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Healthy Places: Mapping the Theoretical Landscape

Keith Diaz Moore

Abstract

This 21st century has brought robust attention to the role the environment plays in human health. This article offers a mapping of the theoretical landscape to help orient and potentially connect the diverse research conducted in the areas of healthy places. The premise is that much research has been conducted within the environmental stress approach to understanding the health-environment nexus, but that additional, important work has also been conducted within both a Fit and a Place approach that provide different insights into healthy places. Each approach has its own underlying assumptions regarding the relationship between human and environment, the research questions that should be asked, the type of validity valued and praxeological assumptions. Each approach also has differing affinities with various theories of health that may serve useful in connecting Healthy Place Research to interdisciplinary research endeavors. Here it is asserted that the concepts and models of allostatic load, salutogenesis and cumulative (dis)advantage hold great promise for connecting Healthy Place Research to robust fields of health inquiry.

Keywords: Healthy Places, theory, environmental stress, person-environment fit, theory of place

Introduction

During this 21st century, significant effort has enlarged our empirical knowledge base regarding the impact the built environment has upon health outcomes. Much of this knowledge has been catalogued in oft-cited literature reviews (Dijkstra, et.al., 2006; Gharaveis, et.al., 2018; Joseph, et.al., 2018; Saelens, et.al., 2003; Ulrich, et.al., 2008; Van de Glind, 2007) and published in new journals specific to the health-place nexus that have emerged over the past 25 years (e.g. Design for Health; Health and Place; Health Environments Research and Design Journal). The concept of Evidence-based Design (EBD) emphasizes the role of research in informing conscientious design decisions (Hamilton & Watkins, 2008). In the original piece regarding EBD, Hamilton (2003) suggests it is a corollary to evidence-based medicine which Sackett and colleagues (1996: 712) define as "the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients." Because of the importance of the term "best" in defining the evidence on which to draw, evidence-based medicine has defined best in terms of a hierarchy of research design (c.f. Guyatt, et.al., 1992) that ranges from case reports at the low end, through large, randomized control trials, to systematic reviews and meta-analyses at the top. This influenced Ulrich and colleagues' (2004: 3) criteria for choosing relevant studies in their seminal literature review: "research studies were assessed on their rigor, quality of research design, sample sizes, and degree of control."

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Corresponding Author: Keith Diaz Moore <diazmoore@utah.edu>

Yet research designs do not exist in a vacuum. By privileging certain research designs and a particular set of criteria, a concomitant devaluing of other research orientations and theories occurs. This concern is poignant, as Shannon and colleagues (2020: 2) present, "(w)ithout a strong theory of how built environmental designs are conceptualized to work, researchers risk not asking the right questions, measuring the right outcomes, or attributing findings correctly." Certain research questions are best pursued within certain approaches and each approach has certain values of what constitutes good research that are internally consistent with themselves. In previous work, Diaz Moore and Geboy (2010) discuss the three basic types of questions research may ask: causal, relational and descriptive. These map onto the three orientations of Healthy Places Research that are overviewed here: Stress (seeking causal—although usually achieving correlational—explanations, Fit (typically seeking relationships/patterns) and Place research (typically providing what has been called "thick description").

The primary purpose of this article is to provide a mapping of the theoretical landscape regarding the health-environment nexus, or in other words Healthy Places Research. It suggests there are three meta-concepts at work in this domain as just mentioned: Stress, Fit and Place. The article will provide an overview of each of these by briefly describing the approach within the meta-concept, followed by an exemplary theory and a brief discussion highlighting the core epistemological assumptions. The article asserts that each of these meta-concepts serves, to continue the landscape metaphor, as a point of origin and an orientation for inquiry including the nature of the theory, the type of knowledge sought and the likely methods to be employed. It is argued that the landscape of Healthy Places Research needs to accommodate inquiry occurring within all three orientations as each reveals different dimensions of this critical domain.

A second purpose of this article is to offer a parallel theory of health that shares the same orientation as research found within each meta-concept that may provide theoretical enrichening as well as theoretical linkages to better position this work more broadly within the discourse on health. The article asserts that research within the stress orientation of health-environment research may well consider the theory of allostatic load (McEwen, 1998). Fit could be enriched by a positioning in relation to salutogenic theory (Antonovsky, 1996). Finally, Place would be enriched by the concept of cumulative advantage/disadvantage (Dannefer, 2003). By proposing this taxonomy of meta-concepts and describing their associated assumptions and orientations, the article aims to contribute to a greater critical understanding of and appreciation for the diversity of work conducted in the domain of Healthy Places and to point to how that work may achieve greater impact through connection to Theories of Health (ToH).

Stress

Without question, the most substantively and methodologically mature approach toward health and environment stems from the environmental stress perspective. This orientation is rooted in understanding people as biologically responsive creatures who respond, positively or negatively, to various external stimuli in whose terms the environment is thereby conceptualized. The aim for the biological creature is to engage processes of self-regulation in a hope to maintain homeostasis, or the ability to maintain stability. As Evans and Cohen (1987: 573) define it, "stress is a process that occurs when there is an imbalance between environmental demands and response capabilities of the organism."

The environment may impact stress either directly or indirectly. Direct effects stem from factors such as crowding (Rollings & Evans, 2019), air quality (Thomson, 2019), and noise (Evans, 2006) while factors such as social support (Evans & Lepore, 1993) and personal control (Evans & McCoy, 1998) have indirect effects. Much environmental stress research has at its roots the work of Selye (1956) whose profound aspects include: 1) the assumption that there is only a finite level of adaptive energy one has to respond to stress; and 2) that there is an "adaptive-cost" the body and psyche have in responding to stress. This is why it is common to find the concepts of both restoration as well as reduction associated with stress (c.f. Evans & McCoy, 1998; Wells, et.al., 2016). Restoration has focused on the restoration of cognitive capacity, and more specifically, directed attention, after effort has been exerted to respond to external stress (c.f. Kaplan & Kaplan, 1989). Kaplan's (1995) Attention Restoration Theory (ART), for instance, posits natural environments possessing the four properties of being away, fascination, extent and compatibility promote the restoration from directed attention fatigue. While some Healthy Place Research has drawn upon Attention Restoration Theory, much more draws upon the strand of inquiry emphasizing stress reduction as

found in the work of Roger Ulrich (1983; Ulrich, et.al., 1991; Andrade & Devlin, 2015).

