BUILDINGS & CITIES

Wellbeing as an emergent property of social practice

SYNTHESIS PAPER

GARRETT T. MORGAN
SYLVIA COLEMAN
JOHN B. ROBINSON
MARIANNE F. TOUCHIE
BLAKE POLAND
ALSTAN JAKUBIEC
SARAH MACDONALD
NORENE LACH
YUAN CAO

*Author affiliations can be found in the back matter of this article

ubiquity press

ABSTRACT

Wellbeing in buildings is often approached by practitioners and researchers as the aggregate result of individual interactions between building occupants and building features. This sum-of-the-parts approach, however, ignores the ways in which broader social (*i.e.* sense of ownership and belonging) and symbolic (*i.e.* what it means to be 'well' in a specific culture at a particular place and time) components of wellbeing influence occupant experience of the built environment. A social practice perspective on wellbeing in buildings is proposed that accounts for these elements. Beginning with discussions of how wellbeing has been assessed and the foundations of social practice theory, it is suggested that occupant wellbeing is emergent not just from individual interactions with building features but also from broader social and symbolic elements.

POLICY RELEVANCE

A social practice perspective on wellbeing in buildings has implications for both the assessment of wellbeing and the role of wellbeing in the building design process. Integrating social and symbolic elements into measures of wellbeing pushes assessment beyond the typical focus on comfort and spatial experience (indoor environmental quality). These more nuanced assessments may in turn shape how wellbeing is addressed in building design, construction, and management.

CORRESPONDING AUTHOR:

Garrett T. Morgan

Department of Geography & Planning, University of Toronto, Toronto, ON, CA

garrett.morgan@mail.utoronto.ca

KEYWORDS:

buildings; built environment; social practice theory; wellbeing

TO CITE THIS ARTICLE:

Morgan, G. T., Coleman, S., Robinson, J. B., Touchie, M. F., Poland, B., Jakubiec, A., Macdonald, S., Lach, N., & Cao, Y. (2022). Wellbeing as an emergent property of social practice. *Buildings and Cities*, 3(1), pp. 756–771. DOI: https://doi.org/10.5334/bc.262

DOI: 10.5334/bc.262

1. INTRODUCTION

Buildings shape the nature and experience of everyday life for occupants through many ways ranging from features determining lighting, temperature, and noise levels to the shared spaces that allow for social encounters. With most of the world's urbanized population spending as much as 80% of their time inside (Rice & Drane 2020), a percentage that has increased—at least temporarily—due to the COVID-19 pandemic (Lades *et al.* 2020), buildings are a critical factor in 'determining or influencing human physical, mental, and social health in positive or negative ways' (Rice 2019: 160). How buildings are designed and operated impacts individual and collective wellbeing of residents, visitors, and employees (Altomonte *et al.* 2020; Hanc *et al.* 2019; Jones *et al.* 2019). The views of occupants about their wellbeing can influence their behavior in the building (Ortiz *et al.* 2017). For these reasons, analysts have called for the intentional integration of wellbeing into building design processes (Rice 2019; Keeling *et al.* 2012).

Certification systems such as the International Well Building Institute's (IWBI) WELL standard are informed by the growing research-based evidence that engineering wellbeing in buildings is possible (Loder *et al.* 2021). The emergence of these and other certification systems has given rise to what some have called a 'wellbeing turn', where meeting human needs is seen as an integral part of sustainability writ large (Deneulin 2019; O'Mahony 2022; Rogers *et al.* 2012). Moreover, occupant wellbeing interacts in complex ways with the environmental performance of buildings (Andargie *et al.* 2019; Jakubiec & Alight 2021). If the goal of sustainable buildings is to enhance both human wellbeing and environmental performance, then wellbeing assessment tools need to be embedded in building design much as energy modelling has become a standard part of the design process.

This paper argues that wellbeing is best understood as the outcome of communally derived meanings and skills, which emerge from constant interaction with other people, and the designed materials and objects of everyday life. This has implications for both building design and wellbeing assessment. To account for its communally held, cultural components, wellbeing in buildings can be understood as more than the interaction between individual occupants and design elements. Instead, occupant wellbeing in buildings may be seen as *emergent* from the context in which occupants interact with each other (social), the building itself (spatial, material) and the broader cultural understandings of what wellbeing is, could, or should be (symbolic).

Social practice theory provides a framework through which to explore the social, spatial, and symbolic elements of interactions relating to wellbeing. Social practice approaches describe everyday activities, often not routine in nature, that individuals perform. While these everyday activities are carried out by individuals, they are shared, co-created, and emergent out of specific contexts (such as the built form and spaces of buildings) through the interactions of three elements: meanings, skills, and objects (Reckwitz 2002; Schatzki 1996, 2002; Shove *et al.* 2012). Practices take place at both the scale of the individual and at the collective level (thereby straddling 'individual agency' and 'social structure') (Reckwitz 2017; Shove 2017).

This approach to social practice analysis allows explicit inclusion of how spaces in buildings facilitate specific, often normalized, activities. For example, in the context of an office building, these activities may include taking regular coffee or smoking breaks; printing documents; using headphones to create soundscapes to focus or drown out background noise; or eating lunch at one's desk or with others—all activities that can be influenced (or not) by shared organizational norms or physical building features. The interconnections between the social, spatial, and symbolic elements of these activities can be identified (Strengers & Maller 2011) and assessed for a more nuanced understanding of occupant wellbeing in buildings (Coleman 2016; Coleman & Robinson 2017).

There is a need for greater attention to be paid to the ways that socio-cultural elements influence how individual and collective wellbeing is both understood and pursued. The development or diminishment of wellbeing is akin to an 'ongoing conversation' that can be understood through continuous monitoring and assessment over time. This paper explores how a social practice perspective on wellbeing in buildings can inform a more dynamic integrative approach to building design, construction, and management.

DOI: 10.5334/bc.262

2. THE CONCEPT OF WELLBEING

The drive to understand wellbeing has attracted scholars from a range of disciplines, most notably in psychology and behavioral economics. Often implicitly framed through a lens of rational choice theory (Kollmuss & Ageyman 2002) as the cumulative result of individual choices and internal dispositions, wellbeing scholarship often emphasizes the primacy of individual agency over broader social, ecological, and economic structures (Shove & Walker 2014). The pursuit of wellbeing in this tradition is framed as an aggregate outcome of one or more specific components (*i.e.* physical/mental illness, job satisfaction, income, family life *etc.*), rather than as a *dynamic process*, emergent from a complex interplay of ever-changing social practices and contexts (Slater & Robinson 2020).

Scholars have traced the concept of wellbeing as emergent from two distinct conceptions of human nature: hedonic and eudaimonic. Broadly, hedonic traditions focus on the short-term maximization of pleasure or happiness, while eudaimonic approaches emphasize human development and fulfilment over time (Deci & Ryan 2008; Ryan & Deci 2001). Hedonic approaches are outcome based and assume that human nature is driven by the maximization of individual pleasure (Wiseman & Brasher 2008). Hedonic wellbeing is measured by how people evaluate their own lives in terms of both affective (how they feel) and cognitive (what they think) components of wellbeing (Adler & Seligman 2016). Eduaimonic traditions, on the other hand, are based on an understanding that wellbeing is a constantly evolving process rather than a final destination. Eudaimonic wellbeing includes multiple dimensions (Ryan & Deci 2001) often featuring metrics such as meaning, autonomy, authenticity, social connectedness, and self-acceptance (Adler & Seligman 2016: 5).

Table 1 provides a speculative list of aspects provided by the building context that may contribute to hedonic and eudaimonic experiences.

Table 1: Hedonic and eudaimonic wellbeing outcomes according to building feature.

