SPACES: A PROJECT ON GLAZED GEOMETRIES FOR IMPROVED INDOOR CLIMATE AND SOCIAL INTERACTION

INITIAL INTERVIEWS AND DATA GATHERING

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Bovieran, Hönö - glazed atrium with weekly social activities like boule and bridge

Greenhouse Augustenborg, Malmö - glazed balcony for recration and urban farming

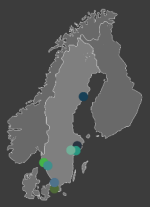
Ginnober, Göteborg - common glazed spaces increase daylight access for the residents

INTRODUCTION

Glazed spaces in buildings are used for transportation, such as entrance areas or stairways, as living space, such as glazed balconies, or as meeting areas, such as atriums. A glazed space in a Nordic climate contributes to social interaction but can also lead to larger energy use and to overtemperatures during sunny periods. The project Spaces investigates glazed spaces in residential buildings as a robust solution from a health and resource perspective. The hypothesis is that glazed geometries, with a more adapted volume, can increase well-being and social interaction without increased energy use.

AIM

The aim of the Spaces project is to present examples of well functioning glazed spaces (both technically and socially), information on how to evaluate these spaces early in the design process (with respect to, for example, thermal comfort, daylight and social aspects) and support to the architectural design. An evaluation on how the current building regulations affect the design of a glazed space in Sweden will also be made.
The aim of the initial stage of the project is to determine the parameters and relations that are of importance to the success or failure of a glazed space in terms of indoor climate and social interaction.



NAME	CITY	YEAR OF CONSTR.	GLAZED SPACE GEOMETRY	NR. OF APT.	INTERVIEWS	QUANTIFIABLE SURVEY	OWNERSHIP STATUS
Bovieran	Hönö	2014		48	Chairman/ Residents	Yes	Coop. Housing
Cinnober	Göteborg	2018		89	Chairman/ Residents	Yes	Coop. Housing
Greenhouse Augustenborg	Malmö	2016		32	Prop.mang/ Residents	Yes	Rental
Gårdsåkra	Eslöv	1983		126	Property manager	No	Rental
Höstvetet	Stockholm	1986		71	Property manager	No	Rental
KTH Hemmet	Stockholm	2015		58	Prop.mang/ Residents	Yes	Rental
Musteriet	Stockholm	1983		42	Chairman	No	Coop. Housing
Sjöjungfrun	Umeå	2005		32	Residents	Yes	Coop. Housing

Table 1. Information about case studies and interviews

METHODS

In the following stages of the Spaces project, different glazed spaces will be investigated using numerical and analytical heat, air and moisture modelling, measurements of daylight, temperature and relative humidity in glazed spaces and architecture program work for the design of the spaces, including furnishability and functionality. The initial stage of the project, which is partly presented here, is based on study visits and interviews. A pre-study was made in order to develop templates for gathering data from different sources. These were then used in interviews with residents, consultants, and property managers as well as in the process of collecting data from databases/literature and study visits. Eight case study buildings with glazed geometries, from Malmö to Umeå, (see Table 1) have been studied and seven case study buildings were visited. The buildings were either housing cooperatives or rental buildings and the glazed spaces in the buildings were either atriums, glazed balconies or glazed roof tops (glazed balconies are not presented further here). In total 14 interviews with residents have been performed and a survey to quantify different aspects was handed out. The interviews and surveys focused on thermal comfort, daylight, air quality, geometry, social and human aspects and urban farming, and the material from the interviews and surveys was processed in a workshop, where trends and results were extracted. The material will be used for further investigations, as previously described, and the presented trends are not statistically secured material. This poster focuses on thermal comfort and social interaction in the atriums.

SOCIAL AND HUMAN ASPECTS

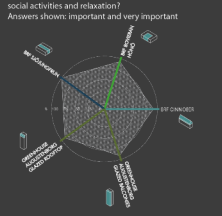
The social and human aspects of the glazed spaces are divided into discussions on territories and activities. The people are the most important in order to get social interaction and the building can support the interaction.

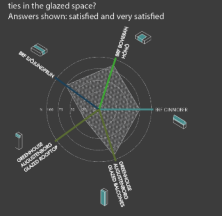
Expectations

If there is a clear expectation of social interaction, either through information when considering moving to the premises, or through discussions with neighbors, this will facilitate interactions. In many of the studied cases, social activities were highly dependent on one or a few individuals and thus, engaged persons are highly valuable. There were no economical benefits for these individuals, but possible contributions were discussed in several cases.

