



Quality of life in Montevideo.

Ferre, Zuleika

Universidad de la República

Gandelman, Néstor

Universidad ORT Uruguay

Piani, Giorgina

Universidad de la República

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Abstract

This paper we analyze various dimensions of the quality of life of people living in Montevideo. We found out that the satisfaction with various public goods and services at the neighborhood level play a minor role in the overall reported well being of individuals and in the satisfaction of life domains, such as leisure, social life, family, health, housing, neighborhood economic situation and work. This is in spite the fact that there are significant disparities in a wide range of indicators among those living in different areas of the city. Our results suggest that the differences in overall happiness and in domain satisfaction are mostly due to differences in individual outcomes like education, health, labor situation and housing quality

Keywords: quality of life, Montevideo

1. Introduction

Starting in 1999, the Uruguayan economy was hit by a serious recessive period with a strong contraction of the real economy that anticipated the 2002 economic crisis, which was indeed caused by internal factors in combination with external negative shocks. This kind of events highlights the relevance of the regional and international scenarios in a Uruguayan sustainable growth strategy. Since then, the Uruguayan economy has enjoyed a significant growing period, with an average GDP growth rate of 6.7% between 2002 and 2006 and with a historical record of 11% between 2004 and 2005. In this scenario, it is critical to be able to accurately assess and monitor the population quality of life (QoL) as a measure of the country's capacity to improve life standards for everybody.

Montevideo is the largest city, capital and chief port of the country. Given the fact that it is more than twice as large as any other city in Uruguay, it is considered a primate city. The current population estimates for Montevideo are 1,349,000 habitants within the city boundaries. Montevideo's population makes up roughly 44% of the entire population of the country.

The general purpose of this study is to provide updated estimates of satisfaction with life as a whole and satisfaction in several life domains (leisure, social life, family, health, economic situation, work, housing and neighborhood) for the city of Montevideo and to study their determinants and how these determinants affect rental values. In order to do so we use data from the 2006 Household survey and we conduct a special survey with national coverage. The paper proceeds as follows. In section 2 we present the main data sources. Section 3 and 4 present a descriptive analysis of secondary sources and our neighborhood survey respectively. The descriptions of differences in socioeconomic indicators by neighborhood of these two sections serve as background analyses for the measures of quality of life introduced in the following sections. Section 5 presents a brief descriptive analysis of the main focus of our neighborhood survey: how people enjoy and

use their leisure time. Section 6 deals with the econometric methodology needed to present the main results in section 7. Finally section 8 concludes.

2. Data sources

2.a) Secondary data (Household Surveys)

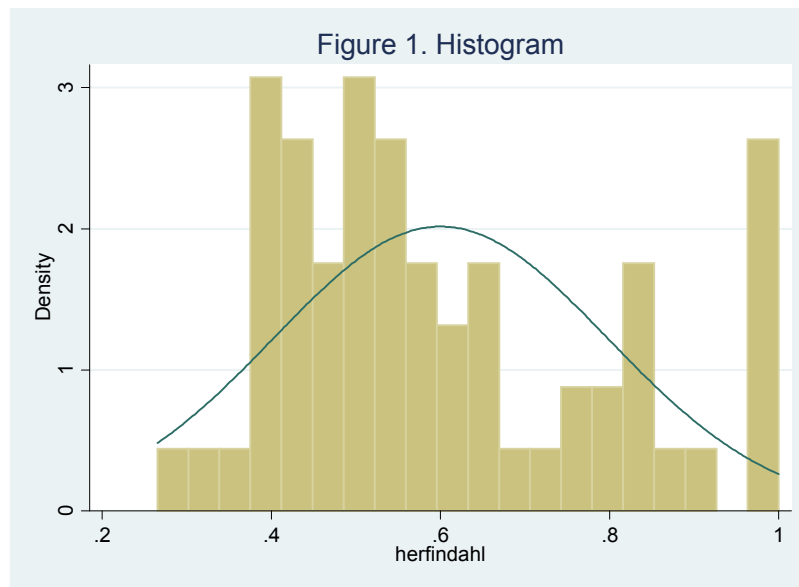
Based on the 2006 Household Surveys information on household income and unemployment rate, the National Statistical Institute (INE) classifies every city censal segment using a 4-category socioeconomic indicator: low, medium-low, medium-high and high.

Consequently, the whole population of households is assigned to one of these four strata according to the location of their dwellings. All household members within the censal segment get the same socioeconomic level classification, independently of their personal income and/or employment condition.

The city of Montevideo is divided into 62 different neighborhoods; each of these is inhabited by a different composition of socioeconomic strata, as can be seen in Table 1. Montevideo has a marked stratum segregation in its neighborhoods. Half of the 62 neighborhoods are composed by more than 70% of people of only one stratum.

Using concentration indexes it is possible to provide a more sophisticated picture of the degree of neighborhood segregation. The share of each stratum in the population of neighborhoods can be used to compute Herfindahl concentration indexes. With four strata the Herfindahl index varies between 0.25 and 1 corresponding respectively to the maximum level of integration (25% of each strata in the neighborhood) and maximum segregation (only population of one strata). Figure 1 shows the histogram of this concentration index vis a vis a normal density curve. Clearly, there are very few neighborhoods with similar participation of individuals of all four strata. Comparing with the normal distribution the histogram is skewed to the left. The skewness is produced by

a concentration of neighborhoods with Herfindahl values between 0.4 and 0.6. This corresponds to neighborhoods where between 60%-75% of the population are of the same stratum. So, although the histogram shows a lower segregation than what is implied by a normal distribution, the segregation level is still high. Moreover, the histogram presents a mass concentration point of fully segregated neighborhoods with Herfindahl values of 100%.



Source: own elaboration based on INE's 2006 Household Survey

Table 1. Neighborhood composition (% of households of each stratum)

Source: own elaboration based on INE's 2006 Household Survey

| STRATUM | | | | | STRATUM | | | | |
|------------------------------|---------------|----------------|---------------|---------------|-------------------------------|---------------|---------------|---------------|---------------|
| BARRIO | Low 1 | Medium - Low 2 | Medium-High 3 | High 4 | BARRIO | Low 1 | Medium Low 2 | Medium High 3 | High 4 |
| Aguada | 0.00% | 11.17% | 86.25% | 2.58% | Larrañaga | 0.00% | 0.00% | 72.59% | 27.41% |
| Aires Puros | 41.45% | 9.16% | 49.40% | 0.00% | Las Acacias | 26.35% | 65.86% | 7.79% | 0.00% |
| Atahualpa | 0.00% | 25.48% | 51.59% | 22.93% | Las Canteras | 16.50% | 37.97% | 45.53% | 0.00% |
| Barrio Sur | 0.00% | 0.00% | 100.0% | 0.00% | Lezica, Melilla | 54.23% | 25.37% | 20.40% | 0.00% |
| Bañados de Carrasco | 44.80% | 52.80% | 2.40% | 0.00% | Malvín | 0.00% | 0.00% | 15.14% | 84.86% |
| Belvedere | 0.00% | 46.94% | 53.06% | 0.00% | Malvín Norte | 0.00% | 0.00% | 100% | 0.00% |
| Brazo Oriental | 0.00% | 14.12% | 79.71% | 6.18% | Manga | 89.96% | 10.04% | 0.00% | 0.00% |
| Buceo | 0.00% | 0.00% | 62.11% | 37.89% | Manga, Toledo Chico | 77.65% | 20.34% | 2.02% | 0.00% |
| Capurro, Bella Vista | 22.93% | 34.53% | 17.40% | 25.14% | Maroñas, Guaraní | 43.88% | 45.70% | 10.42% | 0.00% |
| Carrasco | 0.00% | 0.00% | 0.00% | 100% | Mercado Modelo, Bolívar | 26.74% | 7.52% | 58.50% | 7.24% |
| Carrasco Norte | 0.00% | 39.68% | 11.11% | 49.21% | Nuevo París | 46.74% | 49.59% | 3.67% | 0.00% |
| Casabó, Pajas Blancas | 89.72% | 10.28% | 0.00% | 0.00% | Palermo | 0.00% | 39.47% | 50.75% | 9.77% |
| Casavalle | 100% | 0.00% | 0.00% | 0.00% | Parque Batlle, Villa Dolores | 0.00% | 0.00% | 59.20% | 40.80% |
| Castro, Castellanos | 8.28% | 76.07% | 15.64% | 0.00% | Parque Rodó | 0.00% | 38.76% | 15.50% | 45.74% |
| Centro | 0.00% | 0.00% | 82.37% | 17.63% | Paso de la Arena | 90.62% | 8.90% | 0.48% | 0.00% |
| Cerrito | 44.26% | 24.47% | 28.30% | 2.98% | Paso de las Durañas | 0.00% | 0.00% | 91.75% | 8.25% |
| Cerro | 21.34% | 71.27% | 7.40% | 0.00% | Peñarol, Lavalleja | 21.82% | 70.39% | 7.79% | 0.00% |
| Ciudad Vieja | 0.00% | 72.07% | 27.93% | 0.00% | Piedras Blancas | 42.48% | 57.52% | 0.00% | 0.00% |
| Colón Centro, Colón Noroeste | 25.65% | 62.66% | 11.69% | 0.00% | Pocitos | 0.00% | 0.00% | 5.29% | 94.71% |
| Colón Sureste, Abayubá | 53.66% | 27.75% | 18.59% | 0.00% | Prado, Nueva Savona | 0.00% | 10.80% | 52.78% | 36.42% |
| Conciliación | 38.71% | 58.27% | 3.02% | 0.00% | Punta Carretas | 0.00% | 0.00% | 0.00% | 100% |
| Cordón | 0.00% | 33.26% | 57.66% | 9.08% | Punta De Rieles, Bella Italia | 76.04% | 23.96% | 0.00% | 0.00% |
| Figurita | 0.00% | 45.41% | 23.39% | 31.19% | Punta Gorda | 0.00% | 0.00% | 0.00% | 100% |
| Flor de Maroñas | 26.54% | 55.76% | 17.70% | 0.00% | Reducto | 0.00% | 23.10% | 68.23% | 8.66% |
| Ituzaingó | 17.94% | 71.47% | 10.59% | 0.00% | Sayago | 0.00% | 9.83% | 90.17% | 0.00% |
| Jacinto Vera | 0.00% | 25.00% | 53.33% | 21.67% | Tres Cruces | 0.00% | 0.00% | 12.26% | 87.74% |
| Jardines Del Hipodromo | 71.98% | 21.39% | 6.64% | 0.00% | Tres Ombues, Pueblo Victoria | 73.15% | 16.08% | 10.77% | 0.00% |
| La Blanqueada | 0.00% | 0.00% | 20.25% | 79.75% | Unión | 0.00% | 30.34% | 62.86% | 6.80% |
| La Comercial | 0.00% | 21.16% | 78.84% | 0.00% | Villa Española | 11.25% | 67.68% | 21.07% | 0.00% |
| La Paloma, Tomkinson | 93.94% | 6.06% | 0.00% | 0.00% | Villa García, Manga Rural | 68.37% | 31.63% | 0.00% | 0.00% |

| | | | | | | | | | |
|---------|-------|---------------|--------|-------|---------------------|-------|---------------|--------|-------|
| La Teja | 0.00% | 70.87% | 29.13% | 0.00% | Villa Muñoz, Retiro | 0.00% | 67.08% | 32.92% | 0.00% |
|---------|-------|---------------|--------|-------|---------------------|-------|---------------|--------|-------|

Based on the information in Table 1, we have aggregated the censal segments to approximate real neighborhood areas in the city of Montevideo and have assigned each of the 62 existing neighborhoods to one of the four socioeconomic stratum.¹

Another interesting observation that can be inferred from Table 1 is that stratum four (the highest) is the most highly concentrated, almost fully covering four different neighborhoods, even though this stratum is the smallest one. This could be reflecting a certain tendency to isolate themselves from the rest of the population, monopolizing certain areas. This process is not done through an explicit discrimination but merely through the living cost in those places, which can only be reached by people of such stratum. The idea will be reaffirmed later when analyzing the housing services in the block, as its abundance or scarcity could be having a direct effect on the price of living there.

2.b) New data (Montevideo QoL Neighborhood Survey, 2007)

In addition to using available data on household characteristics, we crafted a population survey to obtain critical data on QoL neighborhood-specific characteristics. The survey was applied in three geographic areas in Montevideo; (1) one poor, low QoL area, (2) one rich, high QoL zone and (3) a comparison group, composed by surveys conducted in the rest of the city.

¹ For details on this procedure see Gandelman and Piani (2007).

The neighborhoods were selected to represent low and high income city areas that allowed for enough dispersion to reflect possible differences in QoL dimensions, but avoiding the tails of the distribution (lowest and highest socioeconomic areas).² In the tables we will refer to the low and medium-low area and to the high and medium-high areas.

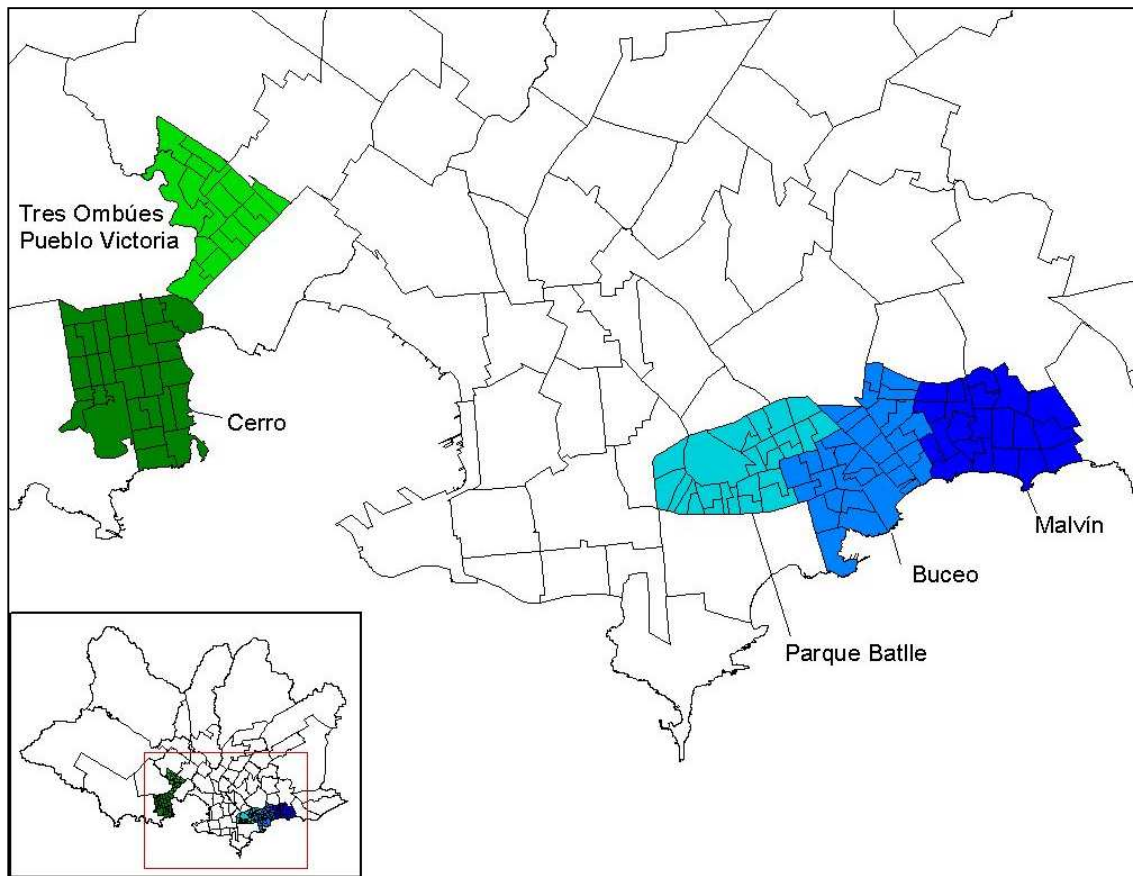
The selected low QoL area includes two traditional neighborhoods located in the southwest side of the city: El Cerro and Tres Ombúes-Pueblo Victoria (Figure 4). According to Table 1 the strata composition (low, medium-low, medium high and high respectively) of these two neighborhoods is: 21.3%, 71.3%, 7.4% and 0% for Cerro, and 73.2%, 16.1%, 10.8% and 0% for Tres Ombúes-Pueblo Victoria. These two neighborhoods were created with an important contingent of European immigrants during the meat industrial development in the first half of the 20th century that gave origin to an important local worker class and to the Uruguayan syndicalist movement. In this context the population developed a strong neighborhood identity and neighborhood cohesion that, although declining, we can still find in the social and cultural life of El Cerro and Tres Ombúes-Pueblo Victoria. In the mid-1950s the industrial crisis hit strongly the population of these two neighborhoods; the local labor sources shut, leaving huge unemployment and changing the neighborhood composition and lifestyle. A long period of declining industry, high unemployment rates, low salaries, social segregation and environmental damage, shows striking effects in this area. Today, the social imaginary of this area combines its flourishing industrial and work class origin with a long period of economic decline and social segregation. The sub-neighborhood “Cerro Norte” (not included in the survey) is well known as a “red zone” area, what has caused that the whole neighborhood is often portrayed as a marginal zone and its inhabitants stigmatized by high reported rates of crime and delinquency.

