### Supplementary Materials: Socioeconomic Inequalities in Green Space Quality and Accessibility—Evidence from a Southern European City

Elaine Hoffimann, Henrique Barros and Ana Isabel Ribeiro *

#### Table S1. Included and excluded items and recodification criteria.

<table>
<thead>
<tr>
<th>Item</th>
<th>Status</th>
<th>Recodification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>General information</td>
<td></td>
</tr>
<tr>
<td>1. Reference</td>
<td>Excluded</td>
<td>-</td>
</tr>
<tr>
<td>2. Address</td>
<td>Excluded</td>
<td>-</td>
</tr>
<tr>
<td>3. Area</td>
<td>Included</td>
<td>Dichotomized according to the median value</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = larger</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 = smaller</td>
</tr>
<tr>
<td>4. Postcode</td>
<td>Excluded</td>
<td>-</td>
</tr>
<tr>
<td>5. Geocode (X,Y)</td>
<td>Excluded</td>
<td>-</td>
</tr>
<tr>
<td>6. Year of establishment of POS:</td>
<td>Excluded (24% missing info)</td>
<td>-</td>
</tr>
<tr>
<td>7. Type of usage</td>
<td>Included</td>
<td>Sum of the number of offered activities and then dichotomized according to the median value:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = ≥2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 = ≤1</td>
</tr>
<tr>
<td>8. For what type of activities is the space designed?</td>
<td>Included</td>
<td>Level of appropriateness to physical activities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sum of the Likert scale and then dichotomized according to the median value:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 = low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = high</td>
</tr>
<tr>
<td>9. Is the POS on the beach/river foreshore?</td>
<td>Excluded</td>
<td>(could artificially overestimate socioeconomic inequalities)</td>
</tr>
<tr>
<td>10. Are there water features within the POS?</td>
<td>Included</td>
<td>Not required</td>
</tr>
<tr>
<td>11. Type of water feature</td>
<td>Included</td>
<td>Sum of the number of water features and then dichotomized according to the median value:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = ≥2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 = 1</td>
</tr>
<tr>
<td>12. Estimate the percentage of the POS occupied by the water feature(s)?</td>
<td>Excluded</td>
<td>(all green spaces had up to 25%)</td>
</tr>
<tr>
<td>13a. Are there other aesthetic features in the POS?</td>
<td>Included</td>
<td>Not required</td>
</tr>
</tbody>
</table>

