}) of the happiness parameters on domain happiness

A	B	C	D	E	F	G	H	I	J	K	Response
1	1	1	1	1	1	1	1	1	1	1	565
1	1	1	1	2	2	2	2	2	2	2	895
1	1	1	1	3	3	3	3	3	3	3	4105
1	2	2	2	1	1	1	2	2	2	3	1521
1	2	2	2	2	2	2	3	3	3	1	2610
1	2	2	2	3	3	3	1	1	1	2	1815
1	3	3	3	1	1	1	3	3	3	2	4580
1	3	3	3	2	2	2	1	1	1	3	3689
1	3	3	3	3	3	3	2	2	2	1	3944
2	1	2	3	1	2	3	1	2	3	1	2631
2	1	2	3	2	3	1	2	3	1	2	2895
2	1	2	3	3	1	2	3	1	2	3	2847
2	2	3	1	1	2	3	2	3	1	3	3336
2	2	3	1	2	3	1	3	1	2	1	2136
2	2	3	1	3	1	2	1	2	3	2	2775
2	3	1	2	1	2	3	3	1	2	2	1920
2	3	1	2	2	3	1	1	2	3	3	3432
2	3	1	2	3	1	2	2	3	1	1	2652
3	1	3	2	1	3	2	1	3	2	1	2795
3	1	3	2	2	1	3	2	1	3	2	2726
3	1	3	2	3	2	1	3	2	1	3	3041
3	2	1	3	1	3	2	2	1	3	3	3546
3	2	1	3	2	1	3	3	2	1	1	2052
3	2	1	3	3	2	1	1	3	2	2	3015
3	3	2	1	1	3	2	3	2	1	2	2152
3	3	2	1	2	1	3	1	3	2	3	3331
3	3	2	1	3	2	1	2	1	3	1	2875

Table II: Description of the parameters and their levels used in the domain happiness

Factor	**Description**	**Levels**
A	Financial Security	1 2 3
B	Personal Development & education	1 2 3
C	Good Health	1 2 3
D	Employment & Job Satisfaction	1 2 3
E	Own House	1 2 3
F	Own Vehicle and personal transport	1 2 3
G	Marriage	1 2 3
H	Children	1 2 3
I	Good family life and well-being of family	1 2 3
J	Good interpersonal relations	1 2 3
K	Leisure and recreation	1 2 3

Table III: Mean Response of various parameters under study of Domain happiness

Level	**Financial Security**	**Personal Development & education**	**God health**	**Good Employment and job satisfaction**	**Own house**	**Own Vehicle and personal transport**
1	2636	2500	2465	2463	2561	2561
2	2736	2534	2520	2501	2641	2688
3	2837	3175	3225	3244	3008	2980
Delta	201	675	760	781	447	419
Rank	**10**	**6**	**4**	**3**	**7**	**8**

Table III continues…

Level	Marriage	children	Good family life	Good interperso	Leisure and
1	2673	2672	2458	2466	2473
2	2662	2710	2494	2489	2530
3	2873	2827	3258	3253	3205
Delta	211	155	800	787	732
Rank	**9**	**11**	**1**	**2**	**5**

Lifetime pursuits and happiness

The results on the sources of lifetime pursuits of happiness have been presented in Table IV, V, and VI. Table IV provides the orthogonal array and the calculated response on happiness. Table V reports the sources used in the study and the levels used for them. Table VI reports the main results on delta and ranks. The ranking suggests that top three sources for lifetime pursuits contributing to happiness are yoga & meditation, principles & responsibility and cultural participation. The least important is faith & spiritual pursuits reflected in religiosity.

Table IV: Orthogonal array (L_{25}) of the happiness parameters on lifetime happiness

A	B	C	D	E	F	Response
1	1	1	1	1	1	41
1	2	2	2	2	2	324
1	3	3	3	3	3	794
1	4	4	4	4	4	462
1	5	5	5	5	5	1433
2	1	2	3	4	5	943
2	2	3	4	5	1	1017
2	3	4	5	1	2	710
2	4	5	1	2	3	355
2	5	1	2	3	4	523
3	1	3	5	2	4	1001
3	2	4	1	3	5	1082
3	3	5	2	4	1	821
3	4	1	3	5	2	885
3	5	2	4	1	3	825
4	1	4	2	5	3	828
4	2	5	3	1	4	767
4	3	1	4	2	5	1220
4	4	2	5	3	1	816
4	5	3	1	4	2	697
5	1	5	4	3	2	858
5	2	1	5	4	3	1056
5	3	2	1	5	4	1211
5	4	3	2	1	5	1080
5	5	4	3	2	1	663