In the book, *Improving Healthcare with Better Building Design* (Marberry, 2006), Ulrich and his colleagues (2006: 37) assert, "(u)nderstanding stress is fundamental to understanding how physical healthcare environments affect outcomes." The domains of these outcomes are physiological, psychological, neuroendocrine and behavioral in nature. Physiologically, numerous body systems respond to stress including cardiovascular (e.g. blood pressure), muscular (tension), and immune response. The psychological dimension has outcomes such as depression at being sick, anxiety over the care regimen and/or its progression and also helplessness, or a loss of agency due to the "total institution" characteristics of acute care environments (Goffman, 1961). In the neuroendocrine system, the hypothalamic-pituitary-adrenal (HPA) axis is what ultimately releases cortisol into the blood stream, which is why cortisol saliva tests are now often used in environmental stress studies. Behaviorally, responses may include agitation (verbal or physical), withdrawal or sleeplessness.

The premise of Ulrich and colleagues (2006: 38) is: "outcomes will be worsened if healthcare facilities have features or characteristics that are in themselves stressors. Conversely, healthcare environments should foster improved outcomes if they are designed to minimize stressors such as noise and promote exposure to physical features and social situations that have stress-reducing influences." Thus the vast majority of this work takes as its point of origin that environmental stress has negative consequences on health outcomes and that the goal of design is to minimize those negative stressors. As such, most health and environmental stress research takes what Battisto and Wilhelm (2020) call a pathogenesis approach to health: the environment as stressor causing the person's biology and/or psychology to be out of balance. As they write (2020: 11), "Current connotations of "healthcare architecture" exhibit this scientific response to disease."

Exemplary Theory: Ulrich's Theory of Supportive Design

This "scientific approach to disease" in Healthy Places Research arguably has its roots in Ulrich's (1984) seminal article "View through a window may influence recovery from surgery" which reported on a study of 46 matched patients wherein 23 surgical recovery patients had a window view of a restorative setting (e.g. "nature") and 23 did not. Those with a window view had shorter postoperative stays, fewer negative comments in nurses' notes and took fewer analgesics. The underlying theory of this work was that "natural views apparently elicit positive feelings, reduce fear in stressed subjects, hold interest, and may block or reduce stressful thoughts, they might also foster restoration from anxiety or stress" (Ulrich, 1984: 224).

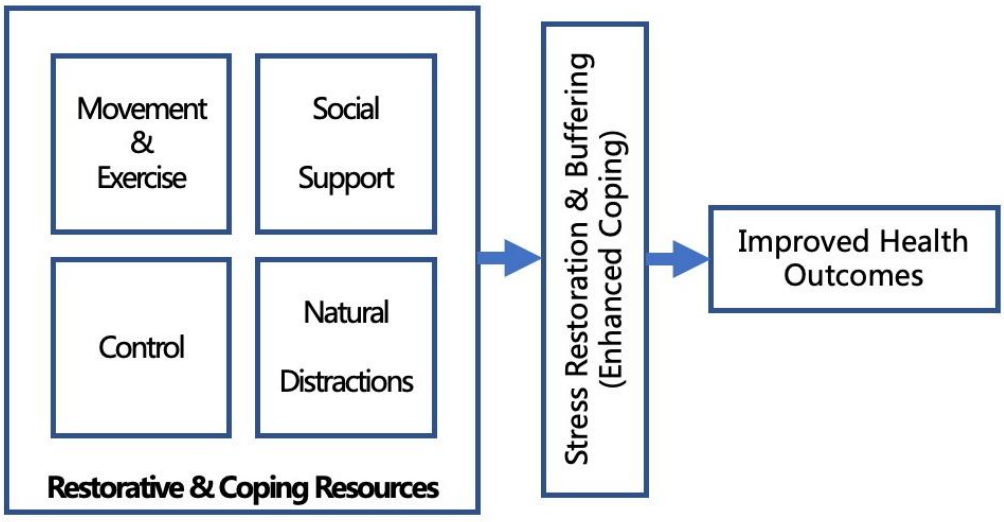

Figure 1: The Theory of Supportive Design (based upon Ulrich, 1999)

In 1991, Ulrich refined the theoretical premise of this work by offering a Theory of Supportive Design, which he subsequently refined in 1999. Initially, this theory suggested three components of supportive design helped individuals cope with stress—a sense of control with respect to physical-social surroundings; access to social support; and access to positive distractions—to which in 1999 Ulrich added movement and exercise in healing gardens (See Figure 1). This theory makes clear that designs possessing these characteristics provide coping resources to buffer and create restoration from stress and thereby improve health outcomes. Stress is clearly the phenomenon of interest in linking the environment to such health outcomes.

An exemplary study rooted in the Theory of Supportive Design is Rodiek (2002) which conceptualized a garden setting as a positive distraction contrasted with an interior environment with only translucent views. Two questionnaires, the Spielberger State-Trait Anxiety Inventory (STAI) (Spielberger et al., 1979) and the Philadelphia Geriatric Center Positive and Negative Affect Rating Scale (Lawton, et.al., 1996) measured anxiety and mood, respectively, and stress was measured through saliva cortisol. The only measure that was statistically significant between conditions was the lowered cortisol levels for participants in the garden condition.

Discussion of the Stress Orientation

Much has been learned about health outcomes arising from human-environment interactions in healthcare settings that have focused on stress as the pathway linking the two. Ulrich and colleagues (2004; 2008) conducted a landmark literature review of empirical studies examining the role of the physical environment in hospitals. The studies found empirical support for the connection between the physical environment and: reducing staff stress/fatigue; improving patient safety; reducing patient stress; and improving overall healthcare quality. Importantly, although conceptualized separately, much of the patient safety studies actually involved environmental stress variables such as uncontrolled stimuli and distractions. Similarly, when discussing improving quality, Ulrich and colleagues (2004: 25, italics added) wrote, "(t)here is strong evidence that design changes that make the environment more comfortable, aesthetically pleasing, and informative *relieve stress* among patients and increases satisfaction." Really, all four areas of findings are rooted in examining stress as the key concept linking health and environment. Other recent and meaningful health and environmental stress literature reviews include Eijkelenboom and Bluyssen (2019), Gillis and Gatersleben (2015), and Shahheidari and Homer (2012).

