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Abstract

This paper argues that the phenomenon of a genetic/cultural ‘adaptive-lag’ is both the motive for the human predisposition to engage in transformative learning, and the origin of anxiety and associated ego-defences that mitigate against the likelihood of transforming epistemic assumptions. Dodds’ (2011) ecopsychanalytic interpretation of Winnicott’s concept of a holding environment provides the conditions to reduce the impact of ego-defences by containing anxiety and therefore supporting the transformation of epistemic assumptions. Such holding environments are conceived to extend from intimate familial and social relationships to include wider ecological interconnectedness. Narratives, literature, and evidence from clinical psychedelic drug studies highlight how an increased sensitivity towards the natural non-human world diminishes ego-defences, enhancing the possibility for transformative learning. The implications for educational settings are that complex and difficult learning should not be ameliorated, and that conditions enabling learners to recognize and manage their own anxieties will enhance epistemic transformation.

Keywords: personal transformation, transformative learning, transformative pedagogy

An Ecology of Transformative Learning: a shift from the ego to the eco

Introduction

This paper is located within the context of the interaction between the human and non-human natural world exploring the motivation for paradigmatic and epistemological transformations associated with existential meaning making. The link between meaning making, identity formation, and transformative learning has already been well made: for example by Illeris (2014) and particularly with reference to transformation being contextual to the individual, involving more than changes to behavioural repertoire or quantity of knowledge (Taylor, 2008). A novel insight into the process of transformational learning, as a function of meaning making, is provided that discusses the human predisposition to interact with and control the external world, or what is referred to by Laland and Brown (2006) as engaging in ‘human niche construction’. We use Dodds’ (2011) ecopsychanalytic interpretation of Winnicott’s (1960/2007) concept of socially situated good enough holding environments to suggest that a sensitively attuned harmonious relationship between the human/non-human can support transformative learning.

Our contention is that the largely unconscious experience of a disconnection with the natural world, over a significant period of history, provides the motivation for the fundamental human ability to learn to act with critical rationality to transform more deeply embodied epistemic assumptions (Dirkx, Mezirow, & Cranton, 2006). One outcome of which is the unintended consequence of ‘adaptive-lag’, experienced as an increasing disconnect between the human and non-human natural world (Laland & Brown, 2006; Tinbergen, 1972). We also suggest that the function of unconscious ego-defence mechanisms to protect the self from being overwhelmed by anxiety, are

both initiated by the existential threat resulting from adaptive-lag and, by the difficult processes associated with learning to modify ecological niches. Therefore the ego-defences that seek to protect the ego from existential threat may also be acting to protect the ego from difficult learning required for transformation.

To signpost our overview, we advocate a move from an '*ego-centric*' to '*eco-centric*' approach to transformative learning. This is not to set up a myopic duality between the ego and ecological but to encourage greater attention to what an eco-perspective can offer to conceptions of transformation. This work, therefore, is situated within existing literature that considers the values and assumptions of transformative processes represented for example by 'planetary perspectives' (O'Sullivan, 1999), 'ecological consciousness' (O'Sullivan & Taylor, 2004), the self and the soul (Dirkx et al., 2006) and the 'spiritual' (Bateson, 1972/2000) at the centre of transformational learning. Such approaches locate transformational learning within a wider ecology that considers the complex interconnectedness between the human and natural non-human world; including political, social and educational world systems, cognition and emotion, learning and existential meaning. The thesis offered here extends this ecological lens to discuss Dodds' (2011) ecopschoanalytic interpretation of Winnicottian holding environments, and how ego-defences are constructed and influence transformative learning processes.

Consequently, transformational learning is recognised as often unpredictable and deeply resistant to pedagogical encounters, particularly when framed within simplistic notions of the transferability of knowledge and skills (Neubauer & Lehmann, 2017). As such, the intention is not to provide models or methods of potentially transformative educational activities but rather to consider how an

understanding of the origins of the human impulse to transform, or indeed resist transformation, might inform pedagogical and andragogical thinking.