Table V: Description of the parameters and their levels used in the Lifetime happiness

Factor	**Description**	**Levels**
A	Cultural participation	1 2 3 4 5
B	Cultural identity	1 2 3 4 5
C	Faith and spiritual pursuits(religiosity)	1 2 3 4 5
D	Honesty and integrity	1 2 3 4 5
E	Principles and responsibility	1 2 3 4 5
F	Yoga and meditation	1 2 3 4 5

Table VI: Mean Response of various parameters under study of Lifetime happiness

Level	**Cultural Participation**	**Cultural Identity**	**Faith and spiritual pursuits**
1	610.8	734.2	745.0
2	709.6	849.2	823.8
3	922.8	951.2	917.8
4	865.6	719.6	749.0
5	973.6	828.2	846.8
Delta	362.8	231.6	172.8
Rank	**3**	**5**	**6**

Table VI Continues…

Level	Honesty and integrity	Principles and responsibility	Yoga and meditation
1	677.2	684.6	671.6
2	715.2	712.6	694.8
3	810.4	814.6	771.6
4	876.4	795.8	792.8
5	1003.2	1074.8	1151.6
Delta	326.0	390.2	480.0
Rank	**4**	**2**	**1**

Global experiences and happiness

Table VII, VIII and IX report the results of global experiences and their relative significance in happiness. Table VII presents the orthogonal array and the calculated responses. Table VIII presents the eight selected sources contributing to global experiences which are likely to affect happiness and the three levels used. Table IX presents the results of calculation and reports delta values and the ranking of sources. The results indicate that most important four sources among global experiences are responsive political leadership, low inflation, global linkage, and good governance & welfare system. The bottom positions are occupied by responsive justice system and responsive law & order.

Table VII: Orthogonal array (L_{27}) of the happiness parameters on Global Experiences and happiness

A	B	C	D	E	F	G	H	Response
1	1	1	1	1	1	1	1	26
1	1	1	1	2	2	2	2	125
1	1	1	1	3	3	3	3	714
1	2	2	2	1	1	1	2	149
1	2	2	2	2	2	2	3	366
1	2	2	2	3	3	3	1	611
1	3	3	3	1	1	1	3	418
1	3	3	3	2	2	2	1	481
1	3	3	3	3	3	3	2	952
2	1	2	3	1	2	3	1	336
2	1	2	3	2	3	1	2	468
2	1	2	3	3	1	2	3	646
2	2	3	1	1	2	3	2	650
2	2	3	1	2	3	1	3	614
2	2	3	1	3	1	2	1	448
2	3	1	2	1	2	3	3	524
2	3	1	2	2	3	1	1	430
2	3	1	2	3	1	2	2	490
3	1	3	2	1	3	2	1	498

3	1	3	2	2	1	3	2	456
3	1	3	2	3	2	1	3	715
3	2	1	3	1	3	2	2	596
3	2	1	3	2	1	3	3	672
3	2	1	3	3	2	1	1	587
3	3	2	1	1	3	2	3	727
3	3	2	1	2	1	3	1	459
3	3	2	1	3	2	1	2	600

Table VIII: Description of the parameters and their levels used in the Global Experiences and happiness

Factor	DESCRIPTION	LEVELS
A	Good governance and welfare system	1 2 3
B	Buoyant Economy	1 2 3
C	Responsive law and order	1 2 3
D	Responsive justice system	1 2 3
E	low inflation	1 2 3
F	Responsive Political Leadership	1 2 3
G	Pride in Nationhood	1 2 3
H	Global Linkage	1 2 3

Table IX: Mean Response of various parameters under study of global experiences and happiness

Level	Good governance and welfare system	Buoyant economy	Responsive law and order	Pride in nationhood
1	426.9	442.7	462.7	445.2
2	511.8	521.4	484.7	46.3
3	590.0	564.6	581.3	597.1
Delta	163.1	121.9	118.7	151.9
Rank	**4**	**6**	**7**	**5**

Table IX Continues…

Level	Responsive justice system	Low inflation	Responsive political leadership	Global linkage
1	484.8	436.0	418.2	430.7
2	471.0	452.3	487.1	498.4
3	572.9	640.3	623.3	599.6
Delta	101.9	204.3	205.1	168.9
Rank	**8**	**2**	**1**	**3**