Fit

A second orientation to understanding the health-environment nexus is the concept of fit. In this case, the person is not just responding to stimuli as found in the stress approach, but rather both the person and the environment have a reciprocal exchange resulting in particular outcomes of the situation. Fit articulates a more dynamic condition than the stress approach as it accepts the person as not just a responder but also a processor engaged in the full range of experiential modalities (e.g. motivation, perception, cognition, affect [Weisman, et.al., 2000]). This means both objective and subjective aspects play a role in the degree of person-environment fit. In regard to the person, the person has some objective aspects as a being, but as importantly will possess perceptions or assessments of their own attributes. This incorporates the critical concept of self or self-identity often overlooked in stress studies. Thus, person-centered care approaches would most likely be considered within the Fit approach (c.f. Van Haitsma, et.al, 2020).

In regard to the environment, there are also objective attributes such as temperature, square footage, number of occupants and the like, but subjectively the environment is also known as it is perceived by the person. Because of this, there are four types of relationships between person and environment constructs: "1) objective P-E fit, which refers to the fit between the objective person and the objective environment; 2) subjective P-E fit, or the fit between the subjective person and the subjective environment; 3) contact with reality, meaning the degree to which the subjective environment corresponds to the objective environment; and 4) accuracy of self-assessment, representing the match between the objective person and the subjective person (Caplan, 1983; French et.al., 1974; Harrison, 1978)" (Edwards, et.al., 1998).

Language common in such studies is to maximize or optimize health outcomes. Battisto and Wilhelm (2020: 9) refer to this as the salutogenic approach: "to achieve a state of wellness, or optimal health, by harnessing people's resources and their capacity to move toward health…it utilizes the interrelated physical, mental, social, and spiritual resources needed to

achieve wellness." In so doing, these researchers hint at the likely theoretical affinity this Healthy Place Research would have to Antonovsky's (1996) salutogenic model found in public health. This will be returned to below.

Exemplary Theory: The Ecological Theory of Aging

An example of the P-E Fit approach in health and environment research is the Ecological Model of Aging (EMA) (Lawton & Nahemow, 1973; Lawton, 1980), the theoretical cornerstone of environmental gerontology (c.f. Scheidt & Norris-Baker, 2003; Wahl & Weisman, 2003). The basic premise of the EMA is an individual's observable behavior is "a function of the competence of the individual and the environmental press of the situation" (Lawton, 1982, p. 26) (See Figure 2). Personal competence is "the theoretical upper limit of capacity of the individual to function in the areas of biological health, sensation and perception, motor behavior, and cognition" (Lawton, 1982, p. 38). Environmental press refers to the forces of the sociophysical environment that place demands on, or in other words stresses, the individual. The relationship between individual competence and environmental press is conceptualized in terms of adaptation, the behavioral and affective outcomes of which may be either positive or negative. The theory posits an individual has adaptive capacity for a certain range of environmental press levels with the adaptive range narrowing as one's competence drops, often referred to as the environmental docility hypothesis. Those environments which fall within that adaptive range are associated with positive affect and appropriate behavior while larger mismatches are associated with negative affect and maladaptive behavior.

Recognizing there are a whole realm of different P-E models just within research on architecture for older adults that have exemplary research studies (e.g. Carp & Carp, 1984; Kahana, 1982; Moos & Lemke, 1994), an exemplary study situated within the EMA approach is Lawton, Fulcomer and Kelban (1984). Within the realm of research on architecture for older adults, a plethora of different P-E models can be found. Exemplary research studies in this arena exist (e.g. Carp & Carp, 1984; Katana, 1982; Moos & Lemke, 1994). Within the EMA approach, an exemplary study is Lawton, Fulcomer and Kelban (1984). This study was an early study of how the environment impacts older adults experiencing dementia. The Weiss Institute was designed to optimize the environment to promote six positive goals: 1) to enhance sensory functioning; 2) to increase autonomy in ADLs; 3) to

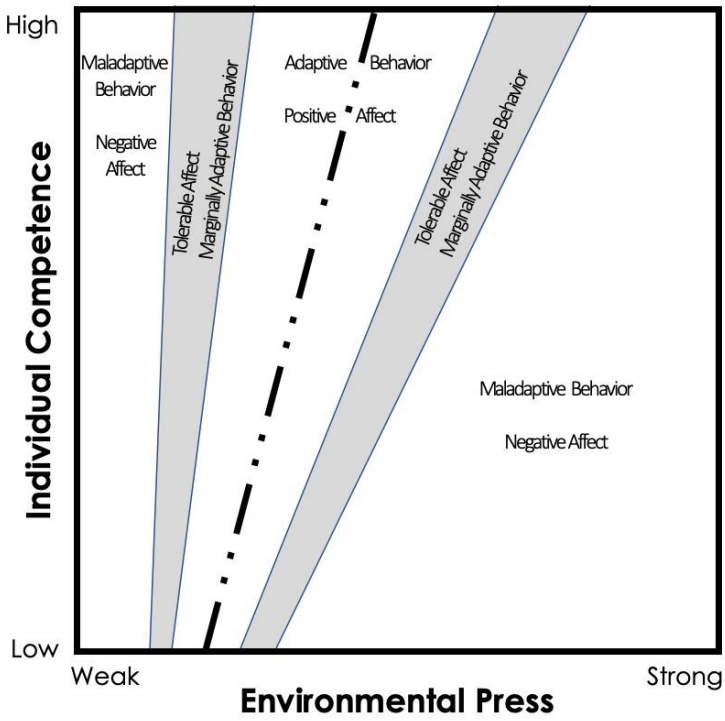

Figure 2: The Ecological Model of Aging (adapted from Lawton & Nahemow, 1973)

enhance cognitive functions; 4) to increase meaningful use of time; 5) to increase social interaction; and 6) to enhance one's sense of self. This study incorporated multiple data types and data points including behavioral and affective observation, subjective environmental evaluations by staff and family members, and outcome measures such as performance of activities of daily living, mental status and various biomarkers of health required of JACHO (Joint Commission on Accreditation of Healthcare Organizations) accredited facilities. The study found an increase in therapeutic staff-resident interactions, increase in visitation and a decrease in pathological behavior, but did not find a decrease in sleeping/null behavior or an increase in socialization.