The selected high QoL area includes three different neighborhoods: Buceo, Malvín and Parque Batlle, which are residential areas with high population density. Buceo and Malvín are located in the southeast side of the city, along the Promenade. They were one

² For more information regarding the neighborhood selection refer to the sampling design appendix.

of Montevideo's former resorts that with the city expansion to the south, in the 20th century, were consolidated as residential neighborhoods. Parque Batlle (which takes its name from the main city park which surrounds) is located in a central area close to Downtown Montevideo. (Figure 2). According to Table 1, the strata composition (low, medium-low, medium high and high respectively) of these three neighborhoods is 0%, 0%, 62.1% and 37.9% for Buceo, 0%, 0%, 15.1% and 84.8% for Malvín and finally, 0%, 1%, 59.2% and 40.8% for Parque Batlle.

Figure 2 – QoL in Montevideo Selected neighbourhoods



Source: own elaboration based on Montevideo QoL Neighborhood Survey Sample (2007)

The research team was in charge of designing, organizing and conducting the neighborhoods survey, which was fielded as a module of the 2007 International Social Survey Program (ISSP)³ survey on the topic “Leisure Time and Sports”.

The sampling design combined the ISSP methodological requisites for a general population representative survey with a representative sample of the two selected areas in Montevideo. The survey is representative of the population aged 18 years old and more, and the questionnaire was responded by a randomly selected member of the dwelling in order to avoid the self selection bias.

The interviews were conducted using a face-to-face paper & pencil method. The fieldwork was implemented from October 2007 to March 2008. The effective number of obtained interviews was 801, according to the following distribution: 380 in the low QoL area, 328 in the high QoL area and 93 cases in the rest of the city (Others).

The resulting Total Response Rate (number of complete interviews with reporting units divided by the number of eligible reporting units in the sample) in Montevideo is 64.9%. As expected, respondents in the low QoL area were significantly more likely to cooperate than their counterparts in the high QoL area (77.5% vs. 54.7% Response Rate respectively). The Total Refusal Rate (number of refusals divided by the interviews (complete and partial) plus the non-respondents (refusals, non-contacts, and others) plus the cases of unknown eligibility) is 16.4%. And the Total Cooperation Rate (number of complete interviews divided by the number of interviews (complete plus partial) plus the number of non-interviews that involve the identification of and contact with an eligible respondent (refusal and break-off plus other) is 79.5%⁴

³ The ISSP is a continuing annual program of cross-national collaboration on surveys covering topics important for social science research. Since 1983 it brings together pre-existing social science projects and co-ordinates research goals, thereby adding a cross-national, cross-cultural perspective to the individual national studies.

⁴ Source: The American Association for Public Opinion Research. 1998. Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for RDD Telephone Surveys and In-Person Household Surveys. Ann Arbor, Michigan: AAPOR.

3. Descriptive analysis of secondary sources

3.a) Housing materials

To study the quality of the materials used in Montevideo's houses we analyzed the INE's household surveys results and after sorting them out based on habitability and hygiene we constructed Table 2.

As it can be observed, stratum 1 houses use almost twice more poor materials in the construction process (walls, roofs and floors) than the rest of Montevideo's houses. Not surprisingly this proportion is also maintained in the global house material variable which has been created by considering as good only those houses that were constructed using only good quality materials in its three bases (floor, roof and walls) once again based on the hygiene and habitability criteria.

| Table 2. Housing materials | | | |
|-----------------------------------|-----------|--------|---------|
| | Quality | Poor | Good |
| Walls | Stratum 4 | 0.00% | 100.00% |
| | Stratum 3 | 0.45% | 99.55% |
| | Stratum 2 | 1.29% | 98.71% |
| | Stratum 1 | 3.38% | 96.62% |
| Roof | Stratum 4 | 0.50% | 99.50% |
| | Stratum 3 | 2.44% | 97.56% |
| | Stratum 2 | 10.02% | 89.98% |
| | Stratum 1 | 21.12% | 78.88% |
| Floor | Stratum 4 | 0.18% | 99.82% |
| | Stratum 3 | 1.24% | 98.76% |
| | Stratum 2 | 4.56% | 95.44% |
| | Stratum 1 | 12.73% | 87.27% |
| Global House materials | Stratum 4 | 0,63% | 99.37% |
| | Stratum 3 | 3.04% | 96.96% |
| | Stratum 2 | 12.12% | 87.88% |
| | Stratum 1 | 26.91% | 73.09% |

Source: own elaboration based on INE's 2006 Household Survey

3.b) Housing quality

We created a house quality index based on a series of questions regarding 12 possible problems in a house. The problems considered were: humidity in the roof, leak, wall fissures, problems in doors or windows, floor fissures, problems with wall or roof plaster, problems with the ceiling, lack natural light, lack ventilation, floods when rains, risk of collapse, humidity in the foundation.

| Amount of Problems | Stratum 4 | Stratum 3 | Stratum 2 | Stratum 1 |
|--------------------|-----------|-----------|-----------|-----------|
| 0 | 59.35% | 42.22% | 30.63% | 21.50% |
| 1 | 18.10% | 18.37% | 17.94% | 15.96% |
| 2 | 9.20% | 13.12% | 14.10% | 13.28% |
| 3 | 6.53% | 8.34% | 10.55% | 11.45% |
| 4 | 3.76% | 6.53% | 8.41% | 9.29% |
| 5 | 1.09% | 4.30% | 6.42% | 8.78% |
| 6 | 0.99% | 3.66% | 4.42% | 6.94% |
| 7 | 0.59% | 1.75% | 2.82% | 5.19% |
| 8 | 0.30% | 1.01% | 2.14% | 3.67% |
| 9 | 0.10% | 0.58% | 1.65% | 2.11% |
| 10 | 0.00% | 0.05% | 0.53% | 1.28% |
| 11 | 0.00% | 0.05% | 0.19% | 0.52% |
| 12 | 0.00% | 0.00% | 0.19% | 0.04% |
| Total | 100% | 100% | 100% | 100% |
| Mean | 0.899 | 1.660 | 2.316 | 3.032 |

Source: own elaboration based on INE's 2006 Household Survey

The analysis concludes that stratum 1 houses have more than 3 times higher mean than stratum 4 houses and 30% higher than overall Montevideo. This means that on average, stratum one houses tends to have almost an additional problem than the average house in Montevideo.

One factor that may be narrowing the difference is the fact that none of these problems have received an adequate weight. For this reason we have developed an alternative index where the importance of different problems was considered following Casacuberta (2006).

In Table 4 the differences between poor Montevideo and the rest of the population widened, generating opposed distributions, while medium values are similar, the lowest and higher have differences rounding 50%.

This result somehow goes in line with intuition since the problems confronted by poorer strata are of a bigger magnitude, even though they may assume the same number of problems, thereby the need to properly evaluate and differentiate the risks confronted by each one.

| Table 4 . Weighted Housing Problems | | | | |
|--|-----------|-----------|-----------|-----------|
| Variable | Stratum 4 | Stratum 3 | Stratum 2 | Stratum 1 |
| No Problems | 59.35% | 42.22% | 30.63% | 21.50% |
| Slight Problems | 3.76% | 4.57% | 4.59% | 4.59% |
| Moderate Problems | 24.23% | 32.71% | 37.53% | 33.87% |
| Serious Problems | 12.66% | 20.50% | 27.32% | 40.05% |
| Total | 100% | 100% | 100% | 100% |

Source: own elaboration based on INE's 2006 Household Survey

3.c) Housing Services in the block

Table 5 is based on INE's household surveys and expresses the amount of services available in the block where the house is allocated for each stratum in Montevideo. The services considered were: electricity network, running water, sewerage, piping access to

gas, daily garbage disposal service, street garbage container, pavement, sidewalks in good condition, rain drain and public lightening system.

By analyzing the means it can be clearly observed that poorer strata have fewer services available in their surroundings. Besides, the marginal effect of belonging to a higher stratum increases at a decreasing rate.

| Amount of Services | Stratum 4 | Stratum 3 | Stratum 2 | Stratum 1 |
|--------------------|-----------|-----------|-----------|-----------|
| 0 | 0.00% | 0.00% | 0.00% | 0.12% |
| 1 | 0.00% | 0.16% | 0.49% | 2.08% |
| 2 | 0.00% | 0.27% | 3.07% | 9.74% |
| 3 | 0.99% | 1.06% | 6.33% | 17.21% |
| 4 | 0.59% | 2.07% | 10.71% | 25.04% |
| 5 | 3.26% | 8.50% | 19.61% | 24.88% |
| 6 | 24.43% | 40.57% | 32.46% | 14.54% |
| 7 | 56.48% | 37.17% | 22.77% | 5.55% |
| 8 | 13.65% | 9.67% | 4.38% | 0.76% |
| 9 | 0.59% | 0.53% | 0.19% | 0.08% |
| Total | 100% | 100% | 100% | 100% |
| Mean | 6.78 | 6.40 | 5.57 | 4.31 |

Source: own elaboration based on INE's 2006 Household Survey

While almost nobody reaches the top of the index, stratum 4 population seems to be more than 2 services ahead of the poorest population, clearly showing the effect of income in the allocation decisions and consequently in the services made available for each house.

3.d) Appliances and other comfort elements

As for comfort elements, Table 6 presents an index constructed with the information collected by INE's household surveys, referring to the number of electrical appliances, communication devices and transport facilities owned by surveyed dwellings. The overall housing comfort index adds 1 point for each owned appliance. The appliances considered were: water heater, instant water heater, refrigerator, TV, cable TV, video, washing

machine, dishwasher, microwave, PC, motorcycle, automobile, land line phone and cell phone.

Observing the differences between means, we conclude that each stratum tends to have almost 1 extra comfort element than the stratum before. This result is made clear by analyzing the accumulated distributions and the lag that seems to be between them. These results may underestimate the differences due to the fact that comfort elements have not been weighted by their value, where a motorbike has the same value as a car.

| Table 6. Comfort elements in the house | | | | |
|---|-----------|-----------|-----------|-----------|
| N° of Comfort elements | Stratum 4 | Stratum 3 | Stratum 2 | Stratum 1 |
| 0 | 0.08% | 0.31% | 1.10% | 2.40% |
| 1 | 0.18% | 0.76% | 2.26% | 4.43% |
| 2 | 0.43% | 1.71% | 4.49% | 8.88% |
| 3 | 1.05% | 3.57% | 7.24% | 12.57% |
| 4 | 4.33% | 8.59% | 11.21% | 13.64% |
| 5 | 6.03% | 12.39% | 14.45% | 14.01% |
| 6 | 9.23% | 12.87% | 14.57% | 12.33% |
| 7 | 11.16% | 13.89% | 12.73% | 11.31% |
| 8 | 12.48% | 13.32% | 11.51% | 8.31% |
| 9 | 12.78% | 12.05% | 8.65% | 6.11% |
| 10 | 16.51% | 11.21% | 7.00% | 3.64% |
| 11 | 17.26% | 7.31% | 3.80% | 1.87% |
| 12 | 8.03% | 1.97% | 0.99% | 0.45% |
| 13 | 0.48% | 0.04% | 0.01% | 0.03% |
| Total | 100% | 100% | 100% | 100% |
| Mean | 8.57 | 7.17 | 6.20 | 5.22 |

Source: own elaboration based on INE's 2006 Household Survey

4. Descriptive analysis of Montevideo QoL Neighborhood Survey (2007)

Tables 7 to 10 present summary statistics of several variables that, according to the literature, are expected to affect the QoL of individuals. All results are presented disaggregated by the low-medium and high-medium strata plus a comparison group of “Others” that corresponds to surveys conducted in the rest of Montevideo. The main picture resulting from these tables is that those individuals living in low-medium strata areas have worse average indicators, both at the individual and neighborhood levels characteristics.

Table 7 shows several individual level variables that may affect happiness. As mentioned above, the response rate in the high QoL neighborhoods were significantly lower than in the low QoL neighborhood. This is reflected in the larger percentage of females in our sample in this area (working males are more reluctant to answer these type of surveys or simple more difficult to be found by the interviewer). Apparently, there are no significant differences in age and cohabitation status between both groups.

Human capital dimensions are in general considered to be very important in personal self-satisfaction. We present several indicators of education and health that transmit the same idea. Those in high areas have on average 4 more years of schooling and a much larger percentage rate of secondary and university complete education. Private health care in high stratum areas is 86% against 50% in low areas. The survey instrument asked whether the individual felt ill in the last 30 days. Responses do not show significant differences across strata (30% in high QoL areas vs. 27% in low QoL areas).

In order to take a closer look at the health status of the population, we constructed a Body Mass Index (BMI) that might also be important to explain the kind of relationships that a

person establishes with others and therefore might be relevant to explain social life or even work satisfaction⁵.

The labor market indicators considered, show that a larger share of individuals in the low stratum is unemployed compared to those in the high stratum (12.4% vs. 9.5% respectively). Another, not so often stressed labor problem, is those individuals that in order to make their living have to work more than 40 hours per week (in one or more jobs). Defining overworked workers as those who work more than 60 hours per week, we find that 21% of people living in low areas have this problem vs. only 9% of the individuals in the high neighborhoods. Nonetheless, if we look at a more subjective indicator, we find that 37% of the respondents in the high stratum “often” and “very often” find themselves “thinking about work” vs. 32% in the low stratum. This result might be reflecting the different responsibility levels involved in the labor positions.

With respect to housing, although there are no significant differences in the share of home ownership between both groups, in the low stratum it is much more common to see families living in houses without formal property rights. The quality of materials used in the construction of the houses and the amount of comfort appliances also reflect the differences in personal and household income between groups.

As expected, the reported household and individual income are significantly higher in the high QoL area compared to the low QoL area and “Others”.

As for social capital, the low stratum and the “Others” show a similar behavior in the dimensions “sociable” and “trustful”. Comparing the different strata, we find that people living in the high area neighborhood are much more sociable and trustful than those living in the low area and the “Others” (76% vs. 66% in the sociable dimension respectively, and 47% vs. 22% in the trustful dimension respectively).

⁵ The BMI is a measure of the weight of a person scaled according to height and is defined as the body weight (in kilograms) divided by the square of their height (in meters). According to the World Health Organization a BMI above 25 is considered overweight and above 30 is considered obese.

| Table 7: Group of variables that are expected to explain differences in QoL: Individual level | | | | | | |
|--|--------------------------------------|------------------------|-----------------------|-------------------------|---------------|--------------|
| | | | Low-Medium low | High-Medium high | Others | Total |
| Demographics | Sex | % female | 56.3 | 62.8 | 57.0 | 59.1 |
| | Age | Mean | 46.9 | 47.4 | 45.9 | 47.0 |
| | | Std. Deviation | 18.4 | 19.0 | 17.8 | 18.6 |
| | Partner - married | % | 34.7 | 40.4 | 33.3 | 36.9 |
| Partner- not married | % | 18.4 | 9.8 | 19.4 | 15.0 | |
| Human Capital: education | Years of Schooling | Mean | 8.2 | 12.4 | 9.2 | 10.1 |
| | | Std. Deviation | 3.5 | 3.6 | 3.6 | 4.1 |
| | Completed Secondary | % | 12.8 | 16.5 | 18.3 | 15.0 |
| Completed University | % | 2.9 | 27.8 | 8,7 | 13.9 | |
| Human capital: health | Private health care coverage | % | 49.7 | 86.0 | 62.4 | 66.0 |
| | Felt sick | % | 26.8 | 29.6 | 19.4 | 27.1 |
| | Physical activity | % | 35.8 | 60.7 | 41.9 | 46.7 |
| | Body mass index | % Overweight (BMI>=25) | 57.9 | 64.4 | 69.6 | 61.8 |
| % Obese (BMI>=30) | | 35.5 | 31.8 | 30.4 | 33.5 | |
| Labor market – use of time | Employed full time | % | 48.9 | 50.3 | 52.7 | 49.9 |
| | Unemployed/subemployed | % | 12.4 | 9.5 | 15.1 | 11.5 |
| | Overworked | % | 20.9 | 9.8 | 28.1 | 17.1 |
| | Not in the labor force | % | 31.6 | 30.8 | 28.1 | 30.8 |
| | Hours of leisure in the last weekend | Mean | 14.8 | 16.1 | 13.0 | 15.1 |
| | | Std. Deviation | 7.8 | 7.6 | 8.3 | 7.9 |
| | Hours worked weekly | Mean | 43.8 | 39.7 | 47.4 | 42.5 |
| Std. Deviation | | 19.4 | 14.6 | 17.7 | 17.5 | |
| Workaholic | % | 32.1 | 37.8 | 37.6 | 35.1 | |

| Table 7 (cont.) | | | | | | |
|-----------------|--|----------------|-------|-------|-------|-------|
| Income | Household income | Mean | 12016 | 23853 | 13465 | 16857 |
| | | Std. Deviation | 10884 | 17603 | 10147 | 14964 |
| | Per capita family income | Mean | 4662 | 10323 | 6551 | 7117 |
| | | Std. Deviation | 4249 | 7827 | 7439 | 6810 |
| | Individual income | Mean | 6282 | 13639 | 8433 | 9470 |
| | | Std. Deviation | 5975 | 15734 | 7944 | 11624 |
| Housing | Distance to the Promenade (in minutes) | Mean | 28.1 | 12.3 | 33.4 | 22.1 |
| | | Std. Deviation | 18.9 | 10.2 | 21.0 | 18.3 |
| | Overcrowding* | % | 12.1 | 14.9 | 11.8 | 13.2 |
| | Housing tenure | % Owners | 54.5 | 56.4 | 55.9 | 55.4 |
| | | % Renters | 14.7 | 27.4 | 15.1 | 20.0 |
| | | % Occupants | 30.8 | 16.2 | 29.0 | 24.6 |
| | Construction materials of good quality | % Walls | 93.7 | 100.0 | 95.7 | 96.5 |
| | | % Roof | 89.2 | 98.5 | 92.5 | 93.4 |
| | | % Floor | 92.9 | 100.0 | 94.6 | 95.9 |
| | Rooms | Mean | 3.22 | 3.61 | 3.26 | 3.38 |
| | | Std. Deviation | 1.30 | 1.43 | 1.33 | 1.37 |
| | Bathrooms | Mean | 1.08 | 1.41 | 1.19 | 1.23 |
| | | Std. Deviation | 0.34 | 0.70 | 0.42 | 0.55 |
| | Utilities (comfort index) | Mean | 9.1 | 12.5 | 9.9 | 10.6 |
| Std. Deviation | | 4.1 | 4.1 | 3.3 | 4.3 | |
| Social Capital | Sociable | % | 66.3 | 75.9 | 64.5 | 70.0 |
| | Trustful | % | 21.8 | 46.6 | 23.7 | 32.2 |
| | Religious | % | 11.3 | 11.9 | 7.5 | 11.1 |

