Embedment in the environment: A new paradigm for well-being?

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Abstract

Dominant models of health view people as essentially separable from their environment, affected directly by specific physical events or indirectly through idiosyncratic perceptions. Health is therefore a function of the individual, whether they are treated alone or in a group of similar individuals. A different (ecopsychological) view is that we are embedded within the environment; that notions of self, illness and well-being relate to where we are. Health practitioners and policy makers have realized that mind and body cannot be seen as being separate when promoting well-being, but 'self' and 'environment' is an equally false dichotomy. Although rarely acknowledged, we are continually interconnected via two-way physical interactions (electromagnetic, chemical and mechanical), and all we can know of the world comes via such interactions. Our concepts of self and other, health and disease, and all the relationships between them, are based on such interactions. If our environment changes, then these interactions change, yet our concepts often remain rigidly fixed. By introducing research into restorative, natural environments, the notion of adaptive mental states and the practices of ecotherapy, this paper offers an alternative view of well-being, shifting the emphasis away from the individual and his/her illness and instead inviting consideration of the more dynamic relationships between people and place.

INTRODUCTION

We often think of ourselves as physically separate from the world around us: isolated bodies passing through an external environment; actors playing out their roles against a painted backdrop. Indeed, a common definition of environment is 'the physical, chemical and biological factors *external to a person*'[1] (emphasis added). All too often, the environment is seen as being of secondary importance when talking about well-being. When it is taken to mean a person's local surroundings, the focus is on external physical factors that affect their internal physical state (for example, heatwave effects on chronic conditions). When it refers to larger-scale surroundings or global situations, the focus is indirect, on risk perception (for example, anxiety about climate change) or societal factors (for example, inequities due to the coping strategies of people in traditional gender roles). This view is starting to change with more researchers and practitioners becoming aware of a wider range of factors: well-being benefits of contact with nature; links between the social environment and health; and improved effects of outdoor physical exercise. A systemic view where we are part of an environment composed of all the physical, biological and social interactions in which we participate (reflected in the World Health Organization's definition[2] of health as 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity'). For example, a recent paper in *Perspectives in Public Health*[3] employed an ecological framework for health promotion, outlining possible interventions that linked climate-change mitigation with individual and collective well-being. However, even this forward-thinking paper only hinted at the level of interconnection between well-being and environment that we are beginning to understand exists.

One novel view is that of ecopsychology. Defined by Roszak[4] as a perspective that 'bridges our culture's long-standing, historical gulf between the psychological and the ecological', it emphasizes an ecocentric viewpoint, with strong links to 'greener' behaviour and societal change.

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It focuses on human relationships with the rest of the natural world, where 'natural' (often represented as anything not under control of humans) refers more to systems that are self-organizing, having qualities that emerge from their inherent biological or physical properties. In this view, we respond beneficially to natural environments because our bodies are themselves natural. We are not only interconnected with our environment, our well-being is dependent upon it: as an integral part of the system, the needs of the person and the planet are a continuum (to paraphrase Roszak).

EMBODIMENT AND EMBEDMENT

So what might this mean in real terms? Many people recognize the concept of embodiment: that our behaviours, motivations, thoughts and feelings are both generated and constrained by our physical nature. That humans have a physical body is something health workers will be very aware of, but how often do you really think about what this means in terms of how you are directly connected to the world around you? Take a moment to focus on what a body is: a complex physical system interacting through a variety of mechanical (for example, rhythmic heart contractions), chemical (such as hormones) and electrochemical (for example, action potentials) processes. Every time we move, our bodies generate electric and magnetic fields as ions move through cell walls. Those fields extend far beyond the skin-defined boundary of our bodies (theoretically, to infinity; practically, they can be detected at least a few metres away), affecting other organisms around us,[5–7] as well as making us in turn sensitive to changes in the electric and magnetic field environment that surrounds us.[8] We continually exhale carbon dioxide, along with a cocktail of other chemicals relating to hundreds of discrete reactions.[9] All of those exhaled (and otherwise excreted) chemicals diffuse into the environment, affecting those around us as their chemicals affect us – think of how women living in close quarters show hormonally influenced menstrual synchronization,[10] or how the various drugs we take (for example, oral contraceptives) and subsequently excrete are detectable in water supplies and in anything that lives in or consume that water.[11] Muscle movements and organs produce heat that also affects our environment, increasing the temperature of a crowded room, spot-heating footprints that can be tracked by the thermal senses of some animals (or a thermal-imaging camera), or attracting cats and other animals (including partners, friends and tired small children) to snuggle up to us on a cold night. Moreover, our every move sends out sound, infrasound and ultrasound vibrations: footsteps are sensed by earthworms and other ground-dwelling creatures; the sounds of clothes rubbing on skin are audible to bats, cats and dogs. Everywhere we go, we leave behind physical trails – skin flakes, hairs, sweat, pheromones – that tell the world around us of the state we were in when we left them. At any given time, we are broadcasting our presence, our actions, our behaviours into the environment through an intricate web of physical connections.