Discussion of the Fit Orientation

Certainly, Fit has its roots in stress or stimulus research, but it understands that people are not just receptors, but rather they engage stimuli based upon their prior experiences and that their subsequent actions are informed by their subjective assessments of both themselves and their situation. As much as a P-E Fit researcher may want to focus on the role of only the physical environment, the underlying ecological thinking of the Fit orientation dismisses the notion of controlling other simultaneous environments that are impacting the person (e.g., social, organizational). Thus, the three biggest differences between P-E Fit and the Stress approach are that P-E Fit: 1) embraces the notion of self and self-efficacy in the person; 2) suggests a person not only adapts to the environment but may adapt the environment itself; and 3) considers environment as an ecology of interrelated systems that collectively must be considered. This approach significantly increases the complexity of the research methods and modes of analyses required and much of the findings become associational rather than causal in nature. Good overviews of P-E Fit connected to health include Golant (2011), Iwarsson (2012), Lai and colleagues (2020) and van Vienen (2018).

Place

The third orientation to Healthy Places Research is Place. Gubrium's (1975) classic *Living and Dying at Murray Manor*, literally begins with the words, "(t)he meaning of place" and thereby catalyzed a more holistic, place-based approach in health and environment research for the next four decades. From his several months' observation of everyday life in a 360-bed nursing home, Gubrium underscores the place-specificity of behavior, concluding dementia should not be considered solely etiological, nor should care assistance be provided from a purely clinical approach. Gubrium's work emphasized the influence of the social dimension in the context of care and extends the idea that all human activity occurs in terms of worlds of meaning.

Work on place has an extensive history in environmental gerontology (e.g. Chaudhury & Rowles, 2005; Howell, 1983; Rubinstein, 1989; Wiles, 2005), but has taken place in the acute care setting as well (e.g. Canter & Canter, 1979). Place-centered theoretical approaches in health and environment have typically emerged with the advance of the scientific interpretivist epistemology and through the use of qualitative research methods including participant observation and interviews. A narrative recounting of case studies of a particular place or a small group of residents of a particular place leading to interpreted themes is a common dissemination strategy.

Important work in regard to the theoretical construct of place emerged in the Institute on Aging and Environment wherein Gerald Weisman attempted to craft a theoretical approach linking the interpretive work of Gubrium and others to the Ecological Model of Aging (Diaz Moore, 2012). Weisman's theoretical construct, the Model of Place, specifies place experience as its core phenomenon while simultaneously identifying components of the place system (e.g. organizational, social, architectural contexts) (Weisman, 1997; Calkins & Weisman, 1999; Weisman, et.al., 2000). Synthesizing the work of environmental gerontologists with respect to qualities or characteristics of the environment (Windley & Scheidt, 1980; Lawton, Fulcomer, & Kleban, 1984; Calkins, 1988; Lyman, 1993; Zeisel, Hyde, & Levkoff, 1994), Weisman suggests environments for aging be conceptualized in terms of particular "attributes of place experience," for example, safety and security, awareness and orientation, support of functional abilities, regulation and quality of stimulation, personal control, privacy, and social interaction. His argument is that these attributes of place experience ought to be the common phenomena of investigation in such studies.

Within the place paradigm, knowledge is constituted of cases often shared as narratives communicating emergent themes (e.g., Verderber & Refuerzo, 2019). Thus, the guiding framework of place inquiry is not in terms of a flow diagram as in the stress orientation,

or the relational graph typical in P-E Fit research, but rather either simply a definition of the concept of place, or a descriptive diagramming of the constituent elements of a place so that inquiries do not overlook an important dimension of place as a whole.

Exemplary Theory: The Ecological Framework of Place

"The Ecological Framework of Place (EFP) defines place as a socio-physical milieu "involving people ("place participants"), the physical setting, and the program of the place, all catalyzed by situated human activity and fully acknowledging that all four may change over time" (Diaz Moore, 2014:184) (See Figure 3). People—whether a person or an aggregation—are viewed as agentic organisms that may be understood at different levels of aggregation (individual, group, organizational, cultural) but must always be understood: 1) to engage in the full range of experiential modalities (e.g., motivation, cognition, affect), not separately, but in an integrated, singular experience and 2) in objective characteristics. The physical setting has both objective sensory and spatial properties as well as its systems (e.g., enclosures, finishes) (Weisman, 2001). Such a definition of the physical setting transcends scales and so places are conceptualized at the proximate/product, building/site, neighborhood/community, or settlement scale. As importantly, the physical setting is viewed as purposeful interventions, as laden with intentionality as are the individuals that occupy them. The idea of program recognizes places as social constructs and "refers to the inherent yet largely implicit socially shared understandings that enable effective co-action and forward the underlying…purpose of the place" (Diaz Moore, 2014: 186). Human activity catalyzes place and it is through human action that places become experienced. In turn, people attribute certain qualities to those place experiences (e.g. privacy, security). Because place is dependent upon human activity and human activity varies over time, time is central to the Ecological Framework of Place.

Geboy (2005) reports on an exemplary study rooted in this place perspective. This study was a 27-month action research project aiming to improve the place experience of an adult day services center. This study employed myriad instruments, including the Adult Day Care Environmental Assessment (ADC EA) (Diaz Moore, et.al., 2006), the Adult Day Care Quality of Interaction Scale (ADC QUIS) (Dean, et.al., 1993), a panel of person-centered care protocols (Geboy & Arnold, 2011) as well as behavioral observations and interviews. Individual, group and organizational outcomes, environment-behavior patterns and change process findings were reported. This holistic study informed and facilitated change, but it did so for only a single case. The extensiveness of the protocol and the simultaneous breadth and depth of the research

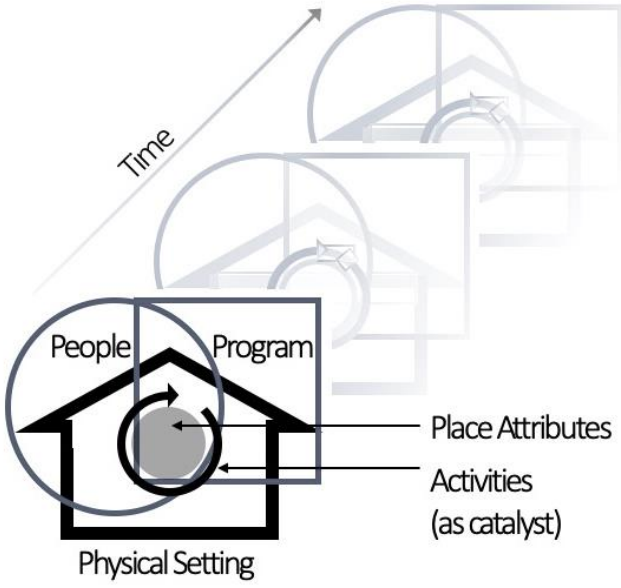

Figure 3: The Ecological Framework of Place (based upon Diaz Moore, 2014)

design results in a study of high ecological and practical validity, but lowered generalizability than studies conducted within the other paradigms. Here—and in most place-oriented research—generalizability is sacrificed for what Lather (1986: 272) calls "catalytic validity" which "represents the degree to which the research process reorients, focuses, and energizes participants toward knowing reality in order to *transform* it."

