Unpacking the Role of Household and Neighborhood Infrastructure in Shaping Human Wellbeing:
Method Development to Inform Sustainability

MS-STEP Professional Paper

In Partial Fulfillment of the Master of Science Policy Degree Requirements
The Hubert H. Humphrey School of Public Affairs
The University of Minnesota

Kyle Flanegin
Kirti Das
Yingling Fan
Anu Ramaswami

5/17/2018

*Signature below of Paper Supervisor certifies successful completion of oral presentation **and** completion of final written version:*

_____   _____   _____
Typed Name & Title, Paper Supervisor   Date, oral presentation   Date, paper completion

_____   _____
Typed Name & Title, Second Committee Member   `   Date
Signature of Second Committee Member, certifying successful completion of professional paper

Abstract

Cities, which are increasingly the key providers of infrastructure provision in an urbanizing world, are a key component of the global striving for a more sustainable world. With three billion people joining cities around the world by 2050, the interactions between Goal 3: Good Health and Well-being, and Goal 11: Sustainable Cities and Communities have come into the spotlight (United Nations, 2018).

These interactions are important, yet data sets at the national level and finer-scale are rare across academia. This study uses a new data set, produced by Kirti Das and Yingling Fan at the University of Minnesota, to unpack the role of household and neighborhood infrastructures among other wellbeing determinants in relationship to the Cantril evaluation of life. We draw from two analysis methods that are typically implemented in the business world, Importance-Performance Analysis and Three Factor Theory regression modeling, to analyze correlations between wellbeing and wellbeing determinants in both a linear and non-linear lens. In addition, we use explicit and implicit techniques to analyze the differences in what people say is important to the evaluation of their life, and what is correlated with their Cantril evaluation.

This study finds that neighborhood infrastructure is near median importance of 13 wellbeing determinants, whereas household infrastructure is the top importance factor in informing reported wellbeing. In the linear models, we find that income, education, family relationships, work, and health are the most important correlates to the Cantril score. However, the threshold analysis clarifies the relationship. Income, education, and neighborhood infrastructure are found to be basic factors, home infrastructure and family relationships are performance factors, and health and work are exciting factors.

Unpacking the Role of Household and Neighborhood Infrastructure in Shaping Human Wellbeing:

Method Development to Inform Sustainability

Kyle Flanegin, Kirti Das, Yingling Fan, Anu Ramaswami*

*= corresponding author

Introduction and Key Literature

Cities, which are increasingly the key providers of infrastructure provision in an urbanizing world, are a key component of the global striving for a more sustainable world. The creation of the United Nations Sustainable Development Goals in 2015 has formalized the need to identify and analyze the nexus interactions between the different goals, many of which are urban in nature (United Nations, 2018). With three billion people joining cities around the world by 2050, the interactions between Goal 3: Good Health and Well-being, and Goal 11: Sustainable Cities and Communities have come into the spotlight at the local and national level as key area of focus.

Understanding the makeup of a human's subjective wellbeing has become a key focus of many governments and organizations around the globe. In 2012, the U.K. Office of National Statistics began including questions about citizen wellbeing in its census, noting that looking beyond pure economic production into health, education, and happiness was an essential lens for the government to use in making policy level decisions (UK ONS, 2018). Other organizations such as Gallup have also begun to collect and publish wellbeing data on the country level, hoping to provide high-level policy guidance and insight into what the most pressing problems of nations are (Gallup, 2017). These groups have found many times over that health, family relationships, education, and income are the key determinants of subjective wellbeing, while other factors such as neighborhood and household infrastructure may play a smaller, but still important part (UK ONS, 2018).

The consensus on defining subjective wellbeing has evolved over the past decade. In academia, wellbeing has been understood as the sum of emotional and cognitive evaluations that people can make about their lives (Diner, 2003). Cognitive evaluations of wellbeing often include questions that ask the respondent to state how their think about their life on a ten point ladder scale, called the Cantrill Scale. This measure has been shown to be very sensitive to local, socio-economic circumstances (Kahneman & Deaton, 2010). Emotional evaluations often focus on how people feel about their life, both positively and negatively. This form of wellbeing has been shown to be more temporary than cognitive factors, but is still important in understanding wellbeing in the short term (Helliwell, Laylard, & Sachs, 2012). In addition, the aspect of life purpose has been recognized as third way to measure and define subjective wellbeing. For example, the CDC's working definition of wellbeing includes "global judgments of life satisfaction and feelings ranging from depression to joy" (CDC, 2018).

In parallel to the evolving definition of wellbeing, members of the health, psychology, and other social science communities have written that understanding wellbeing at the local level is essential to understand how local place characteristics, socio-economics, and equality are connected. It has been argued by Sampson (2003) that problems in the arena of health and wellbeing are closely coupled to the social and physical traits of neighborhoods.