And it is not just a one-way connection: everything we can know of the world comes though physical interactions. Specialized sensory cells convert one type of energy into another, combining these impressions into a model of the environment around us. We absorb chemicals in the form of tastes and smells, olfactory and gustatory cells producing electrochemical signals in response to their detection. Our sense of hearing is based on the movement of the air around our bodies, auditory cells producing electrochemical signals as air oscillating within a specific range of frequencies pulses against the eardrum. We see when light – be it from the sun or another source – is reflected off or refracted through things around us, triggering signals from our eye's photosensitive cells. Even when we touch, the sensations we feel are the result of a very intimate connection with the touched surface. In a very real sense, we become a part of what we touch, the molecules of our skin momentarily becoming part of the molecular structure of that which is touched, the transferred energy stimulating cells sensitive to those specific patterns of interaction that we have learned to call pressure, temperature or texture. Abram[12] put it well when he wrote:

> 'We can experience things – can touch, hear and taste things – only because, as bodies, we are ourselves included in the sensible field, and have our own textures, sounds and tastes. We can perceive things at all only because we are entirely a part of the sensible world.'

The environment is not a scene through which we move but the medium within which we are embedded. It tells us we are an integral part of the place we are in, shaping us, connecting us, guiding and constraining. As embodied beings, we can only understand who we are by being aware of our physical nature; as 'embedded' beings, self-understanding can only come if we are equally aware of our physical environment.[13] The concept of embedment – that our inclusion in the environment is an essential part or characteristic of our selves – means that who we are is intimately connected to where we are.

EVOLUTIONARY WELL-BEING

If we consider mind and body as separate (whether in a dualistic or purely functional-descriptive sense), then it is clear why any significant role of the environment is dismissed: only our interpretation of where we are can have a significant effect on our mental state, and such interpretations are both subjective (top-down perception) and idiosyncratic (learned expectations). Any problems must therefore be the result of faulty perceptions – treated by interpretative or behavioural modification through counselling or cognitive behavioural therapy, or malfunctioning 'hardware' – treated by drugs or other organic modification. But if we really accept that mind is a physical manifestation of a physical system (embodiment), which is itself embedded in a physical environment (embedment), then perhaps we can fundamentally change ourselves by changing our location.

If our mental world really is so intimately connected to the land around us, this should be obvious in the way our bodies respond to where they are. This is supported by empirical work published in environmental psychology journals, in papers exploring the concept of the *restorative environment*. This is generally defined[14] as a place or situation that helps bring about the recovery to baseline levels of functional resources and capabilities that have been diminished through stress, overuse or under-stimulation. Put more simply, when we feel overwhelmed, stressed or fatigued, there are (usually natural) places we can go which have inherent properties that help us feel better, more alert and more able to cope. Irrespective of culture or education, people tend to express a preference for natural environment as it is in such places that they experience fundamental physiological responses to what they experience there: arousal levels decrease,[15,16] attentional capacity increases[17] and emotional processing occurs faster.[18]

Some researchers suggest that this occurs due to our recognition on some innate level of scenes that have features corresponding to our 'evolutionary home'. For example, Balling and Falk[19] found that children tended to express a preference for visual scenes of savannah but that this preference was lacking in older participants, who presumably had learned to disregard their innate responses. The sociobiologist Wilson[20] put forward the idea of *biophilia*, an 'innate tendency to focus on life and lifelike processes' often experienced as a strong emotional affiliation between human beings and other organisms. He thought this was demonstrated by the otherwise paradoxical fascination exhibited by humans and other primates about animals such as snakes and spiders (common foci of innate phobias as well as mythological symbols), as well as widespread cultural icons relating to the natural world. Others point to the cross-cultural prevalence of animals as protagonists in children's stories.[21,22] More generally, Kaplan and Kaplan[23,24] developed an Attention Restoration Theory (ART), describing a process wherein we recover from attentional fatigue through being in an environment with qualities of (i) 'being away' from the demands of regular life; (ii) 'soft fascination', sensory aspects that have an (evolutionary-based) inherent appeal; and (iii) 'extent or scope', a sense of vastness or connection between the experience and one's knowledge of the world.

But why is it that the places and stimuli we find to be restorative are natural, more so even than often beautiful places that have been constructed by humans? Think back to what is being said by the researchers above: natural places affect us by physiologically relaxing us, engaging our emotions and effortlessly attracting our attention. Again, it comes back to the notion of connection: we feel connected when we find a place that is relaxing to be in; a place in which we find our minds stilling, which has the familiar feel of 'being at home' (note that *ecology* comes from the Greek word *oikos*, meaning 'in my house'[25]). We feel connected when our attention is drawn towards something without conscious intention, finding it fascinating or beautiful. We feel connected when we experience positive emotions: happiness, love, reverence or awe. And what starts as a feeling of connection may then grow to become one of kinship, perhaps even changing our concept of self so that we feel like we are merging with or becoming one with an external event, object or place.

