Mental Wellbeing in the Anthropocene: Socio-ecological Approaches to Capability Enhancement

Ross G. White[*]

[*]Institute of Psychology, Health and Society, The University of Liverpool, UK

Corresponding Author:

Dr. Ross G. White
Reader in Clinical Psychology
University of Liverpool
School of Psychology
G.10, Ground floor, Whelan Building
Quadrangle
Brownlow Hill
Liverpool
L69 3GB
UK

Email: ross.white@liverpool.ac.uk
Telephone: 0151 4745532

Author Biography: Dr. Ross White (PhD, DClinPsy) is Reader in Clinical Psychology at the University of Liverpool, UK. His research focuses on evaluating the efficacy of psychological interventions in low- and middle-income countries and 'hard to reach populations' in high-income countries. This includes an interest in the processes involved in the linguistic/cultural adaptation of psychological interventions. Dr. White was co-editor of the *Palgrave Handbook for Global Mental Health: Socio-cultural Perspectives*, which explores challenges and opportunities that exist in efforts aimed at addressing inequities in mental health provision across the globe.

Mental Wellbeing in the Anthropocene

Abstract

There is growing recognition that 'human development' frameworks, such as the Capabilities Approach (CA) with its emphasis on the promotion of justice, offer promise for guiding efforts aimed at enhancing mental wellbeing. This paper explores challenges that might arise when there is a need to arbitrate among the competing demands of different parties in their efforts to enhance capabilities. Particular tensions can arise when the efforts of particular individuals to enhance their capabilities exert pressure on scarce resources, or threaten the safety and security of people living in precarious environmental contexts. Consideration is given to the need for 'an ethos of restraint' to balance the consumption of resources aimed at facilitating human development on one hand, with the need to promote environmental justice on the other. The paper highlights research that has investigated how environmental factors can impact on mental wellbeing, including rapid urbanization, climate-change related issues (such as weather systems, drought, food insecurity and rising sea-levels), and access to 'green/blue spaces'. As such, the paper explores the important links that can exist between people and the eco-systems in which they live (including the way in which particular cultural beliefs and practices of indigenous groups can be tethered to the land). Elinor Ostrom's 'design principles', derived from her work investigating the sustainable use of pooled resources, are presented as a helpful means of assisting members of communities to negotiate and apply 'functioning constraints', which can promote environmental justice whilst not compromising efforts aimed at promoting mental wellbeing.

Keywords: human development, wellbeing, capabilities approach, global mental health, environmental justice

Introduction

The promotion of justice is increasingly recognized as an important consideration for public health efforts aimed at enhancing mental wellbeing. Human development frameworks, such as the Capabilities Approach (CA) (Sen, 1999; Nussbaum, 2006) have highlighted the important role that expanding valuable freedoms (or *capabilities*) can have for justice. This paper explores challenges that may arise in global mental health when there is a need to arbitrate among the competing demands of different protagonists in their efforts to enhance capabilities. Difficulties can emerge when the capability enhancement of some people serve to threaten the safety and security of other people (such as those living in precarious environmental contexts). Frameworks are needed to conceptualize and address these tensions.

The sections that follow outline the CA to wellbeing, and then discuss how socio-ecological perspectives can be integrated to consider environmental issues including the impact of urbanization, climate change, and efforts to achieve environmental justice.

The Capabilities Approach and Mental Wellbeing

White and colleagues (2016) proposed that efforts to build capacity for mental health services are being limited by a lack of sophistication in determining what constitutes a 'good outcome' for people whose experience of mental health difficulties vary according to the contexts in which they live their lives. It was suggested that rather than risk becoming overly preoccupied with treating mental disorders, Global Mental Health initiatives need to focus on eudaimonic conceptualizations of mental wellbeing (White et al., 2016). The work of Carol Ryff and colleagues (Ryff, 2016; Ryff & Singer, 1996), for example, proposed a eudaimonic conceptualization of 'psychological well-being' that consisted of six different aspects: autonomy (a sense of self-determination); environmental mastery (capacity to manage one's life and surrounding world); positive relations with others; purpose in life (belief that one's life is purposeful and meaningful); personal growth (a sense of continued growth and development as a person); and self-acceptance (a positive evaluation of oneself and one's past life). The CA has been highlighted as an important framework for promoting equity in efforts to optimize eudaimonic-informed notions of mental wellbeing across the globe (White et al., 2016).

Sen (1999) proposed the CA as a new approach to economics that prioritized substantive freedoms (e.g. access to markets and associated economic transactions; participating in political activities; ability to live to older age), rather than a focus on 'utility' (or access to particular resources). The CA represented a departure from a *classical utilitarianism* approach to economics as proposed by Jeremy Bentham (1776) that placed specific emphasis on the maximization of happiness (technical referred to as 'utility'). The narrow focus on 'utility' had been criticized on the basis

that hedonic notions of happiness can actually co-exist with forms of injustice (Plagerson, 2015), and that injustices may thwart the possibility that individuals could actually realize an even 'greater good' (to appropriate Bentham's own language). Nussbaum (2000) proposed that financial resources are not sufficient for wellbeing, instead individuals require both the necessary internal traits, and the external circumstances and provisions that can deliver the possibility of a good life.

The CA prioritizes 'justice' as a key issue. Whereas other approaches stipulate that the issue of justice is primarily about the distribution of things between people [e.g. John Rawls' (1971) notion of 'primary goods'], Edwards et al. (2015) pointed out that the CA approach to justice adopts a less absolute, and more comparative perspective that considers justice to be determined by what people value. In essence, the CA places emphasis on people living lives that they regard as valuable and worthwhile (Sen and Nussbaum, 1993). Sen regards 'freedom' to be the principal indicator of justice, and he proposed that the CA aims to promote 'the freedom that a person actually has to do things…that he or she may value doing or being' (Sen, 2002 p.232). However, Nussbaum (2006) focused more specifically on 'wellbeing' as an indicator of justice. Nussbaum (2000) specified ten 'central human capabilities' that are regarded as essential for wellbeing: Life; Bodily Health; Bodily Integrity; Senses, Imagination and Thought; Emotions; Practical Reason; Affiliation; Other Species; Play; Political and Material Control over One's Environment.

The constitution of the World Health Organization (WHO, 1946, P.1) defined *health* as: 'a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity'. In terms of mental health and wellbeing, the

Mental Wellbeing in the Anthropocene

Comprehensive Mental Health Action Plan 2013-2020 (WHO, 2013) identified a wide range of determinants including: 'social, cultural, economic, political and environmental factors, such as national policies, social protection, living standards, working conditions, and community social supports' (WHO, 2013; p.7)]. Similarly, Knapp and colleagues (2007) highlighted a need for mental health policies to be inclusive of a diverse range of sectors, including housing, education, social care, criminal justice and employment. A key benefit of the CA is the scope and opportunities that it provides for facilitating consideration of intersectoral determinants of both justice and mental wellbeing.