Much of this modern data collection at the national level is based off research that has existed within academia for more than a decade, but collecting data that captures the three aspects of wellbeing is rare. The only example that exists in the literature is the United Kingdom's Office of National Statistics efforts in their report titled "Measuring National Well-being", which incorporates the cognitive, affective, and life purpose aspects of wellbeing (UK ONS, 2018). However, this data exists at the national level and finer-scale data sets do not exist.

In addition, threshold analysis of wellbeing determinants is an evolving field in well-being. Many researchers argue that the correlations between wellbeing and various wellbeing attributes are non-linear, and initial findings from the Gallup World Poll show that income and health may be two of these non-linear factors (Deaton, 2008; Stone, 2016). In particular, it is shown that the relationship between income and emotional wellbeing drops off at around $70,000 per year of income, but that it's relationship with cognitive wellbeing may continue past this point (Deaton, 2008). Studies like the UK Office of National Statistics report has demonstrated that other attributes of life like age have a very complex relationship with reported wellbeing (UK ONS, 2018).

This study focuses in on the local neighborhood and household level infrastructure determinants of wellbeing. This paper will analyze resident's thoughts on what is important to their wellbeing, what emerges from the correlations between importance and performance of neighborhood infrastructure, as well as resident's direct thoughts on infrastructure to determine how important local infrastructure is to subjective wellbeing. In particular, the paper investigates three lines of thinking. First, we analyze how important physical provisioning is among a host of other SWB determinants. In addition, we present a typology of provisioning, and analyze the thresholds of SWB determinants on the Cantrill score when they are performing poorly, and at high performance. Third, we analyze how the results inform inequality, disparities and inequities across neighborhoods.

Data

The data used in this analysis was collected by conducting 307 surveys in six different neighborhoods in Minneapolis, Minnesota. The selected neighborhoods were chosen by their differing socio-economic status (low income vs. middle income), and access to transit (high-access vs. low-access).

The survey used a three-stage probability sample design. The first stage was to use the random sampling method to select 921 of the 2443 census blocks in the study areas. The second stage involved recruiting as many households as possible from each block identified in the first stage. The recruitment was done by dropping off postcards with information about the survey in English at each residence; following the drop-off of the postcard, each residence was visited up to three times. The third stage consisted of randomly selecting an individual aged >18 years from each household by asking the adult with the most recent birthday to complete the survey. The selected residents completed a paper and pencil entry survey, a paper and pencil exit survey, and a smartphone-based 7-day activity and well-being survey using an app named Daynamica. Daynamica tracked users' daily activities and trips, as well as their real time emotional wellbeing during each activity/trip episode. The presented analysis focuses completely on the entry and exit survey data of this data collection project.

All surveys were conducted in-person during home visits between October 17, 2016 and October 25, 2017. The survey team, a group of 18 University of Minnesota student researchers were made easily identifiable during visits with large University of Minnesota identification badges. Although efforts were made to conduct home visits on different days of the week and at varied times during the day, the majority of the surveys were conducted on weekday evenings and on weekends.

Methods

This research relies on two well-established methods of analysis: Importance-Performance Quadrant Analysis, and Three-Factor Theory, to investigate the connection between SWB and the importance and performance of subjective-wellbeing determinants and the performance of neighborhood infrastructure.

