

## **The architecture of happiness**

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**Abstract**

Happiness is an increasingly prominent topic of interest across academia. However, relatively little attention has been paid to how it is *created*, especially not in a multidimensional sense. By ‘created’ we do not mean its influencing factors, for which there is extensive research, but how it actually forms in the person. The work that *has* been done in this arena tends to focus on physiological dynamics, which are certainly part of the puzzle. But they are not the whole picture, with psychological, phenomenological, and socio-cultural processes also playing their part. As a result, this paper offers a multidimensional overview of scholarship on the ‘architecture’ of happiness, providing a stimulus for further work into this important topic.

Key words: happiness; neurophysiology; psychology; phenomenology; socio-cultural.

Recent decades have seen a surge of scientific interest in happiness, from research into different types (e.g., hedonia versus eudaimonia) to the myriad factors that affect it (from relationships to economics). Yet relatively little has been done on how happiness is *created* – how it is ‘formed’ or ‘shaped’ – especially not in a multidimensional sense. The attention that *has* been paid tends to focus on physiological dynamics, like biochemical activity. Although such processes certainly play their role, they are not the entire picture, with psychological, phenomenological, and socio-cultural processes also involved. As a result, this paper offers a multidimensional overview of research and theory relating to the ‘architecture’ of happiness. It considers six key realms of processes: genetic, biochemical, neural network, psychological, phenomenological, and socio-cultural. Before that, we first introduce a basic definition of happiness, followed by two multidimensional frameworks that can help us appraise it in a comprehensive way.

### **Happiness**

The following are some basic orienting definitions that, while not the only way of looking at the topic, accord with most of the relevant literature. We can start by considering wellbeing, which most scholars regard as an overarching and all-encompassing concept that includes happiness within it (De Chavez et al., 2005). There are many ways of defining wellbeing, but we view it as a *personal state of quality*, including all the manifold ways that human beings can be, do, and live well. This notion of quality alludes to notions of ‘quality of life,’ a common concept in work on wellbeing (Nussbaum & Sen, 1993). The idea of quality itself has further been influentially explored by Pirsig (1974), who saw it as eluding reductive attempts to pin it down, but nevertheless denoting a fundamental and even irreducible sense of a phenomenon being deemed good or valuable in some way (Reeves & Bednar, 1994). Then, more specifically, one can think about wellbeing with respect to different ontological dimensions of life. There are many ways of conceptualising this complex terrain, but one place to start is to follow the Cartesian mind-body distinction and differentiate between physical and mental wellbeing. Adapting the definition above, we can respectively describe these as a personal physical state of quality and a personal mental state of quality. In addition, we would want to acknowledge social wellbeing – as reflected in the WHO’s (1948) definition of health as ‘a state of complete physical, mental and social well-being, and not merely the absence of disease and infirmity’ – which is thus a personal social state of quality. Finally, some scholars suggest that we ought to recognize spiritual wellbeing (Larson, 1996; VanderWeele et al., 2021), which is therefore a personal spiritual state of quality.

We can then introduce further nuance by viewing all forms of wellbeing as arrayed upon a spectrum between a negative and a positive pole – a metaphor developed by the likes of Keyes (2002) in the context of explaining the relevance of fields like positive psychology (as bringing a renewed focus to the positive pole). Let us now incorporate two additional concepts, illness and health, denoting the negative territory of each spectrum as illness, and the positive territory as health. So, we can speak of physical illness and health, mental illness and health, and even social or spiritual illness and health. The metaphor is imperfect: with regard to all dimensions, people may more accurately be regarded as existing on multiple spectra (rather than just one), doing poorly on some and better on others. Nevertheless, it is a useful guiding image for now. With respect to all spectra, wellbeing then could be seen as the relative absence of illness, and/or relative presence of health. There is, naturally and rightly, a strong focus on the negative territory of the spectra, on curing or at least ameliorating illness. This is the prerogative of fields such as medicine and physiotherapy for physical illness, psychiatry and psychotherapy for mental illness, social work for aspects of social illness, and certain aspects of theology and religion (e.g., both devotional and confessional practices) for spiritual illness. As a basic heuristic, these fields are focused on ameliorating suffering, and more specifically, on respectively treating experiences of discomfort, distress, strife, and anomie, though of course they are not *only* focused on these phenomena (medicine for instance also applies in areas and instances when a person is not experiencing discomfort *per se*). These fields do sometimes aim to push people into positive territory, but broadly speaking prioritise getting people who are not doing as well towards the relative neutrality of ‘zero’ (i.e., absence of illness). This is reflected in Sigmund Freud’s famous remark that the goal of psychotherapy was simply to turn ‘hysterical misery into ordinary unhappiness’ (Breuer & Freud, 1955, p.308).

Bringing people to ‘zero’ is a laudable goal. But crucially, absence of illness does not necessarily entail presence of health. Here the spectrum metaphor asserts its value. A person might be relatively free of physical or mental illness, and in that sense not suffering in negative territory. However, this does not mean they are necessarily flourishing in positive territory. Instead, they may just be languishing around ‘zero’ – not ill *per se*, but not excelling either (Keyes, 2007). Thus, there is increasing interest in the positive territory of these spectra. With physical wellbeing, this means not only being concerned with the absence of illness and disease, but with positive dimensions of physical health. This might include helping people develop a nutritious health-promoting diet, and cultivate good patterns of behaviour and exercise. Similarly, social wellbeing is the focus of some aspects of public

policy, education, and community organizing, which include efforts to improve society, while spiritual wellbeing is the prerogative of theology, religion, philosophy, and spiritual practices. Likewise, there is ever more attention paid to the positive territory of the mental spectrum, as driven by fields like positive psychology. Here is where happiness re-enters the conversation. Essentially, this positive mental territory can be deemed the realm of happiness, which one might define roughly, simply, and expansively – building upon the definition of wellbeing above – as a *personal mental experience of quality* (with ‘mental’ used broadly to encompass all qualia, including emotions). This rough positioning of happiness in relation to kinship concepts such as health and wellbeing is illustrated below. Having set some rough parameters for what we mean by happiness, the paper now outlines a multidimensional approach which can help us develop a comprehensive account of its ‘architecture.’ As a final point, unless otherwise specified, most research below focuses on *hedonic* happiness. Sometimes known as ‘subjective wellbeing’ (Diener et al., 2015), this is usually understood as comprising a cognitive (life satisfaction) and an affective component (positive affect). While some authors refer to both life satisfaction and positive affect as ‘hedonic’, others restrict ‘hedonic’ to positive affect and use ‘evaluative happiness’ for life satisfaction (National Research Council, 2014).

### **A Multidimensional Approach**

The four-fold distinction above between physical, mental, social and spiritual wellbeing highlights the complexity of existence. However, taken alone it may not be sufficient to capture the subtle nuances of the ontological terrain. As such, our understanding can be further enriched by bringing in a *different* ontological schema, Wilber’s (1997) Integral Framework. This also identifies four main dimensions: mind, brain, culture, and society. The crucial difference between the two sets of dimensions concerns the distinction between ‘subjective’ (i.e., phenomenal qualia) and ‘objective’ (i.e., material physiology). In short, the four wellbeing dimensions above all have both subjective and objective aspects. By contrast, Wilber’s four dimensions fall either side of the subjective-objective divide. So, by bringing these frameworks together, and exploring their intersections and tensions, one can better tease apart and conceptualize the subtle complexities of wellbeing. Specifically, Wilber’s ‘Integral Framework’ was created by juxtaposing two common binaries: mind-body; and individual-collective.

The mind-body dichotomy has been debated for centuries, and in some form is accepted by most thinkers (with the exception of some strong materialist or idealist monists) (Chalmers, 1996). The mind refers to our ‘inner’ subjective, phenomenological world of

qualia, whereas the body refers to our physical, material being (including the brain). The relationship between these realms is of course complex and disputed. The dominant scientific approach is the ‘neural correlates of consciousness’ paradigm (Fell, 2004). This examines patterns of association between mind (i.e., mental states) and body (i.e., brain states). However, their relationship remains poorly understood, and is still fundamentally quite mysterious. For instance, this paradigm does not, or cannot yet, establish *causality*. It is not that brain states *cause* mental states per se; at present we are limited to saying they are linked in complex ways. Mental states do *depend* – or ‘supervene’ in philosophical terminology – on brain states for their existence. However, the brain may be better seen as the physiological *architecture* related to the *mechanism* by which the mind is instantiated, rather than its cause. Neurotransmitters like serotonin and dopamine may play a role in experiences of wellbeing, but its proximate *cause* may be a smile from a loved one, for instance. Indeed, in one sense, mind and body could be regarded as two sides of the same coin: mind is the body/brain experienced from the ‘inside,’ and the body/brain is the mind observed from the ‘outside.’ We should further note that this mind-body dyad is only one example of a broader phenomenon which is central to the analysis below, namely the principle of ‘emergence’ (Goldstein, 1999). In addition to the idea that subjective experience emerges out of neurophysiological activity, we can also apply the notion of emergence *within* the realms of subjectivity and neurophysiology in themselves. This application rests on the idea that phenomena can be appraised and ordered in terms of complexity (e.g., with higher and lower orders), whereby higher-level phenomena can emerge out of lower-level phenomena. The higher-level phenomena are therefore dependent upon, but not *reducible* to, these underlying substrates, and so must be analysed on their own terms. To give one example, cognitive mechanisms such as attention are founded upon the activity of neurons, which in turn rest upon a substrate of molecular processes, which in turn involve the interaction of atomic and subatomic particles. Attention would not be possible without these ‘lower’ levels, but we must still analyse it on its own terms. We shall see these principles at play throughout the discussion below.

The second binary invoked by Wilber is the individual-collective distinction. This draws on the idea – articulated by the likes of Bakan (1966) – that human beings have two fundamental modes of existence: agency (as autonomous self-contained beings), and communion (as also inextricably part of networks of other people and processes). Wilber’s insight was to juxtapose this binary with the mind-body distinction, creating a 2x2 matrix, as illustrated below. The top row covers the ‘standard’ mind-body dichotomy – i.e., applied to

the individual – as outlined above. The bottom row then applies this binary at the collective level. In that respect, the mind exists in a collective way as an ‘intersubjective’ phenomenon that Wilber labels broadly as ‘culture.’ Groups of people enter a shared experiential horizon, featuring common ideas, values, traditions, and even feelings. Likewise, the collective also has a physical, material reality, an ‘interobjective’ phenomenon denoted broadly as ‘society.’ At the level of a nation, for instance, the latter includes anything observable or measurable, ranging from its population and wealth through to its geography and climate.

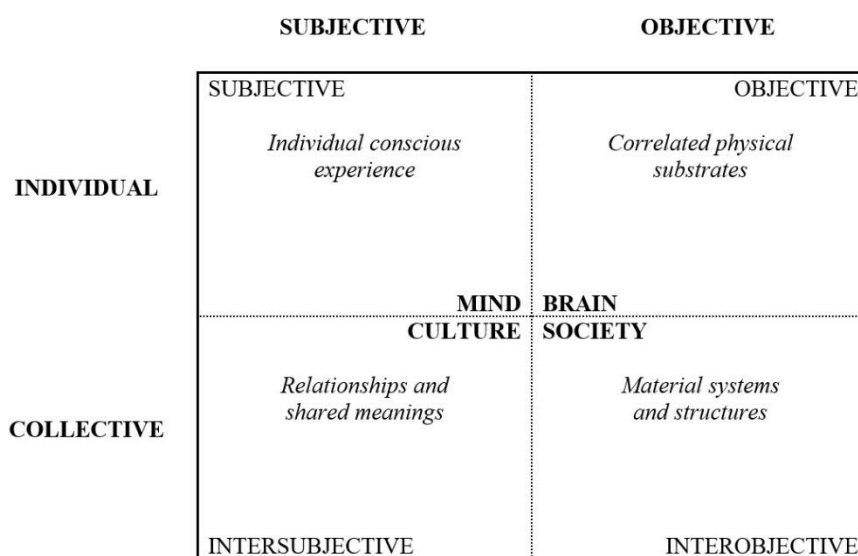


Figure 1. The Integral Framework

With this Integral Framework in mind, in this paper we consider some key processes by which happiness is generated. We begin with the upper-right dimension of the body/brain, since this is where the bulk of the scientific literature is situated – work sometimes known as ‘affective neuroscience’ (Davidson, 2003) or the ‘neural correlates of wellbeing’ approach (King, 2019). Crucially though, we will not *only* look at this dimension; it is important to also consider how happiness is formed by subjective, intersubjective, and interobjective dynamics. The presentation cannot be exhaustive; the literature is too voluminous and complex to provide a complete picture. But it gives a helpful overview of the pieces of the jigsaw. Moreover, we shall offer a rudimentary heuristic for how these pieces might fit together to collectively create experiences of happiness. Although each of the domains considered here has a substantial literature associated with it, these have tended to remain largely siloed and disconnected, both empirically and theoretically. There are some emergent interdisciplinary efforts to integrate them, such as the ‘neurophenomenology’ paradigm (Cahn & Polich,

2006). However, our understanding of how these varied dimensions of happiness – and subjective experience more generally – intersect is in its infancy. As such, we cannot offer a fully substantiated theory for how the different components considered here interconnect to create experiences of happiness. Even so, writing a paper such as this compels us to at least offer a plausible heuristic model by which this may occur, even if only a tentative one whose details will need testing and corroborating through future research.

In that respect, our heuristic draws upon Lisa Feldman Barrett's (2006) influential 'conceptual-act' theory of emotion formation. Her work seeks to provide a bridge between two seemingly oppositional perspectives on emotions. On the one hand, we find 'naturalistic' perspectives, which conceptualise emotions in an essentialist and universalist way as 'natural kinds.' This stance has two key models. First, Russell's (1980) circumplex posits that affective states are generated by the interaction of two independent neurophysiological systems: valence (pleasant-unpleasant) and arousal (active-passive). Second, alternatively, Ekman's (1992) basic emotions paradigm proposes six such emotions – anger, disgust, fear, sadness, surprise and enjoyment – which differ in terms of antecedent events, appraisal, and probable behavioural responses, with each served by discrete, independent neural systems. The theory has been supported by extensive cross-cultural research (Ekman, 2016), although it has also been challenged theoretically and empirically (Gendron et al., 2014). In any case, one can imagine how a neurophysiological event such as a reward-contingent release of dopamine would either generate a positively valenced emotion (per the circumplex model) or a feeling of enjoyment (per the basic emotion model). However, in contrast to naturalistic models are constructionist theories. Rather than emotions being universally available inner states, they are conceived as products of the complex dynamics of social interaction, and of the broader cultural context in which this interaction occurs. Since such encounters are primarily discursive, theorists such as Harré (1986) regard emotions as fundamentally a linguistic construction (albeit one that may incorporate physiological aspects). From this perspective, given linguistic differences across cultures – a point explored below – there is great cross-cultural variation in how emotions are experienced, interpreted and understood (a form of cultural determinism propounded by many anthropologists) (C. A. Lutz, 2011). In that respect, happiness may be shaped and even determined by socio-cultural factors such as language.

