



Spatial design as a facilitator for people with less visible impairments

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RESEACH

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Abstract

Health Environments are commonly understood to be specially designed environments for patients or individuals at risk due to their medical conditions. In addition the role of the environment, although recognised anecdotally as an influencing variable, is generally only perceived as a setting or locality because greater importance is given to the significance of treatments, care regimes and managerial systems for a person to regain his or her health. In contrast, this paper deliberately positions the everyday environments as critical for maximizing the wellbeing of people who have impairments which are not readily visible to the incidental observer. These people need or desire to live their lives in the community. Specifically, the discussion focuses on the implications for individuals with autism, acquired brain injury (ABI) and other forms of cognitive impairment. Therefore, the question is raised: What are the considerations (beyond the realm of the medical model) that are needed when we design everyday environments that these people inhabit to positively facilitate their wellbeing, and as a consequence, health. Three case-studies are drawn upon to highlight the relationship between the environment and people with autism/ASD and/or cognitive impairment. Thereby, the potential to positively facilitate their lives by modifying the environment is demonstrated. As a result the propositions raised have implications for all ages and life styles as such impairments are increasingly present across all strata of our society.

Introduction

Health environments are traditionally custom designed environments catering for the treatment of patients. The physical aspects of these environments are generally considered simply as settings or localities because the significance of treatments, care regimes and managerial systems required for a person to regain his or her health are given precedence. However, there are

people of all ages and walks of life, who in certain situations, may be distinguished from others due to long term impairments that they have—a child with autism, a youth with attention deficit syndrome, a young women with brain injury, or an ageing man with dementia. These impairments are not necessarily visible and the person can operate day to day with varying degrees of success. Although, the symptoms of the impairment are understood as a characteristic of the person—an impairment due to a biological difference [1] rather than as a disease to be 'fixed'—many of these people need to spend time in a range of medically oriented environments including outpatient wards, medical centres, doctors' surgeries, counsellors' offices and pharmacies as well as specifically designed residential or service provider facilities.

However, this discussion paper explores other everyday environments that these people frequent due to their need or desire to live their lives within mainstream community. The aim is to highlight how the physical environment can support people with impairments. Unlike people who have physical impairments that are visible, and therefore readily evident to others, the people considered here have impairments that are not readily visible. Therefore, difficulties they have in managing within an environment—normally geared toward the majority who do not have such impairments—is not readily understood.

Specifically, this discussion focuses on the implications for individuals with autism, acquired brain injury (ABI) and other forms of cognitive impairment. Although known to have specialised needs when in specialised environments, when located in mainstream society a child with autism, a youth with attention deficit syndrome, a young women with brain injury, or an ageing man with dementia may be indistinguishable from those around them. For example, the child with ASD/Autism when compared to another child of the same age may behave totally differently, however, in the play ground he/she may simply be understood as a younger child playing on their own; the youth with acquired brain injury in the shopping centre may be understood as angry, aggressive or badly behaved—in contemporary terminology, 'with attitude'; while the man with dementia as a stereotypically old, forgetful or vague individual. The reason for the behaviour and appearance is not evident to the observer.

Therefore, what are the considerations (beyond the realm of the medical model) needed when we design environments for these people to positively facilitate their wellbeing? To answer this question, examples drawn from a range of studies will be provided to demonstrate the nature of the relationship between the person and their everyday environments. The potential to positively facilitate his/her life by modifying the impact of their



impairment emerges. As a result, the propositions raised have implications for all ages and life styles as such impairments present across all strata of our society.

Background

The environmental influence on people with autism, acquired brain injury, attention deficient syndrome, dementia or the like can not be approached as an intervention that will fix the impairment. To 'fix' implies that the person is deficient or diseased in some way. Instead, it is more productive to consider the particular situation as a relationship between person and place that needs to be understood in order to facilitate the improvement in the individual's quality of life through the design of the physical environment. In association, the physical or built environments can not be simplified to become a setting or backdrop to human activity; nor can non-human elements be dismissed as inert components in the daily experiences of people.