Importance-Performance Quadrant Analysis (IPA) has been widely applied to analyze the various attributes of a type of business or service (Martilla, 1997; Matzler, 2004). Generally, results are plotted on two axes, one showing importance, and one showing performance of various service attributes. Attributes with higher than median importance (I) are shown to the right of center, while attributes with lower than median importance are shown to the left of the center. Meanwhile, attributes with higher than a set performance (P) will show up above a central axis, and vice-versa for those attributes with below a set performance. This process creates four quadrants, those with 1) high I / high P, 2) high I / low P, 3) low I / high P, and 4) low I / low P as seen below (Wu et al., 2010).
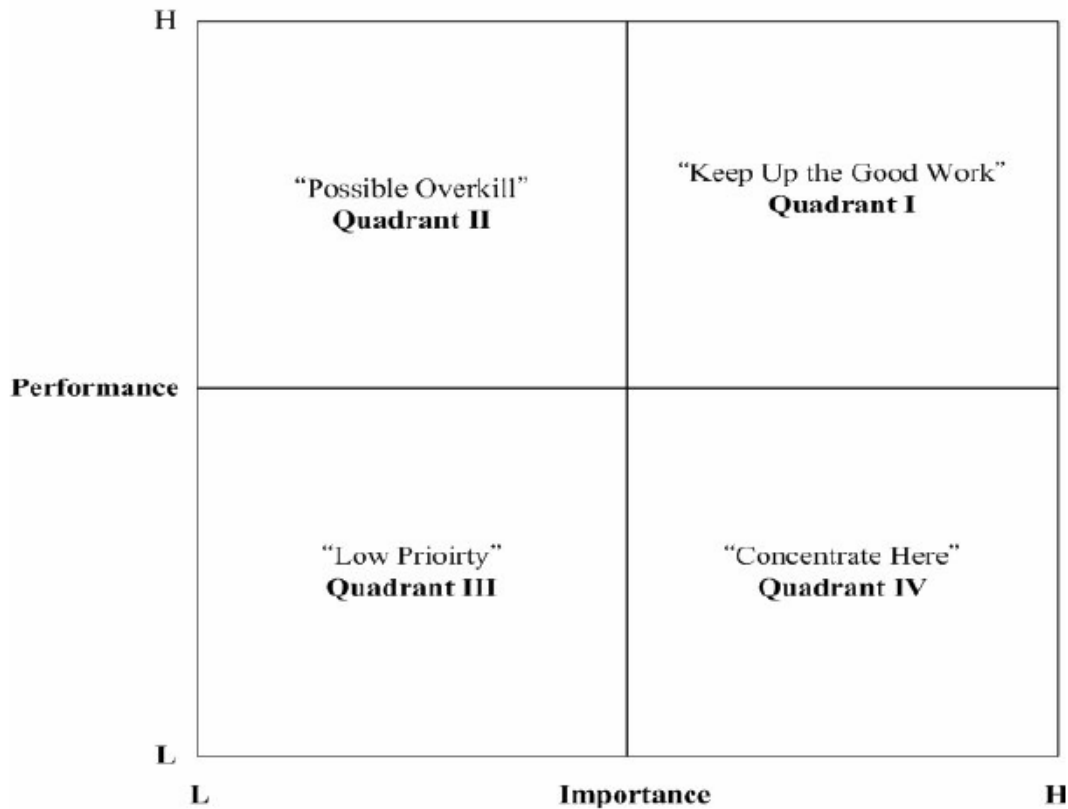
Figure 1. Breakdown of four quadrant important-performance analysis. Adapted from Wu et al. (2010).

This paper presents results both from an explicit and an implicit point of view. For the purpose of this paper, IPA was implemented in order to measure where household and neighborhood infrastructure compare amongst other SWB Determinants as determined by the literature. The UK ONS and Gallup efforts have identified a number of determinants, including income, social relationships, health, and education that influence an overall cognitive wellbeing determination, and thus were included in the list of determinants (UK ONS, 2018; Gallup, 2018). The overall purpose of the IPA model is to use the cognitive wellbeing score as a model of overall performance, and to measure the importance of neighborhood and household infrastructure in that evaluation compared to other factors. IPA analysis relies on two main assumptions, that the determinant importance and performance are independent, and that the effect of a determinant on the overall satisfaction is linear (Matzler et. al, 2004).

The list of 10 SWB determinants analyzed during the IPA portion of the analysis is as follows: Education, Work, Household Income, Health, Family Relationships, Daily Work Commute, Daily Leisure Travel, Social Relationships, Household Facilities, Neighborhood Infrastructure. In addition to these ten factors, three other factors were queried based on the aspect of performance alone: Government Services (Police And Judicary), Government Services (Other), and Leisure Time.

Explicit Importance-Performance Quadrant Analysis, or EIPA, relies on the stated importance and performance for various SWB determinants. In this case, data was used from the following survey questions:

1) How **important** are the following dimensions in determining how you think and feel about your life?

2) How **satisfied or dissatisfied** are you with the following domains or aspects of your life?

These questions were both evaluated on a 1-5 score range.

During the EIPA analysis, the first step was to calculate the mean importance and performance from the survey data. Then, these values were placed on a graph with performance on the y-axis, and importance on the x-axis as shown in Figure X. The axes were placed a y=4.0 for performance, and x = median value of importance.

During the IIPA analysis, only the results for question 2 listed above were used in addition to the following question.

3) Imagine a ladder with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you, and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you stand at this time?

The first step in the IIPA analysis was to calculate the correlation between question three with the results of question two for the 13 SWB determinants based off performance. Then, the median correlation out of the factors was determined, and each determinant correlation was divided by the median correlation. Then, these values were placed on a graph with performance on the y-axis, and importance on the x-axis. The axes were placed a y=4.0 for performance, and x = median value of importance.

The second bucket of analysis used is a form of Three-Factor Theory regression modeling. This analysis technique was chosen because it lets the second assumption of IPA analysis, that of the linearity between the relationship of cognitive wellbeing and satisfaction with any SWB determinant. This technique allows the study of thresholds in the relationship, where strong correlations between a person's cognitive wellbeing score and income may start of strong, but taper off over time (Cao, 2017).