One may be tempted to conclude that the naturalistic and constructionist perspectives are irreconcilable. However, theories are emerging that incorporate elements of both: allowing for the possibility of universal inner states, but also recognising that these may be



shaped by socio-cultural contexts. Perhaps most prominent is Feldman Barrett's (2006), which proposes that discrete emotions emerge from a conceptual analysis of a 'momentary state of core affect' (p.49). The concept of core affect arguably aligns with naturalistic theories, being a state of affective arousal or a basic emotion. With happiness, for instance, this may be a surge of pleasure linked to dopaminergic activity. However, the 'ebb and flow of core affect' is then filtered through a person's linguistic-conceptual schemas – which are culturally influenced – and thereby interpreted as a specific emotion with a particular meaning. Such schemas not only determine what label the feeling is given, but in part how it is appraised (e.g., desirable or undesirable, right or wrong, merited or underserved, etc.), with these thoughts and judgements interwoven throughout the emotional experience. This model strikes us as a plausible and useful account for how the myriad processes discussed below might interrelate to create experiences of happiness.

Essentially, in broad terms, we interpret neurophysiological dynamics as providing the 'raw material' for happiness. At the base, genetic processes form the underlying physical substrate out of which this material is fashioned. Then, from this genetically driven substrate emerge biochemical processes, which are the basic constituent elements giving rise to the phenomenon of happiness. Then, supervening upon these processes is the larger-scale activity of neural networks, which elaborate upon these elements in complex ways. Then, out of neurophysiological dynamics emerge psychological mechanisms – which themselves are influenced by socio-cultural forces – that filter and shape this underlying material to produce the phenomenology of happiness. Another way to picture these dynamics is through the prism of our architectural metaphor. Imagine happiness as a building: genetic processes constitute its initial design or 'blueprint'; biochemical processes represent the creation of the actual physical structure; neural networks elaborate upon this structure in complex ways (e.g., its wiring and plumbing); psychological processes are the more visible design aspects; socio-cultural processes are the wider systemic forces which shape all aspects of the architectural process; and phenomenological processes are the experience of actually being in the building. These complex interrelated dynamics are illustrated in Figure 2 below, though we have refrained from making the causal relationships too definitive, since the research base is not sufficiently advanced to allow us to do so. At most we would venture to suggest that genetic factors primarily act upon biochemical and neural network processes, while socio-cultural factors primarily act upon neural network and psychological factors. In turn, biochemical, neural network, and psychological processes all provide the substrate for phenomenological experiences, though biochemical processes are often filtered through neural network and

psychological processes in exerting their impact. We will elaborate on these ideas – Feldman Barrett’s theory, our heuristic interpretation, and this architectural metaphor – throughout the paper and further in the conclusion.

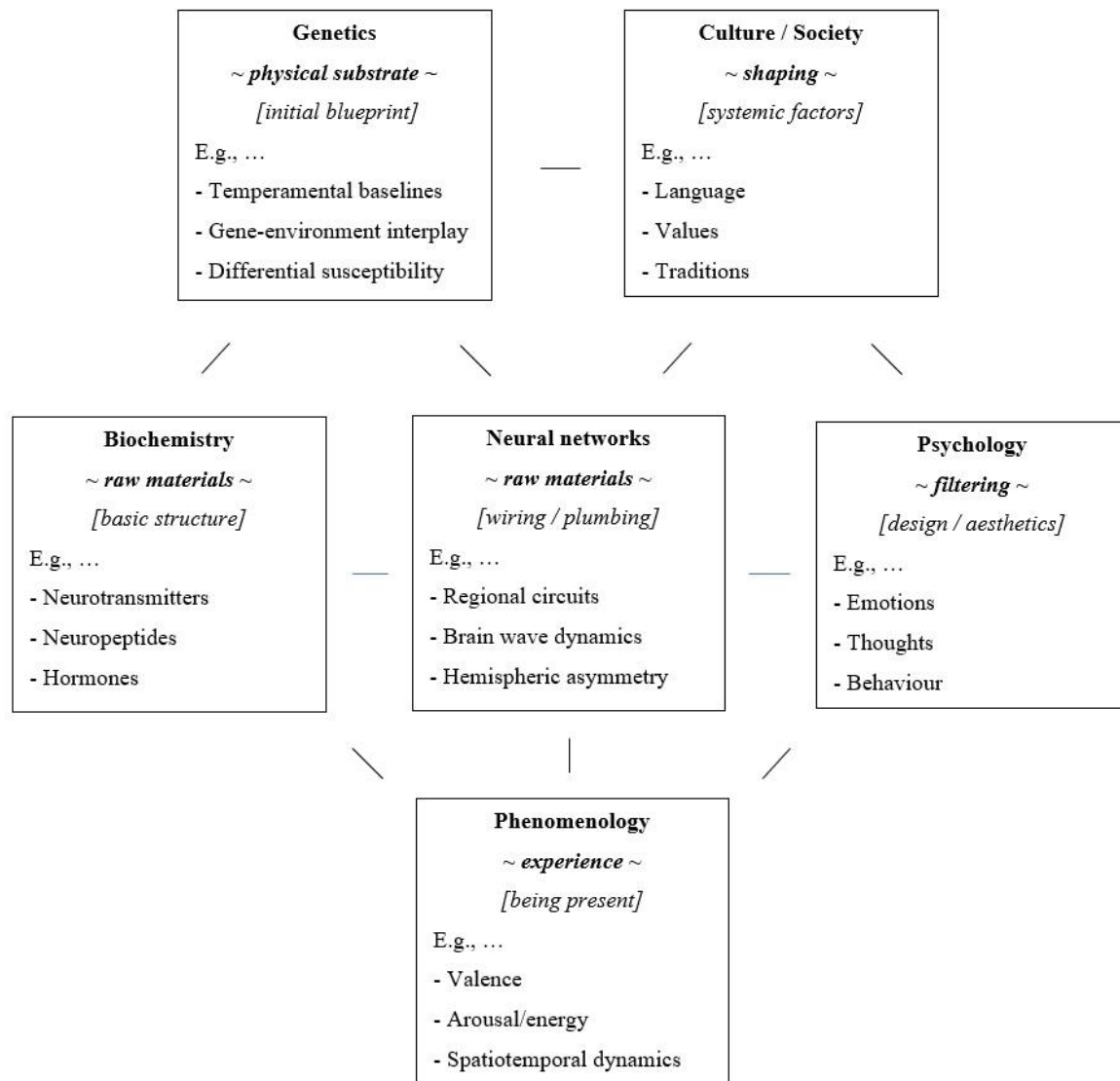


Figure 2. The architecture of happiness

### Genetic Processes

Genetic processes are not an explicit aspect of Feldman Barrett’s conceptual act theory (upon which our own heuristic model is based). Nevertheless, such processes create and shape the very terrain – i.e., the material body – on which all the other processes here play out. To use our architectural metaphor, if happiness is a building, genetic processes constitute its initial design or ‘blueprint.’ We note that viewing genes as a blueprint is somewhat problematic

(Condit, 1999), not least because of complex processes of epigenetics – though to play with the metaphor, epigenetics could be the way an architect’s initial design may be adapted by builders in light of realities on the ground. Moreover, while a blueprint suggests an inflexible design, the influence of genetic predisposition is highly dependent on one’s environmental context, both present and past. In any case, metaphors aside, genetic processes set the broad context in which the other processes subsequently unfold. In that respect, as with most aspects of human functioning, researchers have explored whether there is a genetic aspect to happiness. This enquiry is partly motivated by the two-part observation that, (a) people seem to have a relatively stable temperamental happiness baselines or ‘set points,’ and more relevantly and significantly, (b) these baselines vary among people. Thus, one wonders whether, as with other phenotypes, these variations reflect inherited predispositions in some way. Both points are complex and contested, but some version of these theses, subject to qualifications, is fairly well supported.

Regarding the first point, a substantial literature has emerged around the idea of a ‘hedonic treadmill.’ This was prompted by research that purported to show that significant changes in fortune – for good or bad – did not seem to durably alter happiness (Brickman et al., 1978). People mostly seemed to adapt to their circumstances relatively quickly (after a few months, say), whereupon they reportedly returned to their ‘habitual’ level of happiness. However, the study did not actually measure happiness before and after the change, but relied on people’s retrospective and prospective ratings, and subsequent work has provided caveats to its conclusions (Diener et al., 2006). On the positive side, it does appear possible to shift one’s baseline upwards through activities like meditation (Zeng et al., 2015), or through events such as marriage (Grover and Helliwell, 2019), lottery wins (Lindqvist et al., 2020), or becoming more religious (Headey et al., 2010) whereas on the negative side, some experiences may be so traumatic that the baseline is durably lowered (Lucas, 2007). That said, happiness does still appear *relatively* stable (Lykken, 1999). In any case, any within-person change does not interfere with the central point regarding a genetic underpinning of happiness: a given intervention or event may improve happiness overall, and yet genetically determined individual differences may stay constant, resulting in mean level change with stable variance.

This brings us to point (b). Significantly, people vary in their baseline of wellbeing. Many factors potentially contribute to this, including environmental influences such as socialization (Corapci et al., 2018). But at least part of the puzzle appears to be genetic. Researchers have reached this conclusion via various methods. The most common is the

classical twin design, which relies on the fact that monozygotic (MZ) twins share approximately 100% of their segregating genes, while dizygotic (DZ) twins on average share 50%. While the different types of twin pairs do not share the same proportion of their genetic material, under the assumption that they are raised in the same family, they both share a common family environment. Therefore, any difference between MZ twins must be attributable to unique environmental experiences, while any difference between DZ twins can be due to both unique environmental experiences and genetic differences. By comparing phenotypic similarity for wellbeing in MZ twins and DZ twins, researchers can model the extent to which individual differences in wellbeing can be attributed to additive genetic, dominant genetic, shared environmental, and unique environmental variation. There is a wide range of literature examining the heritability of happiness across different countries and age groups. Together, these studies indicate a meta-analytic heritability of around 40% (Bartels, 2015; Nes & Røysamb, 2015; van de Weijer et al., 2021), indicating that around 40% of individual differences can be attributed to genetic differences between people (and the remaining 60% to environmental influences).

Complicating the picture, however, is recognition that genetic and environmental factors are not independent of one another or in their effects but interact in complex ways through gene-environment interplay. This includes various forms of gene-environment correlation (rGE) as well as gene-environment interaction (GxE). According to rGE, the genetic component of an individual's wellbeing influences their exposure to specific environments. For example, the heritable components of happiness traits have been found to be associated with the experience of positive life events (Wootton et al., 2017). This suggests the genetic propensity for wellbeing increases the odds of also experiencing more positive environments (e.g., a sociable person is more likely to experience positive social interactions, which then enhance wellbeing even further). Hence, it is often difficult to disentangle purely genetic from purely environmental effects on wellbeing (or any other common human trait). Another important way in which genetic and environmental influences are intertwined is found in gene-environment interaction, whereby genetic factors can influence the magnitude of effects environmental factors have on wellbeing, as captured in the related frameworks of Differential Susceptibility (Belsky & Pluess, 2009) and Vantage Sensitivity (Pluess & Belsky, 2013). The former holds that genetically driven temperament moderates the impact of environmental factors – both good and bad – such that people identified as highly susceptible to negative environmental influences may also receive the greatest benefit from positive environmental influences. The theory of Vantage Sensitivity makes a similar claim, but

focuses on positive experiences in particular (e.g., the likelihood people will benefit from psychological interventions). Thus, with regard to Differential Susceptibility, for example, carriers of certain gene variants are less vulnerable to adverse experiences (i.e., more resilient). This has been shown in relation to the serotonin transporter gene (5-HTTLPR) and stress (for a meta-analysis see Karg et al., 2011) – although such findings and conclusions are disputed (Culverhouse et al., 2018) – with carriers of the long version of the gene seemingly being protected from the negative effects of adverse experiences. Intriguingly, a growing body of research suggests that the same people who are more vulnerable to adverse experiences are also disproportionately likely to show Vantage Sensitivity (Belsky & Pluess, 2009).

Given such findings, researchers have sought to identify *which* genes contribute to variation in wellbeing, applying various methodologies. Initially the focus was the so-called candidate gene approach, where one or a few genetic variants, usually selected based on their specific biological role, are associated with happiness. For example, there is a set of studies examining a potential link with the aforementioned serotonin transporter gene 5-HTTLPR. However, this method has been criticised given that these studies often lack the statistical power required to test for genetic associations and the fact that results were not easily replicated in a genome-wide context (Border et al., 2019). As such, more recently, attention has concentrated on genome-wide association studies (GWAS). In a GWAS, millions of genetic markers called single nucleotide polymorphisms (SNPs) are associated with scores on a phenotype of interest (without considering hypotheses regarding the biology of the phenotype). The advent of GWAS soon made it clear that most common human emotional and behavioural traits are not influenced by a few genes with large effects, but rather by hundreds to thousands of SNPs with small effects. For wellbeing, the largest GWAS so far identified 148 SNPs associated with life satisfaction and 191 SNPs associated with positive affect (Baselmans et al., 2019). Genome-wide approaches have moreover revealed genetic moderation regarding the effects of positive experiences (Pluess, 2017), including psychological intervention (de Villiers et al., 2018). For example, some participants benefitted more from a relationship support programme due to genetic differences (Pluess et al., 2022). Such differences in general environmental sensitivity (Pluess, 2015) as a function of genetic factors are supported by the fact that it was the same genome-wide polygenic score for sensitivity (Keers et al., 2016) that moderated the effects of stress on depression (Davidson et al., 2021) as well as the intervention effects on relationship outcomes (Pluess et al., 2022) mentioned above. It is beyond the scope here to fully review all the literature

around the genetics of happiness. The point is to highlight genetics as well as the interplay between genetic and environmental factors as a vital aspect of its architecture. Similar considerations apply to our next factor.

### **Biochemical Processes**

In terms of the architecture of happiness, while genetics provides an initial design, biochemical processes provide the real substance from which this experience of happiness arises, constituting its ‘raw material.’ From the perspective of Feldman Barrett’s conceptual act model, such processes generate the initial state of ‘core affect’ upon which emotional experiences are built. Or to use our architectural metaphor, biochemical processes are the basic structure of the building (i.e., its ‘skeleton,’ such as walls and floors/ceilings). In that respect, among the most commonly studied biochemical processes for happiness – and emotional experience more broadly – are neurochemicals (organic molecules or peptides that are generated by and modulate the nervous system). Their activity is influenced by genes, but also factors such as the environment and behaviour. A classic example of the latter is the way exercise generates neurochemicals associated with the ‘runner’s high’ (Boecker et al., 2008), to which compounds below contribute. With happiness, researchers often highlight serotonin, dopamine, oxytocin, and endorphins, as well as, less frequently, endocannabinoids, GABA, epinephrine, and cortisol. We’ll briefly consider each. Indeed, even these do not exhaust the possibilities, with a handful of studies exploring the impact on happiness of such chemicals as dehydroepiandrosterone sulfate (DHEA-S) (Sonnenblick et al., 2018), testosterone (Masuda et al., 2014), vitamin D (Schäfer et al., 2016), estradiol (Lackeret et al., 2020), FSH, LH, prolactin (PRL) (Castanho et al., 2014), IGF-I, and IGFBP-3 (Emeny et al., 2014). However, we shall briefly just discuss the eight mentioned above, as these have a larger literature. That said, a large forthcoming systematic review found that evidence for the effect of biochemicals on happiness *specifically* is overall tentative or inconclusive: the studies reviewed were characterised by inconsistent, weak, or non-significant results, as well as poor experimental designs (de Vries et al., under review). As such, these studies do not provide a firm basis for drawing conclusions about the potential biochemical basis of happiness. Given that, current thinking around this potential does not rest on this relatively weak set of studies focusing on happiness per se, but rather on research involving clinical populations, studying outcomes such as depression, which has then been *extrapolated* to more positive forms of wellbeing. However, while depression and happiness might conceivably be situated on either side of a metaphorical mental wellbeing spectrum, they are not necessarily underpinned by

the same physiological mechanisms. As such, current understanding on these topics must be regarded as tentative and provisional at best, and subject to revision in light of further work.