BUILDING ELEMENT	HEDONIC WELLBEING	EUDAIMONIC WELLBEING
Furniture		
Comfortable	Physical comfort	Sense of belonging
Uncomfortable	Physical pain and distress	Disconnection from space; inability to focus
Personal thermostat		
Present	Thermally comfortable environment	Sense of ownership of individual space and autonomy at the individual level
Not available	Discomfort, require space heaters	Lack of autonomy, daily negotiation
Outdoor spaces		
Provided and accessible	Physical comfort	Job satisfaction, opportunity for breaks, opportunities for informal interaction
Lacking or absent	Confinement	Disconnection from nature/non-work environment, burnout
Fenestration (windows)		
Provided	Natural light	Sense of connection to the natural world, biological response (*e.g.* circadian rhythms)
Lacking	Artificial light	Environmental discomfort and disconnection with natural world

The hedonic tradition has been critiqued as focusing on and supporting selfishness and materialism while ignoring the broader socio-cultural contexts in which individual wellbeing is pursued and 'achieved' (Smith & Reid 2018: 810). Conversely, eudaimonic approaches have been criticized for being overly paternalistic, with experts determining what wellbeing *should* include from the top down, leaving little room for people to define wellbeing on their own terms (Diener *et al.* 1999). More recently, an emerging body of work moves beyond the hedonic/eudaimonic binary towards a more nuanced, but still individualistic, understanding of wellbeing as a multidimensional construct influenced by both philosophical traditions (Dodge *et al.* 2012; O'Mahony 2022; Smith & Reid 2018; Wiseman & Brasher 2008).

How wellbeing is framed has implications for wellbeing assessment. The assessment of wellbeing from a hedonic or eudaimonic perspective relies on different methodologies and indicators. Efforts to understand wellbeing in the built environment that are grounded in the hedonic tradition focus on the relationships between specific design elements and occupant health, satisfaction, and performance (Watson 2018). Conversely, assessments of eudaimonic wellbeing in the built environment focus on the broader relationships between nature, place, and 'mental wellbeing' as a sum of the individual parts (*e.g.* Alvaro *et al.* 2016).

3. TRADITIONAL MEASURES OF SUBJECTIVE AND OBJECTIVE WELLBEING

Wellbeing is typically assessed through subjective and/or objective approaches. Methods to assess subjective wellbeing (SWB) are primarily concerned with satisfaction and feelings as self-reported by individuals (Gasper 2010; Haybron 2008). SWB constructs draw from the psychological literature (La Placa *et al.* 2013), and SWB is usually seen as consisting of three related, but independent, components: life satisfaction, positive emotions, and negative emotions (Helliwell & Barrington-Leigh 2010). SWB approaches understand wellbeing as resulting from internal as well as external processes and influences (Atkinson *et al.* 2019), as defined by the individual themselves, rather than by outside observers (Cramm *et al.* 2013; Diener *et al.* 1999). Due to this more individualistic focus, SWB analysis is usually tied to hedonic outcomes.

While the built environment cannot be held solely responsible for shaping wellbeing, analysts argue that it is at minimum a correlative factor that can be assessed (Altomonte *et al.* 2020; Diaz Lozano Patiño *et al.* 2018; Hanc *et al.* 2019; Jakubiec *et al.* 2020; Stopps & Touchie 2021). Applied to buildings, SWB analysis takes the shape of traditional pre- and post-occupancy evaluations where occupants rate and/or discuss their wellbeing and satisfaction with various elements of building performance (especially indoor environmental quality (IEQ), including thermal comfort, lighting, acoustics, *etc.*) (*e.g.* Preiser *et al.* 2016; Chiu *et al.* 2014; Brown 2018; Watson 2018). Surveys and interviews provide insight into occupant ratings of their own wellbeing (SWB), along with their ratings of their engagement with colleagues, use of spaces, and their use and ratings of the wider built environment outside the building.

Correlations between satisfaction with IEQ and various built environment elements, and wellbeing ratings, can be statistically analysed. A more precise following step that integrates the human and environmental systems (Coleman *et al.* 2018) in empirical study is to correlate SWB and comfort ratings with actual building performance in real time, such as IEQ measurements, including thermal comfort, air quality, acoustic levels, *etc.* (Stopps & Touchie 2021; Vakalis *et al.* 2021). Due to the complexity of variables involved in human–buildings research, it may not be possible to accurately predict wellbeing and ratings of they are based on actual built environment conditions. Connections between wellbeing and building features can, however, raise awareness of wellbeing design through dialogue within industry and within the building (Coleman *et al.* 2018).

In contrast to the self-reported nature of SWB, objective wellbeing (OWB) aims to capture the external and circumstantial components, or the 'non-feeling features', of an individual's life (Gasper 2007: 59). OWB comprises a range of domains, but typically includes socio-demographic, biomedical, environmental, and lifestyle indicators (smoking, mobility, *etc.*) as the primary units of analysis (Gasper 2007). OWB indicators are used in part because they may be extrapolated across communities (Sung & Phillips 2018) or nations (Veenhoven 2009) and can aid in establishing benchmarks which may be used to inform design and/or policy decisions (Helliwell & Barrington-Leigh 2010).

When applied to building occupants, OWB analyses rely on indicators such as age, gender, socio-economic status, and education. Michalos *et al.* (2011) illustrate that these factors are predictors of health, a construct tightly related to wellbeing. Building-specific aspects that may influence OWB include acoustics, thermal or visual comfort, and privacy. Additional concepts such as staff leadership, engagement, and absenteeism are frequently layered onto age, gender, socio-

DOI: 10.5334/bc.262

economic status, and education to attempt to shape a more rounded picture of what factors lead to disparate wellbeing outcomes in office settings (Lach *et al.* 2022). Applied to the built environment more broadly, the proximity to and quality of green space, nutritious food, and efficient transit systems have also been suggested as possible factors contributing to OWB of building occupants, visitors, and/or residents (for an exploration of additional OWB frameworks, indicators, and assessments, see Lach *et al.* 2022).

The focus on external variables, rather than self-reported subjective measures, predispose OWB analyses to align with an eudaimonic perspective on wellbeing. How these measures came to be taken as 'wellbeing indicators' themselves is the result of specific historical practices and processes that emerged from dynamic interaction between material and socio-cultural components over time.

As with the construction of any metric, both subjective and objective approaches use indicators that are developed through value-laden processes that have real-world implications for how wellbeing in buildings is measured and pursued (Helliwell & Putnam 2004; Scott & Bell 2013). As a result, the process of developing wellbeing indicators runs the risk of reflecting, and reinforcing, normative top-down conceptions of what components *should* influence individual wellbeing rather than being informed by the 'conditions and needs' identified by individuals (Sung & Phillips 2018: 77). Working from this normative perspective of what wellbeing is and how it can be 'achieved' has led to approaches to wellbeing in buildings to conceive of it as something that can be 'built' into buildings by following a predetermined list of requirements that ignore local context and do not account for how conceptions of wellbeing change over time (Haybron 2008). As a result, measures linked to OWB and SWB in one place and time may differ from those in another (Sointu 2005). Projects that use open-ended, qualitative measurements, such as interviews, focus groups, or alternative visual methods, such as Photovoice (Wang & Burris 1997), may account for these underlying assumptions and practices that shape wellbeing in specific context (Mazziotta & Pareto 2019).

The IWBI's Global Research Agenda (GRA) (Loder *et al.* 2021) illustrates the potential of an applied approach to wellbeing in buildings that integrates both SWB and OWB measures and concepts. The GRA argues that building health and performance is 'interactive, shifting, adaptive, and occurring at multiple scales' (Loder *et al.* 2021: 10). In their building health conceptual model, health and performance emerge cumulatively from three types of outputs: cognitive/psychological, behavioral, and physiological (Loder *et al.* 2021: 28). In the model, cognitive/psychological outputs include wellbeing, job satisfaction, mental health, and job performance; behavioral outcomes include positive and negative health habits, social capital, and individual physical activity patterns; and physiological indicators include obesity/diabetes, respiratory health, neurological and endocrine health, as well as health and wellbeing status (Loder *et al.* 2021: 28). These outputs are influenced by both internal and external environmental conditions, organizational inputs and work factors, as well as individual character traits and social norms.