Purpose of the space

In order for a space to be used, there has to be a purpose. Just to provide a space for social activities has not been proven successful.
Spaces that seem to work are for example a common entrance, possibility for children to play (if the acoustics allow), laundry room or private areas (in connection to the apartment). If there are several entrances, there is less control of persons entering the common space and there are also less opportunities to meet.





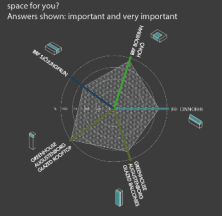
Common spaces that were designed for social activities but without a clear purpose or an engaged person rarely worked. The possibility of using the space privately for parties, with a kitchen or water, seems to be one of the more popular solutions. When a common space is located on top of the building, it cannot be controlled and overviewed in the same way as a central atrium or similar. Problems with unknown people using the space, with smoking and with poor cleaning were problems that occurred in the roof spaces. In one case, the glass roof was used by teenagers, and even though they were not disturbing, it made other people feel less welcome. This would probably be less of a problem if the incentive or purpose to be in the space was stronger, such as with entrances or laundry rooms. The sense of belonging and feeling of safety seem to be crucial for how much the space is used.
The glazed roofs are the geometries that contributes the least to the well-being of people, according to the survey.

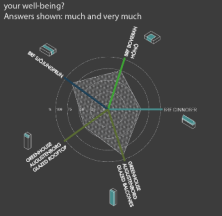
Ownership

People tend to be more engaged if the building is owned by a housing cooperation that they are a part of. This concerns both in taking care of the common spaces and being involved in social activities. In the study, the project that worked well socially were the four housing cooperatives and one rental building. The three projects that worked less well were all rental. Time also seems to be an important aspect. Initially, people who are interested move to a building with a glazed space with clearly expressed expectations of social interactions. As time goes by, new people arrive, the owner might not be persistent in maintaining social interaction and the level of interaction decreases.

THERMAL COMFORT

Most of the inhabitants are satisfied with the thermal comfort in the glazed spaces during spring and autumn time. There are mostly complaints about the thermal comfort in summer but also in wintertime. The opinion on thermal comfort is strongly affected by the expectations, in particular for the winter case. If you expect to use the space as a normal room, a normal room temperature is expected, but if you see the space as a greenhouse for example, there is a larger acceptance for variations in room temperature and thermal comfort.
The glazed space is commonly designed to be cold in wintertime and with as little extra heating as possible (to save energy). In a few cases the winter temperatures are considered good.
However, in several cases, in particular for glazed spaces that are either private (balconies) or roof tops, there is a strong wish to increase the temperature in wintertime for better thermal comfort and larger flexibility in usage. Extra heating has thus been installed in some spaces. In the two atriums that performed well with respect to social aspects, there were also some requests for increased winter temperatures, but this was not done with consideration to energy/cost and due to the plants, that need a winter rest.





A selection of results from the quantified surveys are shown in the rose diagrams. Positive answers (2 out of 4 possible answers) are shown as a percentage of all answers. A clear indication from the survey is that the possibility of using the glazed space socially is important for the residents.

Several of the glazed spaces become warm in the summertime, in particular on the upper floors. The three largest spaces (Bovieran, Gårdsåkra, Höstvetet) had good thermal comfort in the summertime too. Bovieran has an additional glass wall facing north, automatically openable hatches in the roof, solar control coating on windows and large amounts of plants, soil and moisture. Gårdsåkra has openable roof windows and movable solar shading that are automatically controlled and large thermal mass in the flooring material of the atrium which is mainly concrete.

SUMMARY OF THE INITIAL STAGE

The interviews and surveys have provided an overview of the challenges and opportunities of glazed spaces and have shown a number of areas that needs to be addressed in the Spaces project. The early design stages of a project is essential, in particular with respect to how the residents want to use the space, i.e. the purpose of the space, but also with respect to thermal comfort. When designing a space, the human and technical aspects need to be harmonized. The actions of the people that live in the building is what makes the building (and the glazed spaces) work and the building structure can only support, or hinder, their actions. Therefore, clear expectations on the intended use of the space, providing adequate facilities and technical systems, in combination with engaged residents and housing organizations is very supportive for a well-functioning, social, glazed area.

Bovieran, Hönö - both deorative plants and urban farming contribute to well-being

Gårdsåkra, Eslöv - the size of the space is important to enable social interaction in the space and communication across the space

Höstvetet, Stockholm - solar shading prevents over temperature caused by high solar load