THERAPEUTIC APPLICATIONS

Some of this thinking is implicit in the way healthcare is changing. There has been much more emphasis on the way treatment and waiting rooms are designed (for example, see Devlin and Arneill[26] for a good literature review), but only recently has the environment taken on a primary role in the treatment of patients and clients. Researchers and practitioners using ecopsychology approaches have developed the field of *ecotherapy*, an umbrella term covering specific techniques and practices of horticultural (working with plants) or wilderness (away from centres of high population and artificial structures) therapy, and green and blue gyms (meaningful exercise working in green spaces or with waterways). In a review, Chalquist[27] notes some common themes that can be seen as the basis for ecotherapeutic approaches: feeling disconnected from the natural world can produce psychological symptoms such as anxiety, frustration and depression (and concomitant physical symptoms); practices that promote feeling reconnected to the natural world are associated not only with symptomatic relief but also with an increased perception of health, self-esteem, self-relatedness, social connection and joy. Simply put, ecotherapists find significant improvements by incorporating natural stimuli or environments in sessions with clients.[28–30]

Making sense of these findings is difficult if our models of health and well-being are focused on the individual. Whether we are talking about physical or mental illness, *you* are unwell, *you* don't fit in with society's norms, or *you* cannot function in everyday life. Wherever you are, you take *your* illness with you: if you're ill at work, you'll also be ill at home or in the garden. But ecotherapies show us that changing the environment can profoundly affect us over the long term. Getting people to spend time in a natural setting seems to act as a 'reset', changing the way our bodies and minds react to that environment and allowing fatigued faculties time to be restored.

Although articles like Nurse et al.[3] show awareness of this is changing, interest in environmental effects still tends to focus on symptomatic relief, using nature as a health resource,[31] rather than being preventative. To fully appreciate our intimate relationship with the environment – our embedment – requires us to radically rethink the concepts we work with, and to develop more interdisciplinary work between areas that our culture has learned to think of as being separate. For example, several analyses[32] have suggested that contact with green-space environments was systematically related to lessened attention deficit symptoms. Although such deficits are commonly seen as having a biological origin, the

symptomatic reduction related to being in a greener environment showed effect sizes comparable to those reported for longer-term treatment with methylphenidate-based drugs.[33] Such results have led some researchers[34] to propose 'nature deficit disorder' as a useful model to describe an underlying need for unstructured activity in natural environments. Even on a basic biological level, research[35] has shown that telomere length (a marker of biological ageing showing an inverse association to mortality, chronic disease and psychological stress) increases with the available green space in a person's area of residence.

As well as causal links, we can also reframe current concepts in environment-related terms. Mental well-being is one area in which such thinking can give us new insights. Some theorists[36,37] have already attempted to revise current models by taking an evolutionary perspective, looking for the adaptive value of the various 'mental illnesses'. For example, in trying to understand depression, there is a dichotomy between social-constructionist theories exploring interpersonal origins and cultural contexts, and medical-naturalism approaches focusing on pathological changes in cognitive functioning.[38] Historical and cross-cultural differences also question the fundamental concept of depression as a somatic illness.[39] What is usually agreed on is the general phenomenology: severe and prolonged states of negative effect, linked to increased passivity and disengagement from the surrounding world.[40] Irrespective of etiology, this can be usefully viewed as an evolutionary strategy for reducing striving towards an unattainable goal, freeing up mental resources for other 'needs'. But if we take that evolutionary approach further to include being embedded in an environment – think 'survival of the fittest' as referring to the most suitable adaptation (the 'best fit') to a specific environment – then this gives us a different, more ecopsychological take on mental well-being. Those mental states lumped together as 'illness' can be seen to have come about to help (at least initially) the person adapt to an environment that they have trouble fitting into, even if that adaptation is a mental withdrawal from an environment that is perceived as problematic. Changes that are associated with that state must therefore either (a) aid that individual to stay in the specific environment linked to those changes, or (b) change the way the individual affects their environment, attempting to reshape the world to better suit them. But this would mean that *different* environments would require *different* adaptations. So depression would have developed in response to the relationship a person has *with a particular environment*. From this perspective, treating the 'illness' while the patient is still in the same place or situation no longer makes sense, achieving at best a lessening of symptoms (either by suppressing them with drugs or changing aspects of observed behaviour through therapy – a form of adaptation in itself). Moreover, given the accelerating loss of natural (restorative) environments, this perspective would suggest that, without an explicit and widespread recognition of the direct link between mental well-being and the environment we are in, depression and other problematic adaptations are going to become endemic and less easy to treat.

CONCLUSION

With the increasing concern and debate in the media about rapid global climate change and degraded ecologies, any focus on 'the environment' can lead to a protective pulling away from the endless arguments, accusations of misrepresentation and fraud, and general predictions of doom. Habits of professional detachment or feelings of being overloaded can lead us to an attitude of 'it's not my concern' and focus more closely on our own field of expertise. But if we can look past both the dry computer models and all too often emotionally manipulative appeals, we might see a common cause. Environmentalism has never just been about the loss of habitats and other species becoming extinct – it is fundamentally linked to all aspects of who we are, individually and collectively. Well-being requires a healthy environment, local and global, to 'be well' in.

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