Socio-Ecological Models

The CA places emphasis on identifying sources of 'unfreedom' that have a detrimental impact on justice. Drawing on the work of Giullari and Lewis (2005) and Sen (1999), Meintjes (2015) indicated that factors, such as poverty, gender inequality, violence, marginalization and discrimination, can contribute to what are termed 'disabling environments' that serve to limit capability enhancement. The limiting impact that these forms of exclusion can have on capabilities speaks to theoretical enquiry relating to the politics of identity and, in particular, the issue of 'recognition'. Fraser (1997) proposed that the misrecognition (or malrecognition) of people can manifest in three main forms: 1) cultural domination; 2) non-recognition (i.e. being rendered invisible); 3) stereotyping or prejudicial cultural representations. Kompridis (2007) has indicated that there is a need for the 'deinstitutionalization' of 'cultural values' that operate at a macro-level to promote misrecognition and status subordination. However, it is also important to recognize that factors that limit justice

may be operating at various levels of scale.

The work of Urie Bronfenbrenner, a Russian-born American developmental psychologist, has been helpful for illuminating how ecological factors of differing scale can impact on individuals' lives. Over a thirty-year period, Bronfenbrenner developed a Socio-Ecological Model to account for child development. The ecological framework that was initially proposed (Bronfenbrenner, 1979) identified the following levels: microsystem (e.g. the immediate surroundings of a child including the family, neighbourhood), mesosystem (i.e. interactions between systems working at the microlevel, such as the neighbourhood and the school), exosystem (i.e. systems in which the child does not function directly, such as his/her parents' workplaces), macrosystem (e.g. cultural values), and chronosystem (e.g. the passage of time and the occurrence of key events in the individual's life). Bronfenbrenner and Morris (1998) highlighted the need to attend to processes related to the person, context and time, which are collectively captured in the *Process–Person–Context–Time* (PPCT) model. A key aspect of the focus on the PPCT model is the need to attend to what are referred to as proximal processes, which involve the systemic interaction between the person and their environment.

Inspired by Brofenbrenner's work, McLeroy et al. (1988) proposed the socio-ecological model to health promotion initiatives by specifying the relevance of factors at different levels i.e. the intrapersonal (i.e. characteristics that are particular to the individual), interpersonal (i.e. formal/informal social networks), institutional (i.e. institutions of a social nature that have organizational characteristics), community (i.e. relationships between institutions and organizations) and public policy (i.e. laws and

policies operating at the local, national and state level)(P.353). In parallel to these innovations regarding the application of the socio-ecological model, a separate line of enquiry has developed in relation to what have been referred to as 'Social-Ecological Systems' (SES). Anderies et al. (2004) defined a SES as a social system 'in which some of the interdependent relationships among humans are mediated through interactions with biophysical and non-human biological units' (P.3). Moving forward it will be advantageous to include an explicit focus on the dynamic interaction between human and non-human living systems in socio-ecological models. Importantly, the integration of socio-ecological perspectives with the CA provides scope for considering the interaction between determinants of mental wellbeing that operate at a variety of different levels of scale and that are not restricted to the individual alone.

Measuring Capabilities

In an attempt to measure capabilities in the context of mental health, Simon et al. (2013) developed and validated the Oxford Capability Questionnaire-Mental Health (OxCAP-MH) for use in the UK. However, the extent to which this measure might be applicable for use outside the UK remains unclear. Lorgelly (2014) stressed that capabilities are culturally specific, and that the mere translation and cultural adaptation of instruments may be inadequate if the measure fails to be sensitive to locally important capabilities. As such, research is required to facilitate the adaptation and/or *emic* development of measures for assessing capabilities that are tailored to particular cultural contexts. For example, Teerawattananon and colleagues (2011) translated a measure of capabilities that had been developed for use in public health

contexts [the OCAP-18 Lorgelly et al. (2008)] into the Thai language and tested it with a sample of the general population in Samut Songkhram Province, Thailand. Drawing on research investigating the quality of life of women living in rural Malawi, Greco and colleagues (2013; 2015) developed a capabilities index. This was informed by qualitative data that was gathered by conducting a series of focus groups in Mchinji district, which aimed to elicit information about what constitutes a 'good life' and what factors were conducive or detrimental for achieving a good life. The capabilities that were identified as being important in this research were: physical strength, inner wellbeing, household wellbeing, community relations, economic security and happiness. Each dimension was in turn composed of sub-dimensions; for example, physical strength included being able to space births, being able to do physical work, being free from diseases and having access to sufficient amounts of food etc. It may be that future efforts aimed at developing measures of capabilities will benefit from being sensitive to the socio-ecological contexts in which particular communities live their lives.

Urbanization, green space and mental health

The WHO (2008) estimated that three quarters of individuals living in low-income countries live in rural settings. However, projections made by the United Nations Population Division (2008) suggested that by 2030 more people in low and middle-income countries (LMIC) will live in urban than rural areas, and that by 2050 approximately two-thirds of the population in these countries will be living in urban settings. Factors, such as overcrowding and polluted environments, high levels of violence, and diminished social support, which have been closely linked with

urbanization, have been shown to impact on mental health (Srivastava, 2009; Paykel et al., 2000; Thomson et al., 2009). Urbanisation has been associated with increased risk of psychotic disorders (van Os et al., 2001; 2002; Sundquist & Sundquist, 2004), depression (Neff & Husaini, 1987; Sundquist et al., 2004), and increased hospital admission rates for alcohol and drug abuse (Sundquist & Frank, 2004).

Explorations of the detrimental impact that urbanization can have on mental wellbeing sit alongside a body of research that has sought to explore the benefits that exposure to natural environments can have on mental wellbeing. A systematic review conducted by Gascon et al. (2015) synthesized 28 studies that investigated the impact that green (vegetation, including grass, parks and forests) and blue (water surfaces, including lakes and rivers) spaces can have on mental health. The review concluded that there was some evidence, albeit limited, to support a positive benefit of surrounding/residential green-space in adult populations, but no evidence to support other forms of exposure (e.g. access to green spaces, quality of green spaces) in adults and children. The authors highlighted a number of methodological limitations, including the comparatively small number of studies that had been conducted to date, and the heterogeneity in how exposure to green and blue spaces had been assessed across the different studies. One of the few studies included in the review that had longitudinal follow-up, Alcock et al. (2014) found that moving home to an area in the UK with increased green-space can have a positive impact on mental health for up to 3 years proceeding the move. A key recommendation from the Gascon et al. (2015) review was for further research to be conducted - particularly in LMIC, where living near green or blue spaces that lack adequate sanitation could be associated with increased risks to physical health.