Kano et al. (1984) and work that has followed has shown that the determinants of overall satisfaction can be broken in basic attributes, performance attributes, and excitement attributes. Basic attributes are factors that show strong correlation at low to medium levels of performance with cognitive wellbeing, but that do not significantly influence at marginally different levels of high performance. Meanwhile, performance factors show a strong correlation with cognitive wellbeing at all levels of performance. Third, excitement factors are not strongly correlated with cognitive wellbeing score at low performance but have significant correlation at high performance. Finally, we will consider factors that show no significant correlation with the Cantrill score at high and low performance to be 'not important' factors in the analysis.
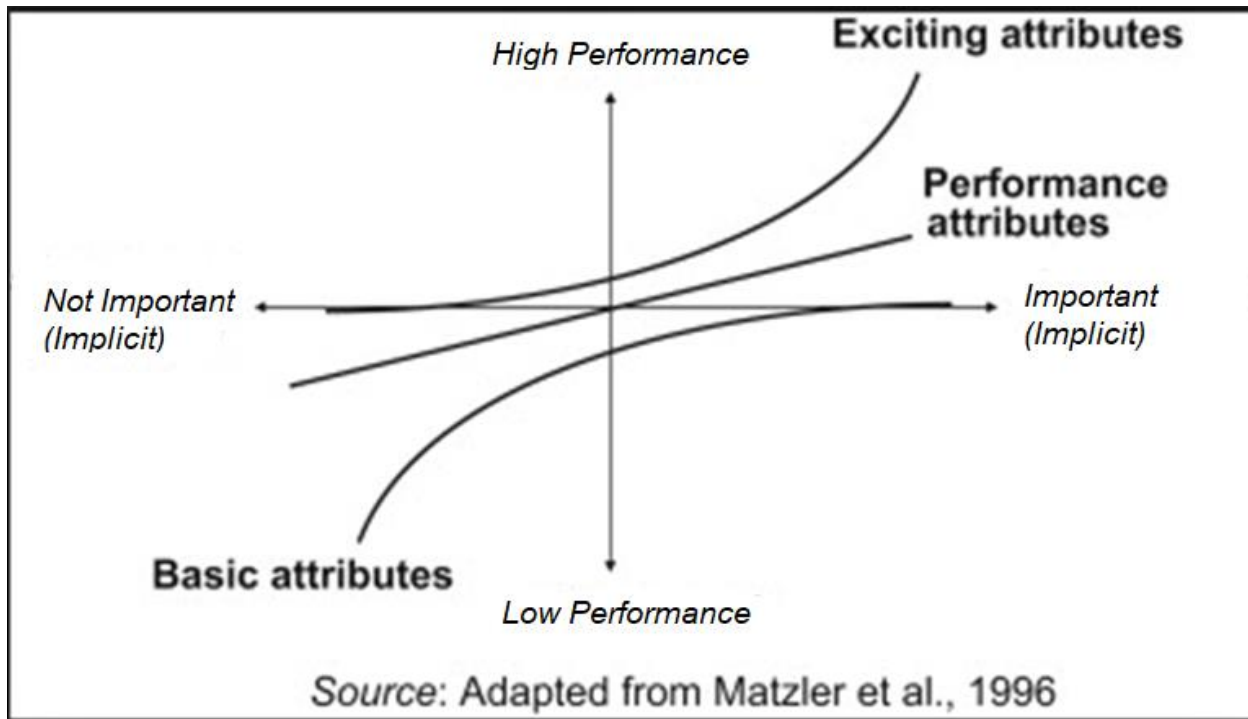
Figure 1. Adapted from Matzler et al. 1996. Three Factor Theory visualized.

This paper has performed three factor theory regression analysis following the lines of Busacca & Padula (2005), and Cao (2017) by splitting each SWB determinant into two dummy variables of low and high performance. While analyzing single determinant scores, scores of 1-2 indicated low performance and 4-5 indicated high performance. Later, results looking at neighborhood satisfaction determinants, instead of cognitive wellbeing determinants, will be shown which include a 1-2.5 category for the low dummy variable category, and 3.5-5 for the high dummy variable category. In both cases, models were built to assess the contribution of a single determinant to overall satisfaction. In the case assessing SWB determinants, the Cantrill score was used as a measure of overall life satisfaction. Meanwhile, in the case of assessing neighborhood infrastructures, overall neighborhood satisfaction was modeled as overall satisfaction.

Results

Importance Performance Analysis

IPA results were calculated both an explicit method, which asked respondents to rate the importance of SWB determinants and implicitly, through analyzing the correlations between the Cantrill score and performance of SWB determinants.

EIPA results

EIPA results can be found summarized in Table 1. and Figure 3.