Interestingly, such assumptions are often the starting point for clients and designers as they strive to cater for all the functional and managerial issues of briefs that are associated with health issues whether the environment is a hospital or a house. These two assumptions—problem to be fixed and setting—need to be challenged in order to generate major shifts in how health and wellbeing are conceptualised in relation to design in the twenty-first century.

Over the past fifty years in particular, the relationship of the environment and people (the users) has been theorized. Key theories include a) Barker's *behavioural setting*; b) Gibson's *affordance*; and Lawton's *environmental fit* and *competence-press*. A behavioural setting consists of a combination of physical components and behaviours that are consistent across time and space. The physical setting provides a clear indication of the pattern of behaviour that will occur within the setting differentiating it from others [2]. Affordance refers to the potential of the environment, as perceived by the person, to enable particular actions.[3] 'Without this knowledge, it would be virtually impossible to know which object is best for hiding behind, sitting on, climbing up'.[4]. In addition, environmental fit is defined as 'the degree to which the needs of a person are congruent with the capability of the environment to meet those needs' [5]; while competence-press theory identifies that 'the less competent the individual, the greater the impact of environmental factors on that individual' [5:p331].

Physical environments for wellbeing and mental health

... challenging is the task of developing underlying models of how the built environment can affect mental health. It is also likely that some individuals may be more vulnerable to mental health impacts of the built environment. Because exposure to poor environmental conditions is not randomly distributed and tends to concentrate among the poor and ethnic

minorities, we also need to focus more attention on the health implications of multiple environmental risk exposure...[1: p.536]

Evans states that the built environment affects mental health directly and indirectly [1]. Direct effects include housing, crowding, noise, indoor air quality, and light. Indirect impact on mental health occurs by 'altering psychosocial processes with known mental health consequences'. The example quoted is higher residential density where density 'interferes with the development of socially supportive relationships within the household'. There is also recognition that: 'more thought and analyses are necessary on why and how the physical environment might affect mental health'.

The investigation and theorising of the design of environments and cognitive impairment has been debated for a long time. In *Madness. A Brief History*, Porter [6] outlines how the environment catered for people with mental impairments, and therefore in association, how the environment reinforced implicit understandings of what it was to be such a person from the outsider's position at that time. For example, Michel Foucault identifies the time when madness was 'undifferentiated as an experience' and how in the Age of Enlightenment, madness became a concept associated with behaviours which positioned it as distinct from mainstream society [6]. Therefore, a social perspective of mental illness, folly and unreason evolved so that those people who are less able to reason were deemed to be mentally ill, and therefore, needed to be treated and housed [6].

... Foucault argues that a culture's relationship to madness is most evident in the distinction between confinement and embarkation. A society that confines the insane understands madness as an error that must be either cured or silenced. A society that practices embarkation—best illustrated through the ships of fools in the Middle Ages—recognizes a possible truth to madness that presents a fundamental challenge to the rational foundation of Western science, religion, and morality. In this sense, embarkation admits a potential contrary to reason, whereas confinement utterly denies it [7:p12]

In 1675, the design of the Hospital General and 'the great confinement' occurred, where people who were deemed idiot regardless of intellectual ability, cognitive impairment or related needs, were locked away. By the end of C18 the construct of madness altered. It was labelled a mental illness and in early C19 madmen were seen "as monsters" [8]: spectacles or things to be shown and/or tamed [6, 8]. Unlike C17 where there was public commentary, individuals were now to be 'silenced' in an asylum, and as a result, stigmatised as inhuman and causing shame for the family [8:p67]. During the Classical period 'the unreasonable' were concealed but according to Foucault, this only emphasised the evolving definition of madness as suppressed bestiality. As a consequence, environments depicting this



