Cyberdelics: Context engineering psychedelics for altered traits

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‘Cyberdelics’ and ‘Cyberdelic Psychotherapy’ have the potential to offer greater precision in modulating and entraining therapeutic psychedelic experiences. Both Psychedelics and Cyberdelics have the potential to immerse users in enriched sensory landscapes; both have been studied as mediums of transformative experience and both have been used as aids to help recovery from mental illness. Psychedelic-assisted therapy (PAT) is a promising and unique therapeutic modality with a focus on disrupting entrenched ways of thinking, feeling and perceiving. Both Psychedelics and Cyberdelics do not guarantee positive change, they are experiential medicines and technologies that may provide a ‘window of plasticity’ that can be utilised within a therapeutic process, towards wellbeing and personal growth. To frame and catalyse both spheres, Context engineering (CE) involves the deliberate re-structuring of experience to enhance and expand perception and cognition. CE gives us new abilities and control over our senses providing us with a new type of self and societal exploration. CE considers the broad spectrum of what augmentation can do but also highlights the dangers of focusing solely on the medicine or the technology. Our hypothesis is that the use of context-engineered virtual and augmented environments can assist in stabilising the insights precipitated through the psychedelic-assisted therapy process. We propose a variety of game mechanics or mechanisms by which cyberdelics may help modulate or optimise psychedelic-assisted therapy, supported by context engineering, positive psychology, mindfulness, transformative experience design, and the gamification of wellbeing. If utilised wisely, cyberdelics may provide an enhanced learning environment for the development of set, setting and skills to support psychedelic-assisted therapy from preparation, acute-experience to integration.

1. INTRODUCTION

Psychedelic experiences and Cyberdelic experiences (which consist of immersive virtual reality (VR) and extended reality (XR) components) open up the experienter to new possibilities and avenues of being. It was Alan Watts a prolific Zen philosopher who in “Work as Play”, makes the suggestion that “playing through” all aspects of life, is the game to outwit the fear of death and make the mundane a game of artful being (Watts 1995). Timothy Leary proposed that Cyberdelics were the way to “democratise the cyberscreen politics of the future”… and reprogram the mind (Leary et al. 1994). Timothy Leary was a polarising pioneer of the early psychedelic movement; it could be said that his involvement with the counter-culture blurred the lines between the goals of the movement, the personal, and the early scientific inquiry into the potential of psychedelics as therapeutic substances, originally coining the phrase “turn on, tune in, drop out”. However, after witnessing the political backlash towards psychedelics in the 70s as well as the rise of personal computing led Leary to self-correct the phrase in the 80s to “turn on tune in, boot up”, in recognition of the opportunities of a more sustainable engagement with the zeitgeist of our time.
2. PSYCHEDELIC ASSISTED THERAPY

Psychedelic assisted therapy (PAT) is intrinsically a unique therapeutic modality. In a supportive setting, psychedelics can disrupt entrenched ways of thinking, feeling and perceiving (Nutt et al. 2020). Fundamentally, psychedelics are an experiential therapy. Healing is mediated through the interaction between pharmacology, neurology, psychology and the context of the psychedelic therapeutic space. Several contributing physiological, neurological and pharmacological mechanisms have been studied to unveil the mechanisms of psychedelics (Nichols et al. 2017, Carhart-Harris & Friston 2019). These theories aim to define the mechanisms behind what has been described as psychedelics ability to open a ‘window of plasticity’, within a therapeutic process to instantiate, and develop the mindset and skills for psychological wellbeing within individuals.

2.1 Transformative Experience: Set, setting and skill

It has been established that psychedelics facilitate a particular variety of experience which, within a therapeutic context, facilitate positive personal change at an increased rate, compared to other therapies (Johnson 2018). In this way, psychedelics may be described as catalysts for transformative experience.

Within the framework of PAT, the terms transformative experience, peak experience and mystical experience have been used interchangeably in the literature (Roseman 2018). Peak or transformative experiences were described by psychologist Abraham Maslow as “rare, exciting, oceanic, deeply moving exhilarating, elevating experiences that generate an advanced form of perceiving reality” (Maslow 1964). Maslow observed that those who experience more frequent peak or transformative experiences are more frequently, self-actualisers, the pinnacle stage of his ‘hierarchy of needs’.