Serotonin (5-hydroxytryptamine) is a monoamine neurotransmitter and hormone involved in various physiological processes, from sleep to bone health (Monti, 2011). Most relevantly, it is involved in mood. There is some evidence that ‘normal’ levels are associated with calmness and emotional stability (Young, 2007), while low levels are implicated in negative affect, and mental health issues such as depression and anxiety (Żmudzka et al., 2018). For decades serotonin has formed the basis for a key class of psychiatric medicines for depression and other disorders (selective serotonin reuptake inhibitors) (Locher et al., 2017). Serotonin can also be boosted ‘naturally’ by activities such as exercise (Zimmer et al., 2016) and environmental factors like natural light (Wirz-Justice, 2018). However, we reiterate the point that most of the reasoning behind linking serotonin and happiness is based on studies of depression, with little research on its associations with positive mental wellbeing in healthy populations.

Dopamine (3,4-dihydroxyphenethylamine) is a neurotransmitter and hormone involved in various processes, including memory, attention, and the regulation of body movements (Frank, 2005). Most relevant, it is linked to pleasure and related states like motivation and enthusiasm, and functionally many theorists see its main role as a ‘reward pathway,’ released in relation to progress towards goals (Arias-Carrión et al., 2010). In that sense, it may confer motivational salience by signalling the desirability of an outcome, so driving one’s behaviour towards (or away from) it. Many addictive drugs for example, such as methamphetamine and cocaine, act upon the dopamine system (Ritzet et al., 1987). As per serotonin though, most research on dopamine has focused on its role in mental disorders such as depression; its impact on positive wellbeing in healthy populations is understudied.

Third, oxytocin is a neuropeptide and peptide hormone normally produced in the hypothalamus and released by the pituitary gland. In popular culture it is sometimes called the ‘bonding molecule,’ being integral to feelings of connection and trust, and as such serving a key function in phenomena like romantic attachment, sexual reproduction, childbirth and child-raising (Uvnäs-Moberg et al., 2019). It is moreover *elicited* by experiences associated with such phenomena, from skin contact (Vittner et al., 2017) to breastfeeding (Moberg & Prime, 2013). It is also implicated in activation of the parasympathetic nervous system (relaxation and recuperation), and reducing sympathetic nervous system activity (‘fight or flight’) (Gamer & Büchel, 2012). Because of these functions, oxytocin is hypothesized to play some role in happiness as well. However, results there are inconclusive; a 10-day

oxytocin administration, for instance, did not generate changes in mental wellbeing in older adults (Barraza et al., 2013). But such studies too must be interpreted carefully since the effect of administering oxytocin may differ from that of oxytocin arising naturally.

Attention has also focused on endorphins, endogenous opioid neuropeptides and peptide hormones produced by the pituitary gland. Their function is directly revealed by their etymology, a combination of endogenous and morphine (an opiate analgesic). That is, they are opioids – a class of powerful pain- and mood-altering substances that also includes legal (e.g., fentanyl) and illegal (e.g., heroin) drugs – naturally produced by the brain. But they do not only relieve pain; they are linked to happiness, including its more intense forms as captured by signifiers like euphoria (Sprouse-Blum et al., 2010). In terms of behaviours that prompt endorphin release, exercise is often cited as the exemplar (Goldfarb & Jamurtas, 1997), though it is also linked to other phenomena, from expressing anger (Bruehl et al., 2007) to singing (Weinstein et al., 2016), though it's important to note that good research with large samples is lacking here.

Another relevant class of biochemicals are endocannabinoids, endogenous lipid-based retrograde neurotransmitters that bind to cannabinoid receptors and receptor proteins. One main function is contributing to homeostasis (stability of the internal 'environment'), and in that respect they are linked to diverse functions, from appetite and metabolism to the cardiac and reproductive systems (Cristino et al., 2014). But they are also implicated in elevating mood. For instance, among the most well-known is anandamide, named after the Sanskrit term *ānanda* (often rendered as 'bliss'); this has been analysed as a marijuana-like substance naturally produced by the brain, associated with positive feelings from pleasure to euphoria (Scherma et al., 2019). As with other compounds, endocannabinoids are also linked to activities like exercise; indeed, it has been proposed that they, rather than endorphins, may be most responsible for the 'runners' high' (Dietrich & McDaniel, 2004).

Operating in a somewhat different affective space is GABA (gamma-Aminobutyric acid), an endogenous amino acid. It functions as the chief inhibitory neurotransmitter in the central nervous system, decreasing activity by blocking or inhibiting brain signals (Owens & Kriegstein, 2002). In that respect, it is associated particularly with low arousal positive affect, like relaxation and calmness, while conversely deficits are implicated in mental health issues such as depression and anxiety (Möhler, 2012). For such reasons, there is increasing interest in substances that either include GABA or work on GABA receptors, from medications such as barbiturates to naturally occurring forms in foods (Park & Oh, 2007). GABA is also



produced naturally in the brain, including in response to relaxation-focused activities like meditation (Guglietti et al., 2013).

Standing in contrasting physiological territory to GABA is epinephrine ('adrenaline'). Whereas GABA was associated with relaxation, adrenaline drives energetic intensity. It is central to the fight-flight response of the sympathetic nervous system, such as increasing cardiac output and raising blood glucose levels (Reims et al., 2005). In many instances, its activation does not reflect happiness at all, such as in situations of fear, anger or stress (Stemmler, 2010). But in other contexts, it might drive happiness, especially intense forms of hedonia, being associated with visceral feelings of thrill, excitement, and vitality (Hart, 1995). Such is its appeal, especially to certain people – such as those with high levels of adventurousness and risk-seeking – that we have the phenomenon of 'adrenaline junkies,' drawn to emotional intensity through activities perceived as challenging (Clasen et al., 2019).

The final endogenous neurochemical we'll highlight is cortisol, often referred to as the 'stress hormone,' produced by the adrenal glands. The review by de Vries et al. (under review) found 25 studies on cortisol, with the main pattern being higher mental wellbeing linked to a steeper diurnal slope of cortisol levels (e.g., Zilioli et al., 2016). Secondly, some potential links between wellbeing and cortisol awakening response were found, although these results were less consistent; most studies did not find an effect, but Smyth et al. (2015) demonstrated that the timing of cortisol sampling is very important, and when participants strictly adhered to the sampling protocol, higher wellbeing was indeed linked to lower cortisol awakening response. Thus, it is possible that inconsistency of findings regarding hormones and happiness is due in part to variability in samples, age, measures of wellbeing, and timing.

In addition to these endogenous biochemicals are manifold psychoactive compounds – naturally occurring and synthetic – that may generate experiences pertaining to happiness. We cannot begin to provide an exhaustive summary of such substances here, so by way of example we'll just note DMT (N,N-Dimethyltryptamine). Found in many plants (e.g., acacia) and animals (e.g., certain frog species), it is a potent hallucinogen illegal in many countries. But where legal, it often functions as an 'entheogen' (capable of eliciting spiritual or mystical experiences) (Hoffman, 2019). For instance, DMT is an active ingredient in ayahuasca, an entheogenic brew used in shamanic and other religious rituals in South American cultures (Orsolini et al., 2020). It is linked to various states that reflect more spiritually oriented forms happiness, from experiences of ego dissolution and self-transcendence to perceived encounters with divine beings (Timmermann et al., 2018).

### Neural Network Processes

Intertwined with neurochemical activity – indeed, precipitated *by* such activity – is the firing of neurons, particularly the co-ordinated activation of neural networks, which thus constitute another important neurophysiological dimension to happiness. Thus, in terms of our heuristic model, we might also regard these processes as – together with biochemistry – providing the raw material of happiness. However, in that respect, we might suggest there are degrees of ‘rawness.’ Biochemical activity could be regarded as more elemental, as somehow a more basic or fundamental constituent. By contrast, neural network processes could be construed as being of a slightly ‘higher’ level (e.g., in terms of organizational complexity), emerging out of and supervening upon biochemistry. After all, neural networks have a rather ambiguous dual nature. On the one hand, they are physiological processes, so could still be seen as the raw material of happiness. On the other hand though, these networks also provide the mechanisms for yet higher level psychological processes, so in a way occupy an emergent middle layer between biochemistry and psychology. To use our architectural metaphor, while neural networks may still constitute the structure of the building, they do so in a more elaborate way that builds upon the basic skeleton provided by biochemical processes, providing the plumbing, heating, and electrical wiring that help bring the building ‘to life.’

In this regard, attempts have been made to study the ‘functional neuroanatomy’ of happiness (e.g., Kringelbach & Berridge, 2009, 2010). For example, a recent systematic review by King (2019) – exploring both hedonic (subjective) and eudaimonic (psychological) wellbeing – found that although considerable variation was found amongst the studies, some consistent patterns were observed. Overall, mental wellbeing was particularly associated with frontal areas (13 studies reporting significant associations), followed by temporal (8), parietal (7), subcortical (5), and occipital areas (2). The strongest and most consistent association involved the anterior cingulate cortex, with an estimated absolute effect size of  $r = 0.41$ , and a significant association reported in 7 studies (involving 6 independent samples), across different paradigms. Besides that, other notable regions include the orbitofrontal cortex, posterior cingulate cortex, superior temporal gyrus, and thalamus, which are all considered to be involved in the salience and default mode networks, suggesting the importance to wellbeing of networks involved in integrating relevant and significant stimuli.

The research cited above, as per much of the physiological work on happiness, focuses mainly on hedonic varieties. But there is also research into other types. Most prominent is a thriving research paradigm on forms of happiness characterised by low-arousal and/or absorption, in the form of burgeoning scientific interest in meditation. Exemplified by

a decades-long collaboration between leading neuroscientists (e.g., Richard Davidson) and the Dalai Lama and colleagues, there are now many hundreds of papers exploring brain activation in meditators across different forms of practice. For example, two key regions implicated across different practices are the prefrontal cortex and the anterior cingulate cortex (Newberg & Iversen, 2003). Both play a key role in control of attention, a defining feature of meditation (Shapiro et al., 2006). Moreover, differences in activation are observed between long-term and novice meditators, implying some durable practice effects (Hölzel et al., 2007).

Further light has been shed on the neurophysiological dynamics of mind states like meditation by paradigms such as electroencephalography (EEG), which reflect large-scale synchronisation of neural networks. With meditation, a key ‘signature’ across different practices is increased amplitude and coherence in alpha and theta bandwidths (Lomas et al., 2015). Although interpreting this pattern can be difficult, it is thought to reflect a state of ‘relaxed alertness’ (Fell et al., 2010). Alpha synchronization was conventionally viewed as signifying deactivation of cortical areas (the brain ‘idling’), since it occurs during relaxed eyes-closed wakefulness; however, it has more recently been linked to ‘inner-directed’ attention (Shaw, 1996). Moreover, its combination with theta is significant, since the latter is associated with various types of cognitive activity, particularly attention modalities. The interpretation of relaxed alertness is further corroborated by the neurophenomenology paradigm (Cahn & Polich, 2006), discussed further below. As per the sections above, so much could be mentioned here, but our coverage of this arena is necessarily partial. It will suffice to just mention one other notable finding, namely ‘hemispheric asymmetry.’ Greater relative activation of the left hemisphere is associated with positive affect, and more generally with ‘approach-related behaviours,’ whereas greater relative activation of the right is linked to negative affect and ‘withdrawal-related’ behaviours (Davidson, 1992). This pattern has been observed in relation to meditation, with greater left-sided activation during sessions compared to eyes-closed rest (Amihai & Kozhevnikov, 2014). But it also generalises across happiness-related experiences, elicited for instance by pleasant music (Kim et al., 2003).

### **Psychological Processes**

Our consideration now turns to psychological processes, which are an emergent product of the dynamics considered above. These processes range from cognitive mechanisms such as attention to discursive thought patterns. In terms of Feldman Barrett’s conceptual act model, this is the point at which discrete emotions begin to emerge from a conceptual analysis of the more elemental state of core affect. Thus, here we start to encounter processes like emotion

and thought, which help shape the raw material discussed above to create more specific experiences of happiness. The ontological status of such processes is intriguing. In terms of Wilber's (1997) Integral Framework, they straddle the mind-body divide, bridging the two upper dimensions. The sections above were firmly in the territory of the brain, while the section below on phenomenology is squarely in the realm of subjective experience. But psychological factors are somewhere in between. This is partly because phenomena like emotions have aspects that are amenable to subjective inspection and conscious engagement (so pertain to the mind), but also aspects that are non-conscious and elude awareness (so still pertain to the brain). Thus, in terms of our architectural metaphor, we might construe these psychological processes as the more visible design of the building. Whereas details of the processes above were hidden from view, at this point in the construction of the building we are talking about how it actually looks to the eye (e.g., its decoration, aesthetics, etc.).

In terms of psychological factors that help generate happiness, many play some role, from perception to memory. Two particularly prominent ones to mention are emotions and thought (i.e., discursive cognition). Sometimes these are seen as distinct, and even as oppositional in some way (as captured in discourses of emotion *versus* reason). However, it is increasingly acknowledged that emotions and thought are closely intertwined, each shaping the other (Damasio, 2006). In Feldman Barrett's (2006) conceptual-act theory for example – which our own heuristic model draws upon – the 'ebb and flow of core affect' is filtered through a person's linguistic-conceptual schemas, thereby leading to identification and experience of that state as a specific emotion with a particular meaning. This latter point illustrates the intersection of emotional and discursive aspects of the happiness-creation process. We have already discussed emotions at length in the sections above, so let us turn now to the discursive aspects of this process.

