

The article analyses findings from *Bo-miljø* and connects them to current research, offering an architectural perspective on design for social sustainability and wellbeing.

Social sustainability in context: rediscovering Ingrid Gehl’s *Bo-miljø*

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The current ways of discussing and evaluating the multidisciplinary concept of sustainability in design tend to rely on the three-pillar model of environment, economy, and society. Of these, the social pillar has been largely neglected and remains poorly defined as the wider debate has prioritised environmental concerns (energy use, climate change) and economic considerations (cost savings, speed of construction, short life spans for buildings).^{1,2} While all aspects sustainability can be considered in their impacts on people, social sustainability is often relegated to a default position, describing those aspects not easily quantifiable as economic or environmental.

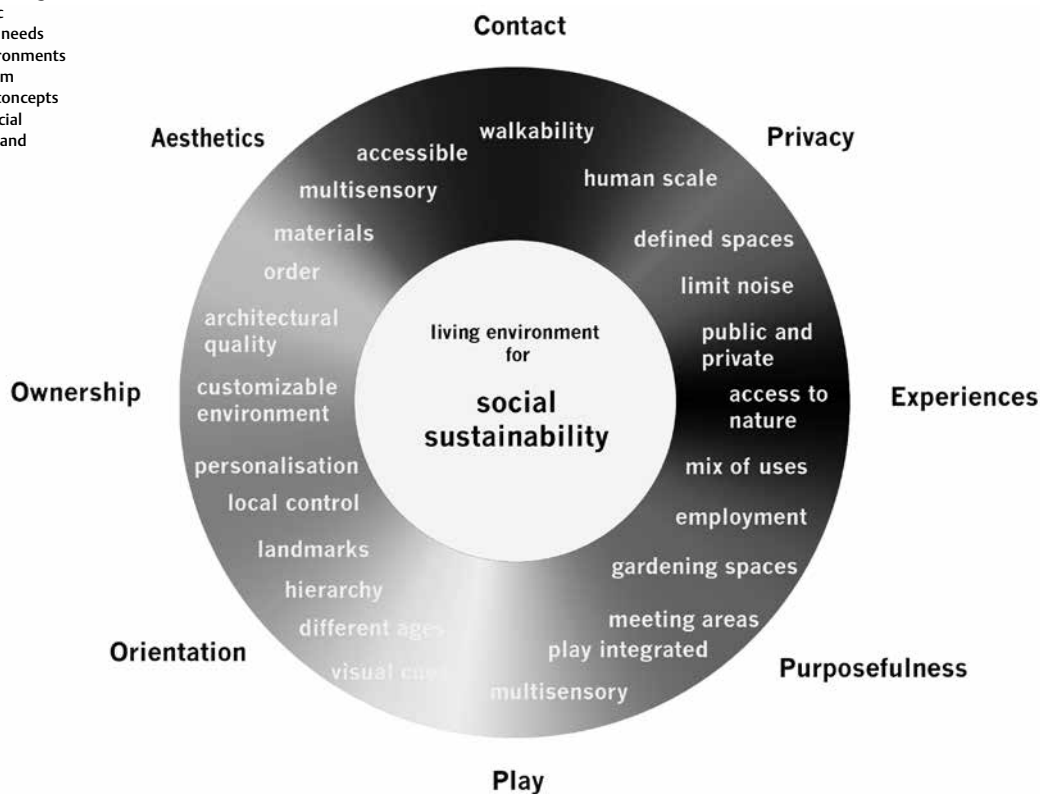
In architecture, a growing number of researchers are critical of how energy efficiency has dominated

the way that sustainability is measured, calling for a fundamental shift towards more critical, interpretive, participative, and pragmatic approaches that encourage a wider range of site-specific responses.³ Better engagement with the social side of sustainability offers a chance to integrate architectural perspectives and reconnect people, places, community, experiences, and spatial quality into the concept and practice of sustainability.

Social sustainability can be defined in relation to architecture as

[...] a process for creating sustainable, successful places that promote well-being, by understanding what people need from the places they live and work. Social sustainability combines design of the physical realm with design of the social world – infrastructure to

1 Diagram connecting the eight basic psychological needs for living environments to findings from research and concepts illustrating social sustainability and wellbeing.



support social and cultural life, social amenities, systems for citizen engagement and space for people and places to evolve.⁴

Central to this definition is the concept of wellbeing, which has no fixed definition and can therefore be difficult to objectively measure.⁵ Hetan Shah and Nic Marks argue that a robust definition is necessary to aid in policy development, and define wellbeing as more than just happiness. As well as feeling satisfied and happy, wellbeing means ‘developing as a person, being fulfilled, and making a contribution to the community’.⁶