PAT may evoke experiences of personal transformation rapidly through the activation of ‘pivotal mental states’ (Brouwer & Carhart-Harris 2021). Pivotal mental states are adaptive and responsive states that are transiently comprised of hyper-plastic mind and brain states, with exceptional potential for mediating psychological transformation. They are an inherent property of the human brain itself, which have served an important evolutionary function, to provide a framework for psychological transformation when actual or perceived environmental pressures demand this.

However, for change to be sustained and stabilised over time it is likely to require the development of metacognitive skills through a consistent and resourcing therapeutic-alliance (Ardito et al. 2011) and, personal contemplative practices (Khoury 2017). While careful attention to ‘set and setting’ is fundamental in the PAT process, we propose that systems to support the development of ‘skills’ is essential in the navigation and stabilisation of transformative experience.

3. CYBERDELICS

Cyberdelic technologies allow us to create novel altered states of consciousness. Cyberdelics do not attempt to replicate psychedelic effects but instead provide an entirely new set of (complementary) experiences to add to the overall toolkit. With the explosion of hybrid and perceptual XR technologies such as VR, AR and MR (Mixed Reality), we are able to extend the possible realities we can reach. The ability to alter our senses and design new senses provides us with a whole new tool-set for metaprogamming and self-transformation.

We will review and discuss a range of cyberdelic experiences that can help support psychedelic therapy whilst focusing on the following framing questions: How adaptable is our perception? How can artificial senses be used to access a wider our perception of reality? How can we develop and use these emerging mixed reality technologies to generate new forms of experience and induce non-ordinary states of consciousness? Can we engineer non-dual awareness through technological interventions? How can we use Cyberdelics to break out of the prisons of our own perception? How can hybrid technological devices, of often-prosthetic alienation, help us to reconnect to ourselves and to the surrounding environment?

4. SUPPORTING FRAMEWORKS

4.1 Gamification of Wellbeing

In games, individuals engage in intrinsically motivated behaviour that may also provide cognitive, emotional, health and social benefit (Johnson et al. 2019). Games are playful experiences that entertain the player(s). Gamification can be defined as the “use of game design elements in non-game contexts” such as in
learning or at work (Deterding et al. 2011). Several examples now exist where games are utilised to elicit behavioural change in a naturally rewarding or ‘autotelic’ way to support psychological wellbeing. XR applications exist for the treatment of OCD, anxiety disorders (Linder et al. 2017), diabetes dietary control (Theng 2015), and development of mindfulness (Döllinger 2021).

On a psychological level, gamification brings to attention concepts of motivation vs control, behaving as a ‘player’ of the game rather at the whim of conditioned responses (Husley 2019). Evidence suggests gamification can have a positive impact for health and wellbeing related interventions (Johnson et al. 2019).

4.2 Context Engineering

In this paper we propose a variety of game mechanics or mechanisms by which cyberdelics may help modulate or optimise psychedelic-assisted therapy. The intention is that this modulation and optimisation results in lasting change (altered traits). Context Engineering (CE) is a framework that helps support this process. (Smith 2014; 2016)

CE is a trend being seen across multiple disciplines where we are moving from a ‘content consuming’ economy to a ‘context creating’ economy. For example, we are no longer satisfied with simply watching media (cinema), we now want to enter the media itself (metaverse). CE is a new paradigm where we focus less on transforming content (as the primary activity), and more on how we can make our own perception the ‘content’.

CE will give us new abilities, control over our senses and the ability to develop new forms of perception, providing us with a new type of self and societal exploration. CE is concerned with the technological extension of the human condition through the investigation of the ethical use of emerging technologies to enhance our biological and cognitive capacities.

CE enables us to change the context ourselves: this could be through i) augmenting our senses, adjusting the way we see, the way we hear, the way we smell, the way we touch or the way we taste. Or ii) by generating entirely new senses such as a time sense or a north sense, where we can permanently locate the sense of north, thereby improving our sense of direction as a whole.

CE forms the basis of Cyberdelic design because when we develop Cyberdelics we want to deeply imprint on our capacities for transformation. We propose that CE systems and skillsets are essential in the navigation and stabilisation of transformative experience. We also carefully design the pre and post contexts of the Cyberdelic experience including the set (body and mind) and the setting (environment).