By now, decades of research have shown that thoughts not only have a significant impact upon emotional experience but are functionally *intertwined* with these experiences. It is not merely that thought processes can causally prompt particular emotions; more significantly, thought processes may be embedded in the very emotions themselves. These issues were brought to widespread attention via cognitive theories and therapies of mental disorder pioneered by Beck (1991) in the 1960s. In contrast to the prevailing developmental-archaeological focus of psychoanalytic therapeutics, he took a more direct approach, arguing that disorders could be linked to people's prevailing thought patterns. Depression for instance was associated with a triad of negative thoughts about the self (e.g., 'I'm useless'), the world (e.g., 'no-one likes me'), and the future (e.g., 'nothing is ever going to get better'). It is not so

much that these thought patterns *cause* depression, but rather they *are* it, at least in part; the thoughts are inseparable from the affect. On the basis of these insights, cognitive therapy was created. Furthermore, cognitive therapy gave rise to cognitive behaviour therapy (CBT), which has since become the dominant model of psychotherapy (David et al., 2018). We shall return below to the significance of the behavioural aspect of this process.

Relatedly, just as negative thoughts are interwoven through distressing emotions, so do positive thoughts help form experiences of happiness. This potential was brought to widespread attention by the ‘positive thinking’ movement led by Peale (2012) in the 1950s. This movement has been critiqued for various reasons, including with regard to the power of such thoughts, which are more limited in their ability to affect happiness than its proponents may claim (Ehrenreich, 2010). Conversely, *negative* cognitions and emotions can sometimes be conducive to happiness; for instance, unpleasant states such as anxiety or anger may lead one to take courses of action which are ultimately beneficial to wellbeing (Lomas & Ivtzan, 2016). But generally, there is a close connection between positive thoughts and emotions, which is why interventions aimed at generating such thoughts – for instance gratitude diaries – can be effective generators of happiness (Emmons & McCullough, 2003). Moreover, such thoughts are not only significant insofar as they generate or cause happiness; as per the negative thoughts involved in depression, from one perspective, these positive thoughts *are* happiness. They may be intertwined with, indeed inseparable from, its emotional aspects. Indeed, going further, many conceptualizations of happiness include forms that are mainly, and perhaps even *only*, discursive in nature. We noted in the introduction that most happiness research focuses on subjective wellbeing (Diener et al., 2015), comprising a cognitive (life satisfaction) and an affective component (positive affect). Crucially, while these components are interrelated, they are distinct processes (conceptually, functionally, experientially, etc.). Positive affect is the current valence of one’s emotional experience, whereas life evaluation is a global assessment (i.e., all elements together) of one’s quality of life in general (i.e., over a reasonable span of time, rather than a momentary period). Thus, it is possible for a person to not be currently experiencing positive affect yet still appraise their life positively; relatedly, factors associated with happiness like income have the potential to affect life evaluation but less so with positive affect (Kahneman & Deaton, 2010). Significantly though, we would often still describe people who are not experiencing positive affect but who have high life satisfaction as ‘happy’; but this is primarily cognitive happiness, rather than affective.

The significance of psychological processes vis-à-vis the architecture of happiness is not limited to thought and emotions. We already alluded to another significant process with

reference to CBT, namely, behaviour. In examining the efficacy of CBT – and third-wave therapies like Acceptance and Commitment Therapy (Hayes et al., 2009) – research suggests the behavioural components of the therapy, rather than its cognitive aspect, may be more beneficial in terms of addressing the problem at hand (Hayes et al., 2012). More generally – within the therapeutic context and beyond – a wealth of work suggests behaviour can shape happiness. In terms of kindness, for instance, studies show that cultivating this quality through activities like practising meditation (Fredrickson et al., 2008), and furthermore engaging in actual acts of kindness (Curry et al., 2018), reliably induces happiness in the actor (even if effect sizes are relatively small). Moreover, a shift in perspective may be also required here; just as thoughts may not only generate but actually *constitute* happiness – as noted above – so too might behaviour. Certain actions might best be seen as the physical embodiment and expression of happiness, rather than just being a precipitating cause or a contingent response (Davis et al., 2016). Imagine a sports fan leaping up in joy at their team winning. This action is not merely induced by happiness but is its behavioural expression. Considerations of such embodied responses will be central to our final realm of consideration, phenomenology, in which all of the above processes ‘come together’ to create the actual experience of happiness. First though, our penultimate section discusses the way socio-cultural factors shape these processes, especially the psychological dynamics we have just been exploring.

### **Socio-Cultural Processes**

Before we turn to the actual phenomenology of happiness, we must acknowledge the role of socio-cultural processes in its creation. Thus, here our brief tour turns to the collective realms of Wilber’s Integral Framework – cultures (intersubjectivity) and societies (interobjectivity). There are so many intersecting dynamics here that we can barely scratch the surface. But we can at least highlight the importance of these dimensions, not least because they are often overlooked when thinking about how experiences like happiness are created (accounts of which tend to focus more on individual-level physiological and psychological dynamics). But as we’ll briefly review, culture and society shape the substance of happiness in many ways. In Feldman Barrett’s (2006) theory, discrete emotions emerge from conceptual analysis of the ‘ebb and flow of core affect,’ which is filtered through a person’s linguistic-conceptual schemas. Significantly, such schemas are thoroughly fashioned by people’s socio-cultural context. Indeed, from one perspective, these schemas might be seen as mostly or even *entirely* shaped by this context, inasmuch as one’s language and conceptual framework for understanding the world are largely a product of the culture into which one was socialized, an

insight shared by both psychology and philosophy (Wittgenstein, 1953; Barrett, 2006). In our heuristic interpretation of Feldman Barrett's theory, socio-cultural processes shape the psychological dynamics considered above. But their influence does not stop there, and in one sense such processes affect all the domains. This even applies to genetic processes, given that these are a product of the lineage and context one is born into, and moreover these shape the actual expression of genes through processes of epigenetics. In terms of our architectural metaphor, socio-cultural processes thus influence all the elements above (e.g., how architects are trained, the materials available, building regulations, design trends, etc.).

Thus, culture and society influence the substance of happiness in many interlinked ways. For a start, these influence people's values, which affects how they perceive and understand happiness. For instance, following distinctions articulated by Hofstede (1980) and Triandis (1988), decades of research suggests the West tilts towards individualism, and the East towards collectivism (Taras et al., 2012). That said, one might argue that this East-West polarity is a contemporary incarnation of the Orientalist thinking identified by Said (2014) – a generalizing discourse through which 19<sup>th</sup>-century Western thinkers sought to understand their society by contrasting it with the 'Other' of the Orient in various ways and moreover then used these narratives in invidious ways in attempt to justify imperialism and colonialism. Moreover, the modernization theory of cultural change suggests some universal movement in the direction of individualism (Hamamura, 2012). However, caveats aside, such dynamics affect which types of happiness might be prioritized in different contexts: Western cultures tend to emphasise more individualistic notions of happiness, while Eastern cultures place greater emphasis on more communal forms, where the flourishing of the group takes precedence over that of the individual) (Joshi, 2014). The point is not that the factors that influence happiness may vary according to cultural context – though that is also true – such as people in collectivist cultures being more affected by group-level processes (e.g., belonging and fitting in) (Lu et al., 2001). Rather, we are talking about the nature of happiness itself: what kind of feelings are interpreted and experienced as happiness. In that respect, it has been suggested that Eastern cultures are more likely to view and understand it in terms of processes of intersubjective harmony (in contrast to Western cultures, which tend to construe it in more individualised ways as a personal subjective experience) (Uchida & Ogihara, 2012). In that sense, happiness may be more an *interdependent* phenomenon in the East (rather than an independent one), as per recent work on the Interdependent Happiness Scale (Hitokoto & Uchida, 2015). Thus, the very substance of what is considered happiness

may differ between these cultures – tending towards more communal forms in the East and more individualized forms in the West.

We can further appreciate how these socio-cultural forces may shape the substance of happiness by considering another experiential pattern in which there are thought to be East-West differences. As per the circumplex model of affect discussed above, positive emotions can be differentiated into high versus low arousal forms (e.g., joy and calmness respectively). In that regard, an emerging body of research, led by Tsai (2007), suggests Western cultures may prioritize high arousal forms, while Eastern cultures place greater value on low arousal forms. Tsai described such preferences as ‘ideal affect’ – i.e., ‘the affective states that people strive for or ideally want to feel’ (p. 243) – and has observed these across a series of studies (see Tsai, 2007, for details). Similar patterns have also been observed by others (e.g., Lee et al., 2013; Leu et al., 2011; Lu et al., 2001). One suggestion is that high arousal states are liable to be interpreted in the East as self-aggrandizing and therefore disruptive of social harmony, whereas low arousal states are more conducive to such harmony (Leu et al., 2011). That said, we must be wary of making broad East-West generalizations, especially as low arousal forms may potentially be more universally valued than is appreciated. For instance, the 2020 Gallup World Poll asked whether people prefer a calm or an exciting life, with the former preferred by the majority in all countries except two (Lomas et al., 2022). Similarly, in a survey of lay perceptions of happiness by Delle Fave et al. (2016) across 12 countries (11 Western), the most prominent psychological definition was a sense of ‘inner harmony,’ featuring three components: inner peace; contentment; and balance. Nevertheless, the scholarly consensus is around preference for low arousal forms in Eastern cultures. Given that, one can imagine how these dynamics might affect experiences of happiness. Consider two people in a relatively similar state of high positive arousal ‘core affect’ (in Feldman Barrett’s terminology). Now suppose that the *ideal* affect for person (a) is low arousal whereas for person (b) it is high arousal (perhaps because they belong to an Eastern and Western culture respectively, though they do not necessarily need to be thus affiliated). As this basic state of core affect becomes processed and elaborated upon through their respective linguistic-conceptual schemas – including interweaving of values and judgements – one could see how the resulting emotional experience might veer off in different ways. Person (a) might appraise a high arousal state as socially undesirable, with their emotional experience thus having a tint of guilt or shame perhaps and seek to dampen it down and not share it; person (b) conversely may be inclined to celebrate the feeling, even taking some pride in it, and relatedly may aim to amplify and broadcast it to others.



The impact of culture is not limited to what people deem important. Its tendrils reach deep into the mind, shaping processes as fundamental as our sense of self and time. A key factor in all this is *language*. We already saw how this is integral to the psychological filtering outlined above. Crucially, language is inextricable from culture. More relevantly, cultures vary in the languages they create – influenced by factors ranging from history and tradition to climate and geography – which in turn shape people’s minds in those cultures. This recognition is known as the linguistic relativity hypothesis (LRH), or sometimes the Sapir-Whorf hypothesis after the anthropologists most closely associated with its emergence. As Whorf (1940) summarised this idea: ‘We dissect nature along lines laid out by our native languages... The world is presented as a kaleidoscopic flux of impressions which has to be organized... largely by the linguistic systems in our minds’ (pp. 213-214). The LRH has generated much debate over the decades, with swathes of research teasing apart its nuances. But its central message is largely accepted, namely that language affects the way people experience the world (with debates focusing on how and to what *extent* it does).

These dynamics affect all aspects of experience, including happiness. This point is illustrated by Lomas’s (2020) evolving lexicography of ‘untranslatable’ words – lexemes in other languages which lack exact equivalent in our own – relating to happiness. Such words are significant for many reasons, not least in highlighting aspects of experience which our own culture has overlooked, but which another has identified and labelled (Lomas, 2018). The project has over 1,800 such words so far, all highlighting nuances and complexities in relation to happiness that are missed or downplayed in English. Such words reveal significant variation in how people in different cultures not only think about but *experience* happiness. After all, the LRH literature shows that language can even disclose or create new realms of experience that might not be perceived or accessed by people unfamiliar with that particular language. For instance, some Eastern philosophies, and related branches of practice – from medicine to martial arts – have developed detailed ideas and language relating to subtle forms of ‘energy’ in and around the body, from the Chinese notion of *qi* to the Sanskrit concept of *chakras* (Albanese, 1999). Whatever these energies’ actual ontological nature, they may not necessarily be universally experienced or perceived. People in the cultures that produced these terms are more likely to dwell on – look for, focus on, articulate, and remember – qualia that appear to reflect these energy currents. By contrast, people outside these cultures, even if experiencing similar visceral sensations, are more likely to ignore, downplay, and forget such phenomena. In such ways can language – and cultural contexts in general – shape our very experience of happiness (and life generally).

As a final point, this section has mostly focused on intersubjective cultural dynamics, but these in turn are influenced by interobjective societal factors. For instance, Inglehart (2018) makes a persuasive case that a culture's values are shaped in large part by its degree of existential security. The greater the sense of threat and peril faced by a people – from poverty and disease to invasion and geopolitical instability – the more readily they appear to embrace conservative traditions, or strong in-group solidarity, or even xenophobia and authoritarian rule. By contrast, the greater their security, the more people tilt towards more liberal, open, and progressive ideals. This is just one theory among many regarding cultural evolution and change, certainly with its exceptions, but all tend to have some comparable account of how culture is shaped in part by societal factors such as politics and economics. Indeed, the point about Wilber's Integral Framework is that all dimensions are interconnected and reciprocally influence each other. This applies to everything in life, not least happiness, which – as illustrated above – is a co-creation of mind, body, culture, and society. Now we can finally explore the 'result' of this creation, the phenomenological experience itself.

### **Phenomenological Processes**

The sections above have shown happiness to be a complex creation of numerous processes, weaving together multiple ontological dimensions. But what of the creation itself? To this we turn our attention in this final main section, in which we move into the realm of the subjective mind – per Wilber's framework – to consider the actual phenomenology of happiness. That said, we have touched upon aspects phenomenology above, particularly when considering psychological and sociological dynamics. Psychological processes, for example, straddle the mind-body divide: some aspects constitute non-conscious brain processes; others fall into the realm of subjective qualia. But now we move fully into the latter terrain, into the mysteries of phenomenology. 'Mysteries' is apt: although we now have a decent understanding of the neurophysiological dynamics of the brain, we still have almost no definitive knowledge about *how* conscious experience arises in relation to such dynamics, only tentative speculations. Nevertheless, arise it certainly does, and even apart from questions of how it emerges out of brain activity, one can still study it on its own terms. The importance of doing so is nicely emphasised by Jackson (1982), who was pivotal in establishing the concept of qualia: 'Tell me everything physical there is to tell about what is going on in a living brain . . . you won't have told me about the hurtfulness of pains, the itchiness of itches, pangs of jealousy, or about the characteristic experience of tasting a lemon, smelling a rose, hearing a loud noise or seeing the sky' (p. 127). From that perspective, we can ask how happiness feels in the broadest sense – not only how we might conceptualise it as an emotion, but what does it

really *feel* like, in all its embodied fullness (Volynets et al., 2019). With our architectural metaphor, finally at this point we are considering what it is like to actually *be* in the building.