understanding arose: Asylum of York provided small cells for 13 women to live (<eight feet by eight feet); Cells of Bicetre (end C18) provided straw to sleep on, confined the body against the walls so that water trickled from the stone over the person; Cells of Salpetriere held the less dangerous in cramped wards while other people were in dungeons beside the Seine where in winter, when the water was level with the sewers, rats sought refuge; Bethnal Green held woman with seizures tied to beds with blankets and placed iron bars between their legs. In short, a 'madman [was] not treated like a human being' [8:p73]—the Model of Animality provided rooms that were cage-like in appearance and the floors grated where people ate, slept and excreted. They were chained like dogs, separated from keepers by iron grilles, locks and bolts, and small openings.

Pinel, a Quaker, questioned the underpinning concepts of inhabitants as sick or beast-like. He therefore spawned the evolution of environments that were no longer prison-like but like country farmhouses in walled gardens [6]. "The Retreat" was designed on the premise that people could reconstruct their lives [6] and Foucault states [7] that now that person was no longer chained they became responsible for their own punishment/guilt. These environments provided a 'new science' of management' including attention to a person's apparel, diet, exercise, movement and music therapy. Psychiatry arose as a discipline within medicine dealing with diseases of the head. However, they also attended to design interventions to improve well being such as nonslip floors, good drainage, and ample ventilation. Recognition of diversity of needs resulted in the separation of men and women, those deemed to be incurable from the curable, the violent from the harmless, and in contrast to previous times, those 'ascending to discharge' were catered for [6].

More recently, the shift to community based support since the late1950s has seen in Australia 'the wholesale dismantling of the mental hospital/asylum system...' influenced by the 'calling for change' by theorists including Goffman and Szasz [9]—and concepts of mental health replaced discourses of illness. [9] Social and cultural perspectives [10] inform or supersede medical frameworks. Associated with these shifts were a change in the built environment requirements as family and friends as well as community took on more of the support roles where needed.

The users' experiences

Mental health (along a continuum from wellness to severe impairment) is a useful starting point to discuss how the everyday environment and people are interrelated. Degrees of impairment and the person's associated experiences foreground considerations relevant to design that are largely undisclosed for the general populous, and therefore, for spatial designers such as interior designers and architects.

People live their lives in parallel scenarios. That is each individual experiences other people and things with the

unconscious belief that they all have similar interpretations about what is happening. However, differences become evident when a word, action, gesture, or expression flags that the individual scenarios are not in fact the same. In the context of the current discussion, the impact of cognitive impairments is often not evident to the incidental observer in everyday situations such as shopping. Therefore, different understandings of a situation where, for example, a person with cognitive impairment behaves anti-socially can arise as a result. For example, the incidental observer and person with impairment (such as brain injury) are both shopping for clothes in a department store (parallel scenarios). However, as the sensory overload from the piped music becomes unbearable for the latter—to the point she cannot remember what she is looking for and as a result frustration and confusion result. Her behaviour, as a consequence, may appear to be confused and she may express her frustration through gesture or verbally as she attempts to cope. The observer, however, understands her behaviour as inappropriate for a shopper in this setting as the observer has no indicator, and therefore insight, into the experience of the other shopper. Important for the designer is the disjuncture between the different experiences which is indicated by the behavioural shift. The act revealed this music in relation to the impairment triggers a decrease in quality of experience for the person. Questions are therefore raised for future designs.

As spatial designers often create these environments, the role of design in the relationship and the impact on the person is important. The designers' and clients' understandings, as the dominant paradigm, generate the environmental outcome—our cities, streets, buildings, and interiors. In summary, the design team create a venue or facility that people will encounter and experience in some way. If we take our hypothetical users—a child with autism, a youth with attention deficit syndrome, a young women with brain injury, or an ageing man with dementia—each will have a different relationship with the physical environment. When there is a match between the person and the provided environment, then the designer and person's understanding of that type of environment and/or activity are similar; or are believed to be operating as such.