By incorporating SWB (*i.e.* job satisfaction, mental health, social capital) with OWB (positive and negative health habits and physiology), the GRA represents an important step toward a dynamic understanding of wellbeing in buildings. However, while the model does include social norms as collective moderators of how individual health and performance outcomes emerge (including wellbeing), the GRA is primarily grounded in the sum-of-the-parts perspective critiqued above. Social practice theory by contrast offers a more holistic framework with which to explore the relationships between material, social, and symbolic elements of wellbeing.

4. SOCIAL PRACTICE THEORY

Theories of social practice investigate everyday life and how it changes over time by focusing on daily activities or practices, as the primary unit of social analysis (Bourdieu 1990; Hargreaves *et al.* 2011; Shove & Walker 2014). According to Schatzki (1996), practices are routinized embodied patterns of activity that emerge from a dynamic state of negotiation and change between

DOI: 10.5334/bc.262

individuals and broader social and cultural influences (Schatzki 2002; Reckwitz 2002). Practices are neither positive nor negative in normative terms. Consider the practice of driving alone in personal vehicles long distances from suburban communities to urban centers for employment. For many, this daily commute is imbued with broader social meanings about social status, autonomy, and the primacy of work in Western capitalist society. The practice of driving in this manner may be seen as positive during one historical context and as negative in another, but the activity of driving itself is not inherently positive or negative.

Social practice approaches acknowledge that human experiences and behaviors, found in daily activities, are the result of interactions between individuals and society. These practices are not confined to the individual, but rather emergent and influenced by each practices' history and ongoing interactions between dynamic material, symbolic, and social aspects. Common social practices include driving, showering, cooking, and walking (Hargreaves *et al.* 2011; Shove *et al.* 2012; Shove & Pantzar 2005). In office buildings, practices may include using a space heater at an individual workspace (Chappells & Shove 2005), taking coffee breaks (Stroebaek 2013), or working long hours (Zhang & Seo 2018). These everyday practices are rarely consciously considered. For example, office building occupants may not consciously determine how they move through their workplaces when they arrive at the building in the morning. Instead they rely on previous experiences of the building, an understanding of organizational norms about how employees should act in the office environment; and the building features and layout that influence how people move through a space.

Drawing from both Schatzki and Reckwitz, Shove *et al.* (2012) argue that practices result from the integration of three dynamic elements: materials (objects, products, things), skills (know-how, competencies, rule-following abilities), and meanings (embedded symbols, images, ideas). In their model, materials are the things used or interacted with in practice (such as a light switch, blind, headphones, water cooler, window, *etc.*); skills or competencies are the know-how that allow the performance of a practice (if occupants 'know' that using a door handle is how a door opens which allows the occupant to leave the building); and meanings are the shared ideas, aspirations, and symbolic understandings represented by and embodied in a practice (Figure 1).

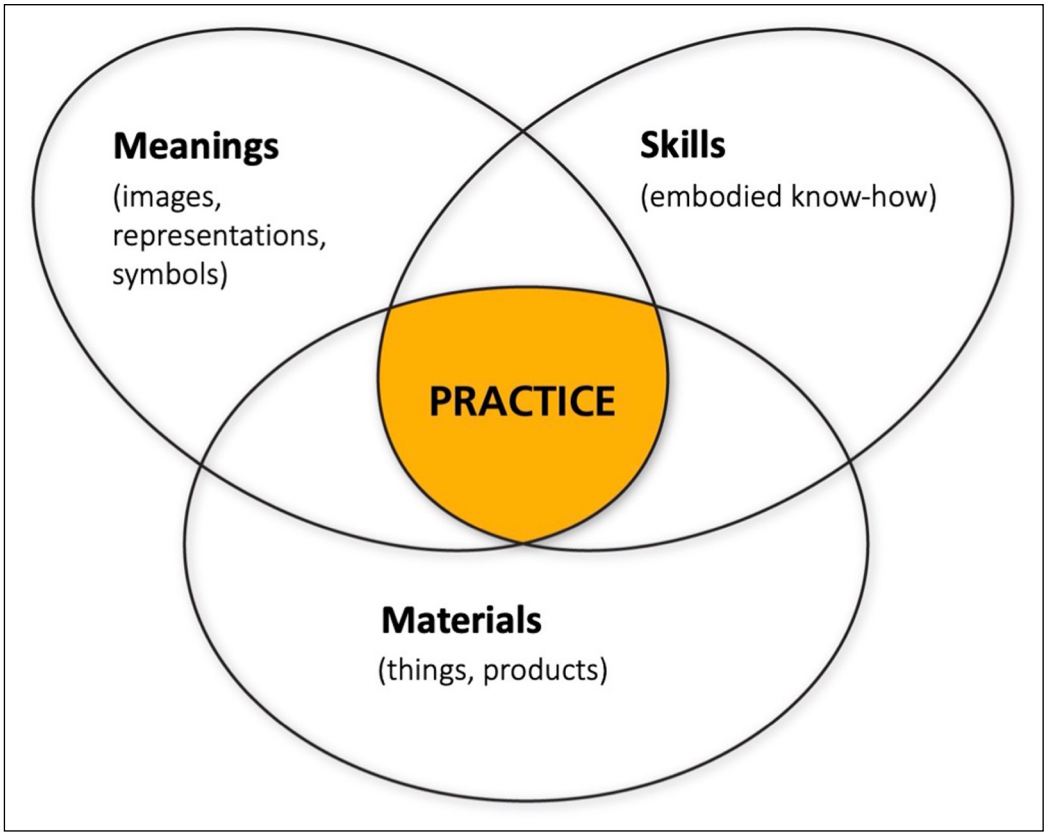

Figure 1: Tripartite model of social practice theory.

Sources: Shove *et al.* (2012), adapted by Coleman (2016) and used by Lach *et al.* (2022).

5. SOCIAL PRACTICE APPROACHES TO THE BUILT ENVIRONMENT

The built environment is a ubiquitous, culturally produced series of objects that are heavily backgrounded in human awareness, and part of routine activities, helping to shape and order everyday lives and practices. Buildings can represent each of Shove *et al.*'s (2012) three elements of social practice: a building can be seen to convey status (meaning); it is a material object that is interacted with; and requires competencies to be known/used (Coleman 2016). As such, social practice theory provides a compelling framework for understanding how wellbeing emerges from human–building interactions. The studies that have adopted a social practice approach to buildings often focus on the relationships between design and occupant practices. Design is the process of shaping existing infrastructure and creating objects that facilitate daily life. Daniels *et al.* (2017) trace how design practices and occupant practices were influenced by a shared vision of what an educational building should be. They illustrate how a collective vision of a school changed over time as the building was built, occupied, and used, which in turn led to changes in the practices that were enacted within the building. In their investigation of the development and implementation of energy retrofit programs in social housing projects, Della Valle *et al.* (2018) found that this dynamic relationship between design vision and occupant behavior and experience impact how buildings are said to 'perform'. Assessments of building performance from a social practice perspective have explored energy consumption (Hampton 2017; Labanca & Bertoldi 2018), physiological health (Crawford 2006; Blue *et al.* 2016), and overall comfort (Madsen & Gram-Hanssen 2017; Hanc *et al.* 2019). This later work on comfort explores the social practices of occupant adaptation to building conditions but does not take the next step to connect occupant adaptation practices with multiple other daily practices from which occupant wellbeing emerges.

