Methodological demonstration for chapter 10 “Children’s perception of their city centre: a qualitative GIS methodological investigation in a Dutch city” (pp. 163-169)

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Disclaimer

This document is an addendum to the chapter mentioned above which is part of the book GIS in Sustainable Urban Planning and Management: A Global Perspective. The purpose of this document is to demonstrate the application of the methods described in that chapter using QGIS 3.x along with the data available here. This document is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License. Different license terms may apply for the data. If that is the case, a file containing the license terms is included with the data.

How to use this document

Most of the steps described are illustrated with screenshots. Bear in mind that what the screenshot depicts and what you see in your computer might differ slightly depending on the QGIS version you are using and the way your toolbars and add-ons are arranged. Along the text you will see different icons. The key for these icons is as follows:

- Data or external resource to download;
- A software action you are supposed to do;
- Information specific about QGIS.
- Additional or complementary scientific information;
- An important concept which you may want keep in mind;
- An operation that is referenced in the flowchart of operations.

Additionally, for the sake of readability, the following style conventions are used:

- A reference to dataset or a layer uses this style;
- A QGIS command, or any clickable button is noted using this style.
- A QGIS menu or section is highlighted using this style.

At the end of the document, a diagram depicting the workflow described in these pages can be seen. It is advisable to look at it first and/or refer to it as you proceed.
Outline

Taking children as active social agents whose insights are relevant when it comes to urban planning, the book chapter describes a case study in the city of Enschede (the Netherlands), where a qualitative GIS approach (qGIS) was used to enable children to register their perceptions of the urban environment. The perceptions of a group of twenty-eight children aged 10-17 years are quantified and mapped.

Getting started

Download the data; the data consists of the following files:

- Enschede.qgs – a QGIS project preloaded with the layers;
- CityCenter_buildings.shp – Polygon features with the building plants;
- Positive.shp – Locations always perceived as positive;
- Negative.shp – Locations always perceived as negative;
- Mixed.shp – Locations perceived both positively and negatively;
- A folder named “photos” containing a sample of the photos taken by the children documenting observation points.

Start QGIS and open Enschede.qgis (Figure 1).

![Figure 1 – opening a project](image1)

From the Layers panel, right-click on a layer and access the attribute table to examine it. Repeat the procedure for the other layers (Figure 2).

![Figure 2 – assessing attribute table](image2)
Create diagrams [1]

The visualization of the data on the perception of children can be enhanced in the case of the mixed perceptions. To achieve that we will make use of diagrams to show the proportion and count of positive and negative perceptions.

From the Layers panel, right-click on the layer Mixed and choose the option Properties. From the Diagrams tab choose Pie chart and then Attributes. Highlight the “Positive” and “Negative” attributes and click on Add. Choose the colors (we suggest green for positive and red for negative) and finish by clicking on Apply (Figure 3).

Continuing on the Layer Properties | Diagrams dialog, click on Placement and mark the option Over Point and Click on Apply (Figure 4).
The reason why we are rendering the diagrams over the points is to make sure the diagrams will always cover the points whose data they are depicting thus ensuring that there is no double representation of the same data (i.e. as point and as diagram) which in turn results in a cleaner visualization.

At this point, we have diagrams depicting the proportion between positive and negative perceptions. We will now define the size of the diagrams as a function of the total number of impressions (children’s perceptions) that are behind it. The idea is that pie chart diagrams are not that revealing if we do not know the numbers behind them.

From the Layer Properties | Diagrams dialog, click on Size and mark the option Scaled Size. Click on the Expression button so that the Expression Dialog opens and enter this expression:

"Positive" + "Negative"

Hit OK to dismiss the Expression Dialog and proceed with the remaining options. Click on Find to determine what is the maximum value resulting from to expression we are using and indicate the size. Finally press Apply to finish the operation (Figure 5).