Table 1. Explicit IPA Results. Below, Importance (I), the standard error in importance (SE +-) at the 95% confidence interval, and Performance (P) are shown in order of decreasing importance. Color bands have been inserted to aid the reader distinguish between determinants that are statistically different from each other at the 90% confidence interval. When people state the importance of SWB Determinants in the lives explicitly, health, education, family relationships, and the home rise to the top of the importance ranking. In terms of performance, family relationships, education, social relationships, and the home also rank quite highly. Neighborhood infrastructure ranks very close to the median importance that was reported explicitly, and is not statistically different from other SWB determinants like social relationships and work at the 95% confidence interval. Meanwhile, the importance of the home and household infrastructure is significantly higher than that of the neighborhood at the 95% confidence interval.

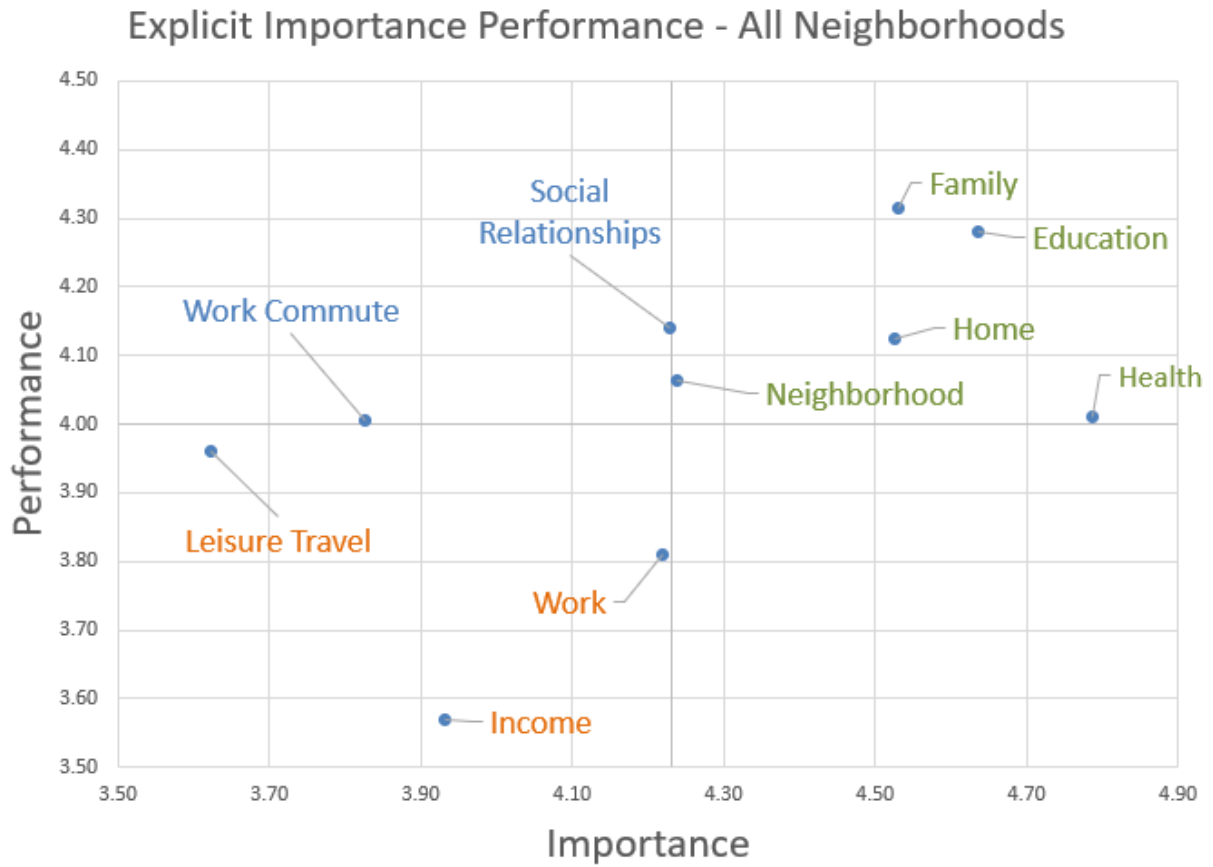| SWB Determinant	I	SE (+-)	P
Health	4.79	0.09	4.01
Education	4.64	0.07	4.28
Family	4.53	0.08	4.32
Home	4.53	0.05	4.13
Neighborhood	4.24	0.09	4.07
Social Relationships	4.23	0.08	4.14
Work	4.22	0.09	3.81
Income	3.93	0.09	3.57
Work Commute	3.83	0.11	4.01
Leisure Travel	3.62	0.11	3.96

Figure 3. Explicit Importance Performance Analysis results for all six neighborhoods combined. The importance of neighborhood infrastructure is very close to median importance, and home infrastructure appears to be more important than neighborhood.

IIPA Results

IIPA results are detailed in Table 2. and Figure 4.

In terms of importance, which is modeled implicitly through correlation with Cantrill score, home, work, income, and family relationships stand out as the most importance factors that influence cognitive wellbeing.