The following discussion has three main parts: the first provides a conception of transformational experiences from an evolutionary and ecological context, considering human learning from the ecological perspective of adaptive-lag. The reader is also introduced to the curious world of psychedelic drug experience and mental ill health to highlight the role and impact of ego-defences on difficult learning. This, in turn, leads into the second part: drawing on the particularities of David and Tracey's narratives of recovery from mental ill health, specifically examining how sensitivity towards the non-human world provides an insight into transformational learning. The final section leads to a theoretical discussion on enhanced sensitivity towards an appreciation of an ecological interconnectedness and the impact this has on ego-defences and human learning. One assumption central to the stories and analysis that follows is that an enhanced sensitivity towards the natural non-human world and the effect of psychedelic drugs reduces the impact of the ego-defences while augmenting opportunities for transformative learning.

Adaptive-lag and a search for meaning

It has been argued (Bainbridge, 2018; Geary, 2010; Tomasello, 2014) that the social and cultural mechanisms to enable humans to dominate the planet through the management and control of a wide variety of ecosystems have arisen due to evolutionary pressures supporting human nurturing, including teaching and learning behaviours. Laland and Brown (2006) refer to these mechanisms as 'human niche building', referring to 'the process whereby organisms, through their metabolism, activities and choices, modify niches' to counteract processes of natural selection (ibid. p. 95). Unlike other animals, who are born adapted into a niche, the human

action of niche modification results in further separation from ancestral ecological relationships (Tinbergen, 1972). Leading to what Laland and Brown (2006) refer to as an ‘adaptive-lag’ or mismatch between evolutionary-influenced genetic outcomes, on one side, and the psychological and physical products of human interaction (culture) with the non-human world on the other. Laland and Brown (2006) claim the motivation for these behaviours represent an ancient desire to reduce the impact of adaptive-lag through the ecological dynamic of niche construction.

The central thesis presented in this paper suggests that the lived experience of adaptive-lag might be the source of both ancient and contemporary human anxiety. Additionally, we will argue that niche modification is motivated by a desire to mitigate anxiety in an attempt to reduce the impact of adaptive-lag and as such represents an unconscious desire to ‘return’ to a pre adaptive-lag experience. Yet, ironically, the consequence of niche building is that humans are now caught-up within a continual dialectic cycle that only serves to maintain, if not increase, the adaptive-lag. The intention of this paper is not to promote a return to a distant archeological Edenic past as this is neither possible nor desirable. Rather, our intention focuses on what can be learned about the human condition and the impulse to educate by considering an ecology of human learning.

In Berger and Luckmann’s (1966) discussion of this uniquely human dilemma, they develop the concept of ‘open and closed worlds’ where, apart from humans, all animals are born adapted to a relatively unchanging ecologically specific ‘closed’ world. Learning within a ‘closed’ environment involves acquiring a relatively fixed repertoire of appropriate behaviours. In contrast, humans are born ‘unfinished’ into an ‘open’ constantly-changing environment requiring unending learning and are therefore required to construct suitable niches in a continual quest to ‘fit’ and find

existential meaning in their external world (Bainbridge, 2018). Berger and Luckmann regard this situation as a restless dialectic where humans must be involved in the paradoxically disruptive act of continual niche modification. Human learning therefore both requires and supports creative behaviours that can respond to change and lead to the continual ecological demand to enhance niche suitability (Geary, 2010). Accordingly, the human experience is a continual existential struggle within a social and cultural 'open' niche to counteract the anxiety resulting from adaptive-lag.

Further insight into the nature of the struggle to reduce the gap between genetic and cultural worlds to find meaning in an open-world is offered by a consideration of anxiety reducing psychoanalytic defence mechanisms. The clinical work of Carhart-Harris, Bolstridge & Rucker, et al. (2016), on psychedelic drugs as a treatment for long-term depression, focused on the role of the ego and its defences. Carhart-Harris has a background in psychoanalysis and explains (Nour, Evans, Nutt, & Carhart-Harris, 2016) the successful treatment of long-term depression as the ability of psychedelics to disrupt ego functioning by triggering ego-dissolution. These findings suggest a reduced influence of protective unconscious ego-defences and therefore enable the participants to approach, explore, confront and transform long-term damaging epistemological assumptions and stuck thinking characteristic of depression. Additionally, it is worth noting that many authors (Bainbridge & West, 2012) regard human learning as an anxiety producing process threatening the existing, known self which will therefore be resisted by ego-defences.