Discussion of the Place Orientation

As we have seen, place research tends to focus on the presentation of robust, extensive case studies utilizing a wide range of research methods generating extensive data types and data points. Studies attempt to describe the everyday experience of the place from multiple perspectives and tend to be longitudinal as opposed to cross-sectional in nature. Time is a critical contextual dimension in terms of understanding a place but also in terms of situating an individual's place experience as activities change depending on time. Wiles (2005) captures this dynamic nature of place well in asserting places have seven characteristics:

1) Places are processes
2) Places are subject to ongoing negotiation
3) The many different experiences and contested
4) Interpretations of places (some of these may compete or conflict)
5) Power relations are expressed through, and shape, places
6) Places are interrelated – to other places, at different scales, at different times, and
7) Places are simultaneously material/physical and symbolic.

At the heart of place research is the powerful driver of meaning, which is constantly being negotiated: between the individual and their past experience; their understood social norms; the cues they are receiving in the place; their intentions; and the intentions of the place itself as expressed as a physical setting but also as a socially-shared hidden program. Thus, the health-environment relationship is dynamic and negotiable in nature. The aim for place research is to inspire change.

Discussion: Three Orientations toward Healthy Places Research

Stress, Fit, and Place provide an initial taxonomy of orientations evident in the landscape of "Healthy Places Research." These are overviewed in Table 1 which summarizes the orientations, highlighting the: types of research questions asked; forms of knowledge sought; the nature of the human-environment relationship assumed; the resulting praxeology of the approach; and the type of validity privileged. The table also offers references to seminal writings in the field of Healthy Places Research as well as makes reference to a related theory of health which will be discussed below.

Table 1: The Theoretical Characteristics of Orientations found within Healthy Places research

Theoretical Characteristics	Stress	Fit	Place
Architectural Theory Exemplar	Theory of Supportive Design (Ulrich, 1991; 1999)	Ecological Model of Aging (Lawton & Nahemow, 1973)	Ecological Framework of Place (Diaz Moore, 2014)
Seminal References	Evans (2003); Kaplan (1995)	Kahana, et.al. (2003); Chaudhury & Oswald (2019)	Gesler & Kearns (2005); Sternberg (2009)
Praxeology	Minimize the Negative	Optimize the Positive	Agency and Change
Assumed Human-Environment Relationship	Interactional	Reciprocal	Cultural/ Negotiable
Forms of Knowledge Sought	Discrete	Patterns	Case
Form of Research Questions	Causal	Relational	Descriptive
Type of Validity Valued	External	Ecological	Catalytic
Related Theory of Health	Allostatic Load (McEwen, 1998)	Salutogenetic Model (Antonovsky, 1996)	Cumulative (Dis)advantage (Dannefer, 2003)

The lion's share of Healthy Places Research has been conducted within the stress orientation and this work has provided a robust understanding of the environmental stimuli that may compromise health. Most of the research has focused on those environmental factors that, if minimized, should result in stress reduction. The underlying model of the human-environment relationship is one where the environment places stressors on the person. It is a unidirectional interaction where one defines the antecedent and observes the outcome of interest. As such, studies aim for control and a highly prescribed focus of interest resulting in highly discrete pieces of knowledge. The questions of interest are therefore causal in nature ("a" causes "b") with a high demand for generalizability, although as mentioned, environmental studies typically rise to correlational findings only. However, these characteristics are connected to the concept of, and reflect a valuing of, external validity (Denzin & Lincoln, 2011).

Recognizing people are thinking, feeling creatures with motivation and not just responders to the external stimuli, the Fit (sometimes called the Person-Environment Fit) orientation still connects to the concept of stress but now focuses on adaptation to stress. Thus the relationship between the person and the environment is now understood as a reciprocal one. Rather than a reductivist view of what in the environment is of interest, Fit models possess more systemic, or ecological, definitions of the environment. Findings often take the form of patterns and associations. Here, translation to practice will typically discuss efforts to optimize the environment.

Place research seeks to retain the holistic nature of the experience of Healthy Places and embraces the concept that people-place experiences are constantly negotiated over time. It often presents itself as a descriptive narrative possessing thick description of a case. Meaning is a core concept and therefore how the person-environment relationship is mediated by culture and experience is central to the work. Work exploring "therapeutic landscapes" (Wood, et.al., 2015) or "landscapes of care" (Milligan & Wiles, 2010) would most likely be associated with the concept of place given its emphasis on thick description and "completeness" regarding the physical, social and symbolic environments (Kearns & Milligan, 2020). Such research is intrinsically value-laden and seeks to effect change, or as suggested above, desires catalytic validity. This focus on time, meaning and culture suggests why this approach to Healthy Places has found much more use in long-term gerontological environments rather than acute care environments—but that is not to say it does not hold potential for such research. A place-based research approach to understanding the experiences of patients, families and staff through COVID-19, where hospital length of stays go on for weeks, would prove extraordinarily powerful.

Related Theories of Health

While one of the issues in Healthy Places Research is the somewhat isolated nature of discourse among these three orientations that results in the relatively weak state of theory in the field as identified by Shannon and colleagues (2020), a more significant issue in terms of impact is the relative isolation of Healthy Places Research from core theories of health. The mapping of these orientations facilitates connections of Healthy Places Research to theories of health (ToH) that share epistemological assumptions and that also possess contemporary currency in health research. Research conducted within the stress orientation would have natural connections to the theory of allostatic load, Fit research with the salutogenic model, and Place with cumulative (dis)advantage as discussed below.