It is important to understand that the above results in diagrams with a maximum size of 18 because for that is the maximum value you can obtain when adding the
values contained under attributes “Positive” and “Negative”. Diagrams whose count is below 18 will be sized in proportion to that size.

The last configuration step of the diagrams consists of defining how they will be depicted in the Legend window.

From the Layer Properties | Diagrams dialog, click on Legend and mark the option Show legend entries for diagram attributes and click on Legend entries for diagram size button to open the Data-defined Size Legend dialog. In the Data-defined Size Legend dialog choose Collapsed legend and then on Legend Symbol. In the Symbol Selector dialog click on Simple marker, set the Fill color to transparent and dismiss the Symbol Selector dialog by hitting the OK button. Click on OK to dismiss the Data-Defined Size Legend and finally, being back on the Layer Properties | Diagrams dialog, click on Apply to conclude (Figure 6).

![Diagram](image.png)

Figure 6 – Defining the size of the diagrams based on attributes/expression.

Your project and respective legend under the Layers panel should now look like this (Figure 7)
In addition to the diagrams, it is also possible to associate some of the photos taken by the children during the visit to the city centre with the point data. Doing this provides a direct document of the reality being observed by the children.

► From the Layers panel, right-click on the layer Mixed and choose the option Properties. From the Source Fields tab toggle Edit mode On and start the Field calculator. Mark the option Create a new field whose Output field name will be “photos”, the Output field type and the Output field length should be Text and 255 respectively. The column “photos” will take the result of the expression:

'C:/International_School/photos/'||"POINT_NAME"||'.jpg'

The absolute path to the photos folder

Dismiss the Field calculator by pressing Ok, toggle Edit mode Off and click on Apply to finish the operation (Figure 8)
In order for QGIS to show the photos associated with a vector feature, the path to the photos has to be stored in the attribute table of the vector layer in order to configure an action that will show a photo whenever the Identify tool is used over a feature (see next step). In this case the path is built from the expression:

```
'\C:/International_School/photos/\'||"POINT_NAME"||'.jpg'
```

Which will result, for each feature, in something like:

C:/International_School/photos/Train_Station.jpg

The attribute table of layer Mixed should now look like this (Figure 9).

From the Layers panel, right-click on the layer Mixed to access its properties and choose the option Actions. Click on the Add button to open the Add New Action dialog. Under Type choose “Open” and under Description enter any text you wish – we suggest “Show Image”. In the Action text box enter:

```
Open[%photos%]
```

Click on Ok to dismiss the Add New Action dialog and then Apply to implement the action (Figure 10).
From the Layers panel, right-click on the layer Mixed and choose the option Attributes form. Choose the “photos” attribute, in the Widget Type section select Attachment and in the Integrated document viewer select Image and hit Apply to finish (Figure 11).

If you now use the identify tool over the features of layer Mixed, the Feature attributes dialog will pop up showing a photo along with the attributes of the feature that you clicked on - please note that not all features have a photo (Figure 12).
The final step is simply a quick demonstration on how the information that we currently have in the attribute table can be enriched, for example to add a description of the photo.

From the Layers panel, right-click on the layer Mixed and choose the option Properties. From the Source Fields tab toggle Edit mode On and click on the Add field button to create a new column. Under Name enter “Descriptio”, make sure the Type is the “Text” and the Length is set to 255. Click Ok to dismiss the Add Field dialog, toggle Edit mode off and click Apply (Figure 13)
From the Layers panel, click on the layer Mixed and toggle Edit mode On. Select the Identify tool and click on the “Oude Markt” point. The Feature Attributes dialog will pop up and under the description attribute enter the text: “Me and my sister keep pressing the button and let the water over flows” (Boy, 12) Click Ok to dismiss the Feature Attributes dialog and toggle Edit mode off (Figure 14).

Figure 14 – Updating attribute table information.

Flowchart of operations
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1. Create Diagrams
2. Associate photos
3. Add information

Final map