A range of theoretical perspectives have been proposed to account for the positive impact that opportunities to connect with nature can have on mental health and wellbeing. The important role that 'nature connectedness' (and related concepts, such as eco-psychology) has on promoting wellbeing has been emphasized. The *Biophilia* hypothesis (Wilson, 1984) proposed that human beings have an innate affinity with the natural world and have a tendency to seek contact with other living systems. Another theory, *Stress Reduction Theory* (Ulrich, 1983) postulates that natural environments (even the passive viewing of natural scenes) provide an antidote for stress through direct influence on physiological and emotional experience. Specifically, it is suggested that presence of structure and water features in natural scenes can facilitate feelings of interest, pleasure and safety that enhance psychophysiological stress recovery. Additionally, the *Attention Restoration Theory* (ART; Kaplan and Kaplan, 1989) claims that peoples' attentional capacities are improved after spending time in nature. It is suggested that this may be because natural environments are rich in what are termed 'soft fascinations' (e.g. bird song, the scattered fall of sunlight through trees etc.) that require 'effortless attention', providing an important break from the effortful attention that may dominate people's normal routine. In terms of a potential dose effect, Fuller et al. (2007) indicated that the psychological benefits of green spaces in urban settings appear to increase along with the expansion in the biodiversity and richness of the green spaces.

Mitchell and colleagues (2015) utilized data from the 2012 *European Quality of Life Survey* (which was completed by 21,294 urban residents in 34 European countries) to examine the impact that green-space can have on socio-economic status and

associated health inequalities. The authors noted that good access to green spaces reduced socio-economic inequality in mental wellbeing by 40%, compared to those with poor access to green spaces. The authors concluded that green-spaces have important *equigenic* properties (i.e. the capacity to reduce inequalities in health). The call to integrate the socio-ecological model with the CA to better understand determinants of mental wellbeing proposed in the current paper, provides opportunities to view this equigenesis as not being directly linked to the green/blue spaces *per se,* but rather the opportunities that these green/blue-spaces provide for people to enhance capabilities and engage in valued functionings. Perhaps green/blue-spaces have a leveling effect whereby, in spite of differences in socio-economic status, these spaces provide opportunities for people to engage in valued functionings and avail of the benefits associated with this. If this were the case, then the extent to which particular green-spaces can enhance mental health and wellbeing will be moderated by the person's access, ability and/or willingness to use these spaces to engage in valued functions. This may account for the lack of clear consensus in the research findings regarding a causative role of green/blue space exposure on mental health. Importantly, efforts to explore further the extent to which green and blue spaces can facilitate capability enhancement, need to be cognizant of the way in which environmental degradation might serve as a source of unfreedom.

Climate Change: Impacts on Physical and Mental Health

Climate change is recognized to be a significant threat to the health and prosperity of the global population (WHO, 2014). Patz et al. (2005) highlighted two major impacts of climate change on physical health: 1) Mortality/morbidity directly associated with temperature change e.g. heat-wave related cardiovascular mortality, respiratory

complications, and malnutrition and death associated with crop failures; 2) Increased incidence of infectious diseases that are mediated by climate change. The World Health Organization (WHO) estimated that by 2030, the death of 250,000 annually would be directly related to climate change (WHO, 2016). In particular, the El Niño/Southern Oscillation (ENSO) phenomenon (an inter-annual variation in global climatic conditions) has been associated with large outbreaks of malaria (Bouma & van der Kaay, 1996; Poveda et al. 2001; Bouma & Dye, 1997; Lindblade et al., 1999), childhood diarrhoeal disease (Checkley et al., 2000) and cholera (Pascual et al., 2000; Rodo et al., 2002). Roy and Venema (2002) noted that a reliance on being able to secure essential resources from their environment means that the physical welfare of people living in rural areas of LMIC are particularly vulnerable to the effects of climate fluctuations. Citing India as an example, Roy and Venema (2002, P.80) highlight that 'Low-caste, tribal, and poor rural women, dependent as they are on their natural environment for access to water, fuel, fodder, and food, are immediately and adversely affected by all forms of environmental degradation, including climate change impacts'.

There is growing awareness that factors such as climate fluctuations (Berry et al., 2010; Obrien et al., 2014) and a lack of food security (Carter et al., 2011; McLaughlin et al., 2012) pose significant issues for people's mental wellbeing. Similar to Roy and Venema's (2002) observation about physical welfare, it is suggested that people living in LMIC will be most susceptible to adverse impacts that climate change can have on mental wellbeing (Berry et al. 2010). Maughan and Berry (2015) proposed that the particular pathological processes that are implicated in the association between climate change and poor mental health remain unclear. The close links that have been noted between physical and mental health (Prince et al., 2007) raise the

possibility that the association between climate change and mental wellbeing could be mediated by the physical health consequences of climate change. However, Doherty and Clayton (2011) proposed that climate change can have three different types of 'psychological effects': 1) *Direct* i.e. the traumatic impact of weather events and associated environmental change; 2) *Indirect* i.e. the emotional implications of observing the impacts and/or worrying about future risks; 3) *Psychosocial* i.e. the chronic consequences for communities of climate change incidents, such as heat waves, droughts, floods and the migrations and conflicts that these can cause. Drawing on the CA, this paper proposes that environmental/climate-change factors may have an enduring impact on mental wellbeing by restricting the opportunities that individuals have to enhance their capabilities and engage in forms of being and behaving that are consistent with their personal and cultural values.

Holland (2008) pointed out that theories of justice have largely ignored the important contribution that environmental factors can make to how social advantage and social disadvantage is apportioned. Reflecting on Martha Nussbaum's list of 10 central capabilities, Holland (2008) notes that: 'environmental resources, as well as broader ecological systems, cycles, and processes, are indispensable to enabling all of the capabilities she advances as central to living a life worthy of the dignity of a human being' (P.323). As such, ecological conditions are referred to by Holland (2008) as a 'meta-capability' that has a direct influence on the likelihood of individuals' capabilities being fulfilled. These observations about environmental conditions and capabilities complement existing theoretical perspectives on the ways in which factors related to people and the environments in which they live dynamically interact to impact on wellbeing. For example, environmental degradations may adversely affect

an individual's 'environmental mastery' (which is one of six key determinants that Ryff and colleagues (1989; 1995) suggested contribute to 'psychological wellbeing') i.e. the extent to which the individual 'has a sense of competence in managing the environment, controls complex array(s) of external activities, makes effective use of surrounding opportunities, (is) able to choose, or create, contexts suitable for personal needs and values' (Ryff & Keyes, 1995; P727).