Stress and Allostatic Load. The theory of "allostatic load," refers to "the wear and tear that results from chronic overactivity or underactivity of allostatic systems" (McEwen, 1998: 171) (See Figure 4). Allostasis is the ability of the body to achieve or maintain stability through change and the physiologic response to stress involves the nervous system, the hypothalamic-pituitary-adrenal (HPA) axis, and the cardiovascular, metabolic and immune systems to provide protection. Biologically, these systems evolved to respond to acute stress, sometimes referred to as "fight or flight" responses, such as increases in adrenalin and heart rate. These systems are crafted to surge until the perceived stress is reduced and then the systems shut off to return to normal levels. However, frequent stress, poor adaptation to recurring stress, the body losing the ability to shut off the systems following stress, or the inability to fully surge the systems upon stress all create conditions of allostatic load. This load results in compromised effectiveness for the cardiovascular system (e.g., hypertension, progression of atherosclerosis), the brain (e.g., increased cortisol suppresses short-term memory function, glucocorticoids inhibit hippocampus function), and the immune system (e.g., greater susceptibility). Pathways

of interest include cortisol, as found in Rodiek (2002), but also inflammation, disrupted insulin and oxidative stress. Arguably, the so-called "Western Disease Cluster" (Miller & Valenti, 2015) of metabolic syndrome, obesity, diabetes, cardiovascular disease, cancer and dementia all have logical connections to allostatic load. Increasingly, mental health is becoming linked to allostatic load as well, whether that be depression and dementia (McEwen & Tasgon, 2018), Post Traumatic Stress Disorder (PTSD) (Lohr, et.al. 2019) or bipolar disorder (Dargel, et.al., 2020).

Connecting environmental stress to allostatic load holds great potential for furthering our understanding of Healthy Places. For instance, in the acute care setting, significant recent interest has focused on specialized units, such as women's health (c.f. Nilsson, et.al., 2020) and psychiatric units (c.f. Pyrke, et.al., 2017). This work has direct relevance to recent work addressing allostatic load wherein women appear to have generally lower allostatic load than men, but present with more allostatic load due to current sleep problems and histories of abuse or assault (Kerr, et.al., 2020) and patients presenting in psychiatric emergency services having elevated allostatic load (Juster, et.al., 2018). Asking how the environment might reduce allostatic load through the four coping resources suggested by the Theory of Supportive Design or the properties articulated within the Attention Restoration Theory could be rich with potential and of high relevance to medical researchers.

Fit and Salutogenesis. Fit has its roots in stress but with a posture where the person and the environment each can have positive or negative dimensions. Salutogenic Theory has its roots in understanding stress and health as well, but rather than focusing on external stimuli that might attack people who are otherwise healthy, the salutogenic model focuses on how to enhance personal resources and capacities to promote self-health (Antonovsky, 1996). Rather than seeing health and illness as dichotomous, Antonovsky (1987) suggests all people are on a continuum from healthy, or ease, to unhealthy, or "dis-ease." Importantly for this discussion, salutogenesis is not a trait or characteristic of the person, "but an interaction between people and the structures of society—that is, the human resources and the conditions of the living context" (Lindström & Eriksson, 2005: 440).

This ecological understanding toward a continuum of health is reflected in the Health Development Model (Bauer, et.al., 2006). This model offers a familiar socio-ecological type of model with clear reference conceptualizing both pathogenetic and salutogenetic

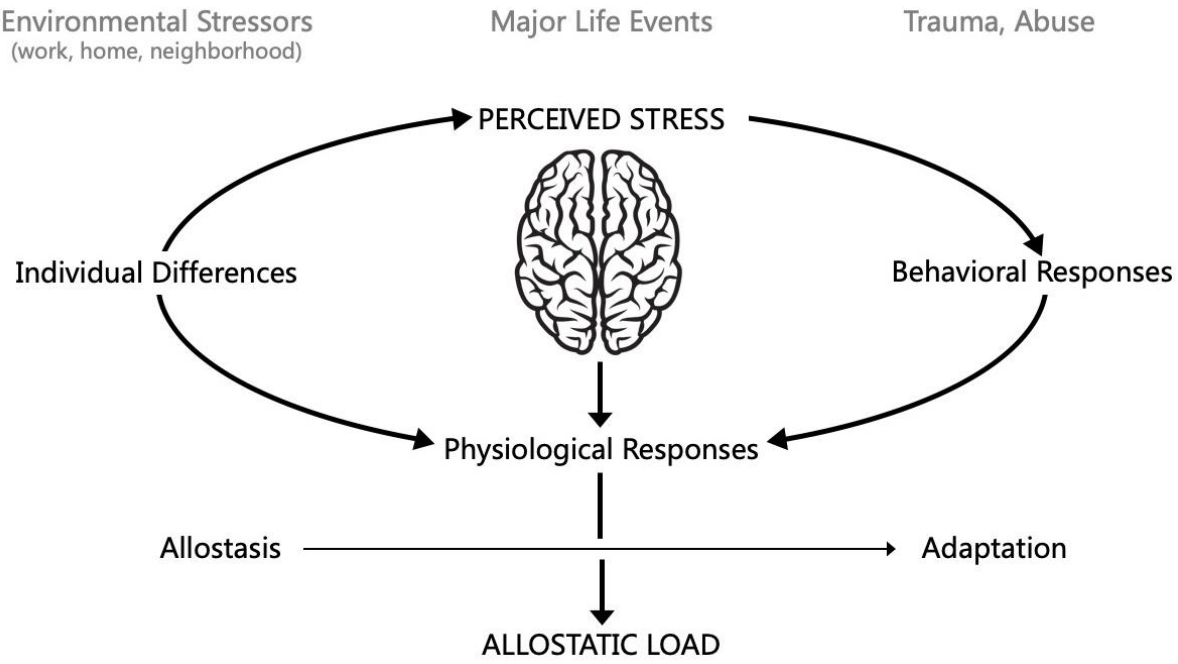

Figure 4: Allostatic Load Model (based upon McEwen, 1998)

aspects of health (See Figure 5). In regard to resources—the physical setting being one—Antonovsky (1991) articulates the need for three complementary characteristics: comprehensibility, manageability, and meaningfulness. In terms of architecture, Ken Yeang (as cited in Dinali, 2017) builds directly on these concepts by suggested salutogenetic design would involve: environmental comprehensibility (legibility, predictability, order); environmental manageability (family/social support); and environmental meaningfulness (aesthetic meaning, interest, contemplative spaces). Understanding health as a continuum, emphasizing the concept of adaptive capacity and situating the environment as socio-physical resources to that adaptation opens tremendous opportunities for research.