Doing so brings us into the realm of phenomenology, a school of philosophy and psychology – initiated in the late 19<sup>th</sup> century by Husserl (1901) and others – involving systematically enquiring into the nature of subjectivity. To ask about the phenomenology of any given human experience like happiness is in part merely to ask what it ‘feels like’ to undergo an experience. This sort of phenomenology is an inquiry whose limits were famously marked out by Nagel (1974) in his influential essay “What Is It Like to Be a Bat?” There Nagel argued that no reductive explanation can explain the relationship of mind to body because for every living organism there is “something that it is like to *be* that organism—something it is like *for* the organism” (p.436). This feeling of what it is like to be a living thing of a given sort is the irreducible remainder in any allegedly exhaustive physicalist theory of experience. Certain kinds of scientific reductionism seem plausible on Nagel’s account. So, for instance, “in discovering sound to be, in reality, a wave phenomenon in air or other media, we leave behind one viewpoint to take up another, and the auditory, human or animal viewpoint that we leave behind remains unreduced” (p.445). Human experience however is not comparable to the physics of sound and its relationship to physical processes. “But while we are right to leave this point of view aside in seeking a fuller understanding of the external world, we cannot ignore it permanently, since it is the essence of the internal world, and not merely a point of view on it” (p. 445). In the case of coming to an explanation of conscious experience, we are left with a constitutive problem that is unique to the conscious experience of what it is like to be a human being, because no putatively ‘objective’ explanation can exhaust the feeling of what it is like to be a human, and that is precisely what happiness concerns: a human phenomenon given to human consciousness. “The problem is unique. If mental processes are indeed physical processes, then there is something it is like, intrinsically, to undergo certain physical processes. What it is for such a thing to be the case remains a mystery” (pp. 445-446).

Phenomenology of the casual sort described by Nagel does indeed leave a nimbus of mystery surrounding conscious experience. It is precisely this nimbus however that fields employing the label ‘phenomenology’ are meant to disperse. In that respect, it is worth differentiating between phenomenology in a more philosophical sense from other fields that embrace aspects of phenomenology, such as psychology. With the former, philosophical forms of phenomenology encompasses the casual sense of introspective phenomenology with its attendant limits in a broader and philosophically rigorous analysis of consciousness and

the experiences given to it. Phenomenology as a method is not based in first-person reporting but in rigorous conceptual analysis of the appearing of appearances, how phenomena come to conscious experience (Heidegger 1962; Henry, 1973). In order to broaden and deepen the philosophical examination of experience it is necessary to study not just the first-personal aspect of individual experiences but the intentional structures that underlie the variety of experiences available to human consciousness. Such a philosophical inquiry also requires rethinking the relationship of what Nagel contrasts as the 'internal' and 'external' worlds. It is axiomatic for phenomenology that consciousness is not in the memorable words of Husserl "like an empty box" that comes to contain impressions or ideas of experiences that lie outside the box (Husserl, 1990, p. 56). By the same token, what we are conscious of is not outside consciousness and then comes to be 'inside' it once it is experienced by consciousness. "The object is not a thing which is put into cognition as into a sack" (Husserl, 1990, p.59). We should not conceive of consciousness as a sort of 'internal' container for 'external' experience but rather as itself already and always consciousness *of* some object (Sokolowski 2000).

For philosophical forms of phenomenology, there is generally no problem of bridging the internal world of subjectivity and the external world of objectivity (as in Descartes and his inheritors both rationalist and empiricist), because consciousness just is this bridge (Sokolowski, 2000). This core doctrine is what is meant by calling consciousness and its structures 'intentional.' Phenomenologists do not have in mind by this term the ordinary-language use of 'intentional' to mean 'planned' or 'purposeful'; rather they are thinking of the Latin term literally meaning 'to stretch out.' In Husserl's words, "Cognitive mental processes (and this belongs to their essence) have an *intentio*, they refer to something, they are related in this or that way to an object" (Husserl 1990, p. 43). Intentionality is the defining activity of consciousness, which always intends or is directed toward some phenomenon of which it is always intentionally conscious; it is the bridge that is 'stretched out' between what is naively taken to be a mind and its object. The objects of consciousness too are many and change modalities of appearance based on the inflection of intentional consciousness appropriate to its object: be that a perceptible thing in the world; or a concept; or a memory; or an imagined, fictional, or fantastical situation or event; or an emotion, mood, or complex felt state of affairs like happiness (Sokolowski, 2000, pp.12-14). From this stance, happiness could be construed as an 'object' for consciousness, which a person's consciousness stretches towards, thereby granting them the experience *of* happiness. One might note here though that philosophical phenomenology has historically tended to overlook happiness as a topic worthy

of study – mirroring similar dynamics in psychology – whereby, as Koski (2015) put it, “a lucid, sober, and disenchanting rationality consigned the phenomenon of happiness to the margins of what appears, ignoring it or making it a mere appearance, suspect of excessive subjectivism or delusions” (p.225). However, Koski sheds some light on the experience by showing how the practice of the phenomenological attitude, epoché, receives the “givenness of a happiness” and, moreover, a “happiness in excess of the ego's being-certain of its happiness.” He does so through the prism of the poet John Keats, who he suggests evokes the idea of epoché when he describes the “poetic character” – characterised by dispositions such as idleness, lassitude, and boredom – which then become, paradoxically, the attitude in which Keats enjoys a “happiness in excess of that constituted by the self-possessed I.”

One can then shed further light on these potential dynamics by considering the way phenomenology has also been embraced – albeit haltingly and partially – by psychology. Phenomenology was indeed a dominant school of psychology in its early decades, but fell out of favour in light of the apparent power and success of paradigms like behaviourism (Alksnis & Reynolds, 2021). Moreover, phenomenology was regarded in many quarters with some suspicion, grounded upon the critique that people are unreliable observers and reporters of their inner states, which puts the validity of their data into some question. However, it did continue as a niche concern within qualitative research, giving rise to analytic techniques like Interpretative Phenomenological Analysis (Smith, 2011). Moreover, over recent decades, it has also been tentatively embraced by *quantitative* researchers; this has been driven by the burgeoning recognition that, as flawed as people’s self-accounts of their subjectivity may be, there is no other way to access it. Thus, for instance, we find Chalmers (2013) influentially arguing that ‘the task of the science of consciousness ... is to systematically integrate two key classes of data into a scientific framework: third person data, or data about brain experiences, and first person data, or data about subjective experiences’ (p. 25). In that respect, various paradigms have emerged integrating qualitative with quantitative data, including critical phenomenology (Velmans, 2002), hetero-phenomenology (Dennett, 2003), and neurophenomenology (Cahn & Polich, 2006).

These methods have further been used to explore the inner terrain of happiness (augmenting the more strictly philosophical endeavours noted above). Although the research base is not particularly extensive, we find an accumulating body of evidence looking at happiness-related experiences in various contexts. Interpretative Phenomenological Analysis, for instance, has been employed to explore such experiences in relation to situations as diverse as childbirth (Larkin, 2018), gardening (Clatworthy et al., 2017), religious conversion

(Iqbal et al., 2019), and awe (Bonner & Friedman, 2011). For instance, the latter reported that experiences of awe are characterized by ten themes: profoundness; connectedness; the numinous; fear; vastness; existential awareness; openness and acceptance; ineffable wonder; presence; and heightened perceptions. Several of these are reflected in a representative quote from one participant: “events that evoke awe are utterly absorbing, physically riveting, and profoundly, emotionally arousing; they are in essence, soul stirring both in the moment and in their wake” (p.277). Moreover, neurophenomenology has sought to combine such methods with analyses of neurophysiology, thus providing innovative integrative accounts of how the different realms considered in this paper might intersect. For instance, Dor-Ziderman et al. (2013) studied advanced Buddhist meditators in the act of endeavouring to reach a ‘selfless’ mode of awareness considered very liberating and life-enhancing. By combining magnetoencephalogram recordings with first-person descriptions, the researchers were able to identify specific neurophysiological dynamics associated with this state (such as attenuation of beta-band activity in the right inferior parietal lobule).

Qualitative interviews are not the only source of phenomenological information. For example, another productive line of enquiry has been to explore language itself for clues about subjectivity. Arguably the foremost theorists in this arena are Lakoff and Johnson (2008), whose groundbreaking 1980 book *Metaphors We Live By* has nearly 77,000 citations as of March 2022. Their work – and scholarship inspired by it – highlights the intimate way thought and language are intertwined with our embodied experience. As Lakoff (2008) writes, our conceptual systems ‘grow out of bodily experience... [being] directly grounded in perception, body movement, and experience of a physical and social character’ (p. xiv). In their theory, in exploring the world as infants, our embodied experience generates three main types of schema: (a) spatial orientations (e.g., up-down); (b) ontological concepts (e.g., container); and (c) structured experiences (e.g., moving). These then provide the basis for a rich, complex system of metaphorical concepts. Such concepts also take three main forms, each drawing primarily on one of the main schemas. Orientational metaphors allow people to think abstractly about phenomena using spatial dynamics (e.g., ‘rising levels of happiness’). Ontological metaphors confer entity or substance status onto phenomena, such as describing one’s mind as a container (‘full of thoughts’). Finally, structural metaphors allow relatively abstract activities (e.g., understanding) to be configured as more concrete ones (e.g., ‘I see what you mean’).

Studying metaphors relating to happiness can give insight into its phenomenological dynamics. Analysing academic discourse on the topic, Lomas (2019) found above all a sense

of *expansiveness* associated with it. Lakoff and Johnson themselves highlight the use of vertical orientational metaphors in this area, with ‘up’ and ‘down’ associated with positive and negative affect respectively (e.g., feeling ‘on a high’ versus ‘downhearted’). But the picture is a little more complicated, as people can also speak of ‘deep’ happiness. As such, Lomas’ analysis suggested happiness is not only about feeling elevated in phenomenological space – though it certainly can include that – but rather the space *itself* being experienced as larger. Fredrickson (2004) makes a similar point with her influential ‘broaden and build’ theory of positive emotions. When people are feeling low, their horizons tend to recede and their world shrinks, closing in upon itself. But when they feel good, the reverse occurs: they look outward and upwards, connecting with more of life. There may also be nuances in how this space is structured, depending on the *type* of happiness: hedonic forms may involve elevation, whereas eudaimonia might be more about being grounded in depth. But generally, there is an overall expansiveness to happiness. Beyond spatial dynamics, further metaphors reveal other dimensions to happiness. For instance, Kövecses (1998) highlights ontological metaphors, such as references to behaviour of liquid in a container (e.g., ‘brimming,’ ‘bubbling up’). Relatedly, structural metaphors include people depicting themselves as moving quickly between locations, often in ways that intersect with orientational metaphors (e.g., ‘I was uplifted’) (Stefanowitsch, 2004). However, these metaphors can also apply to more negative emotions (such as ‘brimming with anger’ or being ‘quick tempered’), so do not characterise happiness in the more exclusive way that expansiveness tends to.

Nevertheless, they still reveal interesting dynamics about its phenomenology, though as ever, more work will be needed to fully delve into the various precious and sought-after forms of subjectivity which we tend to assemble under the label happiness. In doing so, it will be valuable for the various phenomenological approaches discussed above – more classically philosophical compared to more psychologically oriented – to engage with and learn from each other. A philosophically rigorous practice of phenomenology, for example, will of course shed light on the first-person quality of human experiences, but that is because it is not based directly in them but rather upon the structures that make them possible. In the account of Drummond (2008), an important contemporary classical phenomenologist, any given complex situation (in his example a moral interaction) will feature not just a human being’s conscious intentional awareness of his or her own feelings but will require for full phenomenological explanation “good descriptions of these intentional structures,” by which he means “the first-, second-, or third-personal perspective involved in the experience; and the manner in which the intentional direction is achieved” (p.48). Phenomenological study of

a phenomenon like happiness will then call not only for reflection on the intentional contents of the mood or feeling called “happiness” but all the intentional structures that make happiness possible, including first-person perspectival intentional contents, second-person interactions with other conscious subjects, and third-person awareness of objects and settings that attend the life of consciousness. The manner of intentional direction will include the many modes in which intentional contents present themselves to consciousness: as morally valenced, as remembered, as planned for the future, as judged adequate or wanting, and so on. “Good descriptions of these intentional structures will point toward the *kind* of phenomenal content in these different *types* of experience” (Drummond, 2008, p.48).

Drummond’s point is particular to moral situations, but it holds for phenomenology generally, and furthermore it pertains to the question of happiness, which arguably falls under the broad purview of moral phenomenology as he develops it beyond the limits of Nagel-style reflection on first-person experience of what it is like to be a certain kind of being. “Moral phenomenology, therefore, despite the multiplicity of types of moral experience, has a single, theoretical aim—the identification of the (varied) intentional structures belonging to the manifold types of moral experience” (Drummond, 2008, p.48). Husserl said much the same thing of phenomenology in general and the “fundamental structure of cognition”: “a great many forms and types of it are to be distinguished. And not only that; their essential relations to one another need to be investigated” (Husserl, 1990, p.45). Lest we forget however the relationship of consciousness to the facts of human beings’ embodiment and the biologically embedded substructures of consciousness described so far in this article, let us remember that while phenomenology is an inherently nonreductive philosophical method, it also recognizes that consciousness is embodied, that the mind is interrelated with the body. It is characteristic of phenomenology to avoid the reduction of mind to body, but arguably the effort of phenomenologists to grapple directly with the body thematically was a comparatively late development (Merleau-Ponty, 1962). Jonas (2001) reminds us that “the organic even in its lowest forms prefigures mind, and that mind even on its highest reaches remains part of the organic” (p.1). For the purposes of the current study, Jonas would see the highest phenomenological experiences, like that of consciousness’s own happiness, on the extreme end of a continuum that stretches from the lowest forms of organic life, as our metaphor of architecture would also suggest. That both halves of the contention Jonas puts forward are valid is a caution against both reductionism and a tendency to divorce the “mental” from the “physical” entirely. In that sense, we might say that the house of happiness is comprised of both its structural elements and its finished interiors, being in summary a



conscious experience of the physiological and psychological processes and states described above and interpreted within a given social and cultural context.

### **Conclusion**

This paper has provided an account of the architecture of happiness, focusing on the myriad processes upon which it is 'built.' This is a useful addition to the literature in this area, which more commonly focuses on factors that influence it (such as social and economic phenomena and indicators), rather than the dynamics that create it per se. To that end, we considered six substantive realms: genetic, biochemical, neural network, psychological, phenomenological, and socio-cultural. This paper is unusual in its attempt to bring these different realms together under one narrative umbrella. Although each has a substantial literature, these have tended to remain largely siloed and disconnected. However, full understanding of the dynamics of happiness will only be possible by accounts which include all these dimensions. Moreover, that does not only mean situating them in proximity to one another, but actually constructing theories that integrate these different pieces. Offering a fully substantiated theoretical model for how these interrelate to create happiness is beyond the scope of this paper and will require a substantive research program going forward. Nevertheless, we sought to offer a plausible heuristic – drawing on the work of Feldman Barrett (2006) – which may provide a basis and impetus for just such a program.