To the best of the present authors' knowledge, Klapperich *et al.* (2019) are among the few scholars approaching wellbeing in buildings from a social practice perspective. In their case study of a technological product design process, they identify a gap between abstract models of wellbeing and the practical application of specific interactions with building elements. They argue that understanding positive or negative occupant experiences of a building after it is completed and being used does not, by itself, 'provide sufficient support to design for wellbeing' (Klapperich *et al.* 2019: 154). By intentionally organizing all stages of the design process to directly engage with the skills, materials, and symbolic elements of social practices in buildings, however, they argue that wellbeing cannot be simply one of many design goals, but must be the overall design goal itself.[1] Moreover, occupant wellbeing is not something that can be achieved through design alone and then forgotten about once a building is complete. Instead, accounting for the social, cultural, and material elements of occupancy practices through the design process may allow a more dynamic and collective approach to wellbeing to emerge.

6. FROM SOCIAL PRACTICES IN BUILDINGS, TO WELLBEING IN BUILDINGS

The preceding discussion suggests that social practice theory is useful for exploring wellbeing in buildings in five ways:

- Social practice theory provides an alternative model for understanding the human–building interface that has, to date, been unexplored in the wider wellbeing literature and explorations of wellbeing in buildings. In particular it requires the collective practices that occur in the built environment in question to be spelled out in some detail and to analyze their relationships to reported wellbeing.
- Reference to the material world encourages the unpacking of the socio-cultural components in multiple building design processes. Designing infrastructure that has the potential to shape how a practice is carried out is potentially in the purview of designers (who themselves are influenced by industry, design, technological, *etc.* movements in wider culture).
- A social practice approach focused on the collective dimensions of wellbeing facilitates engagement with the question of whether individuals in buildings are passive occupants or

active inhabitants (Cole *et al.* 2008). An 'occupant' is a passive recipient of building design; someone not provided with the agency to adapt their environment. They accept what is offered (or subvert it due to dissatisfaction), often shaped by prior expectation. In contrast to this, an 'inhabitant' has a sense of place in, ownership of, and engagement with the building. By definition, they are able to adapt their surroundings to their needs because of an interactive adaptivity inherent to the building's design (Cole *et al.* 2008). A sense of place and engagement are collective features of the interaction of the inhabitants and the built environment; they are also connected to wellbeing (Rice 2019; Altomonte *et al.* 2020; Jones *et al.* 2019). Implementing 'dialogue'-promoting 'interactive adaptivity' through processes of interaction between inhabitants and the building, with the goal of net-positive building performance and human wellbeing (Coleman *et al.* 2018), can be supported through design solutions of building features (*e.g.*, window-signaling systems), as well as evaluation processes such as post occupancy evaluation and social events (Coleman & Robinson 2017).

- Practices are shared and negotiated socially. If a sense of wellbeing emerges from these shared practices, then the concept of wellbeing itself emerges from the interactions of socio-cultural and material elements. Yet, while practices are negotiated socially, they are usually not negotiated consciously according to social practice theory. Practices that take hold in a given sociocultural context do so as a result of perspectives and actions that are tacit, and shared collectively. For example, it is widely accepted in the business culture of the Global North that office workers step away from their desk in order to take a physical and mental break (possibly based on the lived experience that taking a break from work is rejuvenating, and that it is sanctioned by management and co-workers). Taking a break may involve spending time in a different space or outside, having a drink, running an errand. The practice combines the skills to execute the tasks; the materials required to carry out the tasks (such as comfortable furniture, mugs, a vehicle); and a shared, symbolic understanding that a break is needed, that this is how a break is sanctioned, bounded and accomplished.[2] Office workers 'just know' that this is the expected practice of taking a break, because of contextualized learning and shared understanding, that is rarely if ever consciously apprehended beyond the first time or in a new context (Kurz *et al.* 2015).
- A building or an engineered landscape is necessarily also the product of a broader socio-cultural dynamic where cycles of novelty, innovation, and aesthetics change over time. Practices within buildings are similarly collectively developed, carried, and dropped over time according to what design characteristics and processes are prioritized. As a result practices that emerge in building design and use are often outside of the immediate control of individual occupants or design professionals. Instead, they emerge from and shift in accordance with or in response to broader socio-cultural and material elements that themselves are in flux.

7. ASSESSING WELLBEING IN BUILDINGS FROM A SOCIAL PRACTICE PERSPECTIVE

While no stakeholder can claim certainty about the success of any precondition for comfort and wellbeing in the built environment, a close understanding of how it emerges is essential. It is possible to operationalize this perspective in the context of wellbeing in buildings and to bridge the gap between theory and application by using inclusive, participatory methods of assessment that integrate both quantitative and qualitative methods (Lach *et al.* 2022).

Describing and measuring social practices in the built environment involves qualitative approaches primarily including observation and ethnography, surveying and interviewing, and secondary source research. Wellbeing assessments are often based on standardized frameworks that generate individualized and then aggregated results (Lach *et al.* 2022; Dooris *et al.* 2017). By focusing on individual behaviors, rather than social practices these approaches often miss the dynamic and evolving nature of wellbeing in specific cultural contexts. Moreover, this approach risks reducing the collective and relational components of wellbeing that emerge from

DOI: 10.5334/bc.262

the interaction between the meanings, skills, and material elements understood from a social-practice perspective.

Previous studies that take a social practice perspective on elements of the built environment have primarily used qualitative methods to assess the skills, meanings, and materials that shape social practices over time (Lamond & Everett 2019). These include those who primarily use interviews as well as the more quantitatively inclined who deploy numerical surveys (Hansen 2015). In buildings, this could look like conducting qualitative methods with occupants, such as interviews in order to assess wellbeing and comfort. Interviews can dig deeper into survey responses to gain nuance on individual responses, which can also be compared with other individual responses.

Further, since social practice theory calls for methods that elucidate practices rather than solicit opinions, a method such as Photovoice (Wang & Burris 1997) could be employed since it asks occupants to take photos of the situations and things in their environment, and then researchers interpret meaning, in collaboration with continued discussion with the participants. This method thereby 'shows rather than tells' how the building is performing in both an individual and collective sense.

8. HOW THIS APPROACH MIGHT APPLY TO THE BUILDING DESIGN PROCESS

As earlier scholars of wellbeing have made clear, wellbeing can be impacted by environmental factors as much as by individual or collective processes (Lucas *et al.* 2013; Bluyssen *et al.* 2011). As such, features that are thought to lead to positive wellbeing outcomes can be designed in ways that create the conditions that support social practices that shape occupant wellbeing. By aiming to provide the space for practices that lead to positive wellbeing outcomes to emerge, the design process can also deeply engage with the broader cultural contexts that buildings, and their occupants, inhabit (Freihoefer & Zborowsky 2017). Identifying what practices within buildings are thought to support the emergence of positive wellbeing outcomes requires the more nuanced assessment methods outlined above *and* the reorientation of the building design process that engages with wellbeing throughout the entire design process. A social practice perspective on wellbeing in the buildings has implications for the four stages of the building process: concept; design; construction and commissioning; and building operations and occupancy.

An understanding of inhabitant wellbeing informed by social practice could be addressed during the concept stage. This could mean using an integrated project delivery (IPD) approach that involves (proxies for) the building operators (if the building has them) and the inhabitants in early discussions about the role of the building in creating net-positive wellbeing outcomes (Jones 2014; Raouf & Al-Ghamdi 2018; Carvajal-Arango *et al.* 2019). A key output of this early integration of wellbeing into building concepts involves the development of written and social media materials about the building that frame the story of the building and its inhabitants (Coleman & Robinson 2017). This narrative can carry through to subsequent stages of the building process, ensuring that occupant wellbeing outcomes remain of primary importance to building operations and programming.

By generating anticipated user profiles and how they will interact and experience the building differently during the *design stage*, the design team can articulate affordances of the building that may shape or enable interactive adaptivity processes, such as user controls, adaptive elements, and spaces for independent versus collaborative work, among others described above.