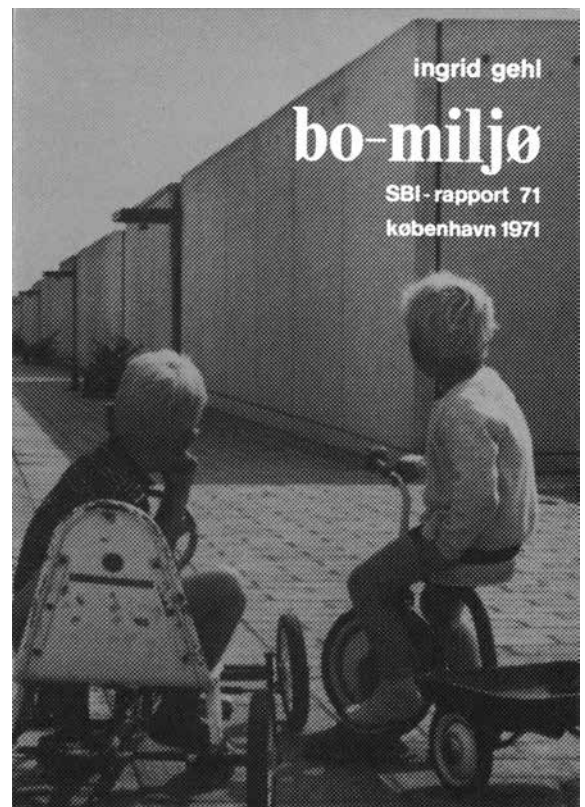
Design principles for social sustainability and wellbeing

Based on these concepts and definitions, principles of social sustainability and wellbeing that apply to design can be characterised in five ways. Firstly, design interventions need to be carried out with local knowledge and strategies, based on the concepts of specific communities. Secondly, these initiatives must be planned and designed, they do not happen on their own. Certain design features and amenities can encourage people to partake in wellbeing-promoting behaviours such as participating in culture and having contact with others. Thirdly, the design needs to be flexible to allow for people to customise their environments and allow spontaneity, new ideas, and the inclusion of varied participants. Fourthly, design for social sustainability should operate at multiple scales and fifthly, initiatives must be integrated into the overall environment, and not be discrete or detached from the overall community in order to be most effective.⁷

Social sustainability is an inherently interdisciplinary topic, it cannot be claimed by one field of study. Currently, many aspects relevant to sustainable architecture are being effectively examined from outside of architecture, and this article mines the work of environmental psychologist Ingrid Gehl for insights. In this article, principles of *Bo-miljø* are summarised, analysed in relation to current research in this area, connected to the concept of wellbeing in social sustainability, and discussed in relation to architectural applications [1].

Architecture shapes behaviour: principles of *Bo-miljø*

In 1971, Danish environmental psychologist Ingrid Gehl wrote *Bo-miljø* (*Living Environment*) as part of the influential Statens Byggeforskningsinstitut (Danish Building Research Institute) SBI series of publications. Ingrid Gehl is the wife of noted urbanist and founder of Gehl Architects, Jan Gehl, and they published their dissertations, hers on environmental psychology and his on urban design, almost simultaneously in 1970–1. Jan Gehl’s book *Livet Melem Husen* (*Life Between Buildings*) was widely circulated, translated into fifteen languages, and is now in its sixth English language edition.⁸ However, Ingrid Gehl’s book was not translated or reprinted, perhaps because of her choice to publish it in a series on building research, outside of her primary area of expertise. While not an architectural text per se,



2 The cover of *Bo-miljø* shows Modern housing from a child’s perspective. Gehl used this to reinforce her

argument that young children have particular needs in a living environment (taken from *Bo-miljø*, p. 106).

Bo-miljø is entirely about people and buildings. The book offers principles and cross-disciplinary references largely in environmental psychology and also to a lesser extent psychology, sociology, and geography, relating to aspects of what we now call ‘social sustainability’.

‘Living Environment’ pursues three objects:

1. to provide a better basis for planning and evaluating living environments by giving an account of some of the most important needs of psychological nature which should be satisfied for man in his living environment,
2. to contribute towards an intensified discussion of living environments today, and
3. to give a survey and evaluation of the existing knowledge with regard to attitudes and behaviour in living environments.⁹

Bo-miljø was intended to be a provocation, to encourage debate and discourse about social needs and values. The book is written for a multidisciplinary, non-specialist audience. Most of the images are photographs of people, with buildings as a secondary aspect, supporting the Danish Welfare State concept that housing should be the safe, secure, quality backdrop to family life. Gehl focused largely on how people experience exterior public and semi-public spaces and building facades but also included a small selection of photographs of interior environments. However, there are few truly private spaces pictured or discussed. The book had no photographs of

kitchens or bathrooms or bedrooms, but there are living rooms and communal areas like laundromats. To gain some insight into Gehl's approach, a brief explanation of the context in which she was working is necessary and summarised here in relation to her choice of cover image.