Maintaining a psychoanalytic outlook provides an insight into the foundational nature of human learning and the conditions required to manage the anxiety particularly associated with transformational learning. It is salient that Winnicott (1960/2007) recognized the importance of external "holding environments", where

the monitoring of emotions by primary caregivers helps contain anxiety and allow the ego of the novice learner to take the risks necessary in the act of creating new knowledge or skills. The ecopsychanalyst Joseph Dodds (2011) expands this model by suggesting that the holding environment with its incumbent caregivers gradually expands from the family setting, to wider ecological niches and ultimately a consideration of an interconnected ecology. The tantalizing possibility is offered whereby the anxiety of learners, previously 'held' by significant others, can now be 'held' by a sensitive awareness towards a wider ecological interconnectivity. As such, human learning is not wholly about adaptation, but rather it represents a continual struggle to overcome unconscious ego-defences to be in harmony within an open world.

The narratives of David and Tracey will be presented next as their responses resonate this dilemma and provide rich and nuanced insight into what it may mean to experience and respond to adaptive-lag.

Narratives of transformation.

In order to explain and justify how an *eco-centric* approach can support transformative learning, the analysis of two narratives is presented to hypothesise the development of ecologically framed epistemological assumptions. Each was collected as part of a research project investigating the role that zoos may have on attitudes towards biodiversity and the re-introduction of two native carnivores to the British Isles (Consorte-McCrea et al. 2016). Although not the immediate focus of the research, two particularly distinctive narratives collected, recounted how an enhanced sensitivity towards the natural non-human world became the catalyst towards overcoming mental ill health. These stories not only indicate that the development of *eco-centrism* can be transformative; more generally, the narratives support the idea that

the containment of anxiety through utilizing an ecologically framed epistemology, decreases ego defenses, thus promoting transformative learning.

The research process used Ajzen's (1991) Theory of Planned Behaviour as the theoretical framework to design the focus group interaction and the stimulus questions used to elicit responses in relation to conservation and re-introduction of the focus species. Recruitment of participants resulted from individual responses to leaflets left in cafes and emails sent to local wildlife interest groups, leading to eight focus groups, involving 22 participants, lasting around 90 minutes. The focus group discussions took place at the zoo after the participants had observed the animals; the discussions group facilitator asked stimulus questions but also provided information on the ecology of lynx and pine marten. These sessions were recorded, transcribed, and analysed by each member of the research team and have been reported in Consorte-McCrea et al. (2016).

The research project acknowledged and responded to the limitation that focus group discussions, despite the skill of the facilitator, can produce a group dynamic that may lead to the over-representation of dominant opinions and topics. Therefore, in an attempt to ameliorate power imbalances and hear the voice and thoughts of the experiencing individual (Merrill & West, 2009), one of the authors (AB) skilled in open-ended interviews conducted an additional series of narrative style interviews. Narrative methodologies, in particular, offer an ideal platform to explore the conscious and unconscious dynamic between the individual and the social world (Bainbridge, 2015), enabling a more nuanced understanding of attitudes adopted towards the re-introduction of wild carnivores. Three participants took the opportunity to take part in more detailed individual open-ended narrative style interviews. The

Biographic-Narrative Interpretive Method (Wengraf, 2001) guided the narrative interview process and after asking the initial question ...

Can you tell me as little or as much as you wish about yourself and your interest in the re-introduction of wild carnivores, such as the lynx and pine martin and biodiversity?

... the participant spoke without interruption. The role of the interviewer after this was to ask for clarification of issues raised until the participant felt they had no more to say.

The narratives offered by David and Tracey have been selected for this study as each contained vivid examples of transformational experiences, and although presented in the context of wild carnivore re-introduction, such detailed life-stories could not have been predicted from the stimulus question. Both narrators articulate very clearly, how they had come to hold their existing understanding of, and their sensitivity towards, the connection between the human and non-human world.

The analysis involved an immersive Gestalt (Merrill & West, 2009) reading and re-reading of the transcripts by the transcriber and Alan, from which sufficient evidence in the form of individual quotes, for two broad themes, emerged. The first relates to how each had a *sensitivity* towards being *connected* to the natural non-human world and how an appreciation of this can, in turn, lead to a sense of lifelong wonderment. The second substantive theme indicates how each experienced their *sense of place* in the non-human world, representing in Mezirow's terms, a disorienting dilemma, and how this enabled them to challenge their existing assumptions, breaking free from negative and debilitating epistemic assumptions. The transformation experienced by David and Tracey relates to overcoming and re-framing long-term depressive thinking. It is worth noting that each of these broad

themes are represented in the focus group research (Consorte-McCrea et al. 2016) although not in the rich detail presented below.