The association between environmental factors and capabilities may be particularly pronounced in contexts where aspects of the ecology carry symbolic, religious or cultural significance for particular groups of people. Holland (2008) cited Ball's (2000) work with the Mescalero Apache Indians of New Mexico (United States), and Anthwal et al.'s (2006) work with people of Garhwal Himalaya (India), to demonstrate how people attribute spiritual power to particular places in their localities (in these cases 'sacred mountains' and 'sacred groves' respectively). Research focusing on the Mapuche people of Chile has highlighted the strong associations that exist between Mapuche cultural practices and the ecological context in which they live their lives (Caniguan, 2013). Ethnographic investigations have highlighted that indigenous psychologies tend to place great emphasis on the sacredness of the environment, which can include a focus on the interconnectedness of cyclical variations in nature and particular aboriginal beliefs and practices (Kirmayer et al., 2009; Archibald, 2008). Schlosberg and Carruthers (2010) highlighted that indigenous people regard their land and resources as crucial to 'their ability to continue and reproduce the traditions, practices, cosmologies, and the relationships with nature that tie native peoples to their ancestral lands' (P.13) Consequently, ecological threats (including climate change) can have profound implications for the socio-cultural fabric that binds groups together. From a CA perspective, it is not just whether the

15

ecological context can provide sufficient water, shelter and sustenance to support capability enhancement, it is also about ensuring that distinctive features of the landscape that are inextricably linked to cultural beliefs and practices are maintained (Holland, 2008). Bockstael and Watene (2016) noted that there has been a comparative lack of consideration given to the contribution that the CA can offer to understanding indigenous wellbeing. Yap and Yu (2016) utilized CA informed participatory research methods to highlight the importance that connection to the land, relationships, and family have for the wellbeing of the Yawuru indigenous people in Australia.

Environmental Justice

In recognition of the fact that particular populations may be predisposed to inequitable and unjust environmental risks by virtue of their social and/or economic circumstances, *Environmental justice* (EJ) has developed as a specific body of study, research and practice. EJ has been defined by the US Environmental Protection Agency as 'the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies' (https://www.epa.gov/environmentaljustice). EJ, as a coordinated endeavor, can trace its origins to when the efforts of campaigners working in Southern states of the US noted how environmental 'bads' (e.g. dumps of toxic waste) tended to occur in areas were disadvantaged minority ethnic communities lived (Bullard, 1990). However, from these origins, the remit of EJ has grown to include an interest in how the actions of international assemblages (such as the World Trade Organization) may threaten the

quality of the environments of indigenous populations (Edwards et al., 2015). Hanna and Vanclay (2013) highlighted the detrimental impact that mining and extractive industries in Brazil have had on the right to self-determination and cultural rights of indigenous groups living in Brazil. Furthermore, there are examples from LMIC of governments embarking on 'conservation programmes' that restrict the practices (e.g. sustainable forms of hunting) of indigenous groups in protected lands, whilst simultaneously allowing multinational companies to extract natural resources from these lands (Vidal, 2016). Critics of what has been referred to as 'anti-people' conservation have proposed that the management of protected land should be returned to indigenous groups who can protect the environment more effectively, and in more cost-effective ways, when they are given full legal rights to it (Parrotta & Trosper, 2012).

Researchers [including Holland (2008), Walker (2012) and Schlosberg (2007; 2012)] have highlighted the important contribution that CA can make to EJ. Edwards et al. (2015) attributed the congruence with the CA to the fact that EJ seeks to ameliorate inequities in the wellbeing of disadvantaged people relative to more advantaged individuals and communities. Edwards et al. (2015) highlighted how the application of the CA to EJ has facilitated a specific focus on the issue of 'functionings'. As Schlosberg (2012) stated: 'being able to function is what is ethically significant, and injustice is found in the limitation of capabilities necessary for that functioning' (P452). The focus on functioning and capabilities in the context of EJ allows for a fuller understanding of the concept of justice in the context of environmental change. As such, it has been suggested that the CA can contribute to the creation of 'a framework of justice for the Anthropocene' (Schlosberg, 2012; P.447) –

Anthropocene[1] being the term used by some to describe the present epoch when human activities started to profoundly impact on the Earth's eco-systems (Lewis and Maslin, 2015).

Managing potential conflicts between human development and environmental justice

The *United Nations Development Programme* (2011) indicated that as human development increases, so too do factors that have global environmental consequences e.g. green house gas emissions. Schlosberg (2012) highlighted a range of models that had been proposed for exploring issues of justice in relation to the impact of factors contributing to climate change: 1) 'Polluter pays' models; 2) 'Fair share' models (i.e. equal allocation of emissions); 3) 'Rights-based' models (e.g. human rights, and environmental rights). These efforts are complicated by the fact that processes associated with human development in one part of the world can have a profound impact on the environment of individuals in other parts of the world. From the perspective of CA, difficulties can emerge when efforts aimed at enhancing capabilities in one particular location can have a detrimental impact on the likelihood of the capabilities of individuals and communities in other parts of the world being enhanced. This issue has stimulated CA theorists to reflect on how capabilities can be enhanced without adversely impacting on EJ, and the potential conflict between enhancing freedom, on one hand, and restricting resource consumption, on the other. This gives rise to what Ostrom (2014) termed a *social dilemma* i.e. 'settings where uncoordinated decisions motivated by the pursuit of individual benefits generate

---

[1] Haraway (2016) has questioned the appropriateness of the definition and characterization of the *Anthropocene* as the current epoch. She has proposed the term *Chthulucene* as an alternative to *Anthropocene* which she believes leads 'too readily to cynicism, defeatism, and self-certain and self-fulfilling predictions' (P.56) in relation to the current period of geological time.

suboptimal payoffs for others and for self in the long run' (P.101-102). Holland (2008) provided an example of a social dilemma, by stating: 'as we fly strawberries and ship exotic wood around the world, we release carbon dioxide that alters the chemical composition of the atmosphere, and this in turn threatens to make the shelter of people living in low-lying coastal areas inadequate, in both the United States (e.g., Louisiana) and in other countries (e.g., Bangladesh)' (P.328).

Sen (2013), consistent with his attitude towards behavior change more generally, advocated for 'non-coercive shifts in consumption habits…through reasoning and freedom' (P.16) to avoid social dilemmas. However, Peeters et al. (2015) proposed that present and future efforts to sustain the requisite environmental conditions for human flourishing necessitates the inculcation of what is referred to as an *ethos of restraint*. It is argued that his ethos of restraint is not necessarily at odds with the political liberalism that CA theorists (and Martha Nussbaum in particular) endorsed, because it involves the protection of environmental conditions that are conducive to human wellbeing (and should, therefore, be politically mandated) (Peeters et al., 2015). Holland (2008) proposed that the CA 'not only needs to account for the ecological conditions that enable a minimum threshold (or floor) of capability protection required for justice…but also needs to account for the maximum (i.e. ceiling) level of capability protection that a society can justify without impacting ecological conditions in ways that undermine the capabilities of vulnerable populations in sometimes distant locations' (P.330). There is a need for thoughtful consideration in how these tensions can be negotiated and how reciprocity can be promoted.