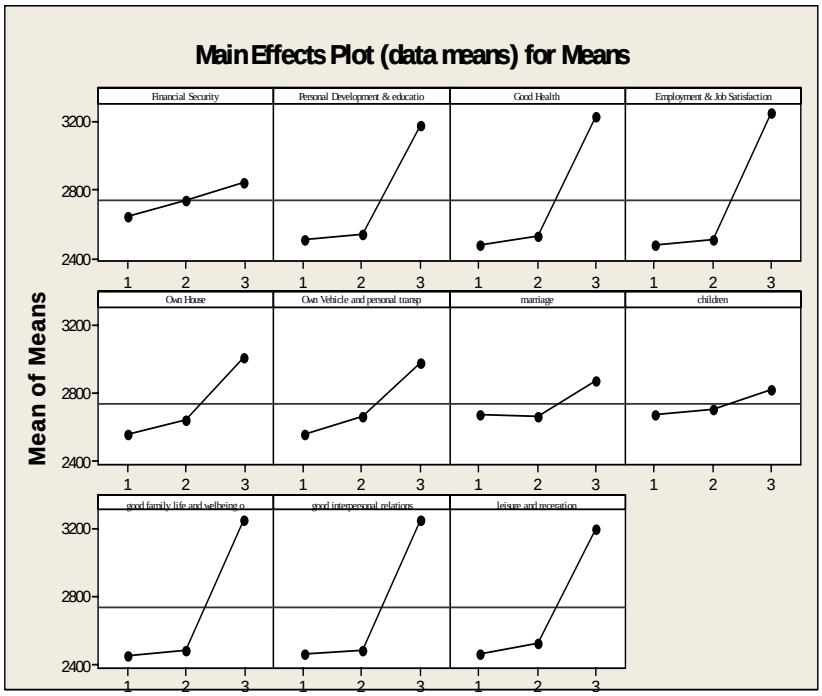
VI. Discussion and Conclusion

Main effect plots in Figure 1, 2, and 3 summarizes for each individual sources for all three facets of happiness viz domain, lifetime and global happiness respectively. The sharp upward turn from one level to other level is indicative of the fact that a marginal change in the source factor results into a big change in happiness and therefore the source factor under consideration is very important. The horizontal line indicates the mean of means and the levels are low, medium and high in a three level graph while from low to high in a five level graph.

Among the domain satisfaction sources, a good sharp turn from medium to high can be found in case of good family life & wellbeing of family, good inter-personal relationship, good employment & job satisfaction, leisure & recreation. Personal development & education and good health too have a sharp upturn from level two to three. A marginal change in all these sources would tend to increase happiness sharply. They are good sources of domain satisfaction. As far as marriage and children are concerned, the results demonstrate the urban compulsion and mentality towards them. Marriage is a source of happiness but people do not seem to weigh children as high as marriage. This is urban compulsion as the demand for children in urban city is constraint by space, congestion, quest for high standard of living, lack of time etc. This is also the reason why living together becoming an urban concept. Not surprising that own house and own vehicle as mode of transportation are held high and people

seem to derive more happiness once these are met with. The result also confirms that introduction of metro in Delhi has increased happiness in general wherein with road congestion increasing day-by-day; people have got solace of comfortable and secure means of transportation. Financial security has been taken as a neutral source of happiness. A marginal change in earnings may not bring about a big change in happiness. In a way, Delhi urban data clearly points out that money is not a major source of happiness for them.

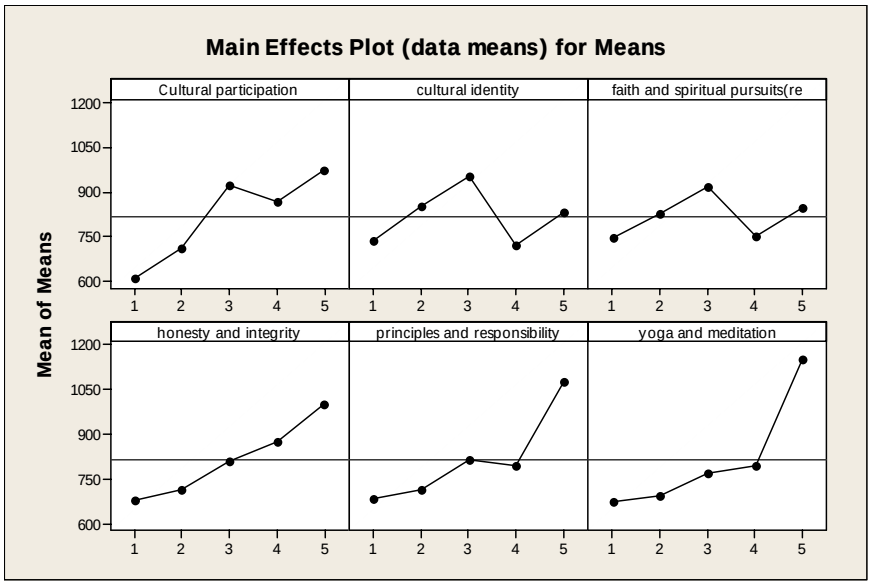
Figure 1: Main Effect Plots of Domain Happiness Sources