*Corresponding author.*

**References:**

1. Reference
2. Address
3. Area
4. Postcode
5. Geocode (X,Y)
6. Year of establishment of POS:
7. Type of usage
8. For what type of activities is the space designed?
9. Is the POS on the beach/river foreshore?
10. Are there water features within the POS?
11. Type of water feature
12. Estimate the percentage of the POS occupied by the water feature(s)?
13a. Are there other aesthetic features in the POS?
<table>
<thead>
<tr>
<th>Question</th>
<th>Included/Excluded</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>13b. Which of the following features are present?</td>
<td>Included</td>
<td>Sum of the number of aesthetic features and then dichotomized according to the median value:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = ≥2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 = 1</td>
</tr>
<tr>
<td>14. Are there trees in this POS?</td>
<td>Excluded</td>
<td>(all green spaces had trees)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Estimate the approximate number of trees present</td>
<td>Included</td>
<td>A measure of tree density was computed according to a classification matrix based on the green space size (terciles of area) and number of trees, as follows:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 = large size areas with 1-100 trees plus medium size areas with 1-50 trees.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = large size areas with more than 100 trees plus medium size areas with more than 50 trees plus small size areas</td>
</tr>
<tr>
<td>16. Where are the trees placed?</td>
<td>Excluded</td>
<td>(unpredictable impact in green space use)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Are there gardens in this POS?</td>
<td>Included</td>
<td>Not required</td>
</tr>
<tr>
<td>18a. Are there walking paths or cycleways within or around the POS?</td>
<td>Included</td>
<td>1 = paths (walking or dual use)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 = no paths</td>
</tr>
<tr>
<td>18b. Shade along paths</td>
<td>Included</td>
<td>1 = very good, good or medium</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0= no paths / poor or very poor</td>
</tr>
<tr>
<td>19. Describe the placement of paths within the POS</td>
<td>Excluded</td>
<td>(unpredictable impact in green space use)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Is there evidence that the grass is watered?</td>
<td>Included</td>
<td>1 = Yes (at all times, at certain times or not specified)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0= No</td>
</tr>
<tr>
<td>21. Are dogs allowed?</td>
<td>Included</td>
<td></td>
</tr>
<tr>
<td>22. Is access for dogs:</td>
<td>Excluded</td>
<td>(unpredictable impact in green space use)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. Is graffiti present?</td>
<td>Included</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 = Yes</td>
</tr>
<tr>
<td>24. Is vandalism evident?</td>
<td>Included</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 = Yes</td>
</tr>
<tr>
<td>25. Is there litter throughout the POS?</td>
<td>Included</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 = Yes</td>
</tr>
<tr>
<td>Domain: Amenities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. Is children’s play equipment present?</td>
<td>Included</td>
<td>Sum of the number of play equipment features and then dichotomized according to the median value:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = ≥6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 = ≤5</td>
</tr>
<tr>
<td>27. What items of play equipment are present?</td>
<td>Included</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28. What is the playground surface?</td>
<td>Excluded</td>
<td>(unpredictable impact in green space use)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Included/Excluded</td>
<td>Comment</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>-------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>29. Is playground shaded?</td>
<td>Excluded (all were shaded)</td>
<td>-</td>
</tr>
<tr>
<td>30. Are barbecues present?</td>
<td>Excluded (absent in all green spaces)</td>
<td>-</td>
</tr>
<tr>
<td>31. Are picnic tables present?</td>
<td>Included</td>
<td>Not required</td>
</tr>
<tr>
<td>32a. Are there parking facilities serving the POS?</td>
<td>Included</td>
<td>Not required</td>
</tr>
<tr>
<td>32b. Estimate the number of bays</td>
<td>Excluded (proportional to the park size)</td>
<td>-</td>
</tr>
<tr>
<td>33. Are there public access toilets?</td>
<td>Included</td>
<td>Not required</td>
</tr>
<tr>
<td>34. Is there a kiosk/café present?</td>
<td>Included</td>
<td>1 = 7 days per week/weekdays only/weekends only 0 = No</td>
</tr>
<tr>
<td>35. Is there access to public transport within one block of POS?</td>
<td>Excluded (present in all green spaces)</td>
<td>-</td>
</tr>
<tr>
<td>36. Is there seating present?</td>
<td>Included</td>
<td>Not required</td>
</tr>
<tr>
<td>37. Are there clubrooms/meeting rooms present?</td>
<td>Included</td>
<td>Not required</td>
</tr>
<tr>
<td>38. Are rubbish bins present?</td>
<td>Included</td>
<td>Not required</td>
</tr>
<tr>
<td>39. Are dog litter bags provided?</td>
<td>Included</td>
<td>Not required</td>
</tr>
<tr>
<td>40. In how many locations in POS are dog litter bags present?</td>
<td>Excluded (proportional to the park size)</td>
<td>-</td>
</tr>
<tr>
<td>41. Are there taps or other water sources accessible for dogs?</td>
<td>Excluded (absent in all green spaces)</td>
<td>-</td>
</tr>
<tr>
<td>42. Are drinking fountains present?</td>
<td>Included</td>
<td>Not required</td>
</tr>
<tr>
<td>43. Is there lighting within the POS? (i.e., not just street lighting)</td>
<td>Included</td>
<td>Not required</td>
</tr>
<tr>
<td>44. Where is the lighting located?</td>
<td>Excluded (unpredictable impact in green space use)</td>
<td>-</td>
</tr>
<tr>
<td>45. From the centre of the POS, how visible are surrounding roads?</td>
<td>Included</td>
<td>1 = clearly or partially visible 0 = not visible</td>
</tr>
<tr>
<td>46a. From the centre of the POS, how visible are the surrounding houses?</td>
<td>Included</td>
<td>1 = clearly or partially visible 0 = not visible</td>
</tr>
<tr>
<td>46b. How many of these houses overlook the park?</td>
<td>Excluded</td>
<td>-</td>
</tr>
<tr>
<td>46c. Is there any area of the POS where you are unable to clearly see surrounding houses?</td>
<td>Excluded</td>
<td>-</td>
</tr>
<tr>
<td>47. Are all roads surrounding the POS minor roads or cul-de-sacs?</td>
<td>Included</td>
<td>Not required</td>
</tr>
<tr>
<td>48a. Does the major road/s have a zebra crossing to assist access to the POS?</td>
<td>Excluded (present in all green spaces)</td>
<td>-</td>
</tr>
<tr>
<td>48b. Does the major road/s have a pedestrian crossing with signals to assist with access to the POS?</td>
<td>Excluded (present in all green spaces)</td>
<td>-</td>
</tr>
</tbody>
</table>
### (A) Measures of green space geographic accessibility and quality according to neighbourhood deprivation quintiles (descriptive statistics).