Critically reflecting on Holland's (2008) notion of *capability ceilings*, Peeters et al. (2015) noted that, because the notion of establishing 'sufficient' levels of capability that are required to support a dignified life is central to the CA, the call to implement 'capability ceilings' is actually surplus to requirements. Peeters et al. (2015) proposed instead that the 'ceiling' should be applied to *functionings,* rather than *capabilities*, in that: 'it is not merely *having the ability to pollute* (i.e. the capability)…but the *polluting* itself (i.e. the functioning) that would have harmful effects' (P.380 emphasis in original). This is consistent with Deneulin's (2002) acknowledgment that it might be more important, at particular times, 'to focus on the human good (functionings), rather than on the freedom and opportunities to realise that human good (capabilities)' (P.506). Drawing on the notion of *functioning ceilings*, Peeters et al. (2015) makes three proposals for mitigating climate change:

1. Individuals' *combinations* of functioning should be constrained as an aggregated whole with regard to the consumption of environmental assets.

2. To help distinguish between what is required for 'subsistence' vs. what might instead be regarded as 'luxury', the difference between *objective needs* and *subjective desires* is important. Peeters et al. (2015) pointed out that, whereas subsistence cannot be disputed on ethical grounds, luxurious levels of consumption could be regarded as legitimate, provided it does not inadvertently prevent others from having their objective needs satisfied.

3. 'Functioning constraints' could be operationalised using Hyams (2009) conceptualization of *per capita* budgets of tolerable personal carbon allowances (PCAs).

Peeters and colleagues suggest that functioning constraints could be used to empower individuals to contribute a fair share to a larger collective effort to promote environmental sustainability.

Negotiating tensions between capability enhancement and environmental justice

To date, the application of the CA has tended to focus on the capabilities of individuals, rather than on communities. Nussbaum (1999) took the position that communities only contribute to the needs of the individual, and as such should not be a primary consideration of justice. However, others have highlighted a need for the CA to be extended to recognize that communities of people, rather than only individuals, have capabilities that require protection (Walker, 2009; Schlosberg & Carruthers, 2010; Yap & Yu, 2016). This is particularly true of indigenous populations, where the smallest units tend to be groups of people rather than individuals (McGregor et al., 2003). In terms of examples of community-based projects utilizing a CA approach to promote EJ, Chopra and Duraiappah (2001) incorporated a focus on Sen's (1999) *instrumental freedoms* (i.e. political freedom; economic facilities; social opportunities; transparency guarantees and protective security) into a programme aimed at improving land management and the maintenance of the environment in the Bihar region of India. Specifically, the 'Chakroya Vikas Pranali' programme focused on finding ways to help members of the community to negotiate rules for using local land and water resources. The authors noted that the initiative delivered tangible benefits for the local community.

Nobel Laureate, Elinor Ostrom, identified what were referred to as 'design principles'

that are purported to improve the effectiveness of groups in managing common (also referred to as 'pooled') resources (Ostrom 1990, 2010; Cox et al. 2014). In particular, Ostrom's work fundamentally challenged the assumption that providing individuals with access to pooled resources would inevitably lead to the 'tragedy of the commons' (Hardin, 1968) i.e. if an individual did not own a particular resource, their interest in preserving the resource in the longer term would be negligible and they would behave in an irresponsible manner with regard to that resource. This work is highly relevant to efforts aimed at helping groups of individuals to negotiate *functioning constraints* that could allow a balance to be struck between EJ and the capability enhancement of group members. Ostrom and Cox (2010) specifically highlighted the need to adopt a socio-ecological approach when trying to bring about behavior change around issues such as climate change, because it moves beyond what has been referred to as the 'panacea problem' (i.e. when a single presumed solution is applied in blanket fashion to a wide range of issues, irrespective of local context) by instead providing multiple levels of analysis and opportunities for change.

In recent years, Ostrom's design principles have informed the development of the PROSOCIAL approach (https://evolution-institute.org/project/prosocial/), which aims to promote collaboration for the mutual benefit of community members. The concept of *prosociality* involves particular behaviors, attitudes and values related to providing assistance to others, being actively involved in a community, and developing as a person (Biglan & Embry 2013; Kasser & Ryan 1993; Wilson et al. 2009). In addition to the benefits that it provides to groups, prosociality has also been linked to enhanced levels of personal well-being (Wilson et al., 2014). The PROSOCIAL approach utilizes generalized versions of eight principles that are specified by Wilson et al. (2013; 2014) as follows: 1) Strong group identity and understanding of purpose; 2)

Fair distribution of costs and benefits i.e. everyone doing their fair share, with those doing more getting additional recognition; 3) Fair and inclusive decision-making; 4) Monitoring agreed upon behaviors; 5) Graduated sanctions for misbehaviors that can range from gentle reminders, to increasing levels of punishment, up to exclusion; 6) Fast and fair conflict resolution; 7) Authority to self-govern i.e. having local autonomy; and 8) Appropriate relations with other groups.

Principles 1 to 3 serve to coordinate actions that are appropriate to the task at hand, principles 2 to 6 aim to limit disruptive self-serving behaviors within the group, and principles 7 and 8 control for external interference, whilst cultivating appropriate relations with other groups. It has been suggested that these eight design principles capture the dynamics of cooperation that have allowed species, including humans, to flourish in evolutionary terms (Wilson et al., 2013).

Guarding against the assumption that the design principles are simply viewed as being intuitive to how groups operate, Wilson et al. (2014) pointed out that groups 'seldom have a strong sense of group identity (a violation of design principle No. 1). Groups frequently consist of a few beleaguered volunteers who do most of the work (a violation of design principle No. 2). Discipline in (settings such as…) schools is frequently neither fast, nor based on a procedure that the students perceive as fair (a violation of design principle No. 6)' (P.407). Ultimately, the PROSOCIAL approach aims to facilitate the creation of social environments that favor cooperation and guard against behaviors that potentially undermine the group's objectives. Explicit emphasis is placed on addressing obstacles (both internal and external to the group) that might arise in group-based activity. Rather than endorsing so-called 'cookie-cutter' (i.e. standardized) policy solutions, proponents of the PROSOCIAL approach emphasize the need to ensure that the principles are applied in a contextually sensitive manner

(Wilson et al., 2014).

A key aspect of the PROSOCIAL approach relates to the emphasis that it places on connecting people's behavioral choices to their values (the focus on values also links the PROSOCIAL approach to the CA). As part of the PROSOCIAL process, groups are required to identify what are referred to as 'auxiliary design principles', which fit with the group's specific objectives (Wilson et al., 2013). Examples of these include: cultivating a safe and secure environment; making long-term social and learning outcomes rewarding over the short term, and adjusting to turnover of group members (Wilson et al., 2013). In recent years, the design principles have been applied to group initiatives related to the development of community spaces (Wilson et al., 2011a; 2011b). Moving forward, the PROSOCIAL approach could prove helpful in providing structures and mechanisms for groups who are committed to entering into *functioning constraint* arrangements aimed at enhancing capabilities, whilst preserving EJ. For cooperation with regard to 'functioning constraints' to be optimized between group members, it will be important for particular characteristics to be met - as outlined by Ostrom (2014; P105): 1) There will need to be agreement amongst group members that there is a need for behavior change and that these parties share joint responsibility for future outcomes; 2) The reliability and frequency of information about the phenomena of concern will need to be relatively high; 3) Parties will need to be aware of who else has agreed to change behavior and the extent to which they are conforming to this is being monitored; and 4) Regular communication will need to occur between at least of subsets of group members.