The front cover of the book [2] is an eye-level view from the perspective of two children, who are looking at the new social housing estate in the new town of Albertslund, Denmark. The scale seems appropriate to their small forms and their play space is separated from cars. Albertslund was considered both then and now as a utopian experimental and influential social housing experiment. Its position and treatment on the front cover shows the optimism and political and social sympathy Gehl had for these developments. The new town of Albertslund was built in 1963, the first big project in the new Copenhagen Regional Development Plan and it quickly became a good example of social progress and equality in Welfare State living. Albertslund was one of the first developments to articulate in the design brief a need for 'family housing'. The term was new because previously families lived in the same kinds of buildings as everyone else but with new developments like Albertslund, there was a chance to create a purpose built family-friendly development. A contemporary architectural critic explained that family housing needed to be designed differently both in terms of the house, and the context:

This type of family needs a spacious dwelling with, on average, three bedrooms. It needs outdoor facilities, preferably in the form of a small garden. Playground facilities must be satisfactory both for small children in the immediate vicinity of the houses and for older children at a somewhat greater distance. Adequate provision must be made for crèches and kindergartens. Children must be able to move about without being endangered by vehicular traffic. The town should be so designed as to simulate a certain community spirit with the necessary premises for joint activities of young people and adults outside their homes. The town should have pleasing and interesting environmental features but should, at the same time, provide for a simple and uncomplicated traffic pattern.¹⁰

Social sustainability needs a site

The development at Albertslund was considered an important example of Danish Welfare State Modernism, 'where all claims have been met'.¹¹ Today it remains a celebrated example of Danish Welfare State suburban development, and is frequently used as an example of how not all 1960s and 1970s housing estates have poor social contexts, and attract residents with no other options. As described above, when designed, Albertslund considered some of the five design principles for socially sustainable environments set out earlier in this article. In particular, the environment was purposefully designed for 'family needs', which are described and seem to meet many ideas of what we now call 'social sustainability'; the housing and common areas were designed to be flexible and

anticipate people growing up and older; design interventions were considered at multiple scales; and in some respects consideration was given for how the housing would integrate into the community. However, the important concept being locally specific and drawing on the existing community, important aspects of what we now call social sustainability are lacking. It is stated that the town design should 'stimulate a certain community spirit' but it is hard to design this in the abstract. The challenge of building a new town meant that there is no existing community to tie into, so Albertslund did not have a lot of social context to foreground. Additionally, the concept of site specific, locally relevant architecture was missing as a design focus in most examples of this kind of Welfare State housing and this has contributed to the difficulties with social sustainability and wellbeing in the renovations.¹²

Basic needs and minimum standards for psychological comfort

Bo-miljø documents and classifies the basic human needs for housing in order to suggest how housing should be designed in future, advocating future 'intensified discussions' and design guides of formalised standards and rules. Gehl argued that the primary needs people have relate to health and survival, then safety and comfort, and then psychological wellbeing. Standards for health, survival, safety and comfort were well covered by existing building codes, but people and human needs were being sidelined.¹³ Gehl considered the living environment as a varied and changing reflection of society, and highly subjective. Many of these concepts hold true today. Building codes and regulations ensure buildings and sites are safe and meet people's basic needs in relation to size and services. As well, the eight territories of psychological wellbeing that Gehl outlined are at least partially covered by current design guides, architectural expertise, and design research.

Gehl summarised in text, and illustrated through photographs of people interacting, how rapidly changing social values, such as gender roles, family structures, attitudes to children and childhood, were changing how people use public and semi-public spaces in housing estates. Rather than making a checklist for designers, she wanted to highlight needs people have – to create *an intensified discussion of living environments today* – and then to suggest that designers take the freedom to address these in different ways for each project. She argued that in order to create better living environments, to an ambitious minimum standard, all consumers, politicians and planners should articulate the human values that they are designing for, and that are being promoted, so that designers could have more freedom to experiment formally and technologically.¹⁴ She called for more transparency and accountability. The minimum standards for psychological health she proposed were designed to help designers, not to change their design processes.