Table 2. Implicit Importance Performance Analysis table results. Importance (I) and Performance (P) are shown. Importance is shown on a scale where determinants with greater than average importance have values higher than 1.0, and those with less than average importance have values less than 1.0. Performance is shown on a 1-5 point evaluation scale.

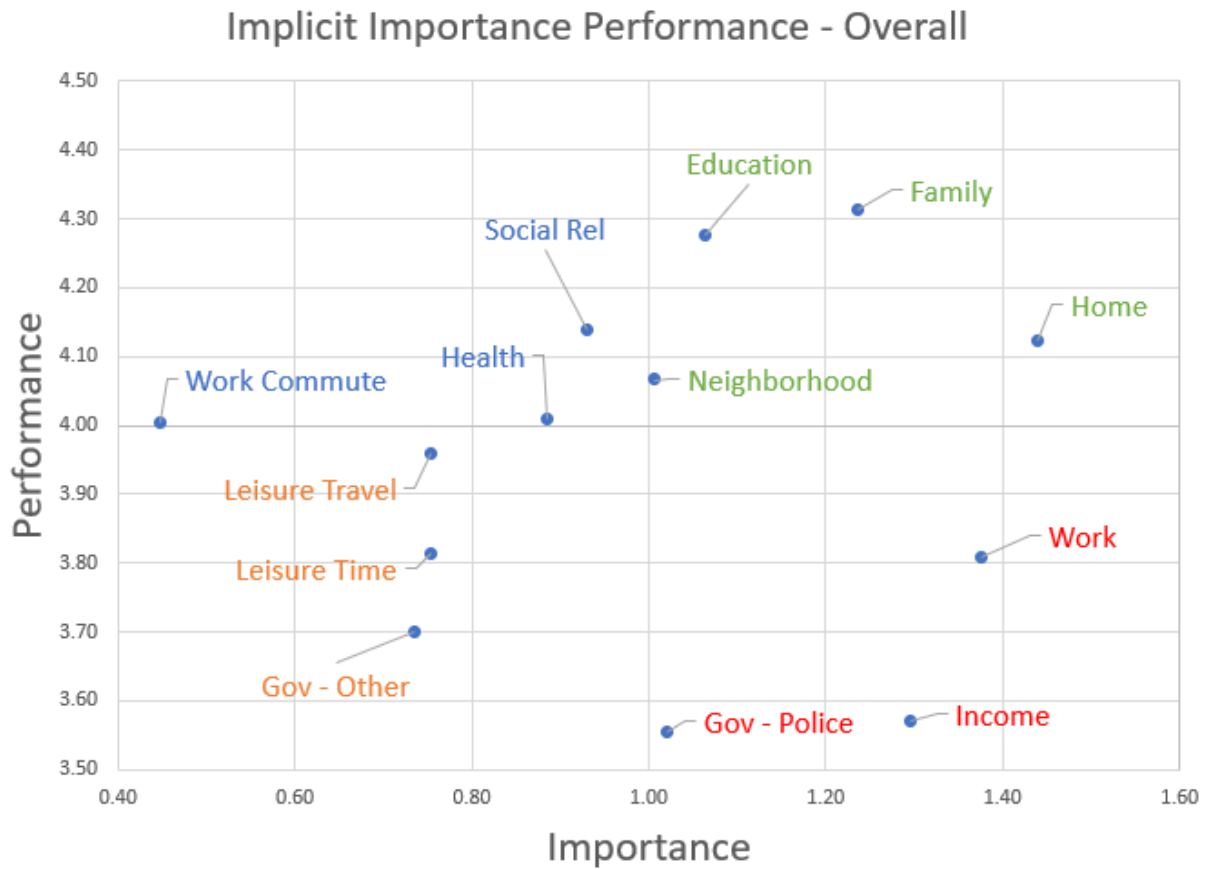| SWB Determinant	I	P
Home	1.44	4.12
Work	1.38	3.81
Income	1.30	3.57
Family	1.24	4.31
Education	1.06	4.28
Gov - Police	1.02	3.56
Neighborhood	1.01	4.07
Social Rel	0.93	4.14
Health	0.88	4.01
Leisure Travel	0.75	3.96
Leisure Time	0.75	3.81
Gov - Other	0.74	3.70
Work Commute	0.45	4.00

Figure 4. Implicit Importance Performance Analysis results. Neighborhood infrastructure ranks at median importance, and home is the most important out of all 13 SWB determinants. Work, Income, and Government-Policy and Judicary become determinants that are important to people's life evaluation, but that are performing poorly compared to equally-important aspects like Home, Family, and Education.

Two models were created and tested using the three-factor theory approach. The first model tested the 13 SWB determinants on the Cantrill score as the independent variable. Second, 31 measures of neighborhood infrastructure performance were grouped into 5 major categories and tested on neighborhood performance as the independent variable.