1). Sensitivity and connection with the non-human world and a sense of wonder.

Both David and Tracey were able to articulate their deep understanding of what it is like to be connected with, as well as separated from, the natural world. When discussing the issue of re-introduction, Tracey acknowledges that separation between humans and the natural world is one possible cause for contemporary environmental problems, she states:

I think part of the problem with, ... how ... how things have become with humans and how we run the planet and that sort of stuff. Is that we have taken ourselves out of the food chain somewhat, and we're like a colony, sort of ...

In particular, she considers the position of humans within the food chain as a feature of being able to understand and connect with the natural world. David regards the experience of connectedness with nature as being 'innate' and yet despite this, for him, his early experiences, which he describes in a family mountain walk, were negative:

I, as a fairly young child, I walked up Ben-Nevis with my family, expecting to find gold, silver and gems at the top, ... but when I got there, there was this, what everybody else told me ... this amazing view of lakes in the ... summits of mountains and I could not appreciate any of that, no aesthetic appreciation of nature at all.

At the time of David's interview, he was in his early fifties, the description above is recalled from over 30 years ago, and yet for most of his life since then, he has experienced a rich feeling of connection with the natural world. David is quite clear

what enabled him to become aware of the wonder and connection with nature that had once alluded him:

[...] one thing that became ... became very clear to me on my first ever LSD experience was the interconnectedness with everything. [...] whether we are aware of it or not everything is connected. I gather from my experiments with LSD was how beautiful nature was and how wondrous. [...] So, the beauty of flowers, the wonder of birds. So, this was a new world which was opening to me...

On numerous occasions David makes it clear that he does not support the use of psychedelic drugs and acknowledges their inherent danger and their potential cause for periods of his own later mental illness. Yet, despite his own difficult past he sees their use as the event that enabled him to recognize a ‘*new world which was opening up*’.

[...] because I think we're very reliant and dependent on nature and that mankind's attachment to nature and mankind's attempts since the industrial revolution, our ability to overrule nature and the ability to rule us ... erm ... has separated us more and more from the earth from animals and plants and ... it's lessened our lifestyle it ... it's depleted our spiritual awareness and makes us less hardy, less physically fit ...

The ‘depletion’ recognized by David is focused on what he experiences as a separation from the non-human world and the associated inability to be able to be sensitive to the ‘reality’ of interconnectedness. David acknowledges how difficult his thoughts are to others and states that ‘*obviously we can't make it all green and pleasant again, that's very kind of, "pie-eyed" and backward*’.

David's sense of connection with the non-human world originated with using psychedelic drugs and this deep connection for many decades has sustained him. So much so that his relationship with nature defines whom he is:

So, with the LSD experience I had with flowers and trees and ... and nature ... erm ... I turned on to ecology and ... erm, the spirituality of nature. I describe myself as a 'pantheist'. I see if you like, erm ... the physical world and nature as my representation of what life should be ... it is a very base level thing.

The depth of Tracey's connection with the non-human world is not articulated with the same clarity as in David's narrative but during a discussion on how attitudes to re-introduction may be reliant on 'education and knowledge', Tracey recognizes the need to think outside current frames of reference:

Interviewer: *... and if you had full knowledge then that would help you to make a better decision?*

Tracey: *It helps but ... erm ... even then for all of us sentient, I don't think we ... erm, because there's other factors you know, we have got our environment and erm ... and our history affecting our thoughts ... You know, I am quite aware of what affects our thinking and our habits and ... erm, I have been trying to strip mine back a bit so I can look at what makes me operate [...] what was it that Jung talked about? The collective conscience ...*

Tracey's acknowledgement that the long time frame of history and the environment can affect thoughts offers some insight into her understanding that complex decisions regarding environmental issues are not only informed by current knowledge but also a distant historical relationship with the environment. David regards his connection with the non-human as being so intimate that information can flow between him and

the birds and trees. He is aware that his experience(s) can be construed in the light of his previous use of psychedelic drugs and offers a cautious exploration on the same issue that vexed Tracey, on how to 'educate people about the natural world'.