A framework for living environments

Gehl wished to provide a basis for formulating requirements for living requirements. In part two of the report, she identified eight environmental psychological requirements that all living spaces should address if the aim is for people to have a satisfying and humane living environment: (1) the need for human contact, to see and meet others; (2) the need for privacy; (3) the need for varied experiences; (4) the need for purposefulness; (5) the need for play; (6) the need for structure and orientation within the environment; (7) the need for a sense of ownership and identification with the community and environment; and (8) the need for aesthetics and beauty. She illustrated each of these principles with photographs of people interacting with buildings. There are no statistics or charts or diagrams, just photographs of people and spaces – for example, walking between buildings, leaning out of facades, next to buildings and in neighbourhoods – as evidence of the impact of design on how we experience our environment. She devoted about ten pages, half photographs and half text, to each of the needs, and on each page gave references to sociology, psychology, architecture, and planning research.

Her central argument was that good or bad housing estates do not just happen, they are the product of a connected series of design decisions that impact on how people perceive the spaces. She argued that if an estate is unsafe, uncomfortable, or alienating then it is at least partially the architecture's fault. She advocated for the power of architecture to frame our perspectives of ourselves, and our built and natural surroundings. She argued that architecture shapes behaviour.

In the following section of this article, the eight psychological needs are analysed and supported with relevant scientific evidence and examples. The social sustainability framework described above provides a bridge between psychological needs and wellbeing. Researchers have defined a basic need, whether physiological or psychological, is 'an energising state that if satisfied, conduces toward health and wellbeing, but if not satisfied, contributes to pathology and ill-being'.¹⁵ Here, Gehl's work is interpreted to formulate a more architecturally-relevant discussion and architectural conceptualisation of social sustainability.

Extending *Bo-miljø*

In many ways, Gehl's assertions about psychologically healthy living environments did not go far enough – the arguments would have been stronger if they had referenced more specific scientific, peer-reviewed studies of psychology to underline each of the main points, driving home the impact of design on human behaviour and wellness. The section of her book that outlines the eight needs has twenty-nine references, but of these there are very few sources that link the needs to her area of expertise, to peer-reviewed studies or experiences of buildings relating to environmental psychology.

Gehl's eight needs offer a starting point for discussion of select architecturally relevant research.

Gehl aimed to provoke intensified discussion of living environments today, and this article is written in the same spirit. The intent is to elaborate upon and amend her initial conceptualisation as it pertains to current the discourses of social sustainability and wellness, and to tailor the discussion to an architectural design context. In this article, the 'evidence' for Gehl's eight needs, into the measurable impacts of the built environment on people, is not intended to imply that these summarise of all relevant research in these areas but rather to offer points of intensified discussions that can be expanded in future research.

Human contact

The first basic needs Gehl outlined is that of human contact, and she argued that in a residential setting, people meet when they are carrying out the practical and functional activities of residential life.¹⁶ She illustrated this section with images of people meeting informally in courtyards, sitting on benches, perched on edges of play structures, and carrying out daily life, eating, sunbathing, and watching children play. The location, size, and qualities of shared elements such as pool decks, patios, and courtyards need to be designed to support people being social and meeting one another. Play areas offer opportunities, because it is where people meet others of different ages, abilities, and personalities by chance.

There are studies that show that human contact improves wellbeing and designing living environments to encourage socialising amongst residents could have measurable benefits.



3 Photograph showing residents interacting by leaning out of their apartments in a way that was not necessarily imagined by the designers.

Gehl used this image as one of many that shows people's fundamental need for human contact (taken from *Bo-miljø*, p. 26).

Researchers have found links between wellbeing and walkability, due to the opportunities for social contact, and sense of community.¹⁷ Studies have shown that people perceive small-scale buildings and cul-de-sacs as being more social than open areas.¹⁸ Spaces that encourage shared activity promote feelings of security. Jane Jacobs observed that 'sidewalk contacts are the small change from which a city's wealth of public life may grow'.¹⁹ Each site's physical environment and social context is unique, and site-specific strategies are important in implementing design for people's psychological needs in an architectural context. This relates to the process of figuring out what needs people have from the places where they live and work. Architectural considerations for psychological health should focus on designing places for human contact at multiple scales, including design details of the public realm, walkability, and human-scaled buildings [3].

Privacy

The thresholds between inside and outside are important for maintaining a sense of privacy and calm. The balance between social contact and privacy needs to be supportive of people's changing needs. Gehl explains this basic need using a quote from Serge Chermayeff and Christopher Alexander (1963) about the importance of privacy. In *Community and Privacy* they argue: 'only through the restored opportunity for first hand experience that privacy gives can health and sanity be brought back to the world of the mass culture'.²⁰

Privacy is hard to come by in overcrowded housing conditions. Research has linked room sizes and proportions to reported feelings of wellness, in particular relating to overcrowding as a measure of substandard housing and health issues such as infectious and chronic diseases.²¹ The impacts of noise on mood and wellbeing tend to be studied in relation to workplace design, but researchers have also analysed noise in relation to wellbeing and mood in residential environments but this seems rather understudied given that choice of materials, proportion, orientation, adjacencies, and other architectural design decisions have great impact in this area. Studies have shown that residents with a bedroom or living room facing the street report higher levels of annoyance²² and hearing unwanted noise has been proven to raise blood pressure and increase stress in other environments.