When not, in Bourdieu's terms, their social capital [11] or ability to connect seamlessly with their community is compromised and it is evident that they do not know 'the game'. This reflects that their habitus—the tacit social understandings which are embodied, practiced and reinforced through their living [12]—is not complementary to the environmental situation. As a result, how they are understood and treated will be affected, and in turn, this may impact on their sense of normality and sense of wellness.

Designers or design teams make assumptions about what 'the game' is for the users, how the environment will be used, and how the game will be played out—although they may do background research about what they are designing (a future situation). As a result the design is an hypothesis



which is based on their education, the client brief, as well as, past experiences and practices. However, this imagined or predicted ‘place’ may not be the same as that which is actually experienced. As described in length elsewhere [13], the resultant designed physical environment only exists as the potential to become a particular place once experienced. The users’ understandings, and experience, develop through their interaction and engagement with the environment; including any ‘disjunctures’ arising through that relationship. Therefore, the environment is not just a setting or a backdrop.

Methods: Environmental case studies

The impact of design is potentially very potent for people with autism/ADS, acquired brain injury, dementia, and the like. To demonstrate, examples are drawn from a cross section of studies undertaken by the author during the past decade that reveal the impact of the environment as a facilitator and/or inhibitor for people with ASD/Autism and CIP in everyday environments.

CASE 1 [14]:School children with cognitive impairment (CIP)

Children spend a significant part of their lives at school. In 2005, fifty thousand children under 16 years old presented at hospitals in the United Kingdom had head injuries per year: that is between 1:500 and 1:200 children suffer traumatic brain injury (TBI) each year. In addition, many more children will not visit hospital and problems subsequent to injury may be unnoticed at school. [15] Therefore, for children with cognitive impairment the impact of the school environment on their wellbeing was considered to be potentially very important. For children a CIP, such as traumatic brain injury from a blow to the head, can result in a significant disability with long term effects as it impacts on the brain as it is developing, and therefore, the pattern of recovery is very different than for adults. [16]

As a consequence, it is hypothesised that obstacles to learning due the physical environment are potentially compounded for these students. It was posited this could occur directly due to what the environment affords and the degree of environmental fit between student with CIP and the classroom or broader school. It was also considered that the environment has indirect impacts, for example, children being uncomfortable, frustrated, and socially affected. A combination of the cognitive impairment and the physical environment would influence their ability to learn and their overall experience of being at school. Schools in two educational districts of Education Queensland were surveyed —one urban and the other rural—potentially embracing 59 primary schools and 700 teachers. (Note: In some instances it was difficult accessing the actual teachers and batches of questionnaires were returned—for example, with a Principal’s memo stating that School X’s staff were too busy to complete.) Although the return rate was lower than hoped, the pilot obtained informative data from experienced teachers regarding the

educational experience of children with cognitive impairment.

Findings:

The target of the pilot study was three pronged:

- a) Identification of students operating within the mainstream state primary system with a diagnosed cognitive impairment/learning disability
- b) The relationship between those students with cognitive impairment, their behaviour and/or their mood with the classroom environment was explored.
- c) The relationship with/ impact on the total class and the classroom environment

Of the 52 questionnaires returned, 27 teachers indicated that they were teaching students with a form of cognitive impairment. The teachers (who all had 10 year or more years experience) were asked if they considered the behaviour of the cognitively impaired students was affected by the physical environment of the classroom: 63% indicated that it did; 14.8% were unsure. Influencing environmental characteristics they observed were categorised into four groupings—space, noise, layout and lighting (Refer Table 1). General observations identified firstly, that children with CIP are the **first and most affected** by changes to the physical environment (climate control, spatial elements, layout etc), and secondly, that consistency of the physical environment—in particular the layout of the room or venue—and a routine are important. Both influence the child’s feelings of security and control.