Note: *More than 2 people per room

Source: own elaboration based on Montevideo QoL Neighborhood Survey (2007)

Tables 8, 9 and 10 show a number of dimensions that were taken into account in our neighbourhood survey questionnaire about the neighbourhood environment and a number of public services. Again, the situation in low stratum areas is considerable worse than in the high stratum zones. The problems with larger differences between both groups are: drug trafficking, rubbish in the streets, water pollution, vandalism, presence of gangs and air pollution. The only dimension that ranked higher in the high stratum neighbourhood was noise pollution (15% vs. 8%).

| Table 8: Group of variables that are expected to explain differences in QoL: Characteristics of the neighborhood | | | | | | | |
|---|------------------|---------------------|----------------|-------------------------|----------------------|------------------|--------------|
| | | Very serious | Serious | Not very serious | Not a problem | No answer | Total |
| Vandalism | Low-Medium low | 28.2 | 26.8 | 17.6 | 26.6 | 0.8 | 100.0 |
| | High-Medium high | 16.5 | 23.5 | 26.5 | 32.3 | 1.2 | 100.0 |
| | Others | 22.6 | 19.4 | 24.7 | 33.3 | 0.0 | 100.0 |
| | Total | 22.7 | 24.6 | 22.1 | 29.7 | 0.9 | 100.0 |
| Car theft or damage | Low-Medium low | 21.8 | 22.6 | 21.1 | 31.3 | 3.2 | 100.0 |
| | High-Medium high | 16.5 | 34.1 | 29.9 | 14.6 | 4.9 | 100.0 |
| | Others | 20.4 | 26.9 | 18.3 | 34.4 | 0.0 | 100.0 |
| | Total | 19.5 | 27.8 | 24.3 | 24.8 | 3.5 | 100.0 |
| Speeding and dangerous driving | Low-Medium low | 27.4 | 25.5 | 16.3 | 28.7 | 2.1 | 100.0 |
| | High-Medium high | 27.4 | 29.3 | 23.2 | 15.2 | 4.9 | 100.0 |
| | Others | 26.9 | 20.4 | 16.1 | 34.4 | 2.2 | 100.0 |
| | Total | 27.3 | 26.5 | 19.1 | 23.8 | 3.2 | 100.0 |
| People who you feel unsafe | Low-Medium low | 24.2 | 31.1 | 18.7 | 23.4 | 2.6 | 100.0 |
| | High-Medium high | 18.3 | 31.7 | 29.0 | 18.9 | 2.1 | 100.0 |
| | Others | 31.2 | 26.9 | 15.1 | 25.8 | 1.1 | 100.0 |
| | Total | 22.6 | 30.8 | 22.5 | 21.8 | 2.2 | 100.0 |
| Presence of gangs | Low-Medium low | 22.6 | 24.2 | 20.8 | 30.8 | 1.6 | 100.0 |
| | High-Medium high | 12.8 | 22.0 | 24.1 | 36.9 | 4.3 | 100.0 |
| | Others | 17.2 | 11.8 | 18.3 | 52.7 | 0.0 | 100.0 |
| | Total | 18.0 | 21.8 | 21.8 | 35.8 | 2.5 | 100.0 |
| Drug trafficking or drug sales | Low-Medium low | 36.8 | 23.9 | 12.4 | 17.9 | 8.9 | 100.0 |
| | High-Medium high | 17.4 | 22.9 | 15.2 | 27.7 | 16.8 | 100.0 |
| | Others | 28.0 | 12.9 | 16.1 | 32.3 | 10.8 | 100.0 |
| | Total | 27.8 | 22.2 | 14.0 | 23.6 | 12.4 | 100.0 |
| Rubbish in the streets | Low-Medium low | 21.1 | 19.5 | 18.2 | 40.3 | 1.1 | 100.0 |
| | High-Medium high | 6.7 | 17.1 | 20.4 | 55.2 | 0.6 | 100.0 |
| | Others | 23.7 | 19.4 | 9.7 | 45.2 | 2.2 | 100.0 |
| | Total | 15.5 | 18.5 | 18.1 | 46.9 | 1.0 | 100.0 |
| Graffiti | Low-Medium low | 4.2 | 10.8 | 18.4 | 63.4 | 3.2 | 100.0 |
| | High-Medium high | 2.4 | 7.6 | 24.4 | 64.3 | 1.2 | 100.0 |
| | Others | 5.4 | 7.5 | 17.2 | 66.7 | 3.2 | 100.0 |
| | Total | 3.6 | 9.1 | 20.7 | 64.2 | 2.4 | 100.0 |
| Air pollution | Low-Medium low | 16.6 | 14.5 | 14.5 | 52.9 | 1.6 | 100.0 |
| | High-Medium high | 7.3 | 12.5 | 20.4 | 57.6 | 2.1 | 100.0 |
| | Others | 7.5 | 23.7 | 12.9 | 55.9 | 0.0 | 100.0 |
| | Total | 11.7 | 14.7 | 16.7 | 55.2 | 1.6 | 100.0 |
| Water pollution | Low-Medium low | 16.6 | 12.6 | 10.5 | 58.4 | 1.8 | 100.0 |
| | High-Medium high | 5.2 | 5.2 | 11.3 | 76.8 | 1.5 | 100.0 |
| | Others | 7.5 | 6.5 | 3.2 | 81.7 | 1.1 | 100.0 |
| | Total | 10.9 | 8.9 | 10.0 | 68.7 | 1.6 | 100.0 |
| Noise pollution | Low-Medium low | 7.6 | 10.8 | 16.6 | 64.2 | 0.8 | 100.0 |
| | High-Medium high | 14.6 | 13.4 | 23.8 | 47.9 | 0.3 | 100.0 |
| | Others | 8.6 | 9.7 | 16.1 | 64.5 | 1.1 | 100.0 |
| | Total | 10.6 | 11.7 | 19.5 | 57.6 | 0.6 | 100.0 |

Source: own elaboration based on Montevideo QoL Neighborhood Survey (2007)

Table 9 shows variables at the neighborhood level with a focus on the provision of public goods. In these questions the possible answers were only “Yes” or “No”, except for “Satisfaction with police service” where the respondents were provided with the following answering scale: “Very satisfied”, “Satisfied”, “Not very satisfied” and “Not at all satisfied” (“Very satisfied”+“Satisfied” = “Yes” and “Not very satisfied”+“Not at all satisfied” = “No”) The only two dimensions in which people in low stratum seem to be more satisfied than individuals in high level neighborhoods are: access to “diary garbage collection” and security to “walk at night in their neighborhood”. According to the respondents the rest of public good provisions seem to be worse in low areas. This includes: sidewalks and pedestrian ways, public parks and green areas, sports infrastructure, police service, access to sewage, street pavement and street lightening. The two areas with the most sizeable differences are: satisfaction with public parks and green areas and the condition of sidewalks.

| Table 9: Group of variables that are expected to explain differences in QoL: Characteristics at the neighborhood level (cont.) | | | | | |
|---|------------------|------------|-----------|------------------|--------------|
| | | Yes | No | No answer | Total |
| Feel safe and secure | Low-Medium low | 52.1 | 43.9 | 3.9 | 100.0 |
| | High-Medium high | 48.2 | 48.2 | 3.7 | 100.0 |
| | Others | 51.6 | 48.4 | 0.0 | 100.0 |
| | Total | 50.4 | 46.2 | 3.4 | 100.0 |
| Satisfied with public transportation | Low-Medium low | 74.2 | 22.1 | 3.7 | 100.0 |
| | High-Medium high | 75.6 | 20.4 | 4.0 | 100.0 |
| | Others | 75.3 | 24.7 | 0.0 | 100.0 |
| | Total | 74.9 | 21.7 | 3.4 | 100.0 |
| Satisfied with public parks and green areas | Low-Medium low | 53.4 | 43.4 | 3.2 | 100.0 |
| | High-Medium high | 84.5 | 15.2 | 0.3 | 100.0 |
| | Others | 45.2 | 54.8 | 0.0 | 100.0 |
| | Total | 65.2 | 33.2 | 1.6 | 100.0 |
| Satisfied with sports infrastructure | Low-Medium low | 38.2 | 55.0 | 6.8 | 100.0 |
| | High-Medium high | 57.3 | 34.8 | 7.9 | 100.0 |
| | Others | 38.7 | 55.9 | 5.4 | 100.0 |
| | Total | 46.1 | 46.8 | 7.1 | 100.0 |
| Satisfied with police service | Low-Medium low | 31.1 | 62.4 | 6.6 | 100.0 |
| | High-Medium high | 44.2 | 43.0 | 12.8 | 100.0 |
| | Others | 43.0 | 53.8 | 3.2 | 100.0 |
| | Total | 37.8 | 53.4 | 8.7 | 100.0 |
| Access to sewage | Low-Medium low | 86.1 | 13.7 | 0.3 | 100.0 |
| | High-Medium high | 99.4 | 0.6 | 0.0 | 100.0 |
| | Others | 83.9 | 16.1 | 0.0 | 100.0 |
| | Total | 91.3 | 8.6 | 0.1 | 100.0 |
| Access to diary garbage collection | Low-Medium low | 20.3 | 79.2 | 0.5 | 100.0 |
| | High-Medium high | 19.2 | 78.0 | 2.7 | 100.0 |
| | Others | 40.9 | 58.1 | 1.1 | 100.0 |
| | Total | 22.2 | 76.3 | 1.5 | 100.0 |
| Access to waste disposal | Low-Medium low | 85.0 | 15.0 | 0.0 | 100.0 |
| | High-Medium high | 96.6 | 3.4 | 0.0 | 100.0 |
| | Others | 67.7 | 32.3 | 0.0 | 100.0 |
| | Total | 87.8 | 12.2 | 0.0 | 100.0 |
| Street pavement | Low-Medium low | 83.9 | 16.1 | 0.0 | 100.0 |
| | High-Medium high | 98.2 | 1.5 | 0.3 | 100.0 |
| | Others | 84.9 | 15.1 | 0.0 | 100.0 |
| | Total | 89.9 | 10.0 | 0.1 | 100.0 |
| Sidewalks in good shape | Low-Medium low | 48.4 | 50.8 | 0.8 | 100.0 |
| | High-Medium high | 85.7 | 14.3 | 0.0 | 100.0 |
| | Others | 53.8 | 46.2 | 0.0 | 100.0 |
| | Total | 64.3 | 35.3 | 0.4 | 100.0 |
| Access to drainage pipe | Low-Medium low | 75.0 | 23.7 | 1.3 | 100.0 |
| | High-Medium high | 96.0 | 3.4 | 0.6 | 100.0 |
| | Others | 86.0 | 14.0 | 0.0 | 100.0 |
| | Total | 84.9 | 14.2 | 0.9 | 100.0 |
| Street lightening | Low-Medium low | 85.5 | 14.2 | 0.3 | 100.0 |
| | High-Medium high | 97.6 | 2.1 | 0.3 | 100.0 |
| | Others | 89.2 | 10.8 | 0.0 | 100.0 |
| | Total | 90.9 | 8.9 | 0.2 | 100.0 |

Source: own elaboration based on Montevideo QoL Neighborhood Survey (2007)

Finally, we tried to complement the neighbourhood subjective view of the respondents with a more objective evaluation. The questionnaire asks the interviewer to rate a number of neighbourhood variables. Table 10 shows some of the most striking results. It seems to

be clear that the declared lack of satisfaction of the previous paragraphs in the low stratum area corresponds to the perception of the objective evaluators. Effectively, our interviewers verified that street lightening was available in a larger percentage in the high strata neighborhoods. The same for the following variables: less garbage in the streets, good paved sidewalks, higher number of trees and higher traffic.

| Table 10: Group of variables that are expected to explain differences in QoL: Characteristics of the neighborhood (cont.) as identified by the interviewer | | | | |
|---|------------------|------------|-----------|--------------|
| | | Yes | No | Total |
| Street lights | Low-Medium low | 87.6 | 12.4 | 100.0 |
| | High-Medium high | 99.7 | 0.3 | 100.0 |
| | Others | 83.9 | 16.1 | 100.0 |
| | Total | 92.1 | 7.9 | 100.0 |
| Garbage in the street | Low-Medium low | 15.0 | 85.0 | 100.0 |
| | High-Medium high | 9.5 | 90.5 | 100.0 |
| | Others | 26.9 | 73.1 | 100.0 |
| | Total | 14.1 | 85.8 | 100.0 |
| Good paved sidewalks | Low-Medium low | 13.0 | 87.0 | 100.0 |
| | High-Medium high | 54.1 | 45.9 | 100.0 |
| | Others | 21.5 | 78.5 | 100.0 |
| | Total | 30.8 | 69.2 | 100.0 |
| Good paved streets | Low-Medium low | 45.9 | 54.1 | 100.0 |
| | High-Medium high | 87.2 | 12.8 | 100.0 |
| | Others | 55.9 | 44.1 | 100.0 |
| | Total | 64.0 | 36.0 | 100.0 |
| Many trees | Low-Medium low | 33.2 | 66.8 | 100.0 |
| | High-Medium high | 53.7 | 46.3 | 100.0 |
| | Others | 37.6 | 62.4 | 100.0 |
| | Total | 42.1 | 57.9 | 100.0 |
| Constant Traffic | Low-Medium low | 12.1 | 87.9 | 100.0 |
| | High-Medium high | 36.3 | 63.7 | 100.0 |
| | Others | 25.8 | 74.2 | 100.0 |
| | Total | 23.6 | 76.4 | 100.0 |

Source: own elaboration based on Montevideo QoL Neighborhood Survey (2007)

5. Free time activities and reported satisfaction with free time

In this chapter we briefly introduce some descriptive statistics about free time activities, satisfaction with free time and factors that prevent respondents from doing the free time activities that they would like to do.

Table 11 shows the respondents reported satisfaction with the amount of free time disaggregated by the three sample strata (Low, High and “Others”). We can clearly see

that there are no differences in the reported satisfaction between the low and high groups (60% vs. 61% respectively are “Satisfied” and “Very satisfied” with the amount of free time that they currently have)

| Table 11: In general, would you say you are very satisfied, satisfied, not very satisfied or not at all satisfied with the amount of free time that you currently have? | | | | | |
|--|----------------|-----------|--------------------|----------------------|-----|
| | Very satisfied | Satisfied | Not very satisfied | Not at all satisfied | NA |
| Low-Medium low | 13.7 | 45.5 | 25.8 | 14.7 | 0.3 |
| High-Medium high | 14.6 | 46.3 | 28.4 | 10.7 | 0.0 |
| Others | 8.6 | 47.3 | 24.7 | 19.4 | 0.0 |

Source: own elaboration based on Montevideo QoL Neighborhood Survey (2007)