For privacy, architecturally relevant elements could include the provision of a mix of dwelling sizes in a building, including some very large ones, so that people can have growing families without having to decide between moving away from their communities and living in overcrowded conditions. The availability of different spaces for relaxation and privacy are important, and having a mix of public and private amenities like private balconies and public courtyards, and choosing materials to reduce noise can improve people's comfort and psychological wellbeing.

The definition of social sustainability includes the need to design environments that connect the



4 Photograph showing women socialising in common areas. Gehl identified the importance of spaces

such as these where people can gather and use as they please (taken from Bo-miljø, p. 32).

physical realms and social worlds, in particular that allow people to change and evolve. This concept is relevant to changing needs in privacy in housing. Chermayeff and Alexander link privacy to modesty, and argue that privacy must be sometimes sought both against neighbours and also other members of the family: 'the individual requires barriers against the sounds and sight of innumerable visitors including the disembodied visitors of TV and radio selected by one or another members of the family'.²³ Designing for social sustainability needs to allow people to customise their spaces to allow for changing needs, to balance the needs to connect to people, and to keep their modesty and dignity.

Varied experiences

Gehl identifies the need for varied experiences in living environment, and this could mean incorporating nature, designing buildings with a mix of uses and amenities, and offering residents

choices of various modes of transport.²⁴ Even though the Danish housing estates that Gehl used to illustrate *Bo-miljø* were intentionally designed as mono-use, residential environments, there are some aspects of urban life that she references and celebrates. She shows old and young people living together, chance meetings of people in courtyards and sidewalks, a range of building sizes (even though these would not likely have been found all on one estate), and she often highlights seasonal and temporary structures in courtyards and shared spaces like sheds, umbrellas, picnic tables, lemonade stands, and flower pots [4].

In designing for social sustainability it is necessary that the process is purposeful and intentional. The careful design and curation of buildings with mixed uses, building sizes, and varied materials can make an urban experience more enjoyable. Studies have shown what people intuitively know, that varied work and breaks from work improve performance. Nature has proven restorative benefits²⁵ and mixed modes of transport can contribute to more easily navigable cities. Designing variety in living environment is not an easy task, due to the nature of architectural time scales and the process of working with clients and site boundaries and regulatory constraints. Adding a mix of uses, such as commercial, cultural, and educational uses in a residential environment could be a strategy for providing a desirable mix and variety, while also potentially reducing the need for commuting, bringing new people to the area, and improving a sense of community.

Purposefulness

Gehl argued that purposefulness is a psychological need in living environments.²⁶ This could be answered by participating in hobbies and clubs, light building maintenance or working in the garden, or pursuing learning. There needs to be meaningful ways for people feel a sense of purpose and self-realisation. This is fundamental to concepts of wellbeing, as defined by Shah and Marks in relation to the need for fulfilment and contribution to the community.²⁷

Having a fulfilling life with meaning is a part of wellness, and researchers have found that that eudaimonic wellbeing, based on Aristotle's principles of virtuous living, focuses on meaning in terms of the degree to which a person is fully functioning.²⁸ Architecture can offer ways for people to contribute, take on responsibilities, and feel a sense of purpose. Studies have shown that seniors who volunteer regularly are in better health, including a lower blood pressure.²⁹ Providing attractive spaces for gardening, dedicated areas for volunteers and community groups to meet are ways that architecture can provide this sense of purposefulness.

Play

The need for play can be formal or informal but it should involve sensory perception, motor activity and it should take place in multidimensional creative environment. Gehl argued that all people,

not just children, need play.³⁰ She rightly differentiates between play and physical exercise although she advocates physical play that involves the senses. Play involves giving people choices in how they behave, and freedom to experiment. It can be linked to happiness and satisfaction, both key components of wellbeing.^{31,32}

It has been shown that how play is framed and introduced impacts on people's attitudes and enthusiasm for the activity. This means that play should be considered a design problem. The relative lack of architectural studies and theories on play and spaces for play offers the opportunity for spatial and sensory experimentation with designing areas for play. Since Gehl's work in 1971, there has been a shift in cultural attitudes and perceived risks associated with playing. For example, studies from the US show that children are being banned from playing in many residential environments. Gayle Souter-Brown notes: 'forty-seven million Americans now live with covenants prohibiting children from playing outside. That means local rules against treehouses, climbing trees, skateboards, basketball net, even sidewalk chalk, and in some places children hanging out with their friends on the street outside their home.'³³ In terms of design strategies, studies have found that designing play structures is not enough to actually encourage play, with Rob Whewey's 2015 paper concluding: 'Play strategies which concentrate on the provision of play facilities are flawed because increased provision cannot compensate for the reduction in children's freedom to play caused by the domination of the car in residential roads.'³⁴