During the design stage, building teams increasingly adopt an integrated design process (IDP) that could also involve representatives of (proxies for) operators and inhabitants (Lu *et al.* 2020; Stevenson & Rijal 2010). This process should include explorations of the design implications of workplace (office buildings) or living culture (residential buildings). In both office and residential settings the design team should aim to design a building that allows occupants to adapt building elements to meet their needs and preferences. These interactive adaptivity processes support a switch from seeing people who experience and use buildings as passive 'occupants' towards

DOI: 10.5334/bc.262

viewing them as active 'inhabitants' who are engaged with the building (Cole *et al.* 2008; Coleman & Robinson 2017). This shift has implications for monitoring wellbeing and building performance as well as for the types of spaces/uses that are incorporated into the building design, *e.g.* on-site showering facilities, meeting rooms, and informal spaces.

As part of the integrated design process, contractors and representatives from the building trades working on the building could be involved in ongoing discussions with the design team throughout the *construction and commission stage*. The latter is significant to ensure that the commissioned building reflects the design intent, but more importantly to include construction issues in the design process. The goal would be to ensure that the building as built reflects the wellbeing goals identified in the concept and design stages of the project.

During the building's final *operations and occupancy stage*, if wellbeing goals are to be achieved or enabled, it is critical to ensure that building operators and inhabitants understand how to maintain, interact, and/or use the building. A key goal is to avoid any potential handover issues by providing thorough and detailed documentation about how the building is intended to be used and its function. Another is to make building inhabitants aware of the wellbeing affordances of the building and the potential for processes of interactive adaptivity with the building.

The wellbeing narrative developed in the design stage should center processes of community engagement with building inhabitants. For example, a 'wellbeing in all designs' orientation could be part of a broader holistic 'health in all designs' approach advocated by Rice (2019). This approach is not a panacea or prescription for wellbeing that can be followed to the letter to achieve preordained results. It may, however, support the emergence of inhabitant wellbeing in buildings that moves beyond the dominant sum-of-the-parts checklist approach to health and wellbeing manifest in many 'healthy architecture' practices today (Rice 2019; Rice & Drane 2020). This approach would not be limited to buildings alone, but would:

> ensure joined-up action across a range of scales including product design, architecture, urban design, town planning, and landscape design.
>
> (Rice & Drane 2020: 909)

9. TOWARDS A SOCIAL PRACTICE PERSPECTIVE ON WELLBEING IN BUILDINGS: RESEARCH DIRECTIONS

Using social practice theory to integrate multiple, individualistic approaches to understanding wellbeing (subjective and objective; hedonic and eudaimonic) in the building context, this article suggests that wellbeing in buildings is an emergent, dynamic process that is shaped by and shared with collective processes and activities. Demonstrating this emergence is tantamount to demonstrating that wellbeing is a communally held and shaped human experience, which has implications for wellbeing research, wellbeing within buildings research, and for working to inscribe wellbeing into building design.

Taking a social practice lens allows it to be envisioned how design can help shape wellbeing because it is critical to simultaneously refer to materials, meanings, and skills. Doing so also allows wellbeing to be conceived of as an inherently shared property. As such, as argued at more length in a companion paper (Lach *et al.* 2022), wellbeing may be more holistically understood as *community wellbeing*. Participatory methods can be deployed to both assess and understand how wellbeing is shaped and emerges from social practices. Framing individuals as active agents influenced and shaped by broader social forces opens a window to move beyond the traditional framing of community wellbeing as the aggregate of its parts, to seeing societal discourses around wellbeing, as a *collective*, emergent, and on-going process (Smith & Reid 2018). Therefore, social practice approaches to wellbeing in buildings are, in application, a way to understand community wellbeing because of how practices are shared and so widespread that they are understood to be normal (Lach *et al.* 2022).

A social practice approach may also help to highlight physical, bodily activity in habits and routines, thereby enriching the discourse that is based on a tendency to focus on mental health. And in enriching the discourse and creating dialogue around the subject, stakeholders in the design industry,

and researchers, for example, may then facilitate some normalization of wellbeing routines. By framing wellbeing as co-produced, collective, and arising from everyday practices, social practice theory can help stimulate an important critical engagement with the very concept of wellbeing itself, bringing it beyond an individual, cognitively oriented sense of happiness (Cieslik 2015).

Wellbeing may be closely tied to a sense of belonging to a social collective (such as within a building, as a shaping and shapeable container), by virtue of what is collectively practiced, known, owned, and/or shared. In this sense, wellbeing may be less connected to whether conditions are specifically cold, hot, dark, bright, *etc*., and more connected to the human sense of belonging. If this perspective is correct, then wellbeing is a primarily shared, community-oriented property that emerges from shared practices.

10. CONCLUSIONS

While design interventions can, and often do, have measurable positive impacts on occupant experiences of a building, physical interventions alone do not account for broader social and symbolic elements that shape occupant wellbeing. As a result, a narrow focus on design or material elements of a building alone is insufficient. The broader social (*i.e.* sense of ownership and belonging) and symbolic components (*i.e.* what it means to be 'well' in a specific culture at a particular place and time) of wellbeing can be integrated to influence both the design of the built environment broadly and the individual and collective experience of building inhabitants. Rather than exclusively focusing on how building occupants interact with building features, this social practice perspective on wellbeing in buildings argues that wellbeing is emergent from the broader material, social and symbolic elements in which individuals necessarily exist and take part. It thereby allows for more nuanced assessments of how wellbeing emerges in buildings, which can, in turn, allow new insights into how wellbeing can be placed at the center of building design, construction, and management.

NOTES

1 This approach is highly consistent with a regenerative sustainability approach that seeks to achieve net-positive outcomes with respect to both ecological and social wellbeing, and their interactions (Robinson & Cole 2015).

2 For a detailed walk through of the 'day in the life' of an office worker from a social practice perspective, see Appendix A in the supplemental data online.

ACKNOWLEDGEMENTS

The authors acknowledge the contributions of the following extended project team members to the thinking that informs this paper: Gregoire Benzakin, Jamie Cryder, Carlos Ernesto Sánchez Pimienta, and Kim Slater. The authors thank the editor and three anonymous peer reviewers for their insightful comments and suggestions on an earlier version of this article.

AUTHOR AFFILIATIONS

Garrett T. Morgan 0000-0002-3441-9569
Department of Geography & Planning, University of Toronto, Toronto, ON, CA

Sylvia Coleman 0000-0002-3938-3913
Munk School of Global Affairs & Public Policy, University of Toronto, Toronto, ON, CA

John B. Robinson 0000-0003-4559-5565
Munk School of Global Affairs & Public Policy, University of Toronto, Toronto, ON, CA
School of the Environment, University of Toronto, Toronto, ON, CA

Marianne F. Touchie 0000-0002-5008-0630
Department of Civil & Mineral Engineering, University of Toronto, Toronto, ON, CA;
Department of Mechanical & Industrial Engineering, University of Toronto, Toronto, ON, CA

Blake Poland 0000-0002-3774-9758
Dalla Lana School of Public Health, University of Toronto, Toronto, ON, CA

Alstan Jakubiec 0000-0002-8534-6902
School of the Environment, University of Toronto, Toronto, ON, CA;
John H Daniels Faculty of Architecture, Landscape, and Design; University of Toronto, Toronto, ON, CA

Sarah MacDonald
Dalla Lana School of Public Health, University of Toronto, Toronto, ON, CA

Norene Lach 0000-0002-3252-3426
Dalla Lana School of Public Health, University of Toronto, Toronto, ON, CA

Yuan Cao 0000-0001-7025-1305
Department of Mechanical & Industrial Engineering, University of Toronto, Toronto, ON, CA

AUTHOR CONTRIBUTIONS

Conceptualization: B.P., S.C., J.R., G.T.M., and M.T.; research: G.T.M., S.C., N.L., S.M., and Y.C.; formal analysis: G.T.M., S.C., J.R., and M.T.; writing—original draft preparation: G.T.M. and S.C.; writing—review and editing: A.J., B. P., S.C., G.T.M., J.R., M.T., N.L., S.M., and Y.C.; supervision: J.R. and M.T.; project administration: S.C., J.R., and M.T.; and funding acquisition: J.R., M.T., and S.C. All authors have read and agreed to the published version of the manuscript.