The lifetime pursuits in a busy urban city take a luxury form wherein a lot of time which will have huge opportunity cost needs to be invested. The results suggest that New Delhi is no exception. Therefore, it is not surprising that people have weighed yoga & meditation as the best source of happiness in the pursuit of better

lifetime satisfaction. Figure 2 clearly points out that as yoga & meditation moves up the scale from level four to five, there is a huge change in happiness. Similar weightage seems to have been assigned to principles and responsibility. People also finds a lot of happiness in cultural participation, but surprisingly not so much in cultural identity. In a cosmopolitan make up of New Delhi, people's perception about cultural identity and mobilization is absolutely clear that culture is a source of happiness but not the cultural hegemony. Honesty and integrity is more important for happiness than cultural identity and mobilization.

Figure 2: Main Effect Plots of Lifetime Pursuits Sources of Happiness



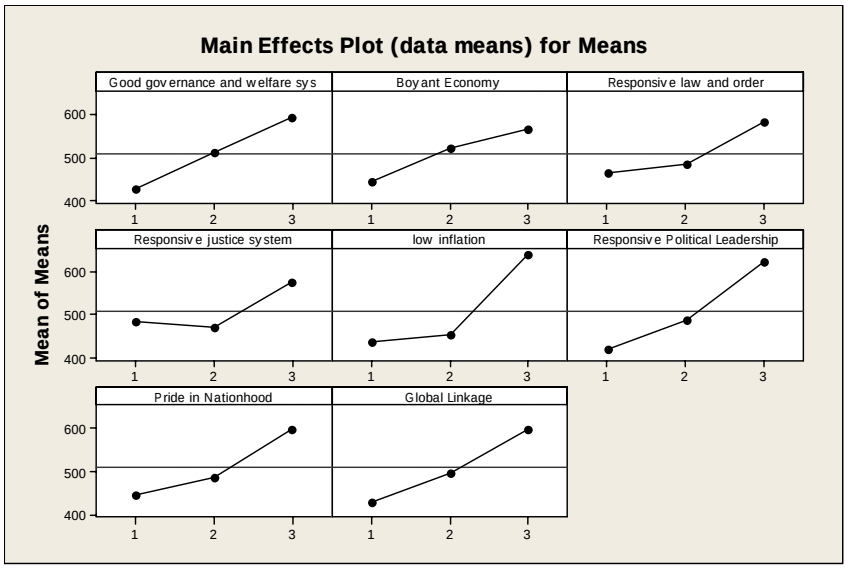
Global experiences are macro factors related to society, economy and global system. Prima face, these macro factors do not seem to be related to individual happiness. However, the global experiences are most likely to be accounted for when lifetime based happiness response is obtained. Among all global experiences, people of New Delhi could immediately relate low

inflation and responsible political system as the most important experiences affecting happiness. Figure 3 clearly provides a sharp upturn in these two cases when we move from level two to three. Next level of important global experiences is good governance, and good law & order situation.

About responsible justice system, Figure 3 reports that when we move from level one to two it actually goes down and from two to three it takes upturn. This indicates that people's choice about justice system is absolutely clear in favour of a proactive and high deliverable system. In fact, a prolonged and low deliverable system is justice is a source of unhappiness.

A buoyant economy is a source of happiness where people do not like economic slump or recession. In fact the expressed choice for global linkage is extremely positive. Therefore, a healthy and buoyant economy with better global linkage creates good global experiences and leads to enhancement in happiness.

Figure 3: Main Effect Plots of Global Experience Sources of Happiness



It is evident from the results and discussion that a good combination of domain satisfaction sources, lifetime pursuits and global experiences would constitute an optimal scale of happiness. A wide based survey for whole nation can provide comprehensive optimal scaling. Such scaling will have possibility for public policy formulation. An informed public policy formulation may incorporate and address sources of happiness obtained through the process of such optimal scaling. This will go a long way in increasing happy life days of a nation and making of a happy nation.

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