The design for play includes more than just swings or slides, it needs to be designed into the concept of the housing. This concept of play being a need is important and must be protected and fully integrated into the environment. If play can be linked to elevated moods, then it follows that play could be linked to wellness and health outcomes with lowered stress and blood pressure levels. The provocation of integrating play, rather than adding a dedicated and discreet children's play area into an existing design, could offer important co-benefits for psychological wellbeing and physical fitness. Design strategies in this area could offer productive links to the social sustainability concept of integrating the physical and social realms.

Structure and orientation

There is a need for structure and organisation in living environments. This means designing environmental strategies for wayfinding and visual and sensory cues. Gehl shows photographs of personalised door signs, distinctive doorbells, exterior light fixtures, potted plants, and painted signs that people use to create small landmarks and find their way in housing estates.

The purposeful design of hierarchy and scale in buildings and environments leads to impacts upon wellbeing [5]. Feelings of autonomy and perceived quality of life have been linked in studies of particular residential environments specific to

spatial organisation in people with dementia in nursing homes.³⁵ Cues such as visual signage, feeling the breeze of an open door, or hearing people taking near a social space can all contribute to positive experience of an environment. Well-designed environments with clear layouts where spaces are easy to find influence people's experiences of a space. A recent study showed that study respondents preferred warmer colours and bright lighting to feel a sense of spatial satisfaction.³⁶ A sense of spatial legibility can be linked to feeling safe and secure and can contribute to wellbeing.

Ownership and identification

The feeling of being able to personalise a space, have a say in how it is organised, and the ability to control one's own environment all lead to a sense of ownership and identification. This is a key part of the Danish Welfare state philosophy that was ingrained in the construction of the housing used to illustrate *Bo-miljø* and it remains a deeply held tenant in contemporary Denmark. The tenant democratic system in Denmark is structured so that tenants have significant control over how the housing is maintained and renovated.

Happiness and wellbeing are linked to control and influence in the environment. Studies have shown that high levels of democracy at both a systems and local level make people feel satisfied.³⁷ A sense of control over one's immediate surroundings has been positively linked to wellbeing and health.³⁸ Designing spaces that are customisable with aspects that can be personalised with colour or furnishings, with local environmental controls such as operable windows, are ways that design can influence wellbeing.

Aesthetics and beauty

Gehl identifies order, variation, and harmony as important needs people have in their environmental, and argues that these should be multisensory and accessible. Considerations of aesthetics are included in all measures of architectural design. Gehl illustrates this section with patterns of facades, public art, minimal interiors, and circular patterns and forms. There are no detailed photographs, such as paving patterns in a courtyard or on a path, or compositions of material finishes such as wood or ceramic. There are also no images of nature, such as trees or landscape.