Table 1: Impact of Physical Environment on Children with CIP’s Behaviour

Characteristic	Teacher Observations	Outcomes
SPATIAL	The size of classroom is important. Need to provide a sense of ‘personal space’ for the child	<ul style="list-style-type: none"> ▪ Inappropriate physical contact. ▪ A deterioration of socially acceptable behaviour. ▪ Increased movement of ‘busy’ children ▪ Increases CIP behaviour management difficulties
NOISE	Quiet physical environment; Provide less distractions	<ul style="list-style-type: none"> ▪ Less distracted ▪ Staying ‘on task’ easier
LAYOUT	Open areas or unstructured classroom Layout of desks important	<ul style="list-style-type: none"> ▪ Increases stress because of its lack of identifiable structure/boundaries ▪ Rows provide a structured or formal setting, ▪ Groups of desks allow for more interaction and socializing so children with CIP withdraw or misbehave or distract others
LIGHTING	Glare from whiteboards	<ul style="list-style-type: none"> ▪ Unsettling element



Behaviours reported to be exhibited included extreme paranoia, severe anxiety/panic, low impulse control (unsettled, constant movement), tactile issues (touching constantly), crying, poor concentration (not able to stay on task), lack of self-discipline/non-compliant, lack of tolerance to peers/others, oppositional/defiant, attention-seeking, passive, shy/withdrawn, aggressive/argumentative, vocalisations (bad language, singing/humming, frustrated noises) and/or anti-social behaviours with peers.

The teachers were also asked to identify if mood was affected as well (Refer Table 2).

Table 2: Impact of Physical Environment on Children with CIP's Mood

Characteristic	Teacher Observations	Outcomes
CLIMATE	Extremes in temperature important (particularly heat)	Causes children with cognitive impairment <i>in particular</i> : <ul style="list-style-type: none"> • be tired and lethargic or complain of sickness; • have reduced level of attention; • show reduced willingness to participate in class activities.
NOISE	A quiet environment is important influence on mood	<ul style="list-style-type: none"> ▪ excessive external or internal noise is unsettling
LAYOUT	A spacious layout was said to create a generally better mood; Limited space increases the aggravation	<ul style="list-style-type: none"> ▪ a clear structure in the classroom is positive ▪ a sense of routine creates less stress ▪ high traffic areas nearby increases distraction
LIGHTING	Insufficient or inappropriate lighting triggers an 'emotional' response.	<ul style="list-style-type: none"> ▪ become annoyed/aggravated ▪ attention to school work is diverted or impeded ▪ lighting can be an unsettling element

CASE 2 [17]: Children with Autism/ASD

This study involved an extensive review of the literature concerning children with autism as a fore runner to observation of children in an Australian suburban ASD/Autism dedicated preschool facility. As the majority of children with ASD/Autism do not have physical disabilities, they are often seen to have serious problems by the general public due to their behaviours or social withdrawal. However, it is important to recognise that a sense of well being is important for their continuing health and development and that the physical environment may be able to play a role in achieving this.

Findings Part a:

The literature review included two perspectives. Firstly, there is a need for attention to the design of environments for children with ASD/Autism. Duker and Rasing [18] observe that by redesigning the physical environment that stimulation levels can be reduced but they state that there are limitations in trying to control or modify the autistic child's behaviour through design. [17: p450]; 'Effective

design for autism education contradicts some conventional architectural wisdom. For example, it's a truism of educational-facility design that learning spaces should stimulate children. Designing schools for autistic kids turns this principle on its head. Because autism is typically marked by extreme sensitivity to sensory stimulation — sound, light, colour, pattern — it is critical that schools for autistic children tightly control the amount and type of visual and aural stimulation' [19: p1].

However, most interventions are based on traditional models of classroom management; and this may be amplified with the increased rate of ASD and the demand for mainstream schooling participation [20] In association with integration comes particular design issues relating to inclusive environments so that the child with ASD/Autism is supported [20].