In the first model, the 13 SWB determinants were broken into three dummy variable groups. The low group included scores of 1-2, the middle group contained scores of 3, and the high group contained scores of 4-5. A regression was run on the Cantrill score which included the low and high dummy variables to test the significance of the determinants at various levels of performance.

Results of the SWB determinant model can be found below in Table 3.

Table 3. Three Factor Theory model 1 results. 13 SWB determinants were regressed on the self-reported Cantrill score at both a low and a high range. For the purpose of the analysis, only the factors with greater than 95% significance were considered to have significant correlation with wellbeing.

SWB Determinants	(1) Low Performance	(2) High Performance
Health	-0.0330	0.0501***
	(0.0622)	(0.0185)
Family	-0.201**	0.0535**
	(0.0841)	(0.0233)
Social Relationships	-0.0159	0.0446*
	(0.0877)	(0.0228)
LeisureTime	-0.0564	0.0120
	(0.0545)	(0.0183)
Education	-0.181**	0.0382*
	(0.0816)	(0.0207)
Work	-0.118*	0.0456***
	(0.0672)	(0.0173)
Income	-0.149***	0.0203
	(0.0496)	(0.0187)
Home	-0.214***	0.125***
	(0.0763)	(0.0227)
Neighborhood	-0.191***	-0.0173
	(0.0676)	(0.0197)
Work Commute	-0.0260	-0.0213
	(0.0610)	(0.0152)
Leisure Travel	0.00355	0.0256
	(0.0723)	(0.0191)
Gov Services Police	-0.103*	0.0324*
	(0.0597)	(0.0194)
Government Services Other	0.0366	0.00717
	(0.0734)	(0.0196)
Constant	3.996***	2.287***
	(0.0443)	(0.126)
Observations	302	302
R-squared	0.291	0.411

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In the second model, 31 neighborhood satisfaction determinants were broken into five categories of

variables: Neighborhood Characteristics (Look and Feel, Safety etc.), Infrastructure (Streets/Sidewalks

etc.), Amenities (Banks, Education, Health etc.), City Services (Snow and Trash Removal), and Sense of

Community (Agency, Number of Friends etc.). These aggregated scores were broken into three dummy

variable groups. The low group included scores of 1-2.5, the middle group contained scores of 2.5-3.5,

and the high group contained scores of 3.5-5. A regression was run on the neighborhood satisfaction

score which included the low and high dummy variables to test the significance of the determinants at

various levels of performance.

Table 4. Three Factor Theory model 2 results. 31 aspects of neighborhood infrastructure were regressed

on the self-reported neighborhood satisfaction score at both a low and a high range. For the purpose of

the analysis, only the factors with greater than 95% significance were considered to have significant

correlation with overall neighborhood satisfaction.

VARIABLES	(1) Low Performance Model	(2) High Performance Model
Characteristics	-0.628***	0.252***
	(0.0701)	(0.0242)
Infrastructure	-0.211	0.0141
	(0.139)	(0.0309)
Amenities	-0.184**	0.0271
	(0.0898)	(0.0237)
CityServices	-0.121	0.0276
	(0.0869)	(0.0244)
SenseofCommunity	-0.228***	0.0981***
	(0.0705)	(0.0238)
Constant	4.371***	2.917***
	(0.0541)	(0.106)
Observations	301	301

In the first model, two SWB determinants showed up as significant at both high and low performance, meeting the criteria of a performance attribute. These SWB determinants were the home and the family. Meanwhile, two SWB determinants showed up as significant at only high performance, meeting the criteria of an exciting attribute. These SWB determinants were Health and Work. Finally, three SWB determinants showed up as significant at only low performance, meeting the criteria of an basic attribute. These SWB determinants were Education, Income and Neighborhood. Other factors that showed up with no significant at either high performance and low performance included Social Relationships, Leisure Time, Work Commute, Leisure Travel, and Government Services (Police + Other).

In the second model, which took a dive into the relationship between neighborhood infrastructure and neighborhood satisfaction, two groups of neighborhood factors showed up as significant at both high and low performance, meeting the criteria of a performance attribute. These SWB determinants were the home and the family. Meanwhile, two SWB determinants showed up as significant at only high performance, meeting the criteria of an exciting attribute. These SWB determinants were Health and Work. Finally, three SWB determinants showed up as significant at only low performance, meeting the criteria of a basic attribute. These SWB determinants were Education, Income and Neighborhood. Other factors that showed up with no significant at either high performance and low performance included Social Relationships, Leisure Time, Work Commute, Leisure Travel, and Government Services (Police + Other).