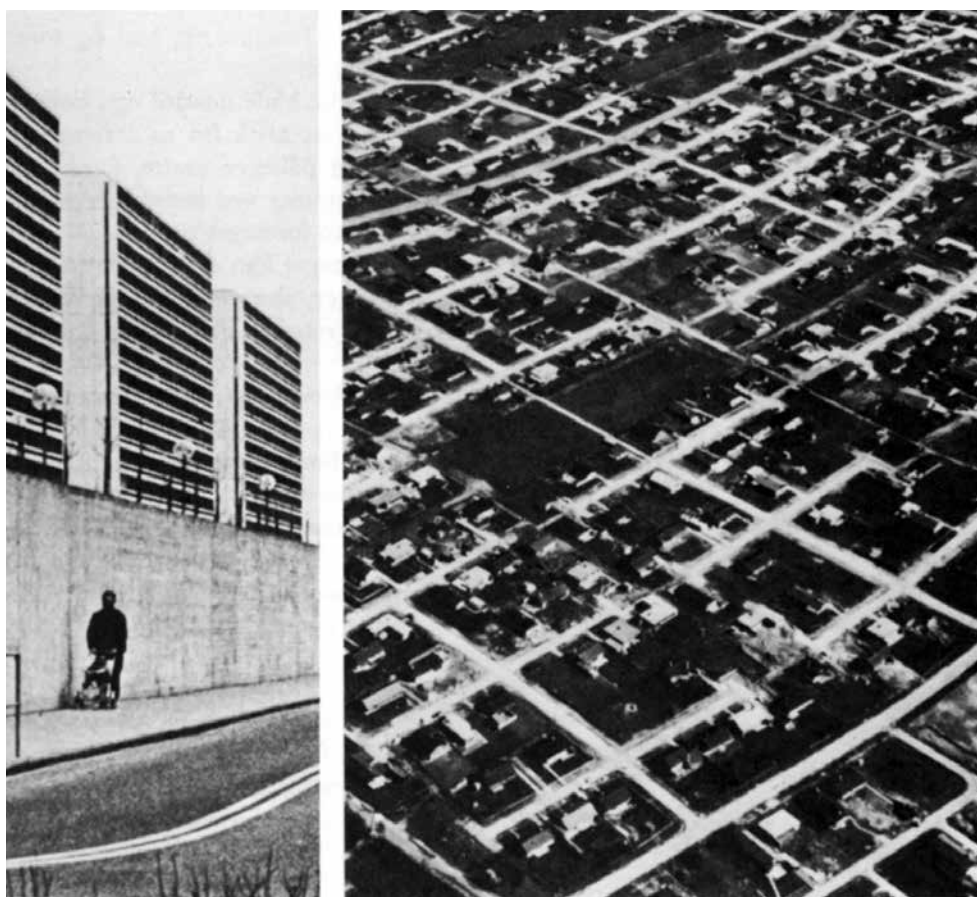
Many architecturally relevant studies of aesthetics and wellbeing focus on greenery and nature. Rachel Kaplan and Stephen Kaplan, in their *The Experience of Nature: A Psychological Perspective* (1989) extensively studied the positive links between exposure to nature and reported wellbeing.³⁹ Order and uncluttered environments, which could be considered aesthetics, are often indicators of housing quality. Researchers have found that uncleanliness and clutter are not just visually dissatisfactory, they can also be linked to children's socio-emotional health.⁴⁰ Gehl's specific mention of ease of access to the experience of aesthetics and beauty is important for designers. All people need to benefit from aesthetics and beauty at various scales.

Discussion and conclusions: psychological needs and social sustainability

Concepts now called sustainability and social sustainability have always been considered as a part of good architecture but they are becoming increasingly quantified and codified. When designing for social sustainability, the concept of wellness is an important consideration and it should be considered by designers. The basic psychological needs that people have in relation to their living environment should be considered when developing local, community focused design interventions at many scales. Architect and social sustainability theorist Jan Gehl professed that design should prioritise 'life, space, buildings, in that order'.⁴¹ Noted town planner and ecologist Patrick Geddes argued priorities should be 'place-folk-work', and he also had theories of urban design for people's 'primary human needs'.⁴² Revisiting reports such as *Bo-miljø* can serve as an important reminder that design has an enormous impact on how people experience space.

Within architecture, practitioners and theorists work to the assumption that the qualities and design of spaces has a strong influence on the behaviour of people that use those spaces. The Architectural Institute of America (AIA) counsels its members that 'as an architect, your everyday decisions, large and small, can affect the mental and physical health of everyone that comes into contact with your work'.⁴³ Architects do not feel the need to 'prove' that cluttered, cramped, unhygienic environments make us feel anxious or that spacious, day lit, and varied environments make us feel better. Architects assume that we are able to impact the moods, desires, and behaviours of people that inhabit the environments we design.⁴⁴

Gehl did not use the term 'sustainable' housing or 'sustainable' living environments in *Bo-miljø*. The environmental examples she presented, and the basic needs that she identified were not judged for their efficiency, or cost, or energy use. A main finding of the book is that housing and sites should not only satisfy the brief in terms of large-scale organisation, space metrics, or views, but should respond to fundamental human needs. Designers cannot know exactly what particular features that people want in their homes, but they can know certain basic needs that people have and they have a duty to design for those. It is difficult for architects to know for certain the specifics of how or if people will enjoy and be inspired to connect with each other in shared spaces, but by explicitly studying spaces from that perspective and thinking about people's basic needs, there could be a process of better decision making in terms of privacy, aesthetics, and other needs. The intensified discussions Gehl advocated could also lead to more support and consensus within the design community and that could lead to more effective and productive discussions with clients to be able to reach out to both intuition and experience as well as research studies that show that there is value in designing certain qualities and spaces.



5 Photograph of a person on a narrow sidewalk near a large housing estate in a mono-use community. The building is not identified but it appears to be the social housing estate Høj Gladsaxe near Copenhagen (taken from *Bo-miljø*, p. 44).