Part of educating humans about wildlife would be to educate humans [about] what it means to be human, amongst the wildlife and about the feelings the ... the ... feelings and agendas. That feeling you can get from being, contacting tree spirits and being at one with nature. I mean, I had a conversation, don't lock me up for this. But, I've had conversations with trees before [...] erm, I've had a bird talk to me before [...] I was with my sister and this ... this magpie, we were at the viewing window and this magpie came down and actually spoke.

David continued to describe how he and his sister both heard the magpie while making it quite clear that was neither on drugs or 'deranged'. David's rationale for the experience was that 'ancients' were attuned to animal behaviour and in the reverie of watching the magpie some information passed between them. Abram (1997) argues that such experiences were once commonplace as ancient people were so intimately connected with the 'more-than human world' that understanding and existential meaning was located within animals, places and weather patterns.

2). A sense of place, meaning-making and transformation

David and Tracey provide some insight into anthropogenic effects on the environment and the impact this has had on humans and animals. What emerges from each narrative of disconnection is how David and Tracey's awareness of a separation between the human and non-human world leads them to seek a reconnection in order to have a positive impact on their own well-being. Each transformation is discussed separately.

Tracey provides a powerful story of wishing to re-establish this connection in the context of seeking a space to come to terms with a difficult experience. After a period of depression, Tracey decided that she needed some space and time to meditate:

And I did something very risky, erm, which normally I wouldn't have done as I was very aware of the risk. I went for a walk in Rennie Manitoba on my own. I knew the snakes would be hibernating but the bears were about and that sort of stuff and probably wolves and whatnot, erm ... I really decided you know, that if something happened, it happened and if it didn't I would have an amazing experience. [...] you know lynxes can have me for dinner if it wants to [...] it's a similar thing with the bears, erm ... There was pristine snow on the bridge and I looked down on the bridge ... there were bear tracks across it and I had to make the decision [...] I think that's part of the problem with erm, ... how ... how things have become with humans and how we run the planet and that sort of stuff ... is that we have taken ourselves out of the food chain somewhat.

This extreme example represents a transformational epistemic shift from ego to eco-centric thinking leading to a lifelong relationship with the natural world. Tracey's experience was a healing one and helped her come to terms with a difficult period of her life. Alan had no doubt from her telling this story that when she walked out into the snowy wilderness, Tracey perceived herself palpably connected to the non-human wilderness and '*if something happened, it happened*'. The important event for Tracey was to experience what it must be like to be part of the food chain and where she fits in the biosphere. Despite this being many decades ago, Tracey uses this rich experience to give her meaning. Throughout the interview, she regularly returns to the

notion that humans are *just* part of the food chain and that their actions can and do have many implications. By taking those steps into the wilderness, Tracey had an experience with nature that provided a '*good sort of check in service*'.

David had also experienced mental health problems and used his very deep relationship with the non-human world to transform his depressive mindset to one where he can acknowledge his self-worth and role in a wider ecological framework. It is significant that he feels that what he has gained was worth the angst, he articulates this aspect very clearly after describing how the material world separates people from nature:

It becomes a very insular world. The world through a microscope. So, yeah, all the mental ill health I have suffered although it has been very painful it has granted me some aspects of myself that ... that I want to keep.

He expands on this theme later, making the claim that:

There's nothing more beautiful to sustain a human than wondering at nature. I have never found anything that matches it.

So much so, that David rents a small piece of woodland that he uses to '*go back to nature and seek solace*' and in his words to become a wild animal again:

It's a coppice wood, to use as a retreat and to have as a kind of ... erm, ... spiritual base a spiritual place to be ... to drum, to dance, and if you like that's become part of me, becoming a wild animal again, it's part of me returning, being ... being part of nature. And that enriches me immensely. It is unbelievably recharging ... erm, ... so humans are part of the natural world as well.

Both David and Tracey have described how the debilitating dilemma of mental ill health has led them to manage these long-term negative epistemic assumptions and experience a more sensitive and meaningful relationship between themselves and the natural non-human world.

