

Biodiversity and our brains: How ecology and mental health go together in our cities

January 3 2020, by Zoe Myers



An urban orchard in Perth. Credit: Zoe Myers

Mental health in our cities is an increasingly urgent issue. Rates of disorders such as [anxiety and depression are high](#). Urban design and planning can promote mental health by refocusing on [spaces we use in our everyday lives](#) in light of what research tells us about the benefits of exposure to nature and biodiversity.

Mental health issues have [many causes](#). However, the changing and unpredictable elements of our physical and sensory environments have a profound impact on [risk, experiences and recovery](#).

Physical activity is still the mainstay of urban planning efforts to enable healthy behaviors. Mental well-being is then a hoped-for byproduct of opportunities for exercise and social interaction.

Neuroscientific research and tools now allow us to examine more deeply some of the ways in which [individuals experience spaces](#) and natural elements. This knowledge can greatly add to, and shift, the priorities and direction of [urban design](#) and planning.

What do we mean by 'nature'?

A large body of research has compellingly shown that "nature" in its many forms and contexts can have direct benefits on [mental health](#). Unfortunately, the extent and diversity of [natural](#) habitats in our cities are decreasing rapidly.

Too often "nature"—by way of green space and "POS" (Public Open Space) – is still seen as something separate from other parts of our urban neighborhoods. Regeneration efforts often focus on large green

corridors. But even small patches of genuinely biodiverse nature can re-invite and sustain multitudes of plant and animal species, as urban ecologists have shown.

It has also been widely demonstrated that nature does not effect us in uniform or universal ways. Sometimes it can be confronting or dangerous. That is particularly true if nature is isolated or uninviting, or has unwritten rules around who should be there or what activities are appropriate.

These factors complicate the desire for a "nature pill" to treat urban ills.

We need to be far more specific about what "nature" we are talking about in design and planning to assist with mental health.



A residential street in Perth. Credit: Zoe Myers

Why does biodiversity matter?

The exponential accessibility and affordability of lab and mobile technologies, such as fMRI and EEG measuring [brain activity](#), have vastly widened the scope of studies of mental health and nature. Researchers are able, for example, to analyze responses to [images](#) of urban streetscapes versus forests. They can also track people's perceptions "[on the move](#)".

Research shows us biodiverse nature has particular positive benefit for [mental well-being](#). Multi-sensory elements such as [bird or frog sounds](#) or [wildflower smells](#) have well-documented beneficial effects on mental restoration, calm and creativity.

Other senses—such as our sense of ourselves in space, our balance and equilibrium and temperature—[can also contribute to us feeling restored by nature](#).

Acknowledging the crucial role all these senses play shifts the focus of urban design and planning from visual aesthetics and functional activity to how we [experience natural spaces](#). This is particularly important in ensuring we create places for people of [all abilities, mobilities and neurodiversities](#).

Neuroscientific research also shows an "[enriched](#)" environment – one with multiple diverse elements of interest—can prompt movement and engagement. This helps keep our brains [cognitively healthy, and us](#)

[happier.](#)

Beyond brain imaging of experiences in nature, there is growing and compelling evidence that contact with diverse microbiomes in the soil and air has a [profound effect on depression and anxiety](#). Increasing our interaction with [natural elements](#) through [touch](#)—literally getting dirt under our nails—is both [psychologically therapeutic](#) and [neurologically nourishing](#).

We also have [increasing evidence](#) that air, noise and soil pollution increase risk of [mental health disorders](#) in cities.

What does this mean for urban neighborhoods?

These converging illustrations suggest biodiverse urban nature is a priority for promoting mental health. Our job as designers and planners is therefore to multiply opportunities to interact with these areas in tangible ways.

The concept of "biophilia" isn't new. But a focus on incidental and authentic biodiversity helps us apply this very broad, at times unwieldy and non-contextual, concept to the local environment. This grounds efforts in real-time, achievable interventions.

Using novel technologies and interdisciplinary research expands our understanding of the ways [our environments affect our mental well-being](#). This knowledge challenges the standardized planning of nature spaces and monocultured plantings in our cities. Neuroscience can therefore support urban designers and planners in allowing for more flexibility and authenticity of nature in urban areas.

Neuroscientific evidence of our sensory encounters with biodiverse nature points us towards the ultimate win-win (-win) for ecology, mental

health and cities.

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