COMPETING INTERESTS

The authors have no competing interests to declare.

FUNDING

This research was funded by a Government of Canada Social Science and Humanities Research Council (SSHRC) Insight Grant (grant number 435-2020-0999) This article is one of the products of the Government of Canada SSHRC-funded project 'Practicing Wellbeing in the Built Environment: The Social Practice of Developing Wellbeing in U of T Living Labs' (2020–23) led by principal investigators John Robinson of the Munk School of Global Affairs & Public Policy and School of Environment at the University of Toronto and Marianne Touchie of the Departments of Civil & Mineral Engineering and Mechanical and Industrial Engineering at the University of Toronto.

SUPPLEMENTAL DATA

Supplemental data for this article can be accessed at: https://doi.org/10.5334/bc.262.s1

REFERENCES

Adler, A., & **Seligman, M. E. P.** (2016). Using wellbeing for public policy: Theory, measurement, and recommendations. *International Journal of Wellbeing*, 6(1), 1–35. DOI: https://doi.org/10.5502/ijw.v6i1.429

Altomonte, S., Allen, J., Bluyssen, P. M., Brager, G., Heschong, L., Loder, A., *et al.* (2020). Ten questions concerning wellbeing in the built environment. *Building and Environment*, 180(August), 106949. DOI: https://doi.org/10.1016/j.buildenv.2020.106949

Alvaro, C., Wilkinson, A. J., Gallant, S. N., Kostovski, D., & **Gardner, P.** (2016). Evaluating intention and effect: The impact of healthcare facility design on patient and staff well-being. *Health Environments Research & Design Journal*, *9*(2), 82–104. DOI: https://doi.org/10.1177/1937586715605779

Andargie, M. S., Touchie, M., & **O'Brien, W.** (2019). A review of factors affecting occupant comfort in multi-unit residential buildings. *Building and Environment*, 88, 484–496. DOI: https://doi.org/10.1016/j.buildenv.2019.106182

Atkinson, S., Bagnail, A.-M., Corcoran, R., South, J., & **Curtis, S.** (2019). Being well together: Individual subjective and community wellbeing. *Journal of Happiness Studies*, 21, 1903–1921. DOI: https://doi.org/10.1007/s10902-019-00146-2

Blue, S., Shove, E., Carmona, C., & **Kelly, M. P.** (2016). Theories of practice and public health: Understanding (un) healthy practices. *Critical Public Health*, 26(1), 36–50. DOI: https://doi.org/10.1080/09581596.2014.980396

Bluyssen, P. M., Janssen, S., van den Brink, L. H., & **de Kluizenaar, Y.** (2011). Assessment of wellbeing in an indoor office environment. *Building and Environment*, 46(12), 2632–2640. DOI: https://doi.org/10.1016/j.buildenv.2011.06.026

Bourdieu, P. (1990). *The logic of practice*. Stanford University Press. DOI: https://doi.org/10.1515/9781503621749

Brown, T. L. (2018). A critical assessment of the place of post-occupancy evaluation in the critique and creation of socially responsible architecture. *Intelligent Buildings International*, 10(1), 1–12. DOI: https://doi.org/10.1080/17508975.2018.1437708

Carvajal-Arango, C., Bajamón-Jaramillo, S., Aristizábal-Monsalve, P., Vásquez-Hernández, A., & **Bótero, L. F.** (2019). Relationships between learn and sustainable construction: Positive impacts of lean practices over sustainability during construction phase. *Journal of Cleaner Production*, 234, 1233–1337. DOI: https://doi.org/10.1016/j.jclepro.2019.05.216

Chappells, H., & **Shove, E.** (2005). Debating the future of comfort: environmental sustainability, energy consumption and the indoor environment. *Building Research & Information*, 33(1), 32–40. DOI: https://doi.org/10.1080/0961321042000322762

Chiu, L. F., Lowe, R., Raslan, R., Altamirano-Medina, H., & **Wingfield, J.** (2014). A socio-technical approach to post-occupancy evaluation: Interactive adaptability in domestic retrofit. *Building Research & Information*, 42(5), 574–590. DOI: https://doi.org/10.1080/09613218.2014.912539

Cieslik, M. (2015). 'Not smiling but frowning': Sociology and the 'problem of happiness'. *Sociology*, 49(3), 422–437. DOI: https://doi.org/10.1177/0038038514543297

Cole, R. J., Robinson, J., Brown, Z., & **O'Shea, M.** (2008). Re-contextualizing the notion of comfort. *Building Research & Information*, 36(4), 323–336. DOI: https://doi.org/10.1080/09613210802076328

Coleman, S. (2016). Normalizing sustainability in a regenerative building: The social practice of being at CIRS (Doctoral dissertation, University of British Columbia).

Coleman, S., & **Robinson, J. B.** (2017). Introducing the qualitative performance gap: Stories about a sustainable building. *Building Research & Information*, 46(5), 485–500. DOI: https://doi.org/10.1080/09613218.2017.1366138

Coleman, S., Touchie, M. F., Robinson, J. B., & **Peters, T.** (2018). Rethinking performance gaps: A regenerative sustainability approach to built environment performance assessment. *Sustainability*, 10(12), 4829. DOI: https://doi.org/10.3390/su10124829

Cramm, J. H., van Dijk, H. M., & **Nieboer, A. P.** (2013). The importance of neighbourhood social cohesion and social capital for the wellbeing of older adults in the community. *Gerontologist*, 53(1), 142–152. DOI: https://doi.org/10.1093/geront/gns052

Crawford, R. (2006). Health as a meaningful social practice. *Health*, 10(4), 401–420. DOI: https://doi.org/10.1177/1363459306067310

Daniels, H., Tse, H. M., Stables, A., & **Cox, S.** (2017). Design as a social practice: The design of a new build school. *Oxford Review of Education*, 43(6), 767–787. DOI: https://doi.org/10.1080/03054985.2017.1360176

Deci, E. L., & **Ryan, R. M.** (2008). Hedonia, eudaimonia, and well-being: An introduction. *Journal of Happiness Studies*, 9(1), 1–11. DOI: https://doi.org/10.1007/s10902-006-9018-1

Diener, E., Suh, E. M., Lucas, R. E., & **Smith, H. L.** (1999). Subjective wellbeing: Three decades of progress. *Psychological Bulletin*, 125(2), 276–302. DOI: https://doi.org/10.1037/0033-2909.125.2.276

Della Valle, N., Bisello, A., & **Balest, J.** (2018). In search of behavioural and social levers for effective social housing retrofit programs. *Energy and Buildings*. 1772(1 August), 517–524. DOI: https://doi.org/10.1016/j.enbuild.2018.05.002

Deneulin, S. (2019). *Wellbeing, justice, and development ethics*. Routledge.