The following section will now consider how sensitivity towards connections between the human and non-human world, including those experienced during mental ill-health and enhanced by the use of psychedelic substances, can support transformative learning. Particular attention will be given to discussing the shift from an *ego* to an *eco-centric* understanding of the genealogy of transformative learning.

From particularities to generalities: Further explorations of transformative learning

The narratives provided by David and Tracey were an unexpected consequence of carrying out open-ended narrative style interviews during a research project on attitudes to wild carnivore reintroduction. We think it is important to acknowledge that both David and Tracey found that a more meaningful connection with nature helped them manage and transform long-term depressive thinking. Although their responses offer insight into the nature of an extreme and very personal experience, they are by no means particular just to them. The paper will now consider other examples of transformative learning resulting from the link between mental health experiences and a sensitivity towards the non-human world, including an extended narrative in the novel *Henry's Demons* (Cockburn & Cockburn, 2012) and the role of Ecotherapy. The consumption of psychedelics, initially within primitive societies (Lawlor, 2013), to enhance meaningful harmonious connections with the non-human world will also be discussed. Finally, recent research on the use of psychedelics as an

effective treatment for long-term depression shall be presented to highlight the role of ego-defences in transformational learning (Nour et al. 2016).

Like David, many of those who experience mental illness also often report auditory or visual hallucinations in the natural world (Cooke, 2014; McCarthy-Jones, 2012). In *Henry's Demons* (Cockburn & Cockburn, 2012), father (Patrick) and son (Henry) provide a detailed and evocative narrative account about the embodied experience of schizophrenia. Henry often describes how the non-human world becomes more vivid and 'real' and how trees, bushes, and birds speak to him. Even after Henry has recovered and no longer has psychotic episodes he carries with him a deeper sense of connection with the natural world and the book ends with Henry reflecting:

It has been a very long road for me, but I think I'm entering the final straight.

There is a tree I sit under in the garden in Lewisham which speaks to me and gives me hope. (p. 222)

Both David and Henry's post-schizophrenic descriptions of connecting with the non-human world are of particular interest as these occur outside of psychosis and therefore necessarily involve thought and the reality testing act that 'I know I am thinking' (Kreinin, 2013).

David is lucid and fearful that others may judge his experience as if he were still unwell and yet in the interview space he is happy to articulate these complex experiences. It is noticeable how, for David, mental ill health is not recalled as an entirely negative experience, as his period of illness has given him a life-long access to a positive and sustaining relationship with the non-human world. Equally, Cooke (2014) provides an example from a participant who had had psychotic episodes and now regards these as transformational experiences:

... I was kind of struggling, I was blocked. The psychosis allowed me to come out of myself and move on. (p. 49)

In the aptly named *Catch Them Before They Fall*, Bollas (2013) argues from a similar position that, with the appropriate psychoanalytic support, breakdown can often lead to a breakthrough. The intention is not to bypass and negate the profound difficulty associated with mental distress but it would be remiss to ignore that the positives identified by David do emerge and are not unique to him. Recovery from mental health conditions, such as anxiety and depression, represents considerable learning and transformation of previously destructive epistemic assumptions. Tracey and David alluded to the eco-therapeutic foundation for the recovery of their mental health. Tracey's journey into bear territory was part of her healing process, while David still visits a piece of woodland to sustain his sense of well-being.

What is increasingly becoming known as 'Ecotherapy or Wild Therapy' has over recent years added to the considerable research evidence on how interacting with the non-human world can have significant mental health benefits. Jordan and Hinds' (2016) edited text provides numerous examples of successful physical and psychological interventions within natural settings and argue that this is an exciting new era for therapeutic work that has its fundamental principles grounded in the interaction between the human/non-human. Although increasingly popular, the principle that improved human/non-human relationships lead to improved well-being is well established. For example, the Romantic Poets evoked experiences with nature as a source of inspiration and learning about the human condition. While, Searles (1960) was one of the first psychoanalysts to suggest that a muted relationship with the natural world may lead to mental ill-health conditions such as schizophrenia.

Later, Eric Fromm (1964) originated the term *biophilia* recognising the deep unconscious desire humans have to maintain close relationships to living things.