Secondly, the way that an environment can facilitate learning and/or development is raised. For example, Case-Smith [21] states that purposeful interaction can occur with the environment when 'appropriate levels of arousal, orientation and attention are attained' [21:p490] and that sensory integration is fundamental to a child's ability to engage in play and sustain interaction. However, Case-Smith only explores the physical environment in terms of furniture (beanbags, shades, sensory table). The potential of the total environment was not recognised. In contrast, Tiegerman & Primavera's [22] observe that by manipulating the environment during play, the child develops control over animate and inanimate objects; and that the objects are important in the development of social and interactional exchange. Although the child with ASD/Autism does not develop in the same way as non-autistic children, their research indicates that by utilising the child's limited manipulative repertoire within an environment his or her interactions can be expanded. [22]

Findings Part b:

Observations were carried out one morning a week over three months and the sessions videoed. During these sessions staff was also consulted regarding the learning objectives, clarification of activities, children responses, and the like. In many instances the difficulties for the child were not readily obvious and the teachers' knowledge of children's of comparable ages without Autism/ASD potential abilities and behaviours, as well as a deep understanding between how Autism/ASD presents uniquely for each child, were invaluable.

Preliminary results from the observations indicate that the environment intervenes and is integrated into the child's life, and therefore, has the potential to facilitate his/her daily life. At a macro level the preschool building and interior:

- acts as the destination or focus
- provides the means to place personal and communal things thereby forming rituals
- acts as a source to bang or push, to play on and with, to climb, to support the body,



- provides sensory stimulation
- offers comfort, security and/or control
- provides containment, order, structure and/or predictability
- provides cues for activities, responses, and behaviour

Depending on the child's individual characteristics and their management, it can also offer:

- restriction
- distraction
- confusion

Although these descriptors would be relevant for all settings, in this case the ability to have an ordered and purposeful interaction in a social setting was facilitated. Developing this is difficult for children with ASD/autism and activities needed to change continually. The environment served as the constant amidst the continual activity and movement.

Case 3 [23]: Public agency for adults with cognitive impairment

People with cognitive impairment are often required to seek assistance from agencies in regard to health and life skills support. As a result, the design and management of such facilities can impact on their ability to participate successfully in society and their general well being. This case-study involved such an agency in urban Australia. (Note: due to confidentiality the facility will not be identified).

The study was instigated by the managers as they had observed that their clients had conditions (including psychiatric conditions, schizophrenia, intellectual disability, acquired brain injury, as well as minor conditions) that often lead to behavioral issues when clients visited their premises. They also identified that disturbances were most commonly linked to people who have acquired brain injury (ABI). These people also needed to visit the premises repeatedly. The managers believed that the environmental design may be an influencing factor.

The study consisted of interviews with individual staff members across the organizational areas that intersected with the client group. Observations of the public areas during client visits were undertaken. A photographic analysis of the design including spatial and furniture layouts, finishes, and materials was also carried out. Access to architectural drawings of the relevant building floors and incident reports were also provided for review.

Findings:

Three aspects for consideration arose—security and safety, freedom of movement, and environmental qualities. The aim was to reduce the instances of the anti-social behaviour.

a) Security and safety: Clarity of purpose, a friendly environment and a non-confining space were deemed

as important. In association, an ability for staff to feel secure and other clients to feel safe was also important. Planning that allows staff to remove themselves from danger yet assist, divert or constrain relevant clients were also issues of concern. Segregation of general business from client interaction areas was desirable.

b) Freedom of movement: Staff attitudes, level of stress, and consequent behaviours needed to be considered in light of the desired service and purpose of the agency. By offering simultaneous support for the client, protection for the staff, and the removal of the need for indirect responsibility for others' safety, a better quality of service to the client by staff potentially could be facilitated. Equity of service rather than equity of access became important.

c) Environmental qualities: Two main aspects became evident.

Noise: Clients with aggressive behaviour are often sensitive to too much noise and find it hard to concentrate. Therefore, distracting noises in interview rooms or other areas requiring concentration need to be minimised. Incidents create a lot of noise and abusive language, so the layout also is required to restrict the sound travelling to other client areas.