Disparity Analysis – unsure if this will be submitted to journal/professional paper

Discussion / Conclusions / Future Work

The overall results, especially those that rely on implicit analysis align very closely with the existing wellbeing literature. During the explicit stage, we saw that many factors like health, education, and family relationships were reported as very important to how people think and about their lives. It was surprising that income did not feature highly on this list. Meanwhile, implicit results showed an increased importance of income, which aligned well with previous studies, but a large decrease in the importance of health, which does not align with previous literature (Kahneman & Deaton, 2010; UK ONS, 2018).

However, a key shortcoming of the IPA analysis lies in the assumption that the correlations between SWB determinants and the Cantril score is linear (Cao, 2017). By using three factor theory, which is inherently an implicit technique, it is possible to relax this assumption to analyze how the relationships change over performance. This technique was able to highlight how the significant determinants identified during the IPA analysis related at different levels of performance. For example, the difference in statistical linkage between health and income was clarified: health is significantly correlated with the Cantril evaluation at high performance, whereas income is significantly correlated at low performance. This result disagreed with previous literature showing that the relationship between income and cognitive wellbeing did not have a threshold, and showed that the Cantril evaluation has a threshold at a certain perceived level of income performance (Deaton, 2008).

To answer the initial research questions, neighborhood infrastructure ranks in the middle of the list of SWB determinants included in the study, both in the explicit and in the implicit analysis. Home infrastructure, on the other hand, was above median importance during the explicit IPA analysis, but showed the strongest correlations with cognitive wellbeing under the implicit IPA lens.

Three factor theory analysis helped to outline how the determinants interact with each other at varying levels of performance. Home infrastructure and family relationships were clarified as performance SWB determinants, health and work as exciting determinants, and income, education, and neighborhood infrastructure as basic determinants. For neighborhoods, neighborhood infrastructure and community were highlighted as performance factors, while neighborhood amenities were a basic factor for determining overall satisfaction with neighborhood.

This analysis demonstrates that cities can raise the wellbeing of their citizens by investing in neighborhood and in particular, household infrastructures. These basic provisioning services are critical to the residents of Minneapolis construction of how they think and feel about their lives.

While performing the various explicit and implicit analysis techniques, it was clear that a larger sample size would be able to detail results within neighborhoods, instead of across them. Additionally, a large sample size would allow for a greater level of analysis within neighborhood infrastructure as well, perhaps allowing the analysis of the 31 neighborhood factors separately instead of grouped into the five categories seen in this analysis.

References

Busacca, B., & Padula, G. (2005). Understanding the relationship between attribute performance and overall satisfaction: Theory, measurement and implications. Marketing Intelligence & Planning, 23(6), 543-561.

Cao, J., & Cao, X. (2017). Comparing importance-performance analysis and three-factor theory in assessing rider satisfaction with transit. Journal of Transport and Land Use, 10(1), 837-854.

CDC. (2018). Well-Being Concepts. Retrieved May 8, 2018, from https://www.cdc.gov/hrqol/wellbeing.htm.

Deaton, A. (2008). Income, health, and well-being around the world: Evidence from the Gallup World Poll. Journal of Economic perspectives, 22(2), 53-72.

Diener, E., Oishi, S., & Lucas, R. E. (2003). Personality, culture, and subjective well-being: Emotional and cognitive evaluations of life. Annual review of psychology, 54(1), 403-425.

Gallup. (2017). Gallup's Top Well-Being Findings of 2017. Retrieved May 8, 2018, from http://news.gallup.com/poll/224675/gallup-top-findings-2017.aspx.

Helliwell, J., Layard, R., & Sachs, J. (2012). World happiness report.

Kahneman, D., & Deaton, A. (2010). High income improves evaluation of life but not emotional well-being. Proceedings of the national academy of sciences, 107(38), 16489-16493.

Martilla, J. A., & James, J. C. (1977). Importance-performance analysis. The journal of marketing, 77-79.

Matzler, K., Bailom, F., Hinterhuber, H. H., Renzl, B., & Pichler, J. (2004). The asymmetric relationship between attribute-level performance and overall customer satisfaction: a reconsideration of the importance–performance analysis. Industrial marketing management, 33(4), 271-277.

Matzler, K., Hinterhuber, H. H., Bailom, F., & Sauerwein, E. (1996). How to delight your customers. Journal of Product & Brand Management, 5(2), 6-18.

Sampson, R. J. (2003). The neighborhood context of well-being. *Perspectives in biology and medicine*, *46*(3), S53-S64.

Stone, A. A., Schneider, S., Krueger, A., Schwartz, J. E., & Deaton, A. (2018). Experiential wellbeing data from the American Time Use Survey: Comparisons with other methods and analytic illustrations with age and income. Social Indicators Research, 136(1), 359-378.

UK ONS. (2018). Wellbeing. Retrieved May 8, 2018, from https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing

United Nations. (2018). SDGs: Sustainable Development Knowledge Platform. (n.d.). Retrieved May 8, 2018, from https://sustainabledevelopment.un.org/sdgs