David and Tracey both narrate how, during and after their experience of mental ill health, they are now aware of a more meaningful connection to the natural world. David conceives his experience in relation to his understanding of how '*the ancients*' lived, and it is well documented that in many pre-modern indigenous cultures a very close connection still exists between human and non-human worlds, and also between history and mythology (Sinding-Jensen, 2009). For example, within the oral tradition of Australian Aboriginal mythology of Dreamtime, stories imbued with ancestral knowledge are linked to precise topographical locations (Whallon, 2016). New Zealand Maori share legends of the mythical parents, Rangi and Papa cruelly separated from their intimate embrace to become the land and sky, as well as birds used to communicate between the people and gods (Orbell, 1998). Finally, the native Mexican Wixáritari maintain a cultural 'trinity' of deer, maize and the psychoactive cactus, peyote. It is by using peyote that distinctions between plants, animals, and humans dissolve and all become part of a unified 'nature' (Lawlor, 2013).

Psychedelic drug use (Luke, 2013) has an ancient history in promoting and enhancing an awareness of the connections between the human and non-human world, providing a narrative resource since pre-history to support human meaning-making and identity formation. Current research (Carhart-Harris, Kaelen & Bolstridge, et al., 2016) also provides evidence as to how the clinical application of psychedelic drugs such as LSD can improve well-being and optimism. It may be easy to disregard these accounts as simply the anomalous result of primitive pre-modern thinking, madness or psychoactive drug use. A more helpful approach is to explore

how these ancient and long-lasting practices provide insight from which to consider an understanding of the important close relationship between the human and non-human world and transformative learning.

Recovery: Transforming epistemologies

The narratives presented by David and Tracey reflect the tension for those whose experience of adaptive-lag, the genetic/cultural separation between the human and non-human, has been sensitized by mental illness or psychedelic drug use. What their stories, and those within the empirical research mentioned earlier allude to, is that their enhanced sensitivity towards the natural non-human world, has been accompanied by transformational learning. Adolescent experiments with psychedelic drugs facilitated David's epistemological shift that led to a discovery of a new appreciation and deeper connection with the natural world. From this frame of reference, he has been able to construct an enabling paradigm, which he refers to as a 'deep ecology' allowing him to locate his sense of self from within a complex interconnected ecosystem; whereupon the distinction between human and non-human began to dissolve. So much so, that he could use this new and closer relationship to help him modify the inflexible and damaging thinking that characterized his depression. Likewise, Tracey described how during a period of depression, she deliberately took herself into the wilderness to experience what it is like to be part of the food chain. Tracey's transformational recovery results in an epistemological shift from which she experiences herself within an *eco-centric* context of an interconnected ecology, even if this meant being devoured.

In *The Spell of the Sensuous*, Abram (1997) also discusses the advantages of a more sensitive connection with the non-human world. He provides the observation that all of the human senses contribute to a language capable of supporting

communication that flows between human and what he terms the ‘more-than-human’ world. For example, in *Henry’s Demon’s* Henry reports of auditory hallucinations, where elements of the natural world ‘speak’ and offer instructions, yet despite the experience occurring within psychosis, this too can engender a deeper connection with the natural world that becomes restorative. Luke (2013) provides a wide variety of evidence on how the use of psychoactive drugs intensifies the feeling of connectedness to the non-human world. From the perspective of clinical research settings, many of those who have undertaken psychedelic drug therapy report an awareness of the self ‘dissolving’ and subsequently an increased experience of interconnectedness (Carhart-Harris, Bolstridge, & Rucker, et al. 2016).

We suggest the insight gained from these observations into what human learning might be is not as simplistic and absurd as suggesting that either an increased sensitivity to the non-human world, or the consumption of psychedelic drugs, can improve self-awareness, learning and the formation of a fulfilling identity. The function of this paper is to provide an alternative and novel lens, with which to interrogate what it may mean to be human, and why and how human learning is different from that of other animals. In particular, the functionality of an enhanced sensitivity towards the non-human world may provide an opportunity to re-imagine the potential for transformative learning to negotiate new identities. For, although humans engage with and are influenced by behaviourist and associative modes of learning, these offer reductive explanations (Bainbridge & West, 2012) that fail to account for the existential human motivation to ‘make meaning’ that is satisfying on an individual and social level. David, Tracey, Henry and those involved with psychedelic clinical trials have been able to transform their thinking towards embracing an ecologically focused epistemology.