Before summarizing this model, we acknowledge that it will require corroboration from future research and indeed may not necessarily prove to be accurate. One difficulty in providing this kind of integrative account is a certain ambiguity in the fundamental nature of the six realms considered here and in their functional relationship to one another. One might argue that they constitute different ontological 'levels' of a psychological experience, each of which can only be analysed on its own terms. In that respect, it is hard to create an account combining them, as each approaches the phenomenon in question with its own language, methods, theories, values, and so on. Consider by analogy how one might analyse a piece of music. It could be approached from numerous perspectives: musical (e.g., its melodic properties); acoustic (e.g., the soundwaves generated); physical (e.g., subatomic dynamics of the soundwaves); neurobiological (e.g., how soundwaves are processed by the ear and brain); psychological (e.g., how the piece is experienced and appraised); historical (e.g., how it relates to prior musical traditions); sociological (e.g., how it was informed by the society in which it was composed); and so on. Each is a useful perspective, and all together offer a comprehensive account of the piece. However, they do not exactly fit together in meaningful ways, and in some senses are incommensurate levels of analysis. The physical account, for

instance, has very little to offer the historical account, and vice versa. It is possible that the various processes associated with happiness outlined here are akin to these different accounts. Each may offer a different way of looking at happiness, and yet not functionally interrelate to some of the others in any clear way. Even were that the case though, there would still be value in bringing them together, since only then can we obtain a complete view of phenomenon in question. This process constitutes a type of ‘triangulation,’ where – by analogy with technologies like radar – combining multiple viewpoints allows a phenomenon to be identified and understood with greater precision (Thurmond, 2001). Even so, such triangulation does not necessarily mean one can construct an interconnected theory in which these different processes or perspectives are functionally integrated.

However, it may be that our proposed interconnected heuristic *is* viable and will be corroborated by future work. To begin with, we suggest genetic processes create and shape the very terrain – i.e., the material body – on which the other processes play out. In that context, neurophysiological processes constitute the raw material of happiness, providing the substance of ‘core affect’ (in Feldman Barrett’s terminology). These processes firstly include neurochemical activity and then – at a higher emergent level – neural network dynamics. Thus, biochemical and neural network processes constitute the raw material of happiness, its biological substrate which – as per Wilber’s Integral Framework – exist in an ontologically objective way. Such processes then give rise to phenomenological experiences of happiness – a basic state of ‘core affect’ – which exist in an ontologically subjective way. That is, as per the neural correlates of the consciousness paradigm (Fell, 2004), a given biochemical event (e.g., reward-contingent dopamine release) is associated with a particular subjective state (e.g., pleasure). It is not that dopamine *causes* the pleasure; as discussed above, the actual cause could be anything from a hug from a loved one to winning a race. It is more that the dopamine *gives rise to* pleasure. Recall the view that mind and body could be regarded as two sides of the same coin (Nagel, 2012): mind is the body/brain understood as experienced from the ‘inside,’ and the body/brain gives rise to the mind, but observed from the ‘outside.’ Thus, together, dopamine and pleasure represent two sides of the same ‘happiness coin’ (or, at least, one form of happiness): dopamine is happiness as manifested objectively in the brain, and pleasure is happiness as manifested subjectively in the mind.

One will note, of course, that the paragraph above does not include psychological or socio-cultural processes. These are generally an important aspect of the creation of happiness, but the degree to which they are an intrinsic part may vary across contexts. In certain situations, it seems possible for a relatively direct, unmediated, and immediate connection

between biochemical activity and subjective experience. Ingesting particularly strong psychoactive substances, for instance, may result in phenomenological effects in which psychological or sociocultural processes play relatively little meaningful role. However, for the most part, these latter processes *do* have a significant role in shaping people's mental experiences, as articulated in Feldman Barrett's model. To begin with, psychological processes influence how people interpret and moreover experience states of core affect. In that respect, these processes have an ambiguous dual status, straddling the mind-body (i.e., subjective-objective) distinction. On the one hand, they have aspects that are non-conscious and so are part of the architecture of the brain, such as implicit biases (FitzGerald & Hurst, 2017). On the other hand, psychological processes also have elements amenable to subjective inspection and conscious engagement and so pertain to the mind. These include discursive thoughts, for instance, which can be inextricably woven throughout the subjective emotional experience. For this reason, our heuristic model suggests that the raw material for happiness – i.e., neurophysiological processes – is 'filtered' through psychological processes. But the latter processes are not simply formed in isolation within the mind of the individual but are shaped by the socio-cultural context in which the person is situated. These range from the earliest forms of socialization and nurturing in childhood to the ongoing impact throughout adulthood of relational and systemic factors.

Again though, to reiterate, this model will require corroboration from future research, and may well need further revision. For instance, although we have suggested the domains here are meaningfully and functionally connected, we have mainly shied away from offering specific details about the potential causal and temporal dynamics, since – to our knowledge – such details have generally not yet been ascertained. As per Feldman Barrett's work, for example, we refer to the 'ebb and flow of core affect' being filtered through one's linguistic-conceptual schemas. In broad terms, that strikes us as correct. But more work will be needed to tease out the nuances of that process, such as the precise flow of events: Does a person first experience certain sensations and physiological processes and *then* its subsequent emotional interpretation following filtering (and if so, what kind of time-lag is involved), or is their intertwining synchronous and thus affect is always-already filtered when one experiences it? These are the kinds of questions future research can endeavour to answer. There have been at least *some* studies seeking to explore such questions. The neurophenomenological paradigm includes research in which advanced meditators attempt to observe the precise micro-dynamics of their subjective experience (Lutz & Thompson, 2003). In future we can aim to conduct more of these kinds of studies, ideally into various happiness-related experiences and

with a range of participants (not only meditators). Such work will help corroborate, challenge, or otherwise refine the model presented here. So, even while awaiting this kind of support, the account offered here at least offers a solid foundation for further research and theorising on this important topic.

### References

- Albanese, C. L. (1999). The subtle energies of spirit: Explorations in metaphysical and new age spirituality. *Journal of the American Academy of Religion*, 67(2), 305–325.
- Alksnis, N., & Reynolds, J. (2021). Revaluing the behaviorist ghost in enactivism and embodied cognition. *Synthese*, 198(6), 5785–5807. <https://doi.org/10.1007/s11229-019-02432-1>
- Amihai, I., & Kozhevnikov, M. (2014). Arousal vs. Relaxation: A Comparison of the Neurophysiological and Cognitive Correlates of Vajrayana and Theravada Meditative Practices. *PLOS ONE*, 9(7), e102990. Retrieved from <https://doi.org/10.1371/journal.pone.0102990>
- Arias-Carrión, O., Stamelou, M., Murillo-Rodríguez, E., Menéndez-González, M., & Pöppel, E. (2010). Dopaminergic reward system: a short integrative review. *International Archives of Medicine*, 3, 24. <https://doi.org/10.1186/1755-7682-3-24>
- Bakan, D. (1966). *The duality of human existence: Isolation and communion in Western man*. Beacon Press (MA).
- Barraza, J. A., Grewal, N. S., Ropacki, S., Perez, P., Gonzalez, A., & Zak, P. J. (2013). Effects of a 10-day oxytocin trial in older adults on health and well-being. *Experimental and Clinical Psychopharmacology*, 21(2), 85–92. <https://doi.org/10.1037/a0031581>
- Barrett, L. F. (2006). Are emotions natural kinds? *Perspectives on Psychological Science*, 1(1), 28–58. <https://doi.org/10.1111/j.1745-6916.2006.00003.x>
- Bartels, M. (2015). Genetics of Wellbeing and Its Components Satisfaction with Life, Happiness, and Quality of Life: A Review and Meta-analysis of Heritability Studies. *Behavior Genetics*, 45(2), 137–156. <https://doi.org/10.1007/s10519-015-9713-y>
- Baselmans, B. M. L., Jansen, R., Ip, H. F., van Dongen, J., Abdellaoui, A., van de Weijer, M. P., ... Bartels, M. (2019). Multivariate genome-wide analyses of the well-being spectrum. *Nature Genetics*, 1. <https://doi.org/10.1038/s41588-018-0320-8>
- Beck, A. T. (1991). Cognitive therapy: A 30-year retrospective. *American Psychologist*, 46(4), 368.
- Belsky, J., & Pluess, M. (2009). Beyond diathesis stress: differential susceptibility to environmental influences. *Psychological Bulletin*, 135(6), 885–908.

<https://doi.org/10.1037/a0017376>

- Boecker, H., Sprenger, T., Spilker, M. E., Henriksen, G., Koppenhoefer, M., Wagner, K. J., ... Tolle, T. R. (2008). The runner's high: opioidergic mechanisms in the human brain. *Cerebral Cortex*, *18*(11), 2523–2531. <https://doi.org/10.1093/cercor/bhn013>
- Bonner, E. T., & Friedman, H. L. (2011). A conceptual clarification of the experience of awe: An interpretative phenomenological analysis. *The Humanistic Psychologist*, *39*(3), 222–235. <https://doi.org/10.1080/08873267.2011.593372>
- Border, R., Johnson, E. C., Evans, L. M., Smolen, A., Berley, N., Sullivan, P. F., & Keller, M. C. (2019). No support for historical candidate gene or candidate gene-by-interaction hypotheses for major depression across multiple large samples. *American Journal of Psychiatry*, *176*(5), 376–387. <https://doi.org/10.1176/appi.ajp.2018.18070881>
- Breuer, J., & Freud, S. (1955). Studies on hysteria. In J. Strachey (Ed.), *The standard edition of the complete psychological works of Sigmund Freud (Vol. 2)* (pp. 1–307). London: Hogarth Press.
- Brickman, P., Coates, D., & Janoff-Bulman, R. (1978). Lottery winners and accident victims: Is happiness relative? *Journal of Personality and Social Psychology*, *36*(8), 917–927. <https://doi.org/10.1037/0022-3514.36.8.917>
- Bruehl, S., Chung, O. Y., Burns, J. W., & Diedrich, L. (2007). Trait anger expressiveness and pain-induced beta-endorphin release: support for the opioid dysfunction hypothesis. *Pain*, *130*(3), 208–215. <https://doi.org/10.1016/j.pain.2006.11.013>
- Cahn, B. R., & Polich, J. (2006). Meditation states and traits: EEG, ERP, and neuroimaging studies. *Psychological Bulletin*, *132*(2), 180–211. <https://doi.org/10.1037/0033-2909.132.2.180>
- Castanho, T. C., Moreira, P. S., Portugal-Nunes, C., Novais, A., Costa, P. S., Palha, J. A., ... Santos, N. C. (2014). The role of sex and sex-related hormones in cognition, mood and well-being in older men and women. *Biological Psychology*, *103*, 158–166. <https://doi.org/https://doi.org/10.1016/j.biopsycho.2014.08.015>
- Chalmers, D. J. (1996). *The conscious mind: In search of a fundamental theory*. Oxford university press.
- Chalmers, D. J. (2013). How can we construct a science of consciousness? *Annals of the New York Academy of Sciences*, *1303*(1), 25–35. <https://doi.org/https://doi.org/10.1111/nyas.12166>
- Clasen, M., Andersen, M., & Schjoedt, U. (2019). Adrenaline junkies and white-knucklers: A quantitative study of fear management in haunted house visitors. *Poetics*, *73*, 61–71.

- Clatworthy, J., Hinds, J., & Camic, P. M. (2017). Exploring the relationship between suburban allotment gardening and well-being: An interpretative phenomenological analysis. *Ecopsychology*, *9*(3), 121–129. <https://doi.org/10.1089/eco.2016.0048>
- Condit, C. M. (1999). How the public understands genetics: non-deterministic and non-discriminatory interpretations of the ‘‘blueprint’’ metaphor. *Public Understanding of Science*, *8*(3), 169. <https://doi.org/10.1088/0963-6625/8/3/302>
- Corapci, F., Friedlmeier, W., Benga, O., Strauss, C., Pitica, I., & Susa, G. (2018). Cultural socialization of toddlers in emotionally charged situations. *Social Development*, *27*(2), 262–278. <https://doi.org/10.1111/sode.12272>
- Cristino, L., Becker, T., & Di Marzo, V. (2014). Endocannabinoids and energy homeostasis: An update. *BioFactors*, *40*(4), 389–397. <https://doi.org/10.1002/biof.1168>
- Culverhouse, R. C., Saccone, N. L., Horton, A. C., Ma, Y., Anstey, K. J., Banaschewski, T., ... Bierut, L. J. (2018). Collaborative meta-analysis finds no evidence of a strong interaction between stress and 5-HTTLPR genotype contributing to the development of depression. *Molecular Psychiatry*, *23*(1), 133–142. <https://doi.org/10.1038/mp.2017.44>
- Curry, O. S., Rowland, L. A., Van Lissa, C. J., Zlotowitz, S., McAlaney, J., & Whitehouse, H. (2018). Happy to help? A systematic review and meta-analysis of the effects of performing acts of kindness on the well-being of the actor. *Journal of Experimental Social Psychology*, *76*, 320–329.
- Damasio, A. R. (2006). *Descartes’ error*. Random House.
- David, D., Cristea, I., & Hofmann, S. G. (2018). Why cognitive behavioral therapy is the current gold standard of psychotherapy. *Frontiers in Psychiatry*, *9*, 4. <https://doi.org/10.3389/fpsy.2018.00004>
- Davidson, R. J. (1992). Anterior cerebral asymmetry and the nature of emotion. *Brain and Cognition*, *20*(1), 125–151. [https://doi.org/https://doi.org/10.1016/0278-2626\(92\)90065-T](https://doi.org/https://doi.org/10.1016/0278-2626(92)90065-T)
- Davidson, R. J. (2003). Affective neuroscience and psychophysiology: Toward a synthesis. *Psychophysiology*, *40*(5), 655–665. <https://doi.org/10.1111/1469-8986.00067>
- Davidson, T., Braudt, D. B., Keers, R., Assary, E., Harris, K. M., & Boardman, J. D. (2021). Polygenic Moderation of the Stress-Depression Relationship with a Nationally Representative Sample of Adults. *Scientific Reports*, *20332*, 1–11. <https://doi.org/10.1038/s41598-021-98684-4>
- Davis, D. L., Maurstad, A., & Dean, S. (2016). ‘I’d rather wear out than rust out’: autobiologies of ageing equestriennes. *Ageing & Society*, *36*(2), 333–355.

<https://doi.org/10.1017/S0144686X14001172>

De Chavez, A., Backett-Milburn, K., Parry, O., & Platt, S. (2005, March). Understanding and researching wellbeing: Its usage in different disciplines and potential for health research and health promotion. *Health Education Journal*, Vol. 64, pp. 70–87.

<https://doi.org/10.1177/001789690506400108>

de Villiers, B., Lionetti, F., & Pluess, M. (2018). Vantage sensitivity: a framework for individual differences in response to psychological intervention. *Social Psychiatry and Psychiatric Epidemiology*, 53(6), 545–554. <https://doi.org/10.1007/s00127-017-1471-0>

de Vriese, L. P., van de Weijer, M. P., & Bartels, M. (n.d.). *The biology of well-being: A systematic review on the association between well-being and the brain, neurotransmitters, hormones, the immune system, and microbiome.*

Delle Fave, A., Brdar, I., Wissing, M. P., Araujo, U., Castro Solano, A., Freire, T., ... Soosai-Nathan, L. (2016). Lay Definitions of Happiness across Nations: The Primacy of Inner Harmony and Relational Connectedness. *Frontiers in Psychology*, 7.

<https://doi.org/10.3389/fpsyg.2016.00030>

Dennett, D. (2003). Who's on first? Heterophenomenology explained. *Journal of Consciousness Studies*, 10(9–10), 19–30.