Table 12 gives us an idea of what people do in their free time. Respondents were asked to report how often they do each of the free time activities contained in the following list:

| Table 12: How often do you do each of the following activities in your free time? | | | | | | |
|--|------------------|-------|----------------------|-----------------------|------------------------------------|-------|
| | | Daily | Several times a week | Several times a month | Several times a year or less often | Never |
| Watch TV, DVD, Videos | Low-Medium low | 71.8 | 17.6 | 4.5 | 1.6 | 4.5 |
| | High-Medium high | 63.7 | 23.2 | 8.2 | 3.0 | 1.8 |
| | Others | 66.7 | 16.1 | 10.8 | 4.3 | 2.2 |
| Go to the movies | Low-Medium low | 0.0 | 0.3 | 2.6 | 20.3 | 76.6 |
| | High-Medium high | 0.0 | 1.2 | 15.5 | 47.0 | 36.3 |
| | Others | 0.0 | 0.0 | 8.6 | 22.6 | 68.8 |
| Go out shopping (for pleasure) | Low-Medium low | 1.1 | 5.5 | 20.8 | 22.9 | 49.7 |
| | High-Medium high | 0.9 | 7.9 | 29.6 | 30.2 | 31.1 |
| | Others | 4.3 | 6.5 | 24.7 | 17.2 | 47.3 |
| Read books | Low-Medium low | 11.1 | 10.3 | 9.5 | 15.5 | 53.4 |
| | High-Medium high | 19.8 | 16.5 | 15.2 | 24.1 | 23.8 |
| | Others | 9.7 | 12.9 | 5.4 | 20.4 | 51.6 |
| Attend cultural events | Low-Medium low | 0.0 | 1.3 | 5.8 | 21.6 | 70.8 |
| | High-Medium high | 0.0 | 3.0 | 12.2 | 45.4 | 39.3 |
| | Others | 0.0 | 0.0 | 6.5 | 29.0 | 64.5 |
| Get together with friends | Low-Medium low | 8.2 | 18.7 | 29.7 | 18.2 | 25.3 |
| | High-Medium high | 7.0 | 23.8 | 39.3 | 21.0 | 8.8 |
| | Others | 12.9 | 11.8 | 26.9 | 19.4 | 29.0 |
| Play cards or board games | Low-Medium low | 2.9 | 7.4 | 12.4 | 17.1 | 60.0 |
| | High-Medium high | 1.2 | 6.4 | 16.8 | 22.3 | 53.4 |
| | Others | 2.2 | 5.4 | 10.8 | 19.4 | 62.4 |
| Listen to music | Low-Medium low | 70.3 | 13.2 | 5.5 | 3.7 | 7.1 |
| | High-Medium high | 60.1 | 23.5 | 9.8 | 2.4 | 4.0 |
| | Others | 62.4 | 21.5 | 7.5 | 6.5 | 2.2 |
| Take part in physical activities | Low-Medium low | 11.6 | 15.0 | 10.0 | 5.5 | 57.6 |
| | High-Medium high | 14.6 | 29.3 | 14.6 | 10.4 | 31.1 |
| | Others | 10.8 | 16.1 | 8.6 | 8.6 | 55.9 |
| Attend sporting events | Low-Medium low | 0.3 | 4.2 | 11.8 | 14.5 | 69.2 |
| | High-Medium high | 0.3 | 4.3 | 11.0 | 23.8 | 60.7 |
| | Others | 0.0 | 1.1 | 11.8 | 18.3 | 67.7 |
| Do handicraft | Low-Medium low | 3.9 | 5.0 | 6.1 | 9.7 | 75.3 |
| | High-Medium high | 4.6 | 7.0 | 8.8 | 16.2 | 63.4 |
| | Others | 1.1 | 4.3 | 6.5 | 12.9 | 75.3 |
| Spend time on the internet/PC | Low-Medium low | 4.2 | 5.0 | 7.9 | 3.4 | 79.5 |
| | High-Medium high | 18.9 | 11.0 | 12.5 | 8.5 | 48.8 |
| | Others | 4.3 | 6.5 | 5.4 | 3.2 | 80.6 |

Source: own elaboration based on Montevideo QoL Neighborhood Survey (2007)

According to our respondents, the two most popular free time activities are: watching TV, DVD and Videos and listening to music, with almost no differences among strata. In all other free time activities, the percentage of respondents in the high neighborhood is higher compared to the other two strata (low and “Others”).

| Table 13: To what extent do the following conditions prevent you from doing the free time activities you would like to do? | | | | | | |
|---|------------------|-----------|-------------------|----------------|------------|-----|
| | | Very much | To a large extent | To some extent | Not at all | NA |
| Lack of facilities nearby | Low-Medium low | 18.2 | 24.2 | 21.8 | 34.5 | 1.3 |
| | High-Medium high | 8.5 | 10.1 | 26.5 | 54.3 | 0.6 |
| | Others | 21.5 | 18.3 | 24.7 | 35.5 | 0.0 |
| Lack of money | Low-Medium low | 32.6 | 34.7 | 15.3 | 16.8 | 0.5 |
| | High-Medium high | 14.9 | 25.0 | 34.8 | 24.4 | 0.9 |
| | Others | 28.0 | 37.6 | 12.9 | 21.5 | 0.0 |
| Personal health, age or disability | Low-Medium low | 10.3 | 9.2 | 11.1 | 67.6 | 1.8 |
| | High-Medium high | 7.6 | 8.5 | 17.1 | 65.9 | 0.9 |
| | Others | 7.5 | 8.6 | 11.8 | 71.0 | 1.1 |
| Need to take care of someone | Low-Medium low | 10.3 | 9.2 | 11.1 | 67.6 | 1.8 |
| | High-Medium high | 7.6 | 8.5 | 17.1 | 65.9 | 0.9 |
| | Others | 7.5 | 8.6 | 11.8 | 71.0 | 1.1 |
| Lack of time | Low-Medium low | 21.3 | 17.9 | 19.7 | 40.5 | 0.5 |
| | High-Medium high | 22.6 | 22.9 | 18.3 | 35.4 | 0.9 |
| | Others | 33.3 | 21.5 | 11.8 | 32.3 | 1.1 |

Source: own elaboration based on Montevideo QoL Neighborhood Survey (2007)

Finally, Table 13 explores the conditions that prevent respondents from doing the free time activities that they would like to do. Lack of money is the major reported cause in the low socioeconomic strata (33% vs. 15%), followed by lack of facilities nearby (18% vs. 9%). Lack of time was also mentioned as an inhibiting factor by 21% of low and 23% of high strata respondents.

6. General econometric strategy

In this paper we use rent information and subjective valuations of life domains to estimate the effect of individual features and neighborhood characteristics. The typical housing hedonic regression is:

$$\ln p_{ij} = \alpha + \beta' H_i + \gamma' Z_j + v_{ij} \quad (1)$$

where p_{ij} is the rental price of house i localized in neighborhood j , H_i is a vector of individual house features (number of rooms, quality of construction, square meters, etc.), Z_j is a vector of neighborhood j amenities (crime rate, green space, etc.), and v_{ij} is the composite error term which is a combination of a neighborhood-specific error component, and a house-specific error component $v_{ij} = d_j + \eta_i$.

The city specific error component (d_j) is common to all houses in the neighborhood, and represents systematic uncontrolled differences in amenity characteristics across sub-city areas. But it also may capture systematic uncontrolled differences in housing quality across neighborhoods. Any of these two factors would imply that the composite error term across houses within the same sub-city area will be correlated, implying a downwards bias to the OLS-based standard errors (Moulton 1987) that need to be corrected using clustered standard errors.

Personal or family characteristics like marital status, schooling, children's education gap are dimensions of QoL that affect the general well being of the population and many QoL domains but are likely not reflected in housing prices. The evaluation of overall happiness and other life domains as leisure time, social life, economic situation, family, work, health, neighborhood, housing is done through questions that run in the following way: "In general, you will say that you are very satisfied, satisfied, not very satisfied or not satisfied at all with your leisure time". By construction of the questionnaire information gathered in this way has a discrete distribution that may take four or five values according to the options given to the respondent. Running a linear regression as (1) will not be correct. The traditional approach is then to postulate a latent equation of the following form:

$$QoL_{ij}^{d*} = \text{constant} + \beta' H_i + \gamma' Z_j + \delta' X_i + v_{ij} \quad (2)$$

where QoL_{ij}^{d*} is a quality of life domain indicator and X_i is a vector of individual socioeconomic characteristics (schooling, health condition, etc.). The true valuation of the domain cannot be observed. For instance, the measure of the happiness will take four

values (not happy at all, somewhat not happy, somewhat happy, very happy) and it is assumed implicitly that those individuals whose happiness level is below a certain threshold μ_1 will be not happy at all, those between these value and a larger μ_2 will be somewhat not happy, those between μ_2 and an even larger μ_3 will be somewhat happy and finally those individuals with happiness level above μ_3 will answer very happy.

$$\begin{aligned}
 \text{QoL}^d_i = 1 & \text{ if } \text{QoL}^{d*}_i \leq \mu_1 && \text{Not happy at all} \\
 \text{QoL}^d_i = 2 & \text{ if } \mu_1 \leq \text{QoL}^{d*}_i \leq \mu_2 && \text{Somewhat not happy} \\
 \text{QoL}^d_i = 3 & \text{ if } \mu_2 \leq \text{QoL}^{d*}_i \leq \mu_3 && \text{Somewhat happy} \\
 \text{QoL}^d_i = 4 & \text{ if } \text{QoL}^{d*}_i \geq \mu_3 && \text{Very happy}
 \end{aligned} \tag{3}$$

Assuming that the error term is normally distributed across observations we have an order probit model that implies the following probabilities:

$$\begin{aligned}
 \text{Prob}(\text{QoL}^d_i = 1) &= \Phi(\alpha_1 - \beta' H_i + \gamma' Z_j + \delta' X_i), \\
 \text{Prob}(\text{QoL}^d_i = 2) &= \Phi(\alpha_2 - \beta' H_i + \gamma' Z_j + \delta' X_i) - \Phi(\alpha_1 - \beta' H_i + \gamma' Z_j + \delta' X_i), \\
 \text{Prob}(\text{QoL}^d_i = 3) &= \Phi(\alpha_3 - \beta' H_i + \gamma' Z_j + \delta' X_i) - \Phi(\alpha_2 - \beta' H_i + \gamma' Z_j + \delta' X_i), \\
 \text{Prob}(\text{QoL}^d_i = 4) &= 1 - \Phi(\alpha_3 - \beta' H_i + \gamma' Z_j + \delta' X_i)
 \end{aligned} \tag{4}$$

where $\Phi(\)$ is the normal cumulative distribution function.

Van Praag, and Ferrer-i-Carbonell (2008) argues that even in an order probit estimation there is to a certain extent an implicit cardinalization of the variable under study. Expanding on this idea he proposes a Probit Adapted OLS (POLS) method that is based on a transformation on the data that allows discrete choice variables as if they were distributed on the whole real line. The transformation consists first on deriving the values of a standard normal distribution that correspond to the cumulated frequencies of the ordinal dependent variable

$$\begin{aligned}\Phi(\mu_1) &= p_1 \\ \Phi(\mu_2) &= p_1 + p_2 \\ \Phi(\mu_3) &= p_1 + p_2 + p_3 \\ \Phi(\mu_4) &= p_1 + p_2 + p_3 + p_4\end{aligned}\tag{5}$$

where p_i is the proportion whose domain lines in the i -th bracket. The final step in the POLS methodology is the estimation of the conditional means for the variables under study.

The main advantage of POLS is that it requires less computing time and allows the application of more complex methods (systems of equations, fixed effects, etc.). The drawback is that for POLS a harsher normality assumption is needed. The results reported in van Praag (2008) suggest that POLS and OP shield almost the same effect except for a multiplication factor.

In order to facilitate comparison with other papers in this project we follow the POLS approach for all discrete choice domain satisfaction variables.

7. Results

7.a) Domain satisfaction

i. Satisfaction distribution

Table 14 reports the distribution of overall happiness and satisfaction with the following specific life domains: economic situation, family, social life, current work, health, leisure, housing and neighborhood (according to the respondent's subjective definition).

| Table 14. Quality of life domains | | | | | | | |
|-----------------------------------|------------------|----------------|--------------|-----------------------------------|----------------------|-------------------|-----------|
| | | Very happy | Fairly happy | Not very happy | Not at all happy | No answer | |
| Overall Happiness | Low-Medium low | 26.8 | 47.6 | 20.5 | 4.5 | 0.5 | |
| | High-Medium high | 31.4 | 56.4 | 11.0 | 0.6 | 0.6 | |
| | Others | 35.5 | 47.3 | 12.9 | 4.3 | 0.0 | |
| | Total | 29.7 | 51.2 | 15.7 | 2.9 | 0.5 | |
| | | Very satisfied | Satisfied | Neither satisfied or dissatisfied | Dissatisfied | Very dissatisfied | No answer |
| Economic situation | Low-Medium low | 3.2 | 29.7 | 21.1 | 31.8 | 14.2 | 0.0 |
| | High-Medium high | 5.5 | 40.2 | 21.6 | 25.0 | 7.3 | 0.3 |
| | Others | 5.4 | 32.3 | 24.7 | 22.6 | 15.1 | 0.0 |
| | Total | 4.4 | 34.3 | 21.7 | 28.0 | 11.5 | 0.1 |
| Family | Low-Medium low | 28.7 | 52.4 | 10.5 | 7.4 | 0.5 | 0.5 |
| | High-Medium high | 36.9 | 52.1 | 7.0 | 3.7 | 0.0 | 0.3 |
| | Others | 31.2 | 57.0 | 6.5 | 2.2 | 3.2 | 0.0 |
| | Total | 32.3 | 52.8 | 8.6 | 5.2 | 0.6 | 0.4 |
| Social life | Low-Medium low | 18.9 | 55.3 | 15.0 | 7.6 | 1.8 | 1.4 |
| | High-Medium high | 24.7 | 51.5 | 16.5 | 5.8 | .6 | 0.9 |
| | Others | 11.8 | 60.2 | 18.3 | 7.5 | 2.2 | 0.0 |
| | Total | 20.5 | 54.3 | 16.0 | 6.9 | 1.4 | 0.9 |
| Work | Low-Medium low | 10.0 | 54.0 | 17.6 | 13.0 | 5.4 | 0.0 |
| | High-Medium high | 16.3 | 55.3 | 14.0 | 10.7 | 3.7 | 0.0 |
| | Others | 17.9 | 50.0 | 17.9 | 5.4 | 8.9 | 0.0 |
| | Total | 13.5 | 54.1 | 16.1 | 11.2 | 5.1 | 0.0 |
| | | Excellent | Very good | Good | Fair | Poor | No answer |
| Health | Low-Medium low | 12.4 | 20.3 | 40.3 | 22.4 | 4.7 | 0.0 |
| | High-Medium high | 14.3 | 31.4 | 38.7 | 12.5 | 3.0 | 0.0 |
| | Others | 12.9 | 22.6 | 49.5 | 11.8 | 3.2 | 0.0 |
| | Total | 13.2 | 25.1 | 40.7 | 17.1 | 3.9 | 0.0 |
| | | Very satisfied | Satisfied | Not very satisfied | Not at all satisfied | No answer | |
| Leisure | Low-Medium low | 13.7 | 45.5 | 25.8 | 14.7 | 0.3 | |
| | High-Medium high | 14.6 | 46.3 | 28.4 | 10.7 | 0.0 | |
| | Others | 8.6 | 47.3 | 24.7 | 19.4 | 0.0 | |
| | Total | 13.5 | 46.1 | 26.7 | 13.6 | 0.1 | |
| Housing | Low-Medium low | 24.7 | 47.6 | 21.3 | 6.1 | 0.3 | |
| | High-Medium high | 39.6 | 44.8 | 12.5 | 3.0 | 0.0 | |
| | Others | 31.2 | 53.8 | 9.7 | 5.4 | 0.0 | |
| | Total | 31.6 | 47.2 | 16.4 | 4.7 | 0.1 | |
| Neighborhood | Low-Medium low | 25.0 | 48.9 | 18.4 | 7.1 | 0.5 | |
| | High-Medium high | 44.8 | 46.6 | 6.1 | 2.1 | 0.3 | |
| | Others | 18.3 | 51.6 | 21.5 | 8.6 | 0.0 | |
| | Total | 32.3 | 48.3 | 13.7 | 5.2 | 0.4 | |

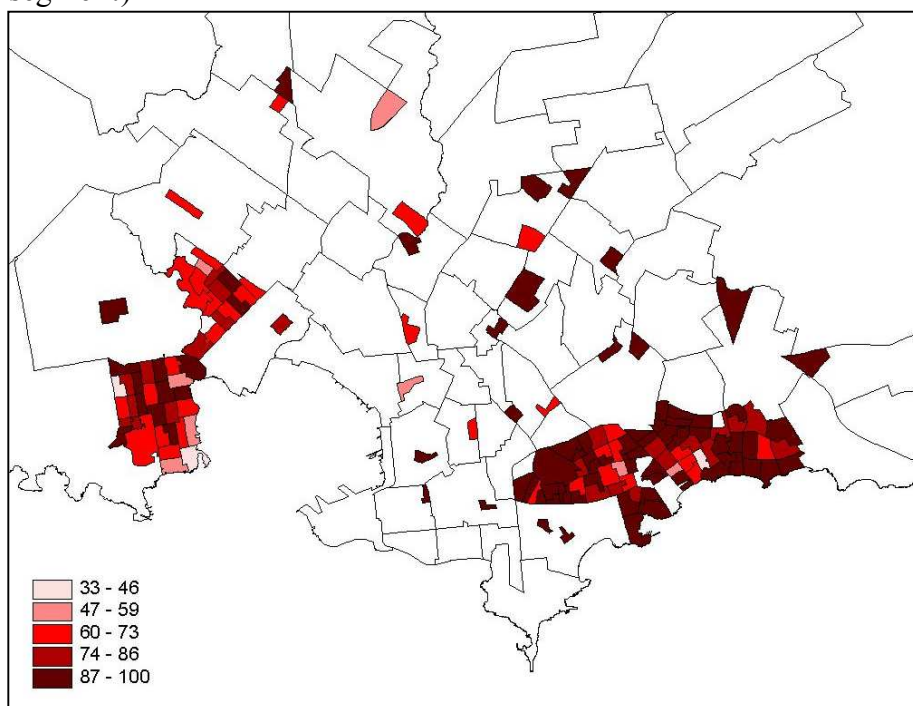
Source: own elaboration based on Montevideo QoL Neighborhood Survey (2007)

Looking at Table 14, we can see that in general respondents in the high QoL area tend to be more satisfied with all the life dimensions tested in the survey (“very satisfied” and “satisfied”). The dimensions that present the more striking differences are: satisfaction

with the neighborhood, health condition and housing. On the other hand leisure, social life and current work show the lower differences between high and low neighborhoods.

Figures 3 to 11 show the Zoom Window presented in Figure 4, and help us to graphically “grasp” the results described above. In order to being able to graphically show the data on maps, we had to calculate the percentage of “very satisfied” and “satisfied” per censal segment. Darker colors indicate higher percentage of satisfaction with the measured dimensions. In general, we can see that dark red is the predominant color in the high QoL area, while red and pink are more salient in the low QoL area. These differences are more easily seen in the following dimensions: Satisfaction with the neighborhood and satisfaction with the housing.