We argue that the existential dilemma to construct a meaningful identity has ecological origins, where, due to the phenomenon of adaptive-lag, the human relationship with the external world is never complete. Therefore, necessitating continual niche construction to satisfy both physical and psychological needs. The dilemma, exacerbated by the predisposition for ‘modern’ humans to be engaged in interminable psychological and physical niche building, only serves to further separate the human from the natural non-human world. We argue that an ecologically focused epistemology, in itself a transformative learning outcome, can lead to additional transformative learning. The final question therefore that needs addressing must focus on ‘why is it that a shift from ego to eco-centric epistemologies can support transformative learning?’

Towards an eco-centric understanding of transformative learning

It is particularly emblematic that the transformative learning experiences present in this paper led to the alleviation of depressive symptoms, resulting from experiencing cogent encounters with nature: David, as a result of psychedelic drug use and Tracey as a conscious decision to walk into and face the possibility that humans are part of a complex ecology. Each was able to perceive that their role is not always to dominate and control nature but to experience being part of a wider more complex interconnected system. Therefore, returning to Carhart-Harris, Bolstridge & Rucker, et al.’s (2016) clinical work, it is not unreasonable to suggest that the transformational learning, which brought about a return to positive mental health: requires a level of ego-dissolution, whereby defences can be sufficiently reduced to allow a true-self (eco-centric self) to approach and respond to difficult and stuck epistemic assumptions.

Although the site of human learning now moves beyond the influence of the family and primary caregivers towards Dodds' (2011) ecological holding environment, what does not change is the essentially embodied nature of epistemic transformation. Moreover, we can see how this revolves around close relationships that provide care during the risky act of exposing the ego to difficult knowledge and many potentially new possibilities. It is noticeable that David and Tracey's experience of transformation occurred alongside an experience of enhanced sensitivity towards the natural non-human world. As such, their holding environment now includes the non-human, and raises the potential that an increased sensitivity towards the natural world can provide the role of an 'eco-centric' anxiety containing caregiver.

Dodds (2011) argues that an autonomous and independent self is the result of a personal identity grounded in an experience of coherence and continuity leading to 'ego-relatedness'. The evidence from the participants in clinical psychedelic drug trails, along with the narratives from David, Tracey, and Henry also report a changed and improved sense of self. We suggest that in the examples discussed in this paper two transformative moments occur. The first, representing a life that has ecological coherence and continuity, resulting from a shift from an ego-centered to an eco-centered self associated with an ecologically focused epistemology. The second transformative moment comes about as a result of an ecological epistemology supporting a move away from ego-centrism and the controlling nature of ego-defences, towards a less defended learner, more open to take risks and to approach difficult knowledge.

The argument is not that transformative learning can only occur when learners become sensitive towards the complexity of the human/natural non-human world relationship or indeed take psychedelic drugs to promote ego-dissolution. Nor should

we abandon the ego for the eco. Rather, adult educators may need to plan to provide a holding environment for the inevitable anxiety associated with learning (Bainbridge, 2018). We mentioned at the start that the intention of the paper is not to provide models of transformative learning as its serendipitous nature makes such a project unlikely to succeed. Instead, broad advice is offered.

So, what is an eco-centric understanding of transformative learning experiences and how may this be used to inform educational practices? The insight provided by an eco-centric perspective positions the learner, protected by ego-defences, in a complex environment riven with potentially debilitating anxiety. Transformative experiences are more likely when learners approach and respond to difficult knowledge and complexity instead of attempting to dominate and control. It has also been suggested that the anxiety aroused during a debilitating dilemma can be contained in holding environments that range from intimate family settings to more expansive ecological niches. The containment of anxiety enhances conditions that mitigate against ego-defences, and offers the likelihood that learners will be more readily open to new ideas and potentialities to engage in critical rationality and the changing of epistemic assumptions.

The challenge for all those involved in life-long human learning is to encourage a more expansive eco-centric approach. One that provides learning spaces where the conscious and unconscious anxieties inherent in human learning are acknowledged, given time and space to be thought about. An approach that accepts the uniquely semantic desire of a particular learner to find individually validated meaning at a particular time in a particular relationship (Bainbridge, 2018). Ultimately, we recommend rejecting the stultifying prospect of increasingly dominant technical-rationalist approaches to education.

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