Diaz Lozano Patiño, E., Vakalis, D., Touchie, M., Tzekova, E., & **Seigel, J. A.** (2018). Thermal comfort in multi-unit social housing buildings. *Building and Environment*, 144, 230–237. DOI: https://doi.org/10.1016/j.buildenv.2018.08.024

Dodge, R., Daly, A., Huyton, J., & **Sanders, L.** (2012). The challenge of defining wellbeing. *International Journal of Wellbeing*, 2(3), 222–235. DOI: https://doi.org/10.5502/ijw.v2i3.4

Dooris, M., Farrier, A., & **Froggett, L.** (2017). Wellbeing: The challenge of 'operationalising' an holistic concept within a reductionist public health programme. *Perspectives in Public Health*, 138(2), 93–99. DOI: https://doi.org/10.1177/1757913917711204

Freihoefer, K., & **Zborowsky, T.** (2017). Making the case for practice-based research and the imperative role of design practitioners. *HERD: Health Environments Research & Design Journal*, 10(3), 66–82. DOI: https://doi.org/10.1177/1937586716674470

Gasper, D. R. (2007). Conceptualising human needs and wellbeing. In *Wellbeing in developing countries: From theory to research* (pp. 1–29). http://hdl.handle.net/1765/50678. DOI: https://doi.org/10.1017/CBO9780511488986.003

Gasper, D. R. (2010). Understanding the diversity of conceptions of well-being and quality of life. *Journal of Socio-Economics*, 39(3), 351–360. DOI: https://doi.org/10.1016/j.socec.2009.11.006

Hampton, S. (2017). An ethnography of energy demand and working from home: Exploring the affective dimensions of social practice in the United Kingdom. *Energy Research & Social Science*, 28, 1–10. DOI: https://doi.org/10.1016/j.erss.2017.03.012

Hanc, M., McAndrew, C., & **Ucci, M.** (2019). Conceptual approaches to wellbeing in buildings: A scoping review. *Building Research & Information*, 47(6), 767–783. DOI: https://doi.org/10.1080/09613218.2018.1513695

Hansen, A. R. (2015). The social structure of heat consumption in Denmark: New interpretations from quantitative analysis. *Energy Research & Social Science*, 11(January), 109–118. DOI: https://doi.org/10.1016/j.erss.2015.09.002

Hargreaves, T., Haxeltine, A., Longhurst, N., & **Seyfang, G.** (2011). *Sustainability transitions from the bottom-up: Civil society, the multi-level perspective and practice theory* (Working Paper 1, 1-26). Centre for Social and Economic Research on the Global Environment. https://www.scopus.com/record/display.uri?eid=2-s2.0-84858018901&origin=inward&txGid=5a7ad080f347a3c664589b32b15e8946

Haybron, D. M. (2008). Philosophy and the science of subjective-wellbeing. In M. Eid & R. J. Larsen (Eds.), *The science of subjective well-being* (pp. 17–43). Guildford.

Helliwell, J. F., & **Barrington-Leigh, C. P.** (2010). Measuring and understanding subjective wellbeing. *Canadian Journal of Economics*, 43(3), 729–753. https://wellbeing.research.mcgill.ca/publications/Helliwell-Barrington-Leigh-CJE2010-measuring-and-understanding-SWB-CJE.pdf. DOI: https://doi.org/10.1111/j.1540-5982.2010.01592.x

Helliwell, J. F., & **Putnam, R. D.** (2004). The social-context of well-being. *Philosophical Transactions of the Royal Society of London B: Biological Sciences*, 359(1449), 1435–1446. DOI: https://doi.org/10.1098/rstb.2004.1522

Jakubiec, J. A., & **Alight, A.** (2021). Spectral and biological simulation methods for the design of health circadian lighting. In Proceedings of Building Simulation, Bruges. http://www.jakubiec.net/papers/Jakubiec%20and%20Alight%20-%20NIF%20Lighting%20Metrics%20(Final).pdf

Jakubiec, J. A., Quek, G., & **Srisamranrungruang, T.** (2020). Long-term visual quality evaluations correlate with climate-based daylighting metrics in tropical offices—A field study. *Lighting Research & Technology*, 53, 5–39. DOI: https://doi.org/10.1177/1477153520926528

Jones, B. (2014). Integrated project delivery for maximizing design and construction considerations regard sustainability. *Procedia Engineering*, 95, 528–538. DOI: https://doi.org/10.1016/j.proeng.2014.12.214

Jones, M., Rice, L., & **Meraz, F.** (Eds.). (2019). *Designing for health & wellbeing: Home, city, society*. Vernon.

Keeling, T., Clements-Croome, D., Luck, R., & **Pointer, P.** (2012). How the sensory experience of buildings can contribute to wellbeing and productivity. *Proceedings of the 7th Windsor Conference: The changing context of comfort in an unpredictable world*, Cumberland Lodge, Windsor, UK, 12–15 April 2012. Network for Comfort and Energy Use in Buildings. http://nceub.org.uk

Klapperich, H., Laschke, M., Hassenzahl, M., Becker, M., Cürlis, D., Frackenpohl, T., Köhler, H., Ludwigs, K., & **Tippkämper, M.** (2019). Mind the gap: A social practice approach to wellbeing-driven design. In A. Petermans & R. Cain (Eds.), *Design for wellbeing: An applied approach* (pp. 54–169). Routledge. DOI: https://doi.org/10.4324/9781315121383-11

Kollmuss, A., & **Ageyman, J.** (2002). Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research*, 8(3), 239–260. DOI: https://doi.org/10.1080/13504620220145401

Kurz, T., Gardner, B., Verplanken, B., & **Abraham, C.** (2015). Habitual behaviours or patterns of practice? Explaining and changing repetitive climate-relevant actions. *WIRES Climate Change*, 6(January–February), 113–128. DOI: https://doi.org/10.1002/wcc.327

La Placa, V., McNaught, A., & **Knight, A.** (2013). Discourse on wellbeing in research and practice. *International Journal of Wellbeing*, 3(1), 38–42. DOI: https://doi.org/10.5502/ijw.v3i1.7

Labanca, N., & **Bertoldi, P.** (2018). Beyond energy efficiency and individual behaviours: Policy insights from social practice theories. *Energy Policy*, 115, 494–502. DOI: https://doi.org/10.1016/j.enpol.2018.01.027

Lach, N., McDonald, S., Coleman, S., Touchie, M., Robinson, J., Morgan, G. T., *et al.* (2022). Community wellbeing in the built environment: Towards a relational building assessment. *Cities & Health*. DOI: https://doi.org/10.1080/23748834.2022.2097827

Lades, L. K., Laffan, K., Daly, M., & **Delaney, L.** (2020). Daily emotional wellbeing during the COVID-19 pandemic. *British Journal of Health Psychology*, 25(4), 902–911. DOI: https://doi.org/10.1111/bjhp.12450

Lamond, J. E., & **Everett, G.** (2019). Sustainable blue-green infrastructure: A social practice approach to understanding community preferences and stewardship. *Landscape and Urban Planning*, 191, 103639. DOI: https://doi.org/10.1016/j.landurbplan.2019.103639

Loder, A., Gray, W. A., & **Timm, S.** (2021). *Global research agenda: Health, well-being, and the built environment*. International Well Building Institute.

Lu, Y., Sood, T., Change, R., & **Liao, L.** (2020). Factors impacting integrated design process of net zero energy buildings: An integrated framework. *International Journal of Construction Management*, 22(9), 1700–1712. DOI: https://doi.org/10.1080/15623599.2020.1742625

Lucas, R. J., Peirson, S. N., Berson, D. M., Brown, T. M., Czeisler, C. A., Figuerio, M. G., *et al.* (2013). Measuring and using light in the melanopsin age. *Trends in Neurosciences*, 37(1), 1–9. DOI: https://doi.org/10.1111/bjhp.12450

Madsen, L. V., & **Gram-Hanssen, K.** (2017). Understand comfort and sense in social practice theory: Insights from a Danish field study. *Energy Research & Social Science*, 29, 86–94. DOI: https://doi.org/10.1016/j.erss.2017.05.013

Mazziotta, M., & **Pareto, A.** (2019). Use and misuse of PCA for measuring well-being. *Social Indicators Research*, 142, 451–476. DOI: https://doi.org/10.1007/s11205-018-1933-0

Michalos, A. C., Smale, B., Labonté, R., Muharjarine, N., Scott, K., Moore, K., Swystun, L., Holden, B., Bernardin, H., Dunning, B., Graham, P., Guhn, M., Gadermann, A. M., Zumbo, B. D., Morgan, A., Brooker, A.-S., & **Hyman, I.** (2011). *The Canadian Index of Wellbeing. Technical report 1.0*. Canadian Index of Wellbeing and University of Waterloo. https://uwaterloo.ca/canadian-index-wellbeing/sites/ca.canadian-index-wellbeing/files/uploads/files/Canadian_Index_of_Wellbeing-TechnicalPaper-FINAL.pdf