Conclusion

This paper has highlighted how socio-ecological perspectives can be integrated with the CA to create a holistic framework for understanding determinants of mental wellbeing that operate at different levels of scale (including the intrapersonal, interpersonal, institutional, community and policy levels). Future efforts aimed at promoting justice and mental wellbeing will benefit from adopting what this author has termed a 'Socio-Ecological Approach to Capability Enhancement' (SEACE). By incorporating a specific focus on Ostrom's design principles, the SEACE framework can provide structures and mechanisms that communities can use to address social dilemmas that may arise when individuals' efforts to enhance their capabilities may threaten EJ and inadvertently limit the capability enhancement of other people. The SEACE framework can guide initiatives that firmly situate people in the places, spaces and everyday realities, in which they live their lives.

Moving forward important opportunities exist for evaluating the extent to which interventions drawing on the SEACE framework can be used to inculcate an 'ethos of restraint' that promotes the mental wellbeing of community members, without adversely impacting on environmental justice. This will allow people to navigate towards, negotiate for, and sustainably use the resources they require to engage in valued forms of functioning. Importantly, the SEACE framework can also be used to guide future green/blue space initiatives by advocating for close consultation with communities and cultural groups to gain consensus about important beliefs and practices, so that the design and development of these spaces can be tailored to facilitate the performance of valued forms of functioning. The effective implementation of the SEACE framework will require the establishment of global

Mental Wellbeing in the Anthropocene

networks committed to upholding Ostrom's design principles. These networks will highlight the precarious nature of ecosystems across the globe and set functioning constraint objectives for network members. With the fragility of our planet becoming increasingly apparent, the SEACE framework provides important opportunities for developing interventions aimed at promoting mental wellbeing that are suitably equipped to meet the considerable challenges that the *Anthropocene* poses.

Author Notes

None

Mental Wellbeing in the Anthropocene

(AH/L006936/1).

References

Alcock, I., White, M.P., Wheeler, B.W., Fleming, L.E., Depledge, M.H. (2014). Longitudinal effects on mental health of moving to greener and less green urban areas. *Environmental Science and Technology, 48*, 1247–1255.

Anderies, J. M., Janssen, M. A., & Ostrom, E. (2004). A framework to analyze the robustness of social-ecological systems from an institutional perspective. *Ecology and Society, 9*(1), 18.

Anthwal, A., Sharma, R. C., & Sharma, A. (2006). *Sacred groves: traditional way of conserving plant diversity in Garhwal Himalaya, Uttaranchal*. Marsland Company.

Archibald, J. (2008). *Indigenous story-work: Educating the heart, mind, body and spirit*. Vancouver, BC: UBC Press.

Ball, M. (2000). Sacred mountains, religious paradigms, and identity among the Mescalero Apache. *Worldviews: Environment, Culture, Religion,* 4 (3), 264-82.

Bentham, J. (1776). *A Fragment on Government: Being an Examination of what is Delivered, on the Subject of Government in General, in the Introduction to Sir William Blackstone's Commentaries: with a Preface, in which is Given a Critique on the Work at Large* (No. 2). T. Payne; P. Elmsly; and E. Brooke.

Berry, H.L., Bowen K., Kjellstrom, T. (2010). Climate change and mental health: a causal pathways framework. *International Journal of Public Health, 52*:123–132.

Biglan, A. & Embry, D.D. (2013) A framework for intentional cultural change. *Journal of Contextual Behavioral Science, 2*(3–4), 95–104.

Bockstael, E., & Watene, K. (2016). Indigenous peoples and the capability approach: taking stock. *Oxford Development Studies, 44*(3), 265-270..

Bouma, M.J., & Dye, C. (1997). Cycles of malaria associated with El Niño in Venezuela. *Journal of the American Medical Association, 278*(21), 1772-1774.

Bouma, M.J., & Kaay, H.J. (1996). The EI Niño Southern Oscillation and the historic malaria epidemics on the Indian subcontinent and Sri Lanka: an early warning system for future epidemics?. *Tropical Medicine & International Health, 1*(1), 86-96.

Bullard, R.D. (1990) *Dumping in Dixie: Race, Class, and Environmental Quality*. Boulder, CO: Westview Press.

Bronfenbrenner, U. (1979). The ecology of human development: Experiments in nature and design. Cambridge, MA: Harvard University Press.

Bronfenbrenner, U., & Morris, P. A. (1998). The ecology of developmental processes. In W. Damon & R. M. Lerner (Eds.), Handbook of child psychology, Vol. 1: Theoretical models of human development (5th ed., pp. 993–1023). New York:

Mental Wellbeing in the Anthropocene

Wiley.

Caniguan, N. (2013) *Relatos del sacrificio en el Budi* [Stories of the sacrifice in the Budi]. Santiago, Chile: Lom.

Checkley, W., Epstein, L.D., Gilman, R.H., Figueroa, D., Cama, R.I., Patz, J.A., & Black, R.E. (2000). Effects of EI Niño and ambient temperature on hospital admissions for diarrhoeal diseases in Peruvian children. *The Lancet, 355*(9202), 442-450.

Chopra, K., & Duraiappah, A. K. (2001). Operationalizing capabilities in a segmented society: the role of institutions. In: "Justice and Poverty: examining Sen's Capability Approach", Conference proceedings, Cambridge: The Von Hügel Institute, St. Edmund's College, University of Cambridge

Cox, M., Arnold, G., & Tomás, S.V. (2014). A review of design principles for community-based natural resource management. In Daniel H. Cole, Michael D. McGinnis (Eds.). *Elinor Ostrom and the Bloomington School of Political Economy: Resource Governance*. New York: Lexington Book.

Deneulin, S. (2002). Perfectionism, paternalism and liberalism in Sen and Nussbaum's capability approach. *Review of Political Economy, 14*(4), 497-518.

Doherty, T. J., & Clayton, S. (2011). The psychological impacts of global climate change. *American Psychologist*, *66*(4), 265.

Edwards, G.A., Reid, L., & Hunter, C. (2015). Environmental justice, capabilities, and the theorization of well-being. *Progress in Human Geography*, 0309132515620850.

Fraser, N. (1997) *Justice Interruptus: Critical Reflections on the 'Postsocialist' Condition*. New York: Routledge.

Fuller, R. A., Irvine, K. N., Devine-Wright, P., Warren, P. H., & Gaston, K. J. (2007). Psychological benefits of greenspace increase with biodiversity. Biology Letters, 3(4), 390-394.

Gascon, M., Triguero-Mas, M., Martínez, D., Dadvand, P., Forns, J., Plasència, A., & Nieuwenhuijsen, M. J. (2015). Mental health benefits of long-term exposure to residential green and blue spaces: a systematic review. *International Journal of Environmental Research and Public Health*, *12*(4), 4354-4379.