Distraction: Distractions in waiting areas need to be provided to occupy the client while they are waiting to see an agency's officer. These potentially reduce how long a client thinks they are waiting, and thereby, reduces agitation. It was unclear if television was a positive distraction as some content may be calming while other may cause agitation. Simply interventions such as magazines, a water supply and views to the outside were identified as useful distractions. However, potential projectiles need to be avoided in case of incidences where clients become more aggressive. In contrast, to waiting areas, interview rooms (or places requiring concentration) need distractions to be minimised because, as stated above, clients with cognitive impairment often have difficulty being able to focus. Distractions can cause difficulties in staying 'on task', and therefore, lead to frustration or agitation which impacts on their interaction with the staff.

In response to the study, a design proposal that provided three different paths of movement—clients, staff, and public — were developed. Rather than inserting barricades and protective devices at the entrance to each room or security screened desks, the proposal clustered functions into spaces which could be easily segregated. These could be isolated or 'locked down' in more discrete ways during an incident to restrict movement of the client involved while others could continue business-as-usual. Therefore, the client's dignity can be maintained while a sense of security for staff fostered. Thus the interaction between staff and clients potentially becomes more open and relaxed.



Discussion and implications

How do the case studies shed light on the role and design of the built environment? Each demonstrates that the everyday environment is potentially critical for the wellbeing and long term development of the users.

The school aged children's behaviour and mood were observed to be affected, and as a result their learning influenced. For the children with ASD/autism, the carers' philosophy is that the children's positive capabilities are utilised to their potential and teaching and organisational strategies need to be developed to reach that end. It was shown in our study that the environment is implicated in the organisation of children's daily learning and socialising activities thereby potentially supporting this goal. For the adults who needed to use the agency's services, the environment not only influenced their mood and behaviour but also indirectly impacted on the service that they received from the agency. The role of the environment, therefore, is much more than just a backdrop or setting.

The three case studies are indicative of the relationship between people and environments. What is of importance here, is the need for people such as the school child with cognitive impairments, the young child with ASD/Autism, and the adult with acquired brain injury, to continually negotiate their environment without others necessarily being aware of the cost it has for person involved. Because such impairments are largely invisible to, and as a consequence, not as readily understood by the incidental observer, the indirect consequences of emotions and behaviours can be misunderstood. The environment (through its relationship with the person) can trigger frustration, anger, loss of identity, sadness, and the like by providing situations where he or she is too cramped, too hot, or distracted. Therefore, their ability to concentrate, to learn, to wait, to engage, or to relax, for example, is compromised. In situations where such emotions and behaviour are triggered and individuals have difficulties as a result. Others such as teachers, early childhood staff, and agency staff, may need to act as proxy 'carers'. If agitation, depression, or frustration lead to acts such as yelling or violence, intervention may become necessary to protect other students, staff, or clients (as well as the person themselves) from being disturbed—or the worst case harmed.

The design of the physical environment needs to cater for all without becoming mundane or insipid. It is important that delight is an aspiration as well as function to support users beyond just the pragmatic issues. Designers of public spaces must aim to become aware of the multiple and parallel scenarios that exist, and as a result, lower the frequency of those variables that are most likely to act as negative triggers for those with less visible impairments. In everyday settings, such as those introduced above, designers create environmental situations where all users seemingly carry out the predicted tasks as generally anticipated. However, for some the relationship between themselves and the physical environment is more taxing

and a point may be reached where an inability to interact in the expected manner is reached. As the number of people with impairments (such as those highlighted) increases, the need for designers to recognise the impact that environments may have on their everyday lives becomes increasingly important. There is also a need for a holistic view of the person with less visible impairments, and therefore, the need to bring to design of everyday environments increased opportunities for wellbeing through designer awareness and sensitivity.

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CONFLICTS OF INTEREST

There are no competing interests to be declared by the author