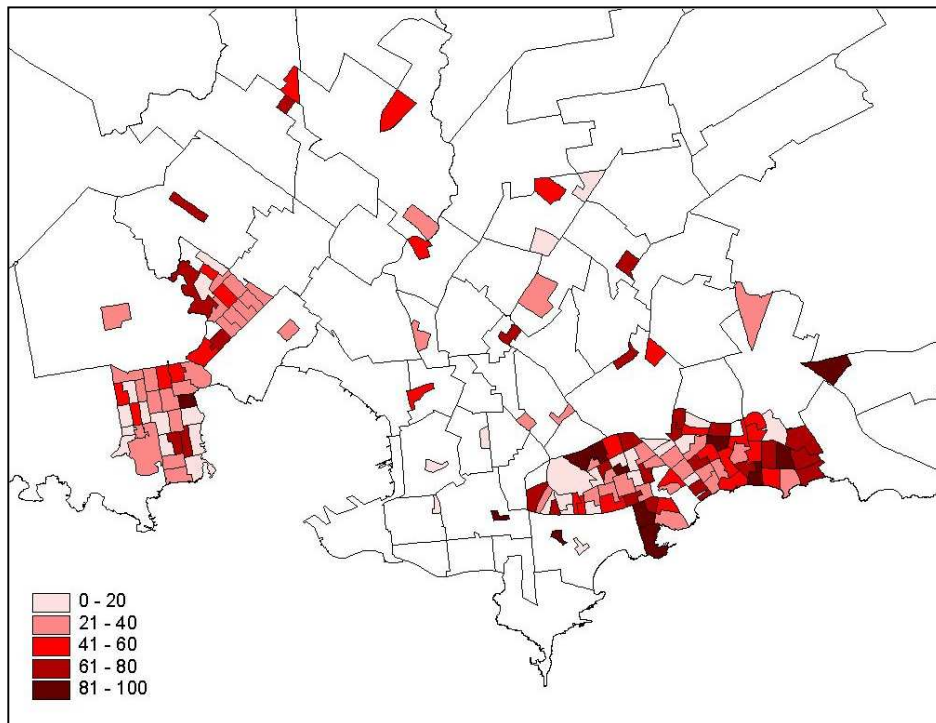
Figure 3: Overall Happiness (% of “Very satisfied” and “Satisfied” per censal segment)



Source: own elaboration based on Montevideo QoL Neighborhood (2007)

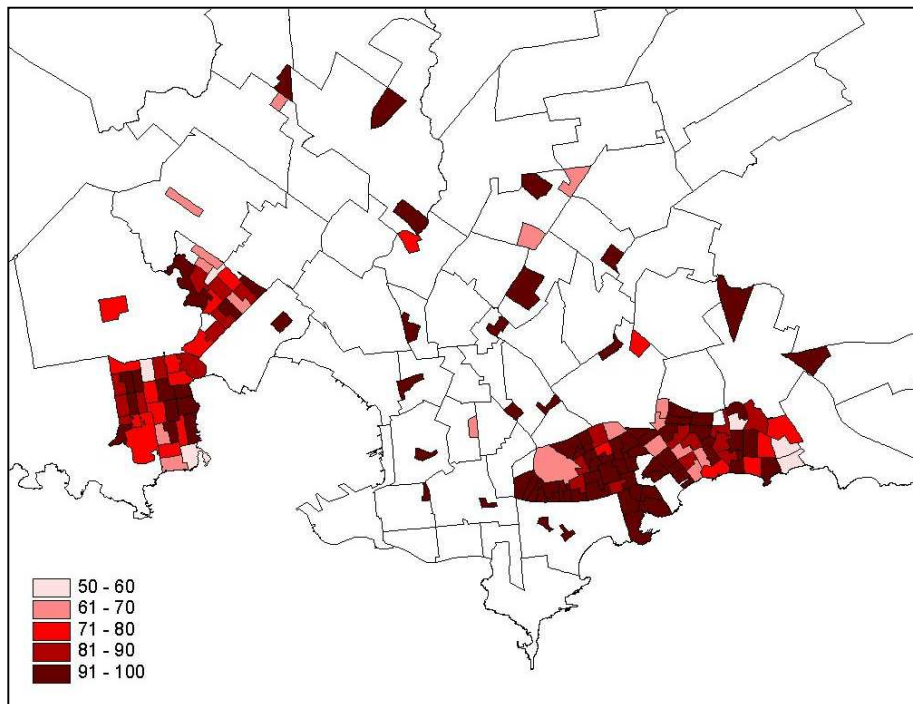


Figure 4: Satisfaction with the economic situation (% of “Very satisfied” and “Satisfied” per censal segment)



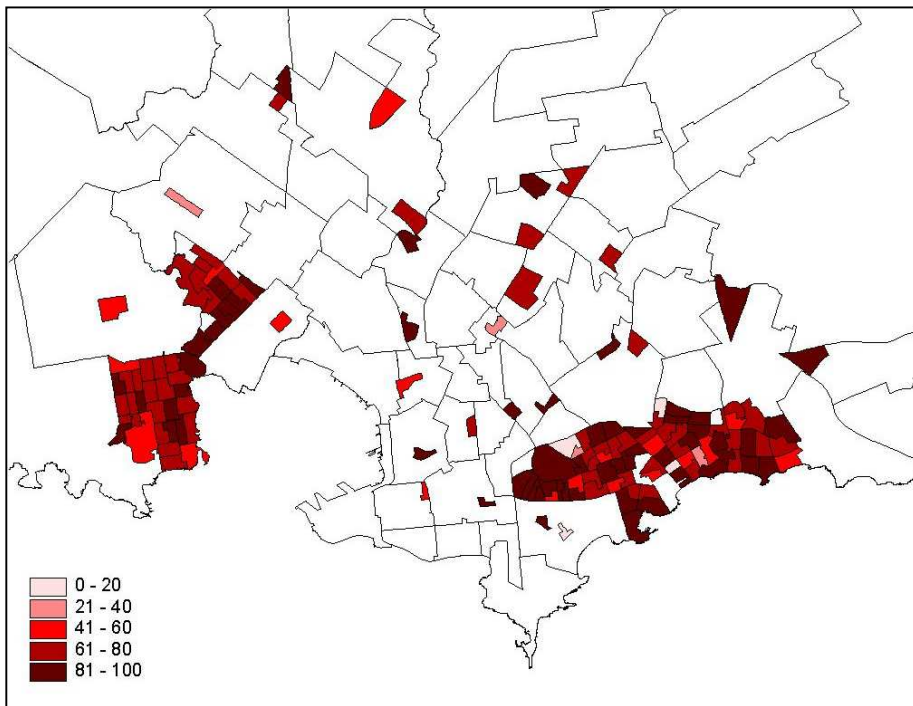
Source: own elaboration based on Montevideo QoL Neighborhood Survey (2007)

Figure 5: Satisfaction with family life (% of “Very satisfied” and “Satisfied” per censal segment)



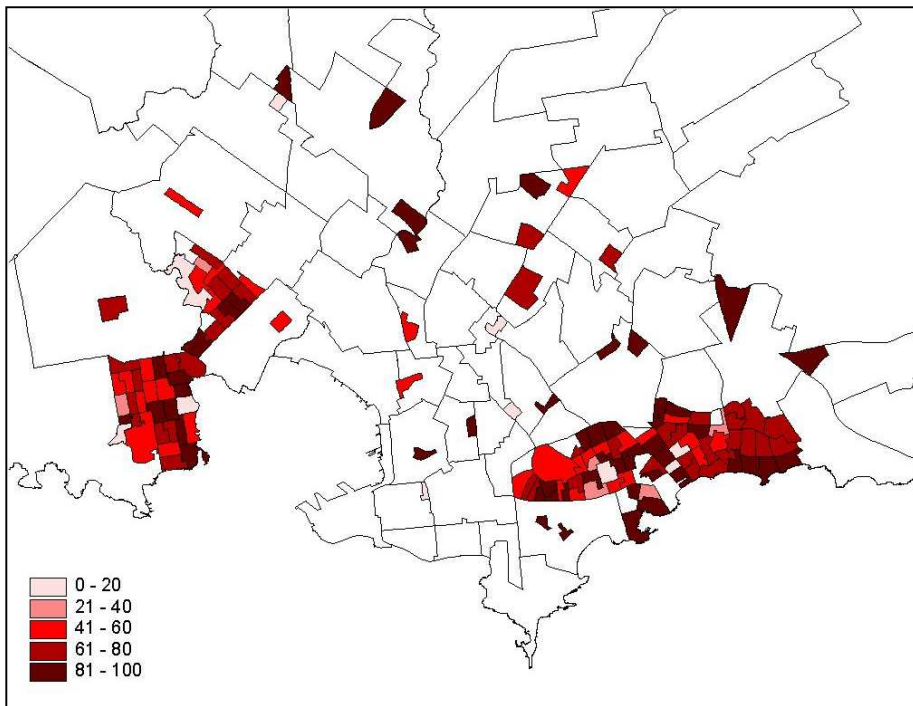
Source: own elaboration based on Montevideo QoL Neighborhood Survey (2007)

Figure 6: Satisfaction with social life (% of “Very satisfied” and “Satisfied” per censal segment)



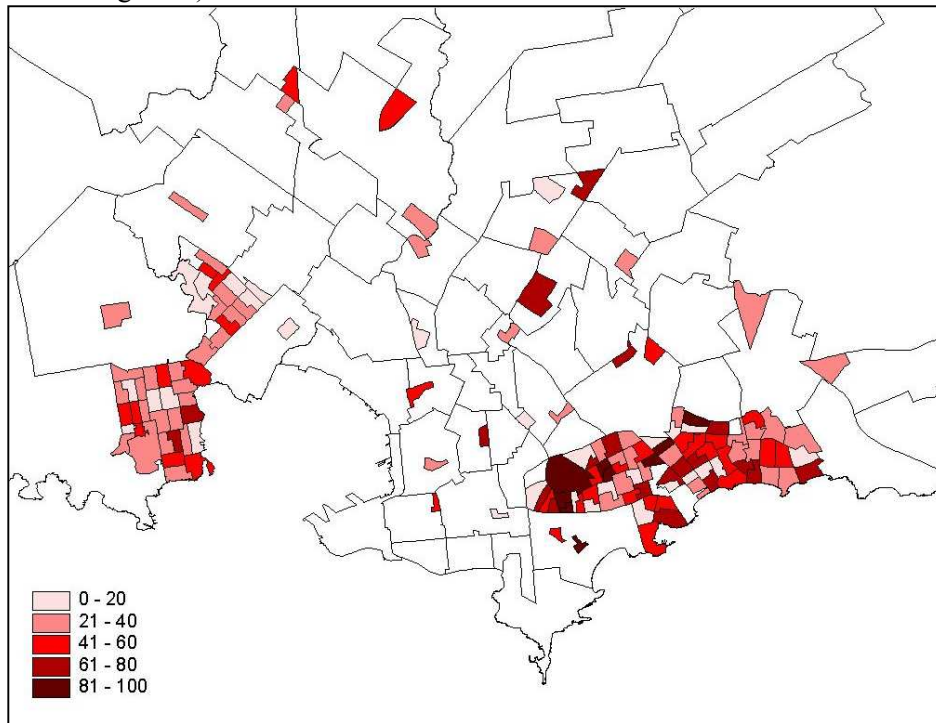
Source: own elaboration based on Montevideo QoL Neighborhood Survey (2007)

Figure 7: Satisfaction with the work situation (% of “Very satisfied” and “Satisfied” per censal segment)



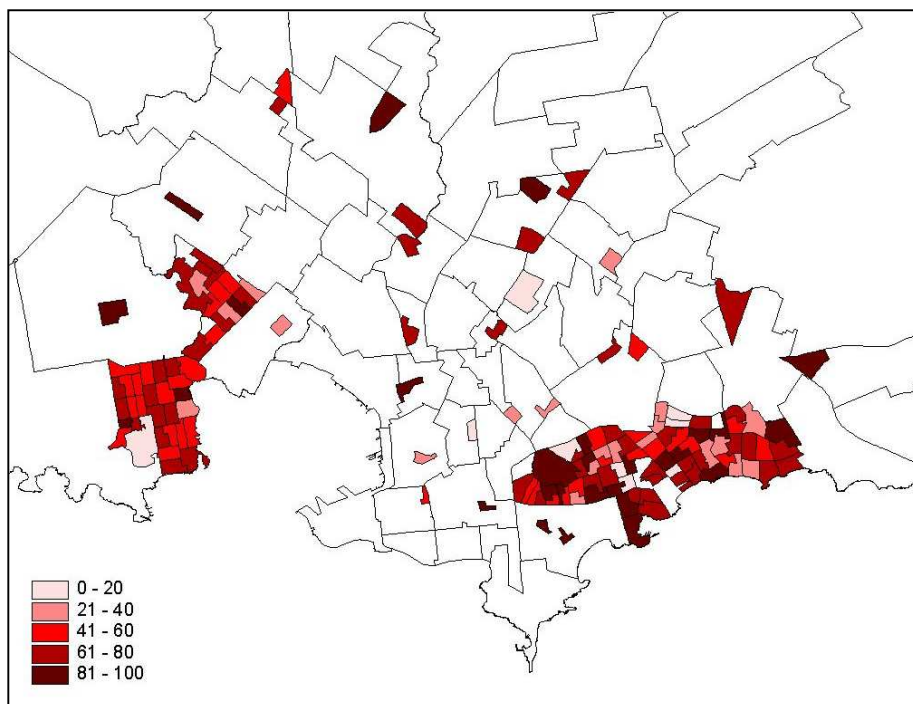
Source: own elaboration based on Montevideo QoL Neighborhood Survey (2007)

Figure 8: Satisfaction with the health condition (% of “Very satisfied” and “Satisfied” per censal segment)



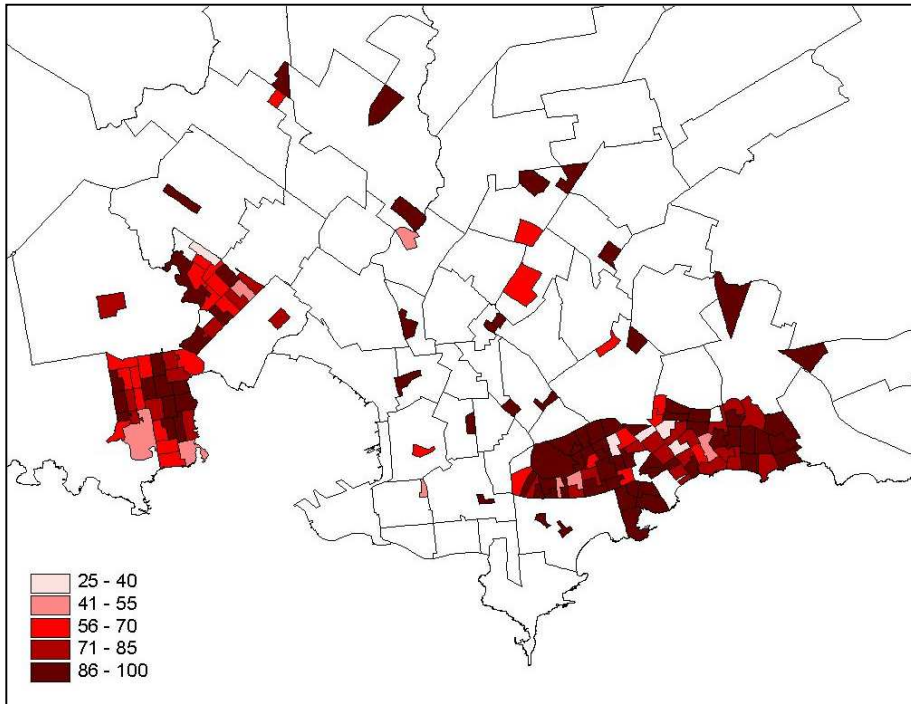
Source: own elaboration based on Montevideo QoL Neighborhood Survey (2007)

Figure 9: Satisfaction with Leisure time (% of “Very satisfied” and “Satisfied” per censal segment)



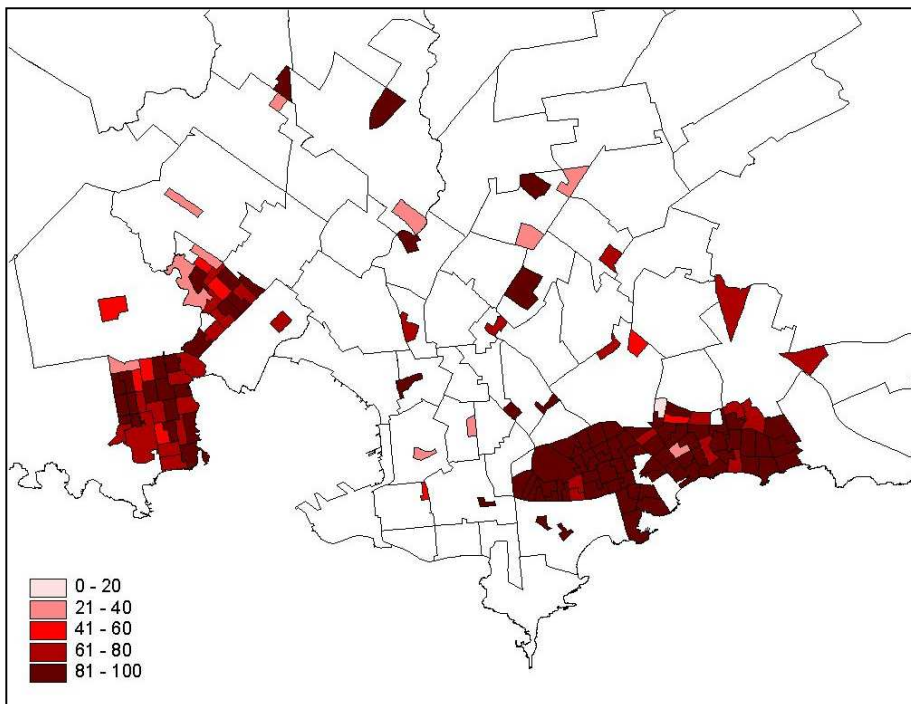
Source: own elaboration based on Montevideo QoL Neighborhood Survey (2007)

Figure 10: Satisfaction with housing (% of “Very satisfied” and “Satisfied” per censal segment)



Source: own elaboration based on Montevideo QoL Neighborhood Survey (2007)

Figure 11: Satisfaction with the neighborhood (% of “Very satisfied” and “Satisfied” per censal segment)



Source: own elaboration based on Montevideo QoL Neighborhood Survey (2007)

The question of what dimensions of day to day life impact the most on happiness cannot be explained by the simple descriptive analysis based on cross tables presented in this section, but needs to be addressed using econometric techniques.

ii. Determinants of life domains

We tried when possible to use a common set of explanatory variables in all domain regressions but in the disjunctive between a better fit or a common structure we favored the first criterion. That is why in some regressions we included squared terms and in others not. Domain satisfaction regressions are reported in Table 15.