Continuing relevance of *Bo-miljø*

Bo-miljø offers valuable perspectives for social sustainability and wellbeing for several reasons. Firstly, the eight needs offer a framework that conceptualises and illustrates a people-oriented approach to housing design, combining equal parts environmental psychology principles and informal photographic documentation of people in and around buildings. The approach to the eight needs is about space and people, making it highly relevant for architects. This area remains understudied in architecture. Secondly, the eight needs are offered to suggest why and how people and their relationships to buildings can be improved, bringing an important environmental psychology perspective that is relevant in architecture. People and their preferences, moods, sense of comfort, and happiness are typically not explicitly considered in minimum standards for housing, although they are central to architectural design, so perhaps this should be reflected in standards. New standards for environmental sustainability are increasing and some are offering links to community and social integration. There could be future standards that focus specifically on social sustainability, and interdisciplinary studies like *Bo-miljø* remain a useful starting point.

The design and renovation of social housing is an important area of architectural inquiry and it remains understudied. This book offers insight into the underlying principles of social housing design in the 1970s as these buildings were the focus of Gehl's

examples. Gehl could have photographed a number of architecturally valuable historic or even 1930s housing in and around Denmark, instead she celebrated 1970s social housing that now is widely regarded as non-socially sustainable because of many reasons including the alienating scale, cheap materials and poor connectivity to their wider communities. In Denmark, the exact Welfare State social housing that is illustrated throughout *Bo-miljø* is currently undergoing its second main wave of renovation and the focus is on regenerating the poor reputation of these estates (often by replacing the facades); and improving social relations and attracting new tenants (with new balconies and better landscaped courtyards).⁴⁵ This type of housing was built in many countries in North America, Europe and elsewhere, and is generally regarded as problematic and in need of renovation or demolition. This book offers specific insight into the design intentions of this kind of social housing, and this could be explored in further study.

Design principles for social sustainability

Saffron Woodcraft *et al.*'s definition of social sustainability⁴⁶ and Shah and Marks's definitions of wellbeing⁴⁷ were used throughout this article as a framework to further discussion of how designers can use these concepts and definitions in the design of socially sustainable architecture. While the basic needs for psychological comfort offer a starting point, they cannot offer a 'solution', since they must be translated into architecturally relevant concepts

that can be applied in different ways depending on the sites. Productive concepts for designers to consider when designing are that designers should: interpret social sustainability concepts to amplify local opportunities and take advantage of locally specific strategies; carefully plan and design social sustainability from the outset; offer designed initiatives that are flexible to allow for customisation and future developments; design for social sustainability at multiple scales; and integrate these concepts into the overall design.

Future applications: renovating modern living environments

Architects today do not explicitly learn about the psychological impacts of housing design on residents, but we should, and this should be a part of the sustainability discussion. The multidisciplinary perspectives of wellbeing should extend to discussions of healthy materials, climatic concerns, and the social impacts of environmentally sustainable architecture.

While Gehl's research has been discussed here in relation to Danish social housing renovation, her work has architectural relevance in other contexts. Globally, one of the most pressing challenges in architectural design is what to do with the ageing institutional built heritage of Modernism. The

hospitals, housing estates, schools, and universities that make up our built environment need urgent renewal, especially with regard to energy consumption, accessibility, and funding structures, if we are to keep them in use for future generations. Part of this multifaceted re-evaluation could include formalised standards for social sustainability, in keeping with the approach to environmental or energy-focused standards.

In architecture, social sustainability deserves far more of our attention, especially concerning life cycle and renovation. The environmental, economic, and social impacts of perceived failed architecture and the process of tearing down and rebuilding is tremendous, yet many of the reasons for this process is due to difficult to quantify social preferences and non-evidence based judgements and opinions. For example, the case of 1970s housing is discussed in this article, as examples of an architectural style that has fallen out of favour around the world, and is in danger of being written off in some contexts such as the UK and Canada, as it is too difficult to renovate. The inclusion of architectural and psychological criteria presented by Gehl can lead to a more holistic and relevant interpretation of socially sustainable design that can inspire the design of living environments to last for future generations.

Notes

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2. Mark Davidson, 'Social Sustainability: A Potential for Politics', *Local Environment*, 14 (2009), 607–19.
3. Simon Guy and Stephen Moore, 'Introduction: The Paradoxes of Sustainable Architecture', in *Sustainable Architectures: Critical Explorations of Green Building Practice in Europe and North America*, ed. by Simon Guy and Stephen Moore (New York: Spon Press, 2005), pp. 1–12.
4. Saffron Woodcraft, Nicola Bacon, Lucia Caistor-Arendar, Tricia Hackett, 'Design for Social Sustainability: A Framework for Creating Thriving New Communities' (Social Life/Young Foundation, 2012), p. 16.
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