<table>
<thead>
<tr>
<th>Variables</th>
<th>All (N = 2064)</th>
<th>Q1 (N = 612)</th>
<th>Q2 (N = 137)</th>
<th>Q3 (N = 286)</th>
<th>Q4 (N = 284)</th>
<th>Q5 (N = 745)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographic accessibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green spaces within 400 m (yes)</td>
<td>1012 (49.0)</td>
<td>347 (56.7)</td>
<td>74 (54.0)</td>
<td>147 (51.4)</td>
<td>133 (46.8)</td>
<td>311 (41.7)</td>
</tr>
<tr>
<td>No. of green spaces within 400 m (mean, SD)</td>
<td>0.69 (0.90)</td>
<td>0.83 (0.98)</td>
<td>1.10 (1.37)</td>
<td>0.61 (0.66)</td>
<td>0.62 (0.78)</td>
<td>0.56 (0.79)</td>
</tr>
<tr>
<td>Distance (in hm) to greenspaces within 400 m (median, IQR)</td>
<td>2.25 (1.79)</td>
<td>2.01 (1.72)</td>
<td>2.31 (1.90)</td>
<td>1.87 (1.97)</td>
<td>2.31 (1.66)</td>
<td>2.47 (1.46)</td>
</tr>
<tr>
<td>Area of greenspace within 400 m per inhabitant (m²/inhab) (median, IQR)</td>
<td>0.00 (1.76)</td>
<td>0.25 (2.84)</td>
<td>0.20 (2.85)</td>
<td>0.00 (1.78)</td>
<td>0.00 (1.44)</td>
<td>0.00 (0.80)</td>
</tr>
<tr>
<td>Green space quality scores</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activities (mean, SD)</td>
<td>1.86 (0.95)</td>
<td>1.95 (0.87)</td>
<td>1.60 (0.77)</td>
<td>1.87 (0.94)</td>
<td>2.02 (0.92)</td>
<td>1.76 (1.08)</td>
</tr>
<tr>
<td>Environmental quality (mean, SD)</td>
<td>8.86 (2.11)</td>
<td>8.69 (2.16)</td>
<td>8.34 (1.49)</td>
<td>9.42 (2.94)</td>
<td>9.45 (2.22)</td>
<td>8.77 (1.62)</td>
</tr>
<tr>
<td>Amenities (mean, SD)</td>
<td>4.76 (2.24)</td>
<td>4.99 (2.20)</td>
<td>4.21 (1.60)</td>
<td>4.82 (2.12)</td>
<td>5.09 (2.74)</td>
<td>4.53 (2.24)</td>
</tr>
<tr>
<td>Safety (mean, SD)</td>
<td>2.88 (0.95)</td>
<td>3.06 (0.98)</td>
<td>3.23 (0.56)</td>
<td>2.94 (0.75)</td>
<td>2.41 (1.17)</td>
<td>2.69 (0.89)</td>
</tr>
<tr>
<td>Total (mean, SD)</td>
<td>18.36 (3.79)</td>
<td>18.69 (3.69)</td>
<td>17.38 (2.88)</td>
<td>19.06 (4.73)</td>
<td>18.97 (3.81)</td>
<td>17.75 (3.58)</td>
</tr>
<tr>
<td>Total domain weighted (mean, SD)</td>
<td>7.81 (1.77)</td>
<td>8.10 (1.67)</td>
<td>7.46 (1.62)</td>
<td>8.18 (1.88)</td>
<td>7.90 (1.58)</td>
<td>7.39 (1.88)</td>
</tr>
</tbody>
</table>