We found age to be a significant determinant of all life domains. Starting at 18 years old, as people get older they tend to be less satisfied with their life. In three regressions: leisure, family and work we included a squared term that allowed us to estimate for these two a turning point for the age effect. The minimum satisfaction level is achieved at age 39 with respect to leisure, 46 with respect to family and 37 with respect to work.

The coefficient estimate of gender is negative in all regressions but statistically significant only for health and economic situation. This result is consistent with past research. Despite the fact that women live longer they tend to report worse health condition than men.⁶

Also in line with the previous literature we found positive effects of living with a partner with respect to the individual's evaluation of their family and of their health. Interesting, the positive impact in family satisfaction is produced by those that are married with their partner while those that live with a partner out of wedlock do not have a statistically significant different family satisfaction than single individuals. Family size was also found to be significant affect leisure satisfaction (negatively), family satisfaction (positively) and economic situation (negatively).

⁶ See for instance Verbrugge (1985) and Ross and Bird (1994).

With respect to education we found that more educated people tend to be less satisfied with their economic situation but more satisfied with their health. Given the results in the labor economics literature on education returns, we expected to find positive effects on work and economic situation. One possible interpretation for the negative and non significant coefficients is that the subjective valuation of work and economic situation are more affected by a sort of relative income (in relation to some expected income level given their education level) than by income in pure monetary terms as used in Mincerian regressions.

For the health regressions we included two special terms: BMI and a dummy if the individual has access to private health care. As expected we found that the larger the value of BMI the worse health satisfaction. Individuals that have access to a private health institution tend to be more satisfied with their health status.

We defined a series of individual characteristics that may affect various life domains. We classified a person as sociable when she prefers to spend most of her free time with other people or at least prefers to spend more of her free time with other people than alone. We considered someone to be workaholic when frequently or very frequently in his spare time he thinks about their work. We find that being sociable improves the satisfaction with social life and the satisfaction with family. On the contrary, being workaholic is associated with a worse leisure, social life, economic situation and work satisfaction. People that participate in sports tend to have a better leisure, social life and health satisfaction.

Leisure hours and work hours have the expected effects. Those individuals that in the last weekend had more hours of leisure were more satisfied with their leisure and social life dimensions of life, while those individuals that work more hours a week tend to have a better economic situation and work satisfaction. In the work satisfaction regression we got a negative statistically significant square term that in line with basic microeconomic theory it implies a decreasing marginal effect of an extra working hour.

With respect to income we find as expected a positive effect on leisure, social life, family and economic situation satisfaction. Also, those individuals with larger per our salary tend to be more satisfied with their work. We found no income effect on health satisfaction.

Finally, we experimented with the inclusion of various variables that could reflect neighborhood externalities and the effects of public goods but found disappointing results. In the Table 15 we report the effect of proximity to the Promenade, quality of green areas and public sports infrastructure. The distance from the Promenade was only significant for leisure satisfaction. Satisfaction with public parks and green areas is associated with better health and satisfaction with public sports infrastructure is associated with better leisure satisfaction.

To control for other neighborhood effects we included a dummy variable for the respondents of the high and medium-high neighborhood and for the respondent of the other control areas. This dummy variables should therefore be interpreted in relation to the individuals living in the poor and medium poor neighborhoods studied. These variables inform us that in general, the are not systematic neighborhood effects not captured by the other variables included in the regressions.

Table 15. Domain Satisfaction. (Source: own elaboration based on Montevideo QoL Neighborhood Survey (2007))

| | Leisure satisfaction | Social life satisfaction | Family satisfaction | Health satisfaction | Economic situation satisfaction | Work satisfaction |
|--|----------------------|--------------------------|---------------------|----------------------|---------------------------------|----------------------|
| ln(Age) | -9.344 (1.452)*** | -0.354 (0.078)*** | -1.911 (1.087)* | -0.582 (0.069)*** | -0.564 (0.093)*** | -6.753 (1.743)*** |
| ln(Age)^2 | 1.274 (0.194)*** | | 0.250 (0.156)* | | | 0.937 (0.235)*** |
| Turning point | 39 | | 46 | | | 37 |
| Woman | -0.025 (0.052) | 0.035 (0.068) | 0.058 (0.046) | -0.150 (0.086)* | -0.163 (0.060)*** | -0.019 (0.093) |
| Partner | 0.039 (0.045) | 0.013 (0.053) | | 0.191 (0.065)*** | | |
| Partner*Married | | | 0.350 (0.072)*** | | | |
| Partner*(1-Married) | | | 0.169 (0.124) | | | |
| ln(family size) | -0.188 (0.099)* | -0.037 (0.075) | 0.113 (0.057)* | -0.060 (0.092) | -0.442 (0.067)*** | |
| ln(years education) | -0.048 (0.054) | 0.016 (0.148) | -0.049 (0.072) | 0.137 (0.047)*** | -0.156 (0.070)** | -0.040 (0.148) |
| Body Mass Index | | | | -0.023 (0.009)** | | |
| Access to private health care | | | | 0.179 (0.088)** | | |
| Sociable | 0.016 (0.071) | 0.224 (0.067)*** | 0.125 (0.055)** | -0.020 (0.083) | | 0.098 (0.090) |
| Workaholic | -0.272 (0.082)*** | -0.252 (0.094)** | -0.116 (0.091) | -0.057 (0.065) | -0.140 (0.055)** | -0.175 (0.089)* |
| Practice sports | 0.108 (0.057)* | 0.228 (0.055)*** | | 0.259 (0.046)*** | | |
| ln(hours of leisure) | 0.219 (0.029)*** | 0.093 (0.034)*** | 0.043 (0.038) | 0.042 (0.028) | | |
| ln(work hours) | | | -0.011 (0.016) | | -0.045 (0.020)** | 1.254 (0.566)** |
| ln(work hours)^2 | | | | | | -0.132 (0.080)* |
| ln(monthly home income) | 0.093 (0.035)** | 0.088 (0.042)** | 0.176 (0.061)*** | 0.023 (0.037) | 0.458 (0.057)*** | |
| ln(per hour salary) | | | | | | 0.226 (0.055)*** |
| Ln (Distance to Promenade) | -0.127 (0.041)*** | -0.036 (0.063) | | -0.045 (0.054) | | |
| Satisfaction with public parks and green areas | -0.010 (0.075) | -0.027 (0.069) | | 0.108 (0.053)** | | |
| Satisfaction with public sports infrastructure | 0.154 (0.060)** | 0.024 (0.054) | | | | |
| High and medium-high stratum area | -0.152 (0.050)*** | -0.052 (0.045) | 0.111 (0.060)* | -0.022 (0.080) | -0.031 (0.090) | 0.068 (0.066) |
| Other areas | -0.065 (0.112) | -0.173 (0.093)* | 0.076 (0.102) | 0.118 (0.086) | 0.027 (0.103) | 0.124 (0.119) |
| Constant | 16.181 (2.766)*** | 0.218 (0.665) | 1.565 (-1.817) | 2.053 (0.727)*** | -0.997 (0.407)** | 8.168 (3.523)** |
| Observations | 703 | 700 | 728 | 679 | 750 | 475 |
| R-squared | 0.19 | 0.10 | 0.11 | 0.19 | 0.20 | 0.09 |

Clustered standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

7.b) Housing and Neighborhood

In Table 16 we present the evaluation of housing and neighborhood determinants. The first three columns present the results of the hedonic regressions (equation 1) where the explanatory variable is the log of the rental value. The following two columns present the result of the housing and neighborhood domain satisfaction.

In the first hedonic regression we considered individual household characteristics. Whenever possible the regressors were also included in logs. Given this log-log functional form used, the estimated coefficients are interpreted as elasticities. For instance the 0.349 coefficient for rooms implies that a house with double amount of rooms (an increase of 100%) implies a rent that is 34.9% higher. This elasticity seems to be rather low. In contrast the price-bathroom elasticity is much larger implying that a house with double amount of bathrooms is associated with a 85.3% larger rent. This specification can also be interpreted in terms of compensating differentials. An increase in the number of rooms implies a larger rent unless it is accompanied by a decrease in the number of bathrooms. In order not to alter the rent, our estimation suggests that

$$0.349 \cdot \ln(\text{Rooms}) + 0.853 \cdot \ln(\text{Bathrooms}) = 0 \quad \text{or}$$

$$-\ln(\text{Rooms}) = -\frac{0.853}{0.349} \cdot \ln(\text{Bathrooms}) = -2.444 \cdot \ln(\text{Bathrooms}). \quad \text{Considering}$$

infinitesimal changes we get the room-bathroom-rent elasticity of -2.444 .

House location was also found to be statistically significant. The farther away from the Promenade, the cheaper the rent. The distance variable is the log of the time it takes to get to the Promenade. The -0.096 elasticity implies that living at double the distance from the Promenade implies a 10% lower rent.

With respect to construction and conservation of the house we found that the houses with problems in their walls or floors have a statistically significant lower rent. Finally, having a kitchen for the exclusive use of the household (not having to share with anybody) is also associated with larger rent value.

The second column of Table 16 focuses on block and neighborhood level public goods and amenities. Some public goods as access to running water and access to sewage, were found to increase real estate prices. Also sidewalks in good condition and public street lighting are associated with larger rental value. On a negative side, rental value of houses in neighborhoods with garbage problems and with problems with the public transportation system tends to be lower.

We included also a series of other problems that people may suffer in their neighborhoods. These are dummy variables that take the value of 1 when the mentioned problem is considered to be a serious or very serious problem by the interviewee. The results of this regression are disappointing. We found no significant effects for vandalism, gangs or pollution.

The third column of Table 16 includes both the regressors of the first two columns. Of the house characteristics, roof condition is the only house characteristic that loses its statistical significance but the effects of public goods and neighborhood externalities practically vanishes.

As in the previous table we report the effect of two dummies to control for other neighborhood effects. Interesting, there are large and significant price differentials that remain unexplained in our regressions. Even after including the house and neighborhood variables we have that houses in the high and medium-high neighborhoods are associated with 50% larger rental values.

These results suggest that most variation in housing prices is determined by housing features. In order to get a more precise estimate we proceed to make a traditional analysis of variance (ANOVA)⁷ but in order to reduce the number of regressors in the ANOVA we perform previously a principal component analysis for the housing and neighborhood variables. The variables considered are those of Table 16.

⁷ See the appendix for details on how the ANOVA is computed.

In particular the housing variables are: the log of the distance to the promenade, the log of the number of rooms, the log of the number of bathrooms a dummy if the walls are not in good condition, a dummy if the roof is not in good condition, a dummy if the floor is not in good condition, a dummy if they have a kitchen for the exclusive use of household, a dummy if they have heater. The neighborhood variables are all dummy variables that reflect: access to running water system, access to sewage, access to drainage pipe, sidewalks in good condition, public street lightening, abundance of trees in the block, vandalism being a problem in the neighborhood, gangs being a problem in the neighborhood, garbage problems, water, air and sound pollution, satisfaction with public parks and green areas, satisfaction with public transportation, satisfaction with public sports infrastructure. We perform two exercises with respect to the area dummies (high-medium and other). It could be argued that this area dummies are capturing neighborhood effects that we are unable to measure with our long list of neighborhood variables and in this case it make sense to include them in the principal component analysis among the neighborhood variables. But since these variables are a measure of ignorance rather than knowledge it also make sense to treat them separately in the analysis of variance.

Columns A through D in Table 17 report the results of the analysis of variance and its sensitivity to the inclusion of up to four principal components for housing and neighborhood characteristics. It shows moderate gains of the inclusion of more than two components. Besides the traditional division of the total variance between the part actually explained by the model and the residuals we disaggregate the part explained by the model in the part of the variance that is explained by each term and the part that depends on the cross terms.

In exercise 1 we included the area dummies as part of the neighborhood principal components. Columns B, C and D show that the model is able to capture more than 50% of total price variations. According to column B 51% of this variation can be attributed directly to housing features and 20% to neighborhood characteristics (according to columns C and D 41% can be attributed to housing and 22% to neighborhood

components). The rest of the variation is due to cross terms of housing and neighborhood components.

In exercises 2 the area dummies are not included in the neighborhood principal component analysis but are included as independent regressors. Again there are minor gains of including more than two principal components and the regressions explain more than 50% (close to 60%) of the variation in rental prices. The main difference with the previous exercise is that the neighborhood components capture now only between 1 and 2% of total price variation. The comparison between the much larger variations attributed to neighborhood components in the first exercise points out that although there are sizeable neighborhood effects, we are unsuccessful in identifying and measuring them in this paper.

In the housing and neighborhood satisfaction regression (Table 16) we included, besides the house, public goods and neighborhood characteristics, some variables to control for individual characteristics as in the other domain regressions. With respect to age, satisfaction with the neighborhood and the house shows a U shape similar to leisure and work. From 18 years old the satisfaction in these two domains decreases with age until 36 and 43 respectively when the relationship is reversed. The sex of the respondent turned out to be not significant in these regressions either.

Similar to the hedonic regressions we find that individuals living in houses with more rooms and without construction problems are associated with better house satisfaction. Since house satisfaction is not measured in logs the coefficients cannot be interpreted as elasticities (they are sometimes called semi-elasticities) but the room-bathroom compensation analysis can be done. Interpreting Table 16 as indifference curves it implies that house satisfaction remains constant when room and bathroom changes are compensated in such a way that $0.315 - \ln(\text{Rooms}) + 0.217 - \ln(\text{Bathrooms}) = 0$. Considering infinitesimal changes the room-bathroom elasticity is -0.69 lower to what we got in the hedonic regression. The location of the house with respect the promenade

was found to significantly affect the satisfaction with the house with a semi-elasticity of about 0.075.

We found that public goods like public parks and public transportation have a positive effect in the neighborhood satisfaction and housing satisfaction. The number of trees in the block has an effect on the neighborhood domain but no effect on housing satisfaction. Neighborhood problems like vandalism, gangs, garbage problems and pollution have a negative impact on neighborhood satisfaction. Pollution also acts as negative externality decreasing housing satisfaction.