Giullari, S., & Lewis, J. (2005). The adult worker model family, gender equality and care. *The Search for New Policy Principles, and the Possibilities and Problems of the Capabilities Approach. UNRISD: Geneva*.

Greco, G. (2013). *Assessing Women's Quality of Life in Rural Malawi: A Capabilities Index*, London: University of London.

Greco, G., Skordis-Worrall, J., Mkandawire, B., Mills, A. (2015). What is a good life? Selecting capabilities to assess women's quality of life in rural Malawi. *Social Science & Medicine 130*: 69–78.

Hanna, P., & Vanclay, F. (2013). Human rights, Indigenous peoples and the concept of Free, Prior and Informed Consent. *Impact Assessment and Project Appraisal, 31*(2), 146-157.

Hardin, G. (1968). The tragedy of the commons. *Science*, 162, 1243-1248

Haraway, D.J. (2016). Staying with the Trouble: Making Kin in the Chthulucene, Durham, NC: Duke University Press.

Holland, B. (2008). Justice and the environment in Nussbaum's" Capabilities Approach": Why sustainable ecological capacity is a meta-capability. *Political Research Quarterly, 61*, (2), 319-332.

Hyams, K. (2009). A Just Response to Climate Change: Personal Carbon Allowances and the Normal-Functioning Approach. *Journal of Social Philosophy*, *40*(2), 237-256.

Kaplan, R., & Kaplan, S. (1989). *The experience of nature: A psychological perspective*. CUP Archive.

Kasser, T. & Ryan, R.M. (1993). A dark side of the American dream: Correlates of financial success as a central life aspiration. *Journal of Personality and Social*

Psychology, 65:410–22.

Kirmayer, L.J., Sehdev, M., Whitley, R., Dandeneau, S. & Isaac, C. (2009) Community resilience: Models, metaphors and measures. *International Journal of Indigenous Health, 5* (1), 62-117.

Knapp, M., McDaid, D., Mossialos, E., Thornicroft, G. (2007). *Mental health policy and practice across Europe*. London: McGaw-Hill.

Kompridis, N. (2007). Struggling over the Meaning of Recognition A Matter of Identity, Justice, or Freedom?. *European Journal of Political Theory, 6*(3), 277-289.

Lewis, S.L., & Maslin, M.A. (2015). Defining the Anthropocene. *Nature, 519*(7542), 171-180.

Lindblade, K.A., Walker, E.D., Onapa, A.W., Katungu, J., & Wilson, M.L. (1999). Highland malaria in Uganda: prospective analysis of an epidemic associated with El Niño. *Transactions of the Royal Society of Tropical Medicine and Hygiene, 93*(5), 480-487.

Lorgelly, P.K., Lorimer, K., Fenwick, E., & Briggs, A.H. (2008). The Capability Approach: developing and instrument for evaluating public health interventions. Section of Public Health and Health Policy, University of Glasgow.

Lorgelly, P. (2014). Cultural adaptation and capability instruments: more than translation and re-valuation, 3rd ICECAP Users Group Workshop: Birmingham.

McGregor, D., Morelli, P., Matsuoko, J., Rodenhurst, R., Konh, N., & Spencer, M. (2003). An ecological model of native Hawaiian well-being. *Pacific Health Dialogue, 10*, 106–128.

McLaughlin, K. A., Green, J. G., Alegría, M., Costello, E. J., Gruber, M. J., Sampson, N. A., & Kessler, R. C. (2012). Food insecurity and mental disorders in a national sample of US adolescents. Journal of the American Academy of Child & Adolescent Psychiatry, 51(12), 1293-1303.

McLeroy, K.R., Bibeau, D., Steckler, A. & Glanz, K. (1988) An ecological perspective on health promotion programs. Health Education Quarterly, 15, 351–377.

Maughan, D.L. & Berry, H.L. (2015). Mind games: standing by while the world ignores climate change. *British Journal of Psychiatry International, 12*, 29-31.

Meintjes, I., Field, S., Van Heyningen, T., & Honikman, S. (2015). Creating Capabilities through Maternal Mental Health Interventions: A Case Study at Hanover Park, Cape Town. *Journal of International Development, 27*(2), 234-250.

Mitchell, R.J., Richardson, E.A., Shortt, N.K., & Pearce, J.R. (2015). Neighborhood environments and socioeconomic inequalities in mental well-being. *American Journal of Preventive Medicine, 49*(1), 80-84.

Neff, J.A., & Husaini, B.A. (1987). Urbanicity, race, and psychological distress. *Journal of Community Psychology*, *15*(4), 520-536.

Nussbaum, M. (1999). Women and equality: The capabilities approach. *International Labour Review, 138*(3), 227-245.

Nussbaum, M. (2000). *Women and Human Development The Capabilities Approach*. Cambridge University Press Cambridge

Nussbaum, M. (2006). *Frontiers of justice: Disability, nationality, species membership*. Cambridge, MA: Belknap Press of Harvard University Press.

O'Brien, L.V., Berry, H.L., Coleman, C., Hanigan, I.C. (2014). Drought as a mental health exposure. Environmental Research, 131, 181-187.

Ostrom, E. (1990). *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge University Press, Cambridge, UK.

Ostrom, E. (2010). Beyond markets and states: polycentric governance of complex economic systems. *American Economic Review,* 100, 1–33.

Ostrom, E. & Cox, M. (2010). Moving beyond panaceas: a multi-tiered diagnostic approach for social-ecological analysis *EnvironmentalConservation37(4):451–463*.

Ostrom, E. (2014). A polycentric approach for coping with climate change. *Annals of Economics and Finance*, 15(1), 71-108.

Parrotta, J.A., Trosper, R.L. (editors) (2012). *Traditional Forest-Related Knowledge: Sustaining Communities, Ecosystems and Bio-cultural Diversity*. World Forest Series vol. 12. Springer, Dordrecht, the Netherlands.

Pascual, M., Rodó, X., Ellner, S.P., Colwell, R., & Bouma, M. J. (2000). Cholera dynamics and El Nino-southern oscillation. *Science, 289*(5485), 1766-1769.

Patz, J.A., Campbell-Lendrum, D., Holloway, T., & Foley, J.A. (2005). Impact of regional climate change on human health. *Nature, 438*(7066), 310-317.

Paykel, E.S., Abbott, R., Jenkins, R., Brugha, T.S., & Meltzer, H. (2000). Urban–rural mental health differences in Great Britain: findings from the National Morbidity Survey. *Psychological Medicine, 30*(02), 269-280.

Peeters, W., Dirix, J., & Sterckx, S. (2015). The capabilities approach and environmental sustainability: The case for functioning constraints. *Environmental Values, 24*(3), 367-389.

Plagerson, S. (2015). Integrating mental health and social development in theory and practice. Health policy and planning, 30(2), 163-170.