SD = standard deviation; IQR = interquartile range.
(B) Association between green space geographic accessibility and quality and neighbourhood deprivation quintiles (univariable and multivariable ordinal regression).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Odds ratio (95%CI)</th>
<th>Odds ratio (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Univariable</td>
<td>Multivariable</td>
</tr>
<tr>
<td>Geographic accessibility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green spaces within 400 m (yes)</td>
<td>0.634 (0.542, 0.742)</td>
<td>*</td>
</tr>
<tr>
<td>No. of green spaces within 400 m</td>
<td>0.758 (0.694, 0.829) *</td>
<td>0.860 (0.743, 0.996) *</td>
</tr>
<tr>
<td>Distance (hm) to accessible green spaces</td>
<td>1.269 (1.145, 1.405) *</td>
<td>1.288 (1.161, 1.429) *</td>
</tr>
<tr>
<td>Area of green space within 400 m per inhabitant (m²/inhab)</td>
<td>0.996 (0.994, 0.999) *</td>
<td></td>
</tr>
<tr>
<td>Quality scores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activities</td>
<td>0.875 (0.771, 0.994) *</td>
<td></td>
</tr>
<tr>
<td>Environmental quality</td>
<td>0.975 (0.925, 1.027)</td>
<td>0.939 (0.884, 0.996) *</td>
</tr>
<tr>
<td>Amenities</td>
<td>0.929 (0.881, 0.978) *</td>
<td>0.857 (0.807, 0.910) *</td>
</tr>
<tr>
<td>Safety</td>
<td>0.714 (0.634, 0.804) *</td>
<td>0.586 (0.507, 0.678) *</td>
</tr>
</tbody>
</table>

* odds ratio and 95% confidence intervals; * p < 0.05.
Table S3. Correlation matrix (Kendall’s tau-b correlation coefficient) of the green space characteristics: (A) Quality scores; (B) Geographic accessibility.

<table>
<thead>
<tr>
<th>Quality Scores</th>
<th>Activities Score</th>
<th>Environmental Quality Score</th>
<th>Amenities Score</th>
<th>Safety Score</th>
<th>Geographic Accessibility</th>
<th>Green Spaces within 800m (yes)</th>
<th>No. of Green Spaces within 800m</th>
<th>Distance (m) to Green Spaces within 800m</th>
<th>Area of Green Space within 800m per Inhabitant (m²/inhab)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities score</td>
<td>1.000</td>
<td>0.168</td>
<td>0.432</td>
<td>−0.189</td>
<td>Green spaces within 800m (yes)</td>
<td>1.000</td>
<td>0.624</td>
<td>−</td>
<td>0.602</td>
</tr>
<tr>
<td>Environmental quality score</td>
<td>0.168</td>
<td>1.000</td>
<td>0.235</td>
<td>−0.370</td>
<td>No. of green spaces within 800m</td>
<td>0.624</td>
<td>1.000</td>
<td>0.053</td>
<td>0.539</td>
</tr>
<tr>
<td>Amenities score</td>
<td>0.432</td>
<td>0.235</td>
<td>1.000</td>
<td>−0.193</td>
<td>Distance (m) to green spaces within 800m</td>
<td>−</td>
<td>0.053</td>
<td>1.000</td>
<td>−0.027</td>
</tr>
<tr>
<td>Safety score</td>
<td>−0.189</td>
<td>−0.370</td>
<td>−0.193</td>
<td>1.000</td>
<td>Area of green space within 800m per inhabitant (m²/inhab)</td>
<td>0.602</td>
<td>0.539</td>
<td>−0.027</td>
<td>1.000</td>
</tr>
</tbody>
</table>

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