The dummies included to capture other neighborhood effects are significant. All other things equal, individual of high and medium-high neighborhoods have better neighborhood satisfaction but a worse housing satisfaction level than individuals in low and medium-low neighborhoods.

| Table 16. Hedonic and neighborhood regressions | | | | | |
|--|------------------------------|---|----------------------|----------------------|---------------------------|
| Documento de Trabajo - ISSN 1510-7477 | Hedonic regressions (lnrent) | | | Housing satisfaction | Neighborhood satisfaction |
| | House characteristics | Public goods neighborhood externalities | Total | | |
| In(Age) | | | | -4.792 (2.348)** | -3.139 (1.681)* |
| In(Age)^2 | | | | 0.639 (0.322)* | 0.438 (0.229)* |
| Turning point | | | | 43 | 36 |
| Woman | | | | 0.026 (0.035) | -0.002 (0.033) |
| In(family size) | | | | -0.361 (0.077)*** | 0.046 (0.095) |
| In(monthly home income) | | | | 0.227 (0.029)*** | 0.038 (0.025) |
| Ln (distance to Promenade) | -0.097 (0.029)*** | | -0.106 (0.024)*** | -0.075 (0.023)*** | |
| In(Rooms) | 0.355 (0.038)*** | | 0.365 (0.035)*** | 0.315 (0.054)*** | |
| In(Bathrooms) | 0.854 (0.159)*** | | 0.801 (0.177)*** | 0.217 (0.184) | |
| Walls not in good condition | -0.311 (0.065)*** | | -0.447 (0.077)*** | -0.432 (0.130)*** | |
| Roof not in good condition | -0.149 (0.066)** | | -0.103 (0.088) | -0.098 (0.154) | |
| Floor not in good condition | -0.378 (0.051)*** | | -0.367 (0.057)*** | -0.202 (0.082)** | |
| Kitchen exclusive for the household | 0.206 (0.091)** | | 0.160 (0.056)*** | 0.156 (0.221) | |
| Access to running water system | | 0.456 (0.254)* | 0.042 (0.110) | 0.130 (0.414) | 0.198 (0.286) |
| Access to sewage | | 0.374 (0.056)*** | 0.030 (0.052) | -0.098 (0.124) | -0.122 (0.089) |
| Access to drainage pipe | | 0.034 (0.052) | 0.061 (0.050) | -0.026 (0.107) | 0.124 (0.116) |
| Sidewalks in OK condition | | 0.156 (0.070)** | 0.047 (0.032) | 0.059 (0.100) | 0.049 (0.059) |
| Public street lightening | | 0.175 (0.070)** | 0.008 (0.066) | -0.209 (0.115)* | -0.083 (0.090) |
| Many trees in block | | 0.062 (0.043) | 0.035 (0.030) | 0.046 (0.057) | 0.204 (0.062)*** |
| Vandalism in neighborhood | | 0.050 (0.042) | 0.044 (0.032) | -0.126 (0.114) | -0.119 (0.042)*** |
| Gangs in neighborhood | | 0.037 (0.047) | -0.021 (0.042) | 0.046 (0.063) | -0.228 (0.087)** |
| Garbage problems in the neighborhood | | -0.075 (0.042)* | -0.048 (0.037) | 0.087 (0.062) | -0.142 (0.064)** |
| Pollution in the neighborhood | | 0.014 (0.043) | 0.004 (0.035) | -0.149 (0.052)*** | -0.120 (0.061)* |
| Satisfaction with public parks and green areas | | 0.113 (0.069) | 0.079 (0.055) | 0.094 (0.056)* | 0.239 (0.064)*** |
| Satisfaction with public transportation | | -0.183 (0.058)*** | -0.107 (0.050)** | 0.151 (0.049)*** | 0.206 (0.076)** |
| Satisfaction with public sports infrastructure | | -0.014 (0.052) | 0.035 (0.025) | -0.019 (0.064) | 0.123 (0.076) |
| High-Medium and high stratum area | 0.583 (0.051)*** | 0.683 (0.077)*** | 0.491 (0.043)*** | -0.150 (0.082)* | 0.227 (0.120)* |
| Other areas | 0.230 (0.068)*** | 0.275 (0.098)*** | 0.224 (0.063)*** | 0.076 (0.110) | -0.120 (0.183) |
| Constant | 7.061 (0.092)*** | 6.910 (0.252)*** | 7.047 (0.204)*** | 6.798 (3.965)* | 4.551 (-3.093) |
| Observations | 651 | 609 | 589 | 647 | 667 |
| R-squared | 0.61 | 0.43 | 0.63 | 0.18 | 0.19 |

Clustered standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%
Source: own elaboration based on Montevideo QoL Neighborhood Survey (2007)

| Table 17 Analysis of Variance – Hedonic regressions | | | | |
|--|-------|-------|-------|-------|
| Exercise 1. Area dummies included in the Neighborhood components | | | | |
| Source of Variation | A | B | C | D |
| Total | 278,0 | 278,0 | 278,0 | 278,0 |
| Residual | 207,7 | 128,6 | 122,6 | 122,4 |
| Model | 70,3 | 149,4 | 155,4 | 155,6 |
| Total Housing | 22,3 | 76,6 | 63,4 | 63,1 |
| <i>First pca housing</i> | 22,3 | 18,2 | 15,4 | 14,9 |
| <i>Second pca housing</i> | | 58,4 | 47,4 | 47,3 |
| <i>Third pca housing</i> | | | 0,7 | 0,8 |
| <i>Forth pca housing</i> | | | | 0,0 |
| Total Neighborhood | 21,6 | 29,4 | 33,7 | 33,9 |
| <i>First pca neighborhood</i> | 21,6 | 18,1 | 17,8 | 17,9 |
| <i>Second pca neighborhood</i> | | 11,3 | 11,7 | 11,7 |
| <i>Third pca neighborhood</i> | | | 4,2 | 4,1 |
| <i>Forth pca neighborhood</i> | | | | 0,2 |
| Cross terms | 26,4 | 43,4 | 58,3 | 58,6 |
| R squared | 0,253 | 0,537 | 0,559 | 0,560 |
| Exercise 2. Area dummies included as independent variables | | | | |
| Source of Variation | A | B | C | D |
| Total | 278,0 | 278,0 | 278,0 | 278,0 |
| Residual | 172,3 | 114,2 | 111,9 | 111,8 |
| Model | 128,6 | 163,8 | 166,1 | 166,2 |
| Total Housing | 8,5 | 68,9 | 60,6 | 59,2 |
| <i>First pca housing</i> | 8,5 | 12,6 | 12,5 | 12,5 |
| <i>Second pca housing</i> | | 56,3 | 47,5 | 46,0 |
| <i>Third pca housing</i> | | | 0,6 | 0,6 |
| <i>Forth pca housing</i> | | | | 0,0 |
| Total Neighborhood | 0,6 | 2,0 | 3,5 | 3,6 |
| <i>First pca neighborhood</i> | 0,6 | 0,8 | 1,0 | 1,0 |
| <i>Second pca neighborhood</i> | | 1,2 | 1,4 | 1,5 |
| <i>Third pca neighborhood</i> | | | 1,1 | 1,1 |
| <i>Forth pca neighborhood</i> | | | | 0,1 |
| Area dummies | 53,8 | 33,6 | 27,6 | 27,6 |
| <i>High-Medium and high stratum area</i> | 48,3 | 29,2 | 23,7 | 23,7 |
| <i>Other areas</i> | 5,5 | 4,4 | 3,8 | 3,9 |
| Cross terms | 119,5 | 92,9 | 102,0 | 103,5 |
| R squared | 0,463 | 0,589 | 0,598 | 0,598 |

7.c) Overall satisfaction determinants

Besides the various life domains we are interested in a summary variable of life as a whole. This general satisfaction measure should intuitively be the result of the satisfaction with the various life domains but before getting into the problems associated

with the aggregation approach we can proceed to estimate a model where the explanatory variables are the regressors of the domain satisfaction estimations. In Table 18 we may be capturing the direct effect of these variables on overall satisfaction or an indirect impact that is channeled through a domain satisfaction. We included in the overall satisfaction regression all the regressors of the domains equation of Tables 15 and 16.

As people become older they tend to be less satisfied with their overall satisfaction level. Although women were more dissatisfied with their health and economic situation, we found no gender significant effects on overall well being. With respect to family, having a partner significantly improves overall satisfaction but we found no effects of family size.

In the domain regressions, education was associated with better health satisfaction but with worse economic situation satisfaction. Overall, more educated people tend to be more satisfied with their life.

The sign and statistical significance of sociable and workaholic people are in line with the domain results. Lonely people and people that even in their spare time continue to think and to worry about work issues tend to be less happy. But the hours dedicated to leisure and to work that were significant in the domain satisfaction regressions had no significant effect for overall satisfaction.

The significance of the variables included for the house and neighborhood domains is as before weak. With respect to housing characteristics the number of rooms and the quality of the walls and floor have a significant impact. With respect to public goods and neighborhood externalities we found that access to running water system, and public street lightning are associated with happier individuals. Puzzling, individuals in neighborhoods that suffer more from vandalism problems are also more satisfied with their life.

Against the popular saying that “money cannot buy happiness” we found that the larger the monthly income the larger the overall satisfaction with life. The significance of the income variable allows us to measure the contributions of other variables in the regression in monetary terms. Thinking again in terms of compensating differentials an increase in an individual’s education needs to be done at the expense of a decrease in his income in order not to change his overall satisfaction. Our results suggest that $0.218 \cdot \ln(\text{years of education}) + 0.089 \cdot \ln(\text{monthly home income}) = 0$ which implies an income education elasticity of -2.4. An increase in 10% in education years must come at the expense of a reduction of 24% in income.

The same procedure can be used to value housing and neighborhood characteristics. The income-room elasticity is -2.4. According to Table 7 the average house in our data has 3.4 rooms. One extra (or less) room implies an increase (decrease) of about 30% in the number of rooms. Changes in the number of rooms are valued as much as 70% on the household income.

For dummy variables a similar procedure can be used. To estimate the increase in the income level to compensate someone from moving from a house without running water system we can consider the following equation $0.089 \ln(\text{income})_{\text{No water}} = 0.089 \ln(\text{income})_{\text{Water}} + 0.830$. Therefore the percentage change in income that compensates someone from not having access to running water equals $\frac{0.830}{0.089} = 9.3\%$. Similarly Street lightening in the block is valued as 3.7% of monthly home income.

| Table 18. Overall satisfaction | | | |
|---------------------------------------|----------------------|----------------------|----------------------|
| | All | Workers | Non workers |
| ln(age) | -0.506 (0.106)*** | -0.501 (0.100)*** | -0.523 (0.140)*** |
| Woman | -0.025 (0.040) | -0.049 (0.043) | 0.016 (0.055) |
| Partner | 0.352 (0.090)*** | 0.354 (0.090)*** | 0.330 (0.099)*** |
| ln(family size) | -0.278 (0.194) | -0.267 (0.190) | -0.190 (0.223) |
| ln(years education) | 0.218 (0.093)** | 0.229 (0.084)*** | 0.207 (0.125) |
| Body Mass Index | 0.005 (0.007) | 0.004 (0.007) | 0.003 (0.011) |
| Access to private health care | 0.001 (0.048) | 0.008 (0.052) | -0.122 (0.085) |
| Sociable | 0.139 (0.078)* | 0.143 (0.078)* | 0.137 (0.053)** |
| Workaholic | -0.202 (0.052)*** | -0.201 (0.061)*** | -0.271 (0.056)*** |
| Practice sports | 0.118 (0.076) | 0.105 (0.075) | 0.106 (0.089) |
| ln(hours of leisure) | -0.026 (0.053) | -0.035 (0.053) | 0.024 (0.056) |
| ln(work hours) | | 0.096 (0.137) | |
| ln(work hours)^2 | | -0.026 (0.031) | |
| ln(monthly home income) | 0.089 (0.042)** | 0.088 (0.040)** | 0.092 (0.061) |
| ln(distance to Promenade) | 0.000 (0.049) | 0.000 (0.048) | 0.009 (0.049) |
| ln(Rooms) | 0.215 (0.105)** | 0.213 (0.110)* | 0.205 (0.118)* |
| ln(Bathrooms) | 0.006 (0.216) | 0.009 (0.224) | -0.144 (0.171) |
| Walls not in good condition | -0.553 (0.218)** | -0.551 (0.219)** | -0.495 (0.320) |
| Roof not in good condition | 0.087 (0.062) | 0.078 (0.067) | 0.046 (0.080) |
| Floor not in good condition | -0.100 (0.047)** | -0.097 (0.044)** | -0.009 (0.059) |
| Kitchen exclusive for the household | -0.423 (0.490) | -0.399 (0.488) | -0.353 (0.480) |

Source: own elaboration based on Montevideo QoL Neighborhood Survey (2007)

| Table 18(cont.) | | | |
|--|--------------------|--------------------|--------------------|
| | All | Workers | Non workers |
| Access to running water system | 0.830 (0.407)** | 0.843 (0.416)* | 0.961 (0.632) |
| Access to sewage | -0.171 (0.171) | -0.180 (0.171) | -0.076 (0.220) |
| Access to drainage pipe | -0.010 (0.093) | 0.001 (0.092) | -0.225 (0.119)* |
| Sidewalks in OK condition | -0.058 (0.091) | -0.064 (0.090) | 0.008 (0.135) |
| Public street lightening | 0.330 (0.148)** | 0.331 (0.151)** | 0.321 (0.162)* |
| Many trees in block | -0.120 (0.106) | -0.121 (0.108) | -0.097 (0.127) |
| Vandalism in neighborhood | 0.113 (0.060)* | 0.113 (0.062)* | 0.045 (0.073) |
| Gangs in neighborhood | 0.026 (0.066) | 0.036 (0.067) | -0.022 (0.075) |
| Garbage problems in the neighborhood | -0.039 (0.066) | -0.028 (0.067) | -0.023 (0.064) |
| Pollution in the neighborhood | -0.063 (0.071) | -0.072 (0.072) | -0.030 (0.072) |
| Satisfaction with public parks and green areas | -0.034 (0.075) | -0.039 (0.071) | -0.070 (0.084) |
| Satisfaction with public transportation | 0.094 (0.065) | 0.095 (0.065) | -0.091 (0.068) |
| Satisfaction with public sports infrastructure | 0.087 (0.070) | 0.088 (0.070) | 0.088 (0.076) |
| High-medium and high stratum area | 0.025 (0.075) | 0.020 (0.076) | 0.026 (0.058) |
| Other areas | 0.166 (0.095)* | 0.165 (0.097)* | 0.291 (0.117)** |
| Constant | -0.200 (0.772) | -0.214 (0.784) | -0.100 (0.657) |
| Observations | 608 | 605 | 414 |
| R-squared | 0.19 | 0.19 | 0.19 |

Clustered standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Source: own elaboration based on Montevideo QoL Neighborhood Survey (2007)

As mentioned before overall satisfaction may be considered the result of aggregating many different domains. The interest on this aggregation approach is that not all of the domains may have the same weight and that there are implicit tradeoffs by which a worse situation in one domain can be compensated by an improvement in other. Therefore this exercise has potentially very interesting monitoring and policy implications.

Unfortunately, there is a methodological problem. One may be tempted to use POLS and regress overall evaluation on a list of domain satisfactions but in doing so it is possible to tint the results by the individuals' general common optimism or pessimism. Column 1 of Table 19 shows that people with better leisure, social life, family, health, economic situation satisfaction tend to have better overall life satisfaction. The only non significant terms are family and economic situation satisfaction for the subset of non workers. Although it sounds reasonable that those people that are satisfied with various domains of their life tend to have a better evaluation of life as a whole it also may be that this result is produced by a common psychological factor.

To control for this endogeneity problem, we follow three approaches. Van Praag, and Ferrere-i-Carbonell (2008) suggests to include a variable that could capture the common psychological trait. This variable is constructed applying principal component analysis to the covariance matrix of the domain satisfaction regression errors of Tables 15 and 16. The significance of the domains terms remains being high. Including this endogeneity control we only loose the significance of leisure for workers and economic situation for the whole database. Somewhat disappointing we found that the additional term ended being non-significance and therefore we must wonder how appropriate is to keep in the regression.

The second approach is similar in spirit to Van Praag and Ferrere-i-Carbonell (2008) suggestion but constructs the additional term in a different way. In Table 18 we present the estimation of the effect of various variables on overall satisfaction. If the regression is well specified and there are no other unobservable variables the common psychological trait must remain in the error term. In the third set of regressions of 19 we report the

aggregation regression including the residuals from the regressions reported in Table 18. We find in the three regressions that this term is positive and statistically significant as expected to be the impact of the common psychological factor. The overall fit of these regressions is (not surprisingly) the best with R-squared values of 90% but what is most interesting is that some of the domains remain statistically significant. According to our results, for the whole database: family, health and economic situation satisfaction and housing are associated with larger overall satisfaction.

The third and final intent approach to control for endogeneity is the classical instrumental variables technique where the instruments are the regressors of Tables 15 and 16 not included as independent variables in Table 19. For the whole database we found a positive association between leisure, family and health with overall satisfaction.

Looking at the three alternatives to control for endogeneity, one should note that family and health satisfaction have the most robust positive association with overall life satisfaction. On the contrary neighborhood satisfaction plays no role in overall satisfaction in any of our alternative procedures.

It may be argued that the effect of the socio economic variables included in Table 19 (age, gender, family size, income and area dummies) is included in the domain satisfaction variables. Table 20 in the appendix replicates the analysis of Table 19 without including these variables as independent regressors. The results remain unchanged.