Poveda, G., Rojas, W., Quiñones, M. L., Vélez, I. D., Mantilla, R. I., Ruiz, D., ... & Rua, G.L. (2001). Coupling between annual and ENSO timescales in the malaria-climate association in Colombia. *Environmental Health Perspectives*, *109*(5), 489.

Prince, M., Patel, V., Saxena, S., Maj, M., Maselko, J., Phillips, M.R., & Rahman, A. (2007). No health without mental health. *The Lancet, 370*(9590), 859-877.

Rawls, J. (1971). *A Theory of Justice*. Cambridge, MA: Harvard University Press.

Rodo, X., Pascual, M., Fuchs, G., & Faruque, A.S.G. (2002). ENSO and cholera: a nonstationary link related to climate change?. *Proceedings of the National Academy of Sciences, 99*(20), 12901-12906.

Roy, M., & Venema, H.D. (2002). Reducing risk and vulnerability to climate change in India: the capabilities approach. *Gender & Development, 10*(2), 78-83.

Ryff, C.D. (1989). Happiness is everything or is it. Explanations on the eaning of psychological wellbeing. *Journal of Personality and Social Psychology, 57*, 1069-1081.

Ryff, C.D., & Singer, B. (1996). Psychological well-being: Meaning, measurement, and implications for psychotherapy research. *Psychotherapy and psychosomatics, 65*(1), 14-23.

Ryff, C.D., & Keyes, C.L.M. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology*, *69*(4), 719.

Ryff, C.D. (2016). Articolo Target. Psychological well-being and health: Past, present and future. *PSICOLOGIA DELLA SALUTE*, 1: 7-26., DOI:10.3280/PDS2016-00100

Schlosberg, D. (2007) *Defining environmental justice*. New York: Oxford University Press.

Schlosberg, D. and Carruthers, D. (2010) Indigenous struggles, environmental justice, and community capabilities. *Global Environmental Politics, 10*: 12–35.

Schlosberg, D. (2012) Climate justice and capabilities: A framework for adaptation policy. *Ethics & International Affairs, 26*: 445–461.

Sen, A. (1999). *Freedom as development*. Oxford University Press.

Sen, A. (2002). *Rationality and Freedom*. Cambridge, MA: Harvard University Press.

Sen, A. & Nussbaum, M.C. (Eds.) (1993) The Quality of Life. Oxford: Clarendon Press.

Simon, J., Anand, P., Gray, A., Rugkåsa, J., Yeeles, K., Burns, T. (2013). Operationalising the capability approach for outcome measurement in mental health research. *Social Science & Medicine, 98*,187-196.

Srivastava, K. (2009). Urbanization and mental health. *Industrial Psychiatry Journal, 18*(2), 75.

Sundquist, K., Frank, G., & Sundquist, J. (2004). Urbanisation and incidence of psychosis and depression. *British Journal of Psychiatry, 184*(4), 293-298.

Sundquist, K., & Frank, G. (2004). Urbanization and hospital admission rates for alcohol and drug abuse: a follow-up study of 4.5 million women and men in Sweden. *Addiction, 99*(10), 1298-1305.

Teerawattananon, Y., Yamabhai, I., & Leelahavarong, P. (2011). *Using capability index to determine a value for money of the AIDS Competence Process in Thailand*. Research Report, Health Intervention and Technology Assessment Program (HITAP), Thailand.

Thomson, H., Thomas, S., Sellstrom, E., & Petticrew, M. (2009). The health impacts of housing improvement: a systematic review of intervention studies from 1887 to 2007. *American Journal of Public Health*, *99*(S3), S681-S692.

Ulrich, R.S. (1983). Aesthetic and affective response to natural environment. In *Behavior and the natural environment* (pp. 85-125). Springer US.

United Nations, Population Division (2008). World Population Prospects: The 2008 Revision, United Nations, Geneva.

United Nations Development Programme (2011). Human Development Report. United Nations, Geneva.

US Environmental Protection Agency: https://www.epa.gov/environmentaljustice. Retrieved 25th October 2016.

Van Os, J., Hanssen, M., Bijl, R.V., et al (2001) Prevalence of psychotic disorder and community level of psychotic symptoms: an urban - rural comparison. Archives of General Psychiatry, 58, 663-668.

Vidal, J. (2016, August 28). The tribes paying the brutal price of conservation. The Guardian. Retrieved from https://www.theguardian.com/global-development/2016/aug/28/exiles-human-cost-of-conservation-indigenous-peoples-eco-tourism

Walker, G. (2009). Environmental justice and normative thinking. Antipode, 41, 203–205.

Walker, G. (2012). *Environmental Justice: Concepts, Evidence and Politics*. London: Routledge.

White, R.G., Imperiale, M.G., & Perera, E. (2016). The Capabilities Approach: Fostering contexts for enhancing mental health and wellbeing across the globe. *Globalization and Health, 12*(1), 1.

Wilson, E.O. (1984) *Biophilia: The human bond with other species*. Harvard University Press.

Wilson, D.S., O'Brien, D.T. & Sesma, A. (2009) Human prosociality from an evolutionary perspective: Variation and correlations at a city-wide scale. *Evolution and Human Behavior*, 30, 190–200.

Wilson, D.S., Kaufman, R.A. & Purdy, M.S. (2011a) A program for at-risk high school students informed by evolutionary science. PLoS ONE 6(11), e27826.

Wilson, D.S., Marshall, D. & Iserhott, H. (2011b) Empowering groups that enable play. *American Journal of Play*, 3(4), 523–37.

Wilson, D.S., Ostrom, E. & Cox, M.E. (2013) Generalizing the core design principles for the efficacy of groups. *Journal of Economic Behavior and Organization, 90*: S21–S32.

Wilson, D.S., Hayes, S.C., Biglan, A., & Embry, D. D. (2014). Collaborating on evolving the future. *Behavioral and Brain Sciences*, *37*(04), 438-460.

World Health Organization (1946). *Constitution of the World Health Organization*. World Health Organization, Geneva.

Mental Wellbeing in the Anthropocene

World Health Organization (2008). *Mental Health Gap Action Programme (mhGAP): Scaling up care for mental, neurological and substance use disorders*. Geneva: WHO.

World Health Organization (2013). *Mental Health Action Plan 2013-2020*. WHO: Geneva.

World Health Organization (2014). *Quantitative risk assessment of the effects of climate change on selected causes of death, 2030s and 2050s*. Geneva: WHO.

World Health Organization (2016). WHO Global Programme on Climate Change & Health. WHO: Geneva.
http://www.who.int/globalchange/mediacentre/news/WHO-Climate-change-Programme-Summary-2016-2017.pdf?ua=1

Yap, M., & Yu, E. (2016). Operationalising the capability approach: developing culturally relevant indicators of indigenous wellbeing – an Australian example. *Oxford Development Studies, 44*(3), 315-331.