Diener, E., Lucas, R. E., & Scollon, C. N. (2006). Beyond the hedonic treadmill: Revising the adaptation theory of well-being. *American Psychologist*, 61(4), 305–314.

<https://doi.org/10.1037/0003-066X.61.4.305>

Dietrich, A., & McDaniel, W. F. (2004). Endocannabinoids and exercise. *British Journal of Sports Medicine*, 38(5), 536 LP – 541. <https://doi.org/10.1136/bjism.2004.011718>

Dor-Ziderman, Y., Berkovich-Ohana, A., Glicksohn, J., & Goldstein, A. (2013).

Mindfulness-induced selflessness: a MEG neurophenomenological study. *Frontiers in Human Neuroscience*, <https://www.frontiersin.org/article/10.3389/fnhum.2013.00582>

Drummond, J. (2008). Moral Phenomenology and Moral Intentionality. *Phenomenology and the Cognitive Sciences*, 7, 35-49.

Ehrenreich, B. (2010). *Smile or die: How positive thinking fooled America and the world.*

Granta books.

Ekman, P. (1992). An argument for basic emotions. *Cognition & Emotion*, 6(3–4), 169–200.

<https://doi.org/10.1080/02699939208411068>

Ekman, P. (2016). What scientists who study emotion agree about. *Perspectives on*

*Psychological Science*, 11(1), 31–34. <https://doi.org/10.1177/1745691615596992>

Emeny, R. T., Bidlingmaier, M., Lacruz, M. E., Linkohr, B., Peters, A., Reincke, M., &

- Ladwig, K. H. (2014). Mind over hormones; Sex differences in associations of well-being with IGF-I, IGFBP-3 and physical activity in the KORA-Age study. *Experimental Gerontology*, *59*, 58–64. <https://doi.org/10.1016/j.exger.2014.08.001>
- Emmons, R. A., & McCullough, M. E. (2003). Counting blessings versus burdens: Experimental studies of gratitude and subjective well-being. *Journal of Personality and Social Psychology*, *84*(2), 377–389. <https://doi.org/10.1037/0022-3514.84.2.377>
- Fell, J. (2004). Identifying neural correlates of consciousness: The state space approach. *Consciousness and Cognition*, *13*(4), 709–729. <https://doi.org/10.1016/j.concog.2004.07.001>
- Fell, J., Axmacher, N., & Haupt, S. (2010). From alpha to gamma: electrophysiological correlates of meditation-related states of consciousness. *Medical Hypotheses*, *75*(2), 218–224. <https://doi.org/10.1016/j.mehy.2010.02.025>
- FitzGerald, C., & Hurst, S. (2017). Implicit bias in healthcare professionals: a systematic review. *BMC Medical Ethics*, *18*(1), 1–18. <https://doi.org/10.1186/s12910-017-0179-8>
- Frank, M. J. (2005). Dynamic dopamine modulation in the basal ganglia: a neurocomputational account of cognitive deficits in medicated and nonmedicated Parkinsonism. *Journal of Cognitive Neuroscience*, *17*(1), 51–72. <https://doi.org/10.1162/0898929052880093>
- Fredrickson, B. L. (2004). The broaden–and–build theory of positive emotions. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences*, *359*(1449), 1367–1377. <https://doi.org/10.1098/rstb.2004.1512>
- Fredrickson, B. L., Cohn, M. A., Coffey, K. A., Pek, J., & Finkel, S. M. (2008). Open hearts build lives: positive emotions, induced through loving-kindness meditation, build consequential personal resources. *Journal of Personality and Social Psychology*, *95*(5), 1045–1062. <https://doi.org/10.1037/a0013262>
- Gamer, M., & Büchel, C. (2012). Oxytocin specifically enhances valence-dependent parasympathetic responses. *Psychoneuroendocrinology*, *37*(1), 87–93. <https://doi.org/10.1016/j.psyneuen.2011.05.007>
- Gendron, M., Roberson, D., van der Vyver, J. M., & Barrett, L. F. (2014). Perceptions of emotion from facial expressions are not culturally universal: evidence from a remote culture. *Emotion*, *14*(2), 251–262. <https://doi.org/10.1037/a0036052>
- Goldfarb, A. H., & Jamurtas, A. Z. (1997).  $\beta$ -Endorphin response to exercise. *Sports Medicine*, *24*(1), 8–16.
- Goldstein, J. (1999). Emergence as a Construct: History and Issues. *Emergence*, *1*(1), 49–72.



[https://doi.org/10.1207/s15327000em0101\\_4](https://doi.org/10.1207/s15327000em0101_4)

- Grover, S., & Helliwell, J. F. (2019). How's life at home? New evidence on marriage and the set point for happiness. *Journal of Happiness Studies*, 20(2), 373-390.
- Guglietti, C. L., Daskalakis, Z. J., Radhu, N., Fitzgerald, P. B., & Ritvo, P. (2013). Meditation-related increases in GABAB modulated cortical inhibition. *Brain Stimulation*, 6(3), 397-402.
- Hamamura, T. (2012). Are cultures becoming individualistic? A cross-temporal comparison of individualism-collectivism in the United States and Japan. *Personality and Social Psychology Review*, 16(1), 3-24. <https://doi.org/10.1177/1088868311411587>
- Harré, R. (1986). *The Social Construction of Emotions*. Oxford: Basil Blackwell.
- Hart, A. (1995). *Adrenaline and stress: the exciting new breakthrough that helps you overcome stress damage*. Thomas Nelson.
- Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (2009). *Acceptance and commitment therapy*. Washington, DC: American Psychological Association.
- Hayes, Steven C, Pistorello, J., & Levin, M. E. (2012). Acceptance and commitment therapy as a unified model of behavior change. *The Counseling Psychologist*, 40(7), 976-1002. <https://doi.org/10.1177/0011000012460836>
- Headey, B., Schupp, J., Tucci, I., & Wagner, G. G. (2010). Authentic happiness theory supported by impact of religion on life satisfaction: A longitudinal analysis with data for Germany. *The Journal of Positive Psychology*, 5(1), 73-82.
- Heidegger, M. (1962). *Being and Time*. Translated by John Macquarrie and Edward Robinson. New York: Harper & Row.
- Henry, M. (1973). *The Essence of Manifestation*. Translated by Girard Etzkorn. The Hague: Martinus Nijhoff.
- Husserl, E. (1990). *The Idea of Phenomenology*. Translated by William P. Alston and George Nakhnikian. Dordrecht, Netherlands: Kluwer.
- Jonas, H. (2001). *The Phenomenon of Life: Toward a Philosophical Biology*. Evanston, IL: Northwestern University Press.
- Hitokoto, H., & Uchida, Y. (2015). Interdependent happiness: Theoretical importance and measurement validity. *Journal of Happiness Studies*, 16(1), 211-239.
- Hoffman, M. A. (2019). Entheogens (Psychedelic Drugs) and the Ancient Mystery Religions. In *Toxicology in Antiquity* (pp. 353-362). Elsevier.
- Hofstede, G. (1980). *Culture's Consequences: International Differences in Work-Related Values*. Beverly Hills, CA: Sage Publications.

- Hölzel, B. K., Ott, U., Hempel, H., Hackl, A., Wolf, K., Stark, R., & Vaitl, D. (2007). Differential engagement of anterior cingulate and adjacent medial frontal cortex in adept meditators and non-meditators. *Neuroscience Letters*, *421*(1), 16–21.  
<https://doi.org/10.1016/j.neulet.2007.04.074>
- Husserl, E. (1901). *Logical Investigations*. London: Routledge.
- Inglehart, R. (2018). *Cultural evolution: people's motivations are changing, and reshaping the world*. Cambridge University Press.
- Iqbal, N., Radulescu, A., Bains, A., & Aleem, S. (2019). An interpretative phenomenological analysis of a religious conversion. *Journal of Religion and Health*, *58*(2), 426–443.  
<https://doi.org/10.1007/s10943-017-0463-4>
- Jackson, F. (1982). Epiphenomenal Qualia. *Philosophical Quarterly*, *32*(127), 127–136.
- Joshanloo, M. (2014). Eastern Conceptualizations of Happiness: Fundamental Differences with Western Views. *Journal of Happiness Studies*, *15*(2), 475–493.  
<https://doi.org/10.1007/s10902-013-9431-1>
- Kahneman, D., & Deaton, A. (2010). High income improves evaluation of life but not emotional well-being. *Proceedings of the National Academy of Sciences*, *107*(38), 16489–16493.
- Karg, K., Burmeister, M., Shedden, K., & Sen, S. (2011). The Serotonin Transporter Promoter Variant (5-HTTLPR), Stress, and Depression Meta-analysis Revisited: Evidence of Genetic Moderation. *Archives of General Psychiatry*, *68*(5), 444–454.  
<https://doi.org/10.1001/archgenpsychiatry.2010.189>
- Keers, R., Coleman, J. R. I., Lester, K. J., Roberts, S., Breen, G., Thastum, M., ... Eley, T. C. (2016). A Genome-Wide Test of the Differential Susceptibility Hypothesis Reveals a Genetic Predictor of Differential Response to Psychological Treatments for Child Anxiety Disorders. *Psychotherapy and Psychosomatics*, *85*(3), 146–158.  
<https://doi.org/10.1159/000444023>
- Keyes, C. L. M. (2007). Promoting and protecting mental health as flourishing: A complementary strategy for improving national mental health doi. *American Psychologist*, *62*, 95–108. <https://doi.org/10.1037/0003-066x.62.2.95>
- Keyes, Corey L M. (2002). The Mental Health Continuum: From Languishing to Flourishing in Life. *Journal of Health and Social Behavior*, *43*(2), 207–222.  
<https://doi.org/10.2307/3090197>
- Kim, W.-S., Yoon, Y.-R., Kim, K.-H., Jho, M.-J., & Lee, S.-T. (2003). Asymmetric Activation in the Prefrontal Cortex by Sound-Induced Affect. *Perceptual and Motor*

- Skills*, 97(3), 847–854. <https://doi.org/10.2466/pms.2003.97.3.847>
- King, M. L. (2019). The neural correlates of well-being: A systematic review of the human neuroimaging and neuropsychological literature. *Cognitive, Affective, & Behavioral Neuroscience*, 19(4), 779–796. <https://doi.org/10.3758/s13415-019-00720-4>
- Koski, J. (2015). For a phenomenology of happiness: John Keats and the practice of époque. *Archivio di Filosofia*, 83 (1/2), 221-235.
- Kringelbach, M. L., & Berridge, K. C. (2009). Towards a functional neuroanatomy of pleasure and happiness. *Trends in Cognitive Sciences*, 13(11), 479–487. <https://doi.org/10.1016/j.tics.2009.08.006>
- Kringelbach, M. L., & Berridge, K. C. (2010). The functional neuroanatomy of pleasure and happiness. *Discovery Medicine*, 9(49), 579–587. Retrieved from <https://pubmed.ncbi.nlm.nih.gov/20587348>
- Kövecses, Z. (1998). Are there any emotion-specific metaphors? In A. Athanasiadou (Ed.), *Speaking of emotions: Conceptualisation and expression* (pp. 127–152). Berlin: De Gruyter.
- Lacker, T. J., Walther, A., Fiacco, S., & Ehlert, U. (2020). The Relation Between Steroid Secretion Patterns and the Androgen Receptor Gene Polymorphism on Physical Health and Psychological Well-Being—Longitudinal Findings From the Men’s Health 40+ Study . *Frontiers in Human Neuroscience* , Vol. 14, p. 43. Retrieved from <https://www.frontiersin.org/article/10.3389/fnhum.2020.00043>
- Lakoff, G. (2008). *Women, fire, and dangerous things: What categories reveal about the mind*. University of Chicago press.
- Lakoff, G., & Johnson, M. (2008). *Metaphors we live by*. University of Chicago press.
- Larkin, P. (2018). Joy, guilt and disappointment: An interpretative phenomenological analysis of the experiences of women transferred from midwifery led to consultant led care. *Midwifery*, 62, 128–134. <https://doi.org/https://doi.org/10.1016/j.midw.2018.04.010>
- Larson, J. S. (1996). The World Health Organization's definition of health: Social versus spiritual health. *Social Indicators Research*, 38(2), 181-192.
- Lee, Y. C., Lin, Y. C., Huang, C. L., & Fredrickson, B. L. (2013). The Construct and Measurement of Peace of Mind. *Journal of Happiness Studies*, 14(2), 571–590. <https://doi.org/10.1007/s10902-012-9343-5>
- Leu, J., Wang, J., & Koo, K. (2011). Are Positive Emotions Just as 'Positive' Across Cultures? *Emotion*, 11(4), 994–999. <https://doi.org/10.1037/a0021332>

- Lindqvist, E., Östling, R., & Cesarini, D. (2020). Long-run effects of lottery wealth on psychological well-being. *The Review of Economic Studies*, *87*(6), 2703–2726. <https://doi.org/10.1093/restud/rdaa006>
- Locher, C., Koechlin, H., Zion, S. R., Werner, C., Pine, D. S., Kirsch, I., ... Kossowsky, J. (2017). Efficacy and safety of selective serotonin reuptake inhibitors, serotonin-norepinephrine reuptake inhibitors, and placebo for common psychiatric disorders among children and adolescents: a systematic review and meta-analysis. *JAMA Psychiatry*, *74*(10), 1011–1020. <https://doi.org/10.1001/jamapsychiatry.2017.2432>
- Lomas, T., Lai, A., Diego-Rosell, P., Uchida, Y., VanderWeele, T. J., & Network. (2022). Insights from the first global survey of balance and harmony. In J. Helliwell, R. Layard, J. D. Sachs, J.-E. De Neve, L. Aknin, S. Wang, & S. Paculor (Eds.), *World Happiness Report 2022* (pp. 127–154). New York: Sustainable Development Solutions.
- Lomas, Tim. (2018). Experiential cartography and the significance of ‘untranslatable’ words. *Theory and Psychology*, *28*(4), 476–495. <https://doi.org/10.1177/0959354318772914>
- Lomas, Tim. (2019). The spatial contours of wellbeing: A content analysis of metaphor in academic discourse. *The Journal of Positive Psychology*, *14*(3), 362–376. <https://doi.org/10.1080/17439760.2018.1450437>
- Lomas, Tim. (2020). Towards a cross-cultural lexical map of wellbeing. *The Journal of Positive Psychology*, 1–18. <https://doi.org/10.1080/17439760.2020.1791944>
- Lomas, Tim, & Ivtzan, I. (2016, August 1). Second Wave Positive Psychology: Exploring the Positive–Negative Dialectics of Wellbeing. *Journal of Happiness Studies*, Vol. 17, pp. 1753–1768. <https://doi.org/10.1007/s10902-015-9668-y>
- Lomas, Tim, Ivtzan, I., & Fu, C. H. Y. (2015). A systematic review of the neurophysiology of mindfulness on EEG oscillations. *Neuroscience & Biobehavioral Reviews*, *57*, 401–410. <https://doi.org/10.1016/j.neubiorev.2015.09.018>
- Lu, L., Gilmour, R., & Kao, S.-F. (2001). Cultural values and happiness: An East-West dialogue. *The Journal of Social Psychology*, *141*(4), 477–493. <https://doi.org/10.1080/00224540109600566>
- Lu, L., Gilmour, R., Kao, S.-F., Weng, T.-H., Hu, C.-H., Chern, J.-G., ... Shih, J.-B. (2001). Two ways to achieve happiness: when the East meets the West. *Personality and Individual Differences*, *30*(7), 1161–1174. [https://doi.org/https://doi.org/10.1016/S0191-8869\(00\)00100-8](https://doi.org/https://doi.org/10.1016/S0191-8869(00)00100-8)
- Lucas, R. E. (2007). Adaptation and the Set-Point Model of Subjective Well-Being: Does Happiness Change After Major Life Events? *Current Directions in Psychological*