Table 19. The Aggregation of satisfaction: alternatives to control for common psychological trait

| | Control for Endogeneity- Van Praag (pca to domain satisfaction residuals) | | | Control for Endogeneity (residuals of overall Satisfaction) | | | Instrumental Variables | | | | | |
|---------------------------------------|--|---------------------|---------------------|--|---------------------|--------------------|------------------------|----------------------|----------------------|---------------------|---------------------|--------------------|
| | All | Workers | Non workers | All | Workers | Non workers | All | Workers | Non workers | | | |
| ln(age) | -0.162 (0.113) | -0.137 (0.100) | -0.111 (0.182) | -0.188 (0.112) | -0.128 (0.073)* | -0.191 (0.291) | -0.356 (0.039)*** | -0.355 (0.034)*** | -0.437 (0.055)*** | -0.245 (0.164) | -0.092 (0.184) | -0.259 (0.279) |
| woman | 0.027 (0.029) | 0.014 (0.036) | 0.114 (0.069) | -0.014 (0.029) | 0.011 (0.047) | 0.030 (0.092) | -0.050 (0.015)*** | -0.059 (0.021)*** | 0.008 (0.038) | -0.001 (0.065) | 0.037 (0.064) | 0.111 (0.204) |
| ln(family size) | 0.132 (0.081) | 0.074 (0.043)* | 0.184 (0.230) | 0.112 (0.114) | 0.077 (0.107) | 0.085 (0.341) | 0.033 (0.024) | 0.008 (0.030) | 0.133 (0.067)* | -0.013 (0.128) | 0.071 (0.103) | 0.004 (0.416) |
| ln(monthly household income) | 0.012 (0.045) | 0.004 (0.030) | -0.013 (0.071) | 0.060 (0.074) | -0.022 (0.109) | 0.084 (0.158) | 0.167 (0.028)*** | 0.192 (0.016)*** | 0.106 (0.038)*** | 0.002 (0.094) | -0.012 (0.063) | -0.062 (0.152) |
| Leisure | 0.129 (0.024)*** | 0.056 (0.028)* | 0.245 (0.052)*** | 0.093 (0.025)*** | 0.048 (0.043) | 0.198 (0.097)* | 0.018 (0.012) | 0.023 (0.014) | 0.039 (0.018)** | 0.187 (0.089)** | 0.152 (0.100) | -0.095 (0.289) |
| Social life | 0.176 (0.041)*** | 0.169 (0.026)*** | 0.182 (0.082)** | 0.178 (0.036)*** | 0.185 (0.057)*** | 0.188 (0.073)** | 0.022 (0.014) | 0.031 (0.019) | 0.008 (0.025) | -0.197 (0.159) | 0.214 (0.144) | -0.216 (0.271) |
| Family | 0.167 (0.028)*** | 0.225 (0.043)*** | 0.075 (0.068) | 0.162 (0.046)*** | 0.226 (0.075)*** | 0.067 (0.080) | 0.049 (0.012)*** | 0.058 (0.016)*** | 0.032 (0.024) | 0.686 (0.113)*** | 0.332 (0.119)*** | 0.472 (0.209)** |
| Health | 0.171 (0.039)*** | 0.126 (0.053)** | 0.223 (0.063)*** | 0.164 (0.042)*** | 0.134 (0.047)*** | 0.194 (0.109)* | 0.037 (0.021)* | 0.042 (0.028) | 0.018 (0.025) | 0.422 (0.137)*** | 0.184 (0.170) | 0.424 (0.257) |
| Economic situation | 0.104 (0.042)** | 0.119 (0.038)*** | 0.070 (0.091) | 0.073 (0.051) | 0.156 (0.044)*** | -0.017 (0.145) | 0.030 (0.015)* | 0.035 (0.020)* | -0.000 (0.023) | -0.067 (0.163) | 0.046 (0.137) | 0.044 (0.284) |
| Work | | 0.071 (0.038)* | | | 0.102 (0.087) | | | -0.006 (0.019) | | | 0.143 (0.090) | |
| House | 0.046 (0.027)* | 0.056 (0.028)* | 0.012 (0.060) | 0.054 (0.052) | 0.071 (0.077) | 0.044 (0.096) | 0.022 (0.011)** | 0.014 (0.015) | 0.030 (0.021) | 0.101 (0.165) | 0.064 (0.161) | 0.455 (0.351) |
| Neighborhood | 0.049 (0.051) | 0.013 (0.046) | 0.125 (0.098) | 0.043 (0.047) | 0.017 (0.058) | 0.110 (0.121) | -0.007 (0.012) | -0.002 (0.010) | -0.016 (0.033) | -0.076 (0.127) | -0.187 (0.076)** | 0.267 (0.281) |
| First Principal Component | | | | 0.028 (0.054) | -0.035 (0.115) | 0.045 (0.187) | | | | | | |
| Overall satisfaction residuals | | | | | | | 0.949 (0.018)*** | 0.928 (0.023)*** | 0.948 (0.018)*** | | | |
| High-Medium-high area stratum area | 0.084 (0.046)* | 0.051 (0.059) | 0.198 (0.071)*** | 0.070 (0.059) | -0.002 (0.067) | 0.243 (0.088)** | 0.102 (0.029)*** | 0.071 (0.034)** | 0.074 (0.032)** | 0.036 (0.072) | 0.084 (0.098) | 0.016 (0.154) |
| Other areas | 0.200 (0.087)** | 0.286 (0.091)*** | 0.136 (0.148) | 0.230 (0.090)** | 0.295 (0.091)*** | 0.229 (0.182) | 0.195 (0.032)*** | 0.193 (0.033)*** | 0.289 (0.062)*** | 0.125 (0.135) | 0.312 (0.115)** | -0.027 (0.277) |
| Constant | 0.255 (0.597) | 0.337 (0.533) | 0.075 (0.845) | -0.057 (0.719) | 0.585 (0.943) | -0.394 (0.871) | -0.315 (0.287) | -0.512 (0.220)** | 0.419 (0.348) | 0.871 (0.954) | 0.312 (-1.036) | 1.477 (-1.194) |
| Observations | 737 | 481 | 256 | 598 | 390 | 191 | 601 | 407 | 191 | 598 | 407 | 191 |
| R-squared | 0.31 | 0.33 | 0.33 | 0.32 | 0.34 | 0.35 | 0.91 | 0.90 | 0.93 | 0.03 | 0.27 | |

Clustered standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

Source: own elaboration based on Montevideo QoL Neighborhood Survey (2007)

8. Conclusion

In this paper we analyze various dimensions of the quality of life of people living in Montevideo. Besides the official household surveys we conduct a specially designed neighborhood survey to address these issues. We found out that the satisfaction with various public goods and services at the neighborhood level play a minor role in the overall reported well being of individuals and in the satisfaction of life domains, such as leisure, social life, family, health, housing, neighborhood economic situation and work. This is not to say that individuals in low and high socioeconomic areas of the city enjoy the same quality of life. Quite the contrary, there are significant disparities in a wide range of indicators. Our results suggest that the differences in overall happiness and in domain satisfaction between individuals living in different areas are mostly due to differences in individual outcomes like education, health, labor situation and housing quality. Public goods, as those provided at the neighborhood level, were found to significantly affect the satisfaction with the neighborhood and to a lesser extent to improve rental values, but no other life dimension.

9. Some Policy Implications

Even when we have found out that the satisfaction with the measured public goods and services at the neighborhood level play a minor role in the overall reported well being of individuals and in the satisfaction of life domains, we would recommend to pay special attention to the following variables: public street lightening and vandalism. These two neighborhood level variables resulted significant in the Overall Satisfaction models and are believed to be related to public safety.

According to a number of public opinion polls conducted in Montevideo, feeling insecure is one of the most serious perceived problems by the population⁸. In this direction, we

⁸ Public Opinion Poll conducted by Interconsult and published in the Newspaper Ultimas Noticias, May 2008

would suggest to monitor a specific set of variables to capture these subjective feelings at the neighborhood level.

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Appendix A

Montevideo QoL Neighborhood Survey (2007): Sampling Design

One of the main advantages of conducting the QoL survey as a module of the 2007 ISSP survey is the synergies in the sample design. The research team designed and implemented a sample strategy that is a compromise between the two studies and that captures meaningful:

1. Country level averages (Montevideo vs. Rest of the country)⁹
2. City of Montevideo level averages, and also
3. Variations across main sub-city areas in Montevideo

The sample design combines the ISSP methodological requisites for a general population representative sample (representative of the Montevideo and Rest of the country); with the QoL survey requirement to field the questionnaire in at least two neighborhoods: one poor, low QoL area and the other in a rich, high QoL zone.

Based on the 2006 Household Surveys information on household income and unemployment rate, the National Statistical Institute (INE) classifies every censal segment in Montevideo using a 4-category socioeconomic indicator:

- 1) Low
- 2) Medium-Low
- 3) Medium-High
- 4) High

Every household is assigned to one of these four stratum according to the location of the dwelling. All household members get the same socioeconomic level classification, independently of their individual income and/or employment condition. Based on this procedure the National Statistical Institute has aggregated censal segments to match “real” neighborhood areas in the city of Montevideo, a total of 62 neighborhoods were identified.

⁹ In this paper we use data only for the City of Montevideo

Based on this secondary data, we redefined the map of neighborhoods in Montevideo to obtain bigger representative areas (extended neighborhoods). We aggregated censal segments in approximately 20 sub-city areas with a mean population of 60 thousands each. The new classification was conducted using cluster analysis, being the censal segments the unity of analysis. The key clustering variables were selected from the 2006 Household Survey; each variable seeks to represent some of the most relevant dimension of QoL (dwelling characteristics, subsistence capacity, health and education):

- 1) Segment average rent or implied rent (for owners).
- 2) Segment average per capita income
- 3) Segment unemployment rate
- 4) Percentage of people with health insurance per segment
- 5) Household educational level (head of household average years of education completed + partner average years of education completed) per segment

From this resulting classification we selected two representative areas (that included more than one neighborhood): one close to the first quartile and the other close to the third quartile of the per capita income and unemployment distributions. With this procedure we tried to avoid the selection of neighborhoods in both tails of the distribution.

The sample frame was the 2004 Population Census and the population universe was all adults (aged 18 years old or more) living in urban areas (cities with at least 5,000 inhabitants).

Once the two areas were selected, we selected an independent random sample of 385 cases in each plus 100 cases split in the rest of the city (Others). The effective sample size of 2007 ISSP survey will be around 1,500 cases in total: 770 cases in two representative areas of Montevideo, 100 in the rest of Montevideo (Others), 110 in Montevideo Metropolitan area and 520 in the Rest of the Country.

The design is a multi-stage stratification. Three major domains are represented:

1. Two areas in Montevideo
2. Metropolitan Area (Montevideo surroundings) and
3. Rest of the Country (cities with at least 5,000 inhabitants)

The re-classified neighborhoods in Montevideo plus three additional sub-city areas in the Metropolitan zone were the Primary Sampling Units (PSUs) in the first sampling stage. In a second stage two areas were selected in Montevideo and one sub-city area in the Metropolitan zone. This procedure allows us to gain representative sample of the two selected neighborhoods in Montevideo and Metropolitan Area as well.

In the third sampling stage, we implement the following procedure for each of the three selected PSU in Montevideo and Metropolitan Area:

1. Census zones (usually blocks) were selected by a systematic probability proportional to size (PPS) scheme (“size” being the number of population living in each block).
2. Four households were selected in each block
3. At the final sampling stage only one respondent was selected among all eligible household members using the approximately random rule of the “next birthday”.

In the Rest of the Country, twelve cities were selected via systematic PPS sampling (size being the number of population living in each city). Census Zones, households and the final respondent was selected in the same way as in Montevideo and Metropolitan Area.

Assuming a similar efficiency to that obtained with a simple random sample, this sample achieves a confidence interval of ± 5 , with an approximate confidence level of 95 for a population proportion close to 0.5, in all mentioned domains.

The survey was applied by professional interviewers, who were selected among the permanent team of the survey organization and were trained in the specific objectives and characteristics of this study. The coordinators of this project were in charge of selecting, training and supervising the interviewers. Finally, the survey instrument was applied using a face to face, paper and pencil mode.

Appendix B

Analysis of Variance – Table 17

The traditional analysis of variance decomposes the variation of the dependent variable in terms of deviation from its means.

Recall from equation (1) the traditional hedonic regression has the following form

$$\ln p_{ij} = \alpha + \beta' H_i + \gamma' Z_j + v_{ij} \quad (1)$$

where p_{ij} is the rental price of house i localized in neighborhood j , H_i is a vector of individual house features, Z_j is a vector of neighborhood j amenities, and v_{ij} is a error term.

Using principal component analysis it is possible to reduce the dimensionality of this problem capturing y those characteristics of the data that contribute most to its variance, by keeping lower-order principal components and ignoring higher-order ones. Considering only the first principal component for housing and neighborhood characteristics we have

$$y_{ij} = \alpha + \beta h_i + \gamma z_j + \varepsilon_{ij} \quad (2)$$

where to simplify notation we denoted the log or prices with the letter y and h and z are the first component of the housing and neighborhood variables.

Variation of the dependent variable can be defined in terms of deviation from its mean $(y_{ij} - \bar{y})$.¹⁰ The total variation of the dependent variables is the sum of the squared deviation:

$$SST = \sum_{i,j} (y_{ij} - \bar{y})^2 \quad (3)$$

¹⁰ $\bar{y} = \hat{\alpha} + \hat{\beta} \bar{h} + \hat{\gamma} \bar{z}$

that can be decomposed in the variation explained by the regression model and the part of the variation that remains in the error term.

$$\sum_{i,j} (y_{ij} - \bar{y})^2 = \sum_{i,j} (\hat{y}_{ij} - \bar{y})^2 + \sum_{i,j} \hat{\epsilon}^2 \quad (4)^{11}$$

SST
SSR
SSE

were \hat{y}_{ij} is the predicted value using the estimated parameters $(\hat{\alpha}, \hat{\beta}, \hat{\gamma})$. The traditional R squared statistic that is used to evaluate the fit of the model is the ratio between the regression sum of squared (SSR) and the total sum of squares (SST).

The part of the variation that is captured by the model can be divided between the part that is captured by each variable and by a set of cross terms. With only two independent variables as in equation (2) it turns out that

$$(\hat{y}_{ij} - \bar{y})^2 = [\hat{\beta}(h_{ij} - \bar{h}) + \hat{\gamma}(z_{ij} - \bar{z})]^2 \quad (5)$$

It is straightforward to show that the regression sum of squares is:

$$SSR = \sum_{i,j} (\hat{y}_{ij} - \bar{y})^2 = \hat{\beta}^2 \sum_{i,j} (h_{ij} - \bar{h})^2 + \hat{\gamma}^2 \sum_{i,j} (z_{ij} - \bar{z})^2 + 2\hat{\beta}\hat{\gamma} \sum_{i,j} (h_{ij} - \bar{h})(z_{ij} - \bar{z}) \quad (6)$$

From the derivation it is clear that as more independent terms are included in the regression there are more cross terms and potentially a lower fraction of the model total variance that can be directly attributed to its regressors.

¹¹ $\hat{y}_{ij} = \hat{\alpha} + \hat{\beta}h_{ij} + \hat{\gamma}z_{ij}$

Table 20. The Aggregation of satisfaction: alternatives to control for common psychological traits

| | Control for Endogeneity- Van Praag (pca to domain satisfaction residuals) | | | Control for Endogeneity (residuals of overall Satisfaction) | | | Instrumental Variables | | | | | |
|--------------------------------|--|---------------------|---------------------|--|---------------------|---------------------|------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | All | Workers | Non workers | All | Workers | Non workers | All | Workers | Non workers | | | |
| Leisure | 0.104 (0.024)*** | 0.056 (0.026)** | 0.210 (0.048)*** | 0.089 (0.026)*** | 0.035 (0.041) | 0.211 (0.071)*** | -0.008 (0.016) | 0.015 (0.016) | 0.017 (0.022) | 0.144 (0.086) | 0.138 (0.098) | -0.121 (0.203) |
| Social life | 0.190 (0.038)*** | 0.170 (0.024)*** | 0.212 (0.089)** | 0.224 (0.050)*** | 0.177 (0.038)*** | 0.309 (0.107)*** | 0.038 (0.012)*** | 0.049 (0.018)** | 0.039 (0.034) | -0.189 (0.130) | 0.136 (0.116) | -0.108 (0.216) |
| Family | 0.178 (0.027)*** | 0.228 (0.041)*** | 0.098 (0.069) | 0.218 (0.038)*** | 0.218 (0.050)*** | 0.190 (0.131) | 0.068 (0.013)*** | 0.089 (0.014)*** | 0.016 (0.041) | 0.610 (0.102)*** | 0.367 (0.101)*** | 0.352 (0.176)* |
| Health | 0.199 (0.026)*** | 0.140 (0.051)*** | 0.246 (0.054)*** | 0.220 (0.027)*** | 0.138 (0.054)** | 0.311 (0.058)*** | 0.099 (0.016)*** | 0.084 (0.029)*** | 0.097 (0.030)*** | 0.568 (0.093)*** | 0.230 (0.130)* | 0.479 (0.121)*** |
| Economic situation | 0.113 (0.036)*** | 0.130 (0.035)*** | 0.050 (0.063) | 0.122 (0.037)*** | 0.162 (0.034)*** | 0.034 (0.068) | 0.102 (0.010)*** | 0.119 (0.021)*** | 0.018 (0.036) | -0.022 (0.127) | 0.085 (0.119) | 0.013 (0.136) |
| Work | | 0.071 (0.032)** | | | 0.088 (0.064) | | | -0.008 (0.022) | | | 0.106 (0.069) | |
| House | 0.046 (0.024)* | 0.058 (0.029)* | 0.032 (0.054) | 0.091 (0.039)** | 0.066 (0.047) | 0.125 (0.076) | 0.036 (0.013)*** | 0.031 (0.022) | 0.062 (0.027)** | 0.101 (0.167) | 0.082 (0.113) | 0.405 (0.280) |
| Neighborhood | 0.045 (0.047) | 0.002 (0.043) | 0.130 (0.084) | 0.056 (0.044) | -0.002 (0.054) | 0.128 (0.096) | -0.002 (0.023) | -0.005 (0.020) | -0.026 (0.049) | -0.099 (0.108) | -0.184 (0.076)** | 0.214 (0.192) |
| First Principal Component | | | | -0.076 (0.052) | -0.010 (0.066) | -0.184 (0.104)* | | | | | | |
| Overall satisfaction residuals | | | | | | | 0.907 (0.023)*** | 0.874 (0.029)*** | 0.894 (0.022)*** | | | |
| Constant | 0.006 (0.021) | 0.034 (0.029) | -0.080 (0.050) | 0.000 (0.027) | 0.045 (0.038) | -0.116 (0.075) | -0.004 (0.029) | 0.040 (0.027) | -0.073 (0.034)** | -0.022 (0.022) | 0.043 (0.051) | -0.013 (0.092) |
| Observations | 781 | 501 | 280 | 598 | 390 | 191 | 601 | 407 | 191 | 598 | 407 | 191 |
| R-squared | 0.30 | 0.31 | 0.32 | 0.30 | 0.32 | 0.34 | 0.86 | 0.86 | 0.86 | | | |

Clustered standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

Source: own elaboration based on Montevideo QoL Neighborhood Survey (2007)