Because salutogenic theory resides in public health, much of the consideration of the environment to date is at the community scale. However, salutogenic theory could certainly be applied at other scales of the physical setting. Using the acute care setting again as an example, significant disparity in technological resources and organizational culture both certainly affect patient and staff outcomes. Particularly with the emphasis on person-centered care and patient satisfaction becoming of increasing importance, a closer examination of the implications of the salutogenic model and its "psychological sister" positive psychology on Healthy Place Research may be warranted.

Place and Cumulative (Dis)Advantage. In previous work, (Diaz Moore, 2014) argues that Place, as a theoretical concept, meets the four central criteria for a developmental science theory (Elder, 1994; Lerner, 2007):

1) relational metatheory and the integration of levels of organization withinthe socioecological system;
2) social embeddedness—that human development is socially embedded across the lifespan and that those relationships delimit the magnitude of plasticity for the person;

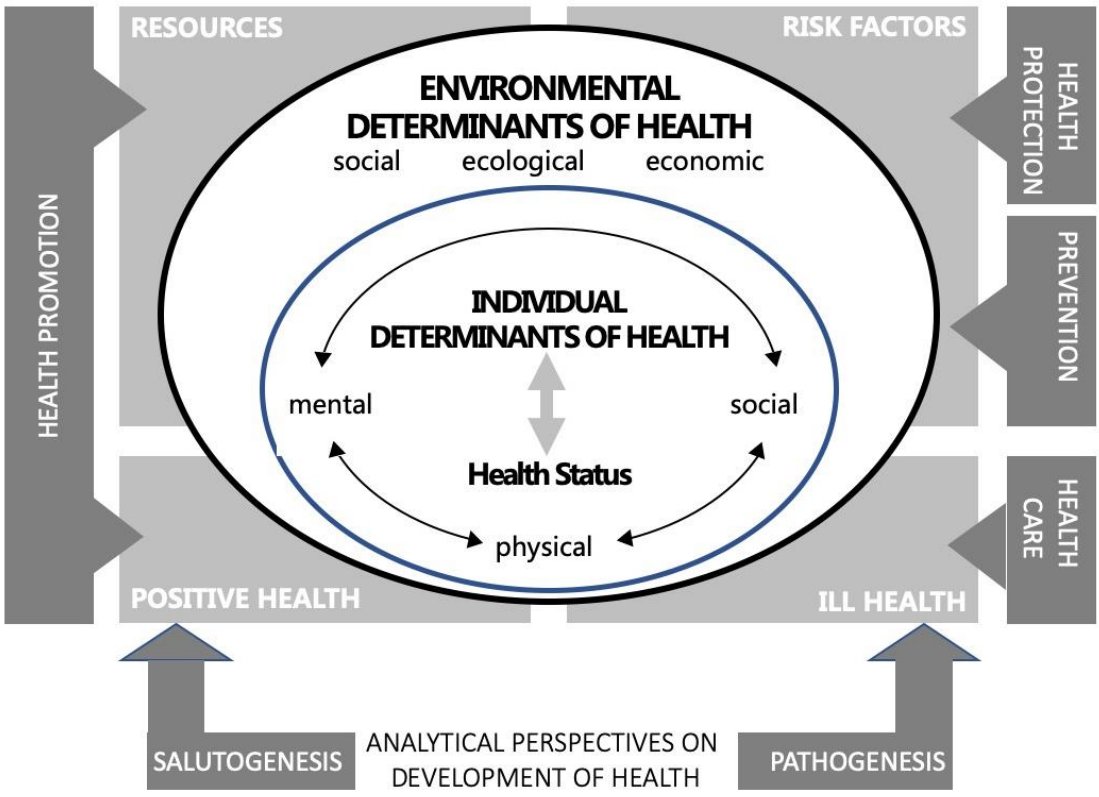

Figure 5: Health Development Model (based upon Bauer, et.al., 2006)

3) temporality—that the timing of lives impacts the plasticity of the developmental system; and
4) human agency—that human actions are purposeful and that is why observable activity is the beginning point for any unit of analysis.

If we begin to consider place from this lifespan development point of view, it is apparent that it is both the temporal and agentic aspects of the place construct that clearly set it apart from the other approaches to Healthy Places.

A developmental science theory that may prove useful to healthy place research is Cumulative Advantage/Disadvantage (Dannefer, 2003: S327) which is defined as "the systemic tendency for interindividual divergence in a given characteristic (e.g., money, health, or status) with the passage of time." This theory focuses attention on two aspects: 1) intracohort variability; and 2) cumulative advantage/disadvantage as not a property of an individual but rather as social in nature. In short, it recognizes diversity in outcomes but asks if it emerges due to the inequality in health-environment transactions over the life course.

The concept of "environmental convoy" might prove useful in such research. This concept has roots in the Convoy Model of Social Supports (Kahn & Antonucci, 1980) which suggests individuals are surrounded by supportive others and that these relationships may vary regarding closeness, quality, function, and structure (Antonucci et al., 2014). Diaz Moore and colleagues (2018) suggest this is also true for physical settings which condition the access to resources and structure the experience of the world, and also influence exposure to pollutants and/or toxins. A more integrative view of the role of the series of environments—or the environmental convoy—on human experience may produce significant insight as to the role of the physical setting over the lifespan. An exploration of people's place biographies as leveraged in the work on place therapies (Chaudhury, 2003; Scheidt & Norris-Baker, 1999) wherein place-based reminiscence facilitates quality of life for older adults in long-term care facilities is a rich area for future inquiry.

Conclusion

This article addressed some of the shortcomings identified regarding Healthy Places Research by Shannon and colleagues (2020:12) including "the weak theoretical nature of the research field." It sought to provide an initial mapping of the landscape of "Healthy Places Research", suggesting the landscape has three primary orientations: Stress, Fit and Place. All three paradigms are, first, not as exclusive as Table 1 may make them appear, and second, all are necessary to further our understanding of Healthy Places as we move forward.