- Science*, 16(2), 75–79. <https://doi.org/10.1111/j.1467-8721.2007.00479.x>
- Lutz, A., & Thompson, E. (2003). Neurophenomenology integrating subjective experience and brain dynamics in the neuroscience of consciousness. *Journal of Consciousness Studies*, 10(9–10), 31–52.
- Lutz, C. A. (2011). *Unnatural emotions: Everyday sentiments on a Micronesian atoll and their challenge to Western theory*. University of Chicago Press.
- Lykken, D. (1999). *Happiness: What studies on twins show us about nature, nurture and the happiness set-point*. New York: Golden Books.
- Masuda, H., Hisasue, S., Murata, H., Ide, H., Akishita, M., Akiyama, H., & Horie, S. (2014). The Impact of Salivary Testosterone Levels on the Quality of Life of a Community-Based Population in Japan. *Journal of Men's Health*, 11(2), 80–87. <https://doi.org/10.1089/jomh.2014.0001>
- Merleau-Ponty, M. (1962). *Phenomenology of Perception*. Translated by Colin Smith. New York: Humanities Press.
- Moberg, K. U., & Prime, D. K. (2013). Oxytocin effects in mothers and infants during breastfeeding. *Infant*, 9(6), 201–206.
- Möhler, H. (2012). The GABA system in anxiety and depression and its therapeutic potential. *Neuropharmacology*, 62(1), 42–53. <https://doi.org/https://doi.org/10.1016/j.neuropharm.2011.08.040>
- Monti, J. M. (2011). Serotonin control of sleep-wake behavior. *Sleep Medicine Reviews*, 15(4), 269–281. <https://doi.org/https://doi.org/10.1016/j.smr.2010.11.003>
- Nagel, T. (2012). Conceiving the impossible and the mind-body problem. *Revista Română de Filosofie Analitică*, 6(1), 5–21.
- Nagel, T. (1974). What Is It Like to Be a Bat? *The Philosophical Review*, 83 (4), 435-450.
- National Research Council (2013). *Subjective Well-Being*. National Academies Press: Washington, DC.
- Nes, R. B., & Røysamb, E. (2015). The heritability of subjective well-being: review and meta-analysis. In M. Pluess (Ed.), *Genetics of Psychological Well-Being* (pp. 75–96). <https://doi.org/10.1093/acprof:oso/9780199686674.003.0005>
- Newberg, A. B., & Iversen, J. (2003). The neural basis of the complex mental task of meditation: neurotransmitter and neurochemical considerations. *Medical Hypotheses*, 61(2), 282–291. [https://doi.org/10.1016/S0306-9877\(03\)00175-0](https://doi.org/10.1016/S0306-9877(03)00175-0)
- Organization, W. H. (1948). *Preamble to the Constitution of the World Health Organization as Adopted by the International Health Conference, New York, 19-22 June, 1946*.

Geneva: World Health Organization.

- Orsolini, L., Chiappini, S., Papanti, D., Latini, R., Volpe, U., Fornaro, M., ... De Berardis, D. (2020). How does ayahuasca work from a psychiatric perspective? Pros and cons of the entheogenic therapy. *Human Psychopharmacology: Clinical and Experimental*, *35*(3), e2728. <https://doi.org/10.1002/hup.2728>
- Owens, D. F., & Kriegstein, A. R. (2002). Is there more to GABA than synaptic inhibition? *Nature Reviews Neuroscience*, *3*(9), 715–727.
- Park, K.-B., & Oh, S.-H. (2007). Production of yogurt with enhanced levels of gamma-aminobutyric acid and valuable nutrients using lactic acid bacteria and germinated soybean extract. *Bioresource Technology*, *98*(8), 1675–1679.
- Peale, N. V. (2012). *The power of positive thinking*. Random House.
- Pluess, M., Rhoades, G., Keers, R., Knopp, K., Belsky, J., Markman, H., & Stanley, S. (2022). Genetic sensitivity predicts long-term psychological benefits of a relationship education program for married couples. *Journal of Consulting and Clinical Psychology*. <https://doi.org/10.1037/ccp0000715>
- Pluess, Michael. (2015). Individual Differences in Environmental Sensitivity. *Child Development Perspectives*, *9*(3), 138–143. <https://doi.org/https://doi.org/10.1111/cdep.12120>
- Pluess, Michael. (2017). Vantage Sensitivity: Environmental Sensitivity to Positive Experiences as a Function of Genetic Differences. *Journal of Personality*, *85*(1), 38–50. <https://doi.org/https://doi.org/10.1111/jopy.12218>
- Pluess, Michael, & Belsky, J. (2013). Vantage sensitivity: Individual differences in response to positive experiences. *Psychological Bulletin*, *139*(4), 901–916. <https://doi.org/10.1037/a0030196>
- Reims, H. M., Sevre, K., Fossum, E., Mellem, H., Eide, I. K., & Kjeldsen, S. E. (2005). Adrenaline during mental stress in relation to fitness, metabolic risk factors and cardiovascular responses in young men. *Blood Pressure*, *14*(4), 217–226.
- Ritz, M. C., Lamb, R. J., & Kuhar, M. J. (1987). Cocaine receptors on dopamine transporters are related to self-administration of cocaine. *Science*, *237*(4819), 1219–1223.
- Russell, J. A. (1980). A circumplex model of affect. *Journal of Personality and Social Psychology*, *39*(6), 1161–1178. <https://doi.org/10.1037/h0077714>
- Said, E. (2014). Orientalism. In *Geopolitics* (pp. 75–79). Routledge.
- Schäfer, T. K., Herrmann-Lingen, C., & Meyer, T. (2016). Association of circulating 25-hydroxyvitamin D with mental well-being in a population-based, nationally

- representative sample of German adolescents. *Quality of Life Research*, 25(12), 3077–3086. <https://doi.org/10.1007/s11136-016-1334-2>
- Scherma, M., Masia, P., Satta, V., Fratta, W., Fadda, P., & Tanda, G. (2019). Brain activity of anandamide: a rewarding bliss? *Acta Pharmacologica Sinica*, 40(3), 309–323. <https://doi.org/10.1038/s41401-018-0075-x>
- Shapiro, S. L., Carlson, L. E., Astin, J. A., & Freedman, B. (2006, March). Mechanisms of mindfulness. *Journal of Clinical Psychology*, Vol. 62, pp. 373–386. <https://doi.org/10.1002/jclp.20237>
- Shaw, J. C. (1996). Intention as a component of the alpha-rhythm response to mental activity. *International Journal of Psychophysiology*, 24(1–2), 7–23. [https://doi.org/10.1016/S0167-8760\(96\)00052-9](https://doi.org/10.1016/S0167-8760(96)00052-9)
- Smith, J. A. (2011). Evaluating the contribution of interpretative phenomenological analysis. *Health Psychology Review*, 5(1), 9–27. <https://doi.org/10.1080/17437199.2010.510659>
- Smyth, N., Thorn, L., Hucklebridge, F., Evans, P., & Clow, A. (2015). Post awakening salivary cortisol secretion and trait well-being: The importance of sample timing accuracy. *Psychoneuroendocrinology*, 58, 141–151. <https://doi.org/https://doi.org/10.1016/j.psyneuen.2015.04.019>
- Sonnenblick, Y., Taler, M., Bachner, Y. G., & Strous, R. D. (2018). Exercise, Dehydroepiandrosterone (DHEA), and Mood Change: A Rationale for the ‘Runners High’? *The Israel Medical Association Journal : IMAJ*, 20(6), 335–339. Retrieved from <http://europepmc.org/abstract/MED/29911751>
- Sokolowski, R. (2000). *Introduction to Phenomenology*. Cambridge: Cambridge University Press.
- Sprouse-Blum, A. S., Smith, G., Sugai, D., & Parsa, F. D. (2010). Understanding endorphins and their importance in pain management. *Hawaii Medical Journal*, 69(3), 70–71. Retrieved from <https://pubmed.ncbi.nlm.nih.gov/20397507>
- Stefanowitsch, A. (2004). Happiness in English and German: A Metaphorical-pattern Analysis. In K. Achard & S. Kemmer (Eds.), *Language, Culture, and Mind* (pp. 137–149). Stanford: CSLI.
- Stemmler, G. (2010). Somatovisceral activation during anger. In *International handbook of anger* (pp. 103–121). Springer.
- Taras, V., Steel, P., & Kirkman, B. L. (2012). Improving national cultural indices using a longitudinal meta-analysis of Hofstede’s dimensions. *Journal of World Business*, 47(3), 329–341. <https://doi.org/10.1016/j.jwb.2011.05.001>

- Thurmond, V. A. (2001). The point of triangulation. *Journal of Nursing Scholarship*, 33(3), 253–258. <https://doi.org/10.1111/j.1547-5069.2001.00253.x>
- Timmermann, C., Roseman, L., Williams, L., Erritzoe, D., Martial, C., Cassol, H., ... Carhart-Harris, R. (2018). DMT Models the Near-Death Experience . *Frontiers in Psychology* , Vol. 9, p. 1424. Retrieved from <https://www.frontiersin.org/article/10.3389/fpsyg.2018.01424>
- Triandis, H. (1988). Collectivism v. individualism: A reconceptualisation of a basic concept in cross-cultural social psychology. In *Cross-cultural studies of personality, attitudes and cognition* (pp. 60–95). Springer.
- Tsai, J. L. (2007). Ideal Affect: Cultural Causes and Behavioral Consequences. *Perspectives on Psychological Science*, 2(3), 242–259. <https://doi.org/10.1111/j.1745-6916.2007.00043.x>
- Uchida, Y., & Ogiwara, Y. (2012). Personal or interpersonal construal of happiness: A cultural psychological perspective. *International Journal of Wellbeing*, 354–369. <https://doi.org/10.5502/ijw.v2.i4.5>
- Uvnäs-Moberg, K., Ekström-Bergström, A., Berg, M., Buckley, S., Pajalic, Z., Hadjigeorgiou, E., ... Dencker, A. (2019). Maternal plasma levels of oxytocin during physiological childbirth – a systematic review with implications for uterine contractions and central actions of oxytocin. *BMC Pregnancy and Childbirth*, 19(1), 285. <https://doi.org/10.1186/s12884-019-2365-9>
- van de Weijer, M., de Vries, L., & Bartels, M. (2021). Happiness and Wellbeing; the value and findings from genetic studies. *Psyarxiv*. <https://doi.org/10.31234/OSF.IO/ZVU8J>
- VanderWeele, T.J., Long, K. and Balboni, M.J. (2021). On tradition-specific measures of spiritual well-being. In: M. Lee, L.D. Kubzansky, and T.J. VanderWeele (Eds.). *Measuring Well-Being: Interdisciplinary Perspectives from the Social Sciences and the Humanities*. Oxford University Press, Chapter 16: 482-498.
- Velmans, M. (2002). How could conscious experience affect brains. *Journal of Consciousness Studies*, 9(11), 3–29.
- Vittner, D., McGrath, J., Robinson, J., Lawhon, G., Cusson, R., Eisenfeld, L., ... Cong, X. (2017). Increase in Oxytocin From Skin-to-Skin Contact Enhances Development of Parent–Infant Relationship. *Biological Research For Nursing*, 20(1), 54–62. <https://doi.org/10.1177/1099800417735633>
- Volynets, S., Glerean, E., Hietanen, J. K., Hari, R., & Nummenmaa, L. (2019). Bodily maps of emotions are culturally universal. *Emotion*.



- Weinstein, D., Launay, J., Pearce, E., Dunbar, R. I. M., & Stewart, L. (2016). Group music performance causes elevated pain thresholds and social bonding in small and large groups of singers. *Evolution and Human Behavior: Official Journal of the Human Behavior and Evolution Society*, 37(2), 152–158. Retrieved from <https://www.jstor.org/stable/1465739>
- Wittgenstein, L. (1953). *Philosophical Investigations*. G. E. M. Anscombe, translator. New York: Macmillan.
- Whorf, B. L. (1940). *Science and linguistics*. Bobbs-Merrill Indianapolis, IN.
- Wilber, K. (1997). An integral theory of consciousness. *Journal of Consciousness Studies*, 4(1), 71–92.
- Wirz-Justice, A. (2018). Seasonality in affective disorders. *General and Comparative Endocrinology*, 258, 244–249. <https://doi.org/https://doi.org/10.1016/j.ygcen.2017.07.010>
- Wootton, R. E., Davis, O. S. P., Mottershaw, A. L., Wang, R. A. H., & Haworth, C. M. A. (2017). Genetic and environmental correlations between subjective wellbeing and experience of life events in adolescence. *European Child & Adolescent Psychiatry*, 26(9), 1119–1127. <https://doi.org/10.1007/s00787-017-0997-8>
- World Health Organization. (1948). Constitution of the World Health Organization: principles. <http://www.who.int/about/mission/en/>.
- Young, S. N. (2007). How to increase serotonin in the human brain without drugs. *Journal of Psychiatry & Neuroscience : JPN*, 32(6), 394–399. Retrieved from <https://pubmed.ncbi.nlm.nih.gov/18043762>
- Zeng, X., Chiu, C. P. K., Wang, R., Oei, T. P. S., & Leung, F. Y. K. (2015). The effect of loving-kindness meditation on positive emotions: a meta-analytic review . *Frontiers in Psychology* , Vol. 6, p. 1693. Retrieved from <https://www.frontiersin.org/article/10.3389/fpsyg.2015.01693>
- Zilioli, S., Imami, L., & Slatcher, R. B. (2016). The impact of negative family–work spillover on diurnal cortisol. *Health Psychology*, Vol. 35, pp. 1164–1167. <https://doi.org/10.1037/hea0000380>
- Zimmer, P., Stritt, C., Bloch, W., Schmidt, F.-P., Hübner, S. T., Binneböbel, S., ... Oberste, M. (2016). The effects of different aerobic exercise intensities on serum serotonin concentrations and their association with Stroop task performance: a randomized controlled trial. *European Journal of Applied Physiology*, 116(10), 2025–2034. <https://doi.org/10.1007/s00421-016-3456-1>

Żmudzka, E., Sałaciak, K., Sapa, J., & Pytka, K. (2018). Serotonin receptors in depression and anxiety: Insights from animal studies. *Life Sciences*, *210*, 106–124.  
<https://doi.org/https://doi.org/10.1016/j.lfs.2018.08.050>