O'Mahony, T. (2022). Toward sustainable wellbeing: Advances in contemporary concepts. *Frontiers in Sustainability*, 3, 807984. DOI: https://doi.org/10.3389/frsus.2022.807984

Ortiz, M. A., Kurvers, S. R., & **Bluyssen, P. M.** (2017). A review of comfort, health, and energy use: Understanding daily energy use and wellbeing for the development of a new approach to study comfort. *Energy and Buildings*, 151(October), 323–335. DOI: https://doi.org/10.1016/j.enbuild.2017.07.060

Preiser, W. F. E., White, E., & **Rabinowitz, H.** (2016). *Post-occupancy evaluation*. Routledge. DOI: https://doi.org/10.4324/9781315713519

Raouf, A. M. I., & **Al-Ghamdi, S. G.** (2018). Building information modelling and green buildings: Challenges and opportunities. *Architectural Engineering and Design Management*, 15(1), 1–28. https://doi.org/10.1080/17452007.2018.1502655

Reckwitz, A. (2002). Toward a theory of social practices: A development in culturalist theorizing. *European Journal of Social Theory*, 5(2), 243–263. DOI: https://doi.org/10.1177/13684310222225432

Reckwitz, A. (2017). Practices and their affects. In A. Hui, T. Schatzki, & E. Shove (Eds.), *The nexus of practices: Connections, constellations, practitioners* (pp. 114–125). Routledge.

Rice, L. (2019). A health map for architecture: The determinants of health and wellbeing in buildings. In M. Jones, L. Rice & F. Meraz (Eds.), *Designing for health and wellbeing: Home, city, society* (pp. 155–184). Vernon.

Rice, L., & **Drane, M.** (2020). Indicators of healthy architecture—A systematic literature review. *Journal of Urban Health*, 97, 899–911. DOI: https://doi.org/10.1007/s11524-020-00469-z

Robinson, J., & **Cole, R. J.** (2015). Theoretical underpinnings of regenerative sustainability. *Building Research & Information*, 43(2), 133–143. DOI: https://doi.org/10.1080/09613218.2014.979082

Rogers, D. S., Duraiappah, A. K., Antons, D. C., Munoz, P., Bai, X., Fragkias, M., *et al.* (2012). A vision for human well-being: Transition to social sustainability. *Current Opinion in Environmental Sustainability*, 4(1), 61–73. DOI: https://doi.org/10.1016/j.cosust.2012.01.013

Ryan, R. M., & **Deci, E. L.** (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, 52(1), 141–166. DOI: https://doi.org/10.1146/annurev.psych.52.1.141

Schatzki, T. R. (1996). *Social practices: A Wittgensteinian approach to human activity and the social*. Cambridge University Press. DOI: https://doi.org/10.1017/CBO9780511527470

Schatzki, T. R. (2002). *The site of the social: A philosophical account of the constitution of social life and change*. Penn State University Press. DOI: https://doi.org/10.1515/9780271023717

Scott, K., & **Bell, D.** (2013). Trying to measure local well-being: Indicator development as a site of discursive struggles. *Environment and Planning C: Government and Policy*, 31(3), 522–539. DOI: https://doi.org/10.1068/c10127

Shove, E. (2017). Matters of practice. In A. Hui, T. Schatzki, & E. Shove (Eds.), *The nexus of practices: Connections, constellations, practitioners* (pp. 155–168). Routledge.

Shove, E., & **Pantzar, M.** (2005). Consumers, producers and practices: Understanding the invention and reinvention of Nordic walking. *Journal of Consumer Culure*, 5(1), 43–64. DOI: https://doi.org/10.1177/0263276414536746

Shove, E., Pantzar, M., & **Watson, M.** (2012). *The dynamics of social practice: Everyday life and wow it changes*. Sage. DOI: https://doi.org/10.4135/9781446250655

Shove, E., & **Walker, G.** (2014). What is energy for? Social practice and energy demand. *Theory, Culture & Society*, 31(5), 41–58. DOI: https://doi.org/10.1177/0263276414536746

Slater, K., & **Robinson, J.** (2020). Social learning and transdisciplinary co-production: A social practice approach. *Sustainability*, 12, 75111. DOI: https://doi.org/10.3390/su12187511

Smith, T. S., & **Reid, L.** (2018). Which 'being' in wellbeing? Ontology, wellness and the geographies of happiness. *Progress in Human Geography*, 42(6), 807–829. DOI: https://doi.org/10.1177/0309132517717100

Sointu, E. (2005). The rise of an ideal: Tracing changing discourses of wellbeing. *Sociological Review*, 53(2), 255–274. DOI: https://doi.org/10.1111/j.1467-954X.2005.00513.x

Stevenson, F., & **Rijal, H. B.** (2010). Developing occupancy feedback improves housing production. *Building Research & Information*, 38(5), 549–563. DOI: https://doi.org/10.1080/09613218.2010.496182

Stopps, H., & **Touchie, M.** (2021). Perceptions of thermal conditions in contemporary high-rise apartment buildings under different temperate control strategies. *Science and Technology for the Built Environment*, 27(10), 1492–1504. DOI: https://doi.org/10.1080/23744731.2021.1929465

Strengers, Y., & **Maller, C.** (2011). Integrating health, housing, and energy policies: Social practices of cooling. *Building Research & Information*, 39(2), 154–168. DOI: https://doi.org/10.1080/09613218.2011.562720

Stroebaek, P. S. (2013). Lets have a cup of coffee! Coffee and coping communities at work. *Symbolic Interaction*, 36(4), 381–397. DOI: https://doi.org/10.1002/symb.76

Sung, H., & **Phillips, R. G.** (2018). Indicators and community well-being: Explore a relational framework. *International Journal of Community wellbeing*, 1, 63–79. DOI: https://doi.org/10.1007/s42413-018-0006-0

Vakalis, D., Patino, E. D. L., Opher, T., Touchie, M. F., Burrows, K., MacLean, H. L., & **Siegel, J. A.** (2021). Quantifying thermal comfort and carbon savings from energy-retrofits in social housing. *Energy & Buildings*, 241, 110950. DOI: https://doi.org/10.1016/j.enbuild.2021.110950

Veenhoven, R. (2009). Well-being in nations and well-being of nations: Is there a conflict between individuals and society? *Social Indicators Research*, 91, 5–21. DOI: https://doi.org/10.1007/s11205-008-9323-7

Wang, C., & **Burris, M. A.** (1997). Photovoice: Concept, methodology, and use for participatory needs assessment. *Health Education & Behaviour*, 24(3), 369–387. DOI: https://doi.org/10.1177/109019819702400309

Watson, K. J. (2018). Establishing psychological wellbeing metrics for the built environment. *Building Services Engineering Research & Technology*, 39(2), 232–243. DOI: https://doi.org/10.1177/0143624418754497

Wiseman, J., & **Brasher, K.** (2008). Community wellbeing in an unwell world: Trends, challenges, and possibilities. *Journal of Public Health Policy*, 29(3), 353–366. DOI: https://doi.org/10.1057/jphp.2008.16

Zhang, L., & **Seo, J.** (2018). Held captive in the office: An investigation into long working hours among Korean employees. *International Journal of Human Resources Management*, 29(7), 1231–1256. DOI: https://doi.org/10.1080/09585192.2016.1192053

TO CITE THIS ARTICLE:
Morgan, G. T., Coleman, S., Robinson, J. B., Touchie, M. F., Poland, B., Jakubiec, A., Macdonald, S., Lach, N., & Cao, Y. (2022). Wellbeing as an emergent property of social practice. *Buildings and Cities*, 3(1), pp. 756–771. DOI: https://doi.org/10.5334/bc.262

Submitted: 11 July 2022
Accepted: 12 September 2022
Published: 06 October 2022