If the purpose of such research is to find its way to inform better practice, it is essential for health place researchers and those seeking to further evidence-based design, to heed Diaz Moore and Geboy's (2010) charge to always return to the definition of evidence: "that knowledge which compels acceptance by the mind of a truth" (Websters, 1990). It is highly specious to believe rigorous findings are more compelling for action-taking than the power of a persuasive story. As we navigate the future of Healthy Places Research, inclusivity of what we view as appropriate evidence in the field of evidence-based design is essential. This is in line with Hamilton's (2018) recent suggestion that due to the confounding variables in architectural design, evidence of causation is extraordinarily difficult to achieve, but architects can certainly say "the research indicates that…" or "the evidence suggests…" That referenced research could come from any of these three orientations.

Diaz Moore and Geboy's (2010) three primary types of research questions (causal, relational, descriptive) together with the three orientations of Stress, Fit and Place offered here are quite complementary to the three functions of evidence discussed in Becker and colleagues (2011): research for justification, research for incremental change, and research for innovation. Becker and colleagues go one step farther in this applied orientation by suggesting the criticality of understanding the ecological context of decision-making in navigating the landscape of Health Places Research. They argue for Integrated Healthscape Strategies (IHS) having three underlying assumptions: "first be clear about the purposes for which research is being conducted and the methods most appropriate for that purpose. Second, whatever its purpose, the research should be guided by a theory that reflects the complexity of the system being studied. Third, processes to involve key stakeholders in interpreting and determining the implications for design derived from the available research need to be employed" (Becker, et.al., 2011: 128).

These strategies suggest a decision-making ecology more similar to public health than medicine and perhaps a reconsideration of the basic premises of evidence-based practice is warranted (c.f. Peavey & Vander Wyst, 2017). For instance, Brownson and colleagues (2009) discuss Evidence-based Public Health (EBPH) as a practice involving consideration of the best available research evidence within the context of the organization, available resources, population variance and the like. This no doubt impacts their inclusive definition of evidence ranging from the objective (e.g. systematic reviews) to the subjective (e.g. personal experience) but including more architecturally familiar evidence such as evaluations. Quite simply, both architecture and public health are not analogous to medicine as:

- both have nowhere close to the same volume or type of evidence
- interventions in both fields are rarely singular in nature but rather bundled interventions;
- randomized experiments where cases are communities or buildings as opposed to people are exceptionally difficult; and
- the duration until impact of the intervention is not days or weeks, but could be years (Brownson, et.al., 2009).

It may well be that in regard to Healthy Places Research, public health may prove to have greater stimulative value for defining evidence-based practice in architecture than medicine. Perhaps a critical step is for the domain of Healthy Places Research to question the syllogism that "evidence-based design" for healthy places should be based on evidence-based practice for medicine.

Such an uncovering of epistemological assumptions also aids in connecting these orientations laterally with theories of health having contemporary currency. This is important in that one characteristic shared by research conducted within all three orientations of Healthy Places research is we desperately need more. We simply are not building our knowledge base and our understandings fast enough or integrated enough. So, one hope by offering these theoretical connections is to provide an initial "Rosetta Stone" of sorts for how Healthy Place researchers may more effectively jump onto interdisciplinary team science efforts in the health disciplines.

Leveraging allostatic load as a theory by which to connect environmental stress research to myriad outcomes provides a rich platform for linking an environmental component to likely ongoing medical research. The same is true for the salutogenetic approach and positive psychology that have affinities for both maximizing positive outcomes and conceptualizing the context within a socio-ecological model. Finally, Cumulative (Dis)advantage speaks to our moment in which health disparities research has been of focus in this 21st century, but this will only increase as society experiences the fallout from the COVID-19 pandemic.

Due to when this article was written, COVID-19 provides an immediate "challenge paradigm" for these ideas. This pandemic will certainly have myriad health manifestations arising from accumulated allostatic load and it may well prove enlightening to raise environmental questions related to COVID-19 with the relevance to allostatic load in mind. In fact, current allostatic load research in the public health domain focuses on health disparities (Geronimus, et.al., 2006; Guidi, et.al., 2020). To raise questions rooted in the Theory of Supportive Design or Attention Restoration Theory and link those questions explicitly to health outcomes impacted by the allostatic load pathway will prove fertile ground. Similarly, one can imagine important questions regarding the workplace environment and chronic health outcomes for staff in healthcare settings that may well be approached efficaciously within a person-environment fit approach. Such work could build on current international interest in Fit research in the hospital setting (e.g. Oh & Han, 2018; Ugwu & Onyishi, 2020). Finally, COVID-19 will have differential health impacts on communities of color and this may be best captured through Healthy Place Research that accommodates Cumulative Advantage/Disadvantage theory. Such understanding would incorporate that lifelong exposure to health threats such as pollution and crowding may well have a central role in the unfolding narrative of COVID-19. Questions arising from this perspective might include:

- Might health outcomes in a hospital vary based upon intrinsic characteristics its patients have developed over a lifetime of environmental experiences? For instance, Hu and colleagues (2002) found that the length of hospital stays is inverse to cumulative advantage (i.e. the more advantage, the fewer the days).

- Might staff outcomes vary over the course of a traumatic week or perhaps even a shift?
- Through what types of people-place experiences is lifecourse resilience promoted?

In regard to the community scale, current health issues being addressed from a Cumulative (Dis)Advantage perspective include asthma (Alcala, et.al., 2019), obesity (Ferraro & Kelley-Moore, 2003) and pain (Goldberg & McGee, 2011).

Healthy Place Research has never been more important than in a time such as 2020. COVID-19 provides an inflection point highlighting that all our environments ought to be understood through a Healthy Place lens. The pandemic raises acute care design questions ranging from surge capability to greater virtual connectivity in a highly contagious environment to a higher prioritization for staff restoration and productivity. But it also raises questions such as: How can homes be designed for greater quarantine possibility and be more accommodative of what some call "hospital at home" (Jepesson, et. al., 2015)? How does that vary depending upon the person's competencies, resources and abilities? What are the neighborhood determinants associated with COVID-19 outbreaks (is it simply density, or more likely integration [c.f. McCormick, et.al., 2019; Peponis & Wineman, 2002])? How might workplaces be designed to promote better health outcomes for their workers? Do we need to reconsider our assumed knowledge base regarding such things as air changes per hour and filtration levels? How might we overcome the inevitable economic disparities in achieving any such change across society? How might social/public life change in response to COVID-19? What will be the differential histories of meaning regarding the impact of this pandemic? COVID-19 challenges the basic assumptions of our practices and the questions it raises will hopefully be addressed with more robust theorization not only within Healthy Places Research but also with ties to prevalent theories of health so as to increase the impact of this important work.

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