5. CYBERDELIC GAME MECHANISMS

5.1 Awe

The experience of 'stimuli that are vast, that transcend current frames of reference, and that require new schenmata to accommodate what is being perceived' with the identification of one as a 'small self' in relation to something larger than oneself (Gandy et al. 2020). The phenomena of being in relationship with something more expansive and complex than oneself. "Whereas the beautiful is limited, the sublime is limitless, so that the mind in the presence of the sublime, attempting to imagine what it cannot, has pain in the failure but pleasure in contemplating the immensity of the attempt" (Kant 1781).

When something is experienced as being much larger than the self’s ordinary frame of reference this leads to a “need to accommodate”, to assimilate an experience into current mental structures (Weger & Wagermann 2018). The need to adjust cognitive schemas to successfully assimilate a new experience is associated with an expansion of one’s frame of reference. This results in a sense of gratitude, humility, sense of connection and perception of beauty. However, a failure to accommodate can produce confronting, terrifying and upsetting feelings. These aspects awe reflect in the fragility of the psychedelic experience as a state of great potential, context and skill dependant.

5.2 Flow

Flow is a state of genuine satisfaction, in absorption with an activity, particularly a creative process (Csikszentmihalyi 2013). Flow states are described as “optimal experience” and an organisation of mind that is “strong, alert, in absorption with an activity, particularly a creative process (Csikszentmihalyi 2013). Flow states are described as “optimal experience” and an organisation of mind that is “strong, alert, in effortless control, unselfconscious.” Csikszentmihalyi theory of flow suggests that happiness does not simply happen, “optimal experience is thus something that we make happen”. It can be prepared for and cultivated by setting challenges that are sufficiently demanding without being too complex for the players abilities.

5.3 Closed Loop Systems

Adam Gazzaley defines a ‘closed-loop system’ as one where (Ziegler et al. 2019):

- an individual is challenged by an intervention,
• the influence the challenge has on the individual is recorded in real-time,
• Data then immediately updates the dynamic to be more effective in eliciting the desired response.

Closed loop systems have been successfully utilised in video game systems for neuro-cognitive optimisation for the treatment of poor executive function, such as ADHD (Mishra et al. 2020).

5.4 Mindfulness in XR
By implementing mindfulness programs in XR, instructions and guidance are provided in an immersive virtual world. These worlds have a range of options that can be tailored to the individuals needs based on their personal development interests. Biofeedback, the data communicated between biosensors, visual feedback through the game and conscious awareness enables the potential for ‘quantified mindfulness’ (Döllinger et al. 2021). Set points from the breath rate, movement, gaze, HRV, GSR and EEG can be tracked to personalise the experience to the user’s state. There are a variety of metacognitive stances that experiences could benefit from eliciting and exploring with appropriate audio guidance and visual reward.

5.4.1. Embodied vs Disembodied cognition
Interception is the perception of sensations from inside the body and includes the perception of physical sensations such as heartbeat, respiration, satiety, as well as bodily emotions (Farb et al. 2015). Interceptive capacity is intrinsic to one’s sense of embodiment, motivation, and wellbeing. Virtual Environments may bring attention to the breath through visualisation of the breath in the game world. Virtual experiences can also support shifts in perspective, for example, transitioning from having a virtual body to being disembodied may facilitate experiences of ‘self transcendence’.

5.4.2. Acceptance vs Autonomy
Shifts between having the ability to modulate the game world to succumbing to circumstances outside of the player’s control.

5.4.3. Focus vs Distraction
Creation of periods of focus while modulating the levels of distraction to entrain attention and concentration.

5.4.4. Compassion and Reflexivity
Narrative framing is used to model metacognitive stances of mature adult development. Scripted meditations invite the player to explore their cognitive landscape with greater awareness and precision.

5.4.5. Tolerance of Ambiguity and Uncertainty
The creation and exploration of paradoxical situations to help entrain a comfort in discomfort.

5.4.6. Relaxation vs Activation
Bringing interoceptive awareness to the transition between relaxation, fight-flight responses, selective attention and the navigation between.

6. EXAMPLES OF RELEVANT CYBERDELICS

6.1 Richie’s plank experience
Richie’s Plank Experience is a VR psychological thriller. The participant enters a hotel, goes in a lift in order to reach the 80th floor. When the lift door opens a cityscape and a single plank pointing outwards towards the city is revealed. The object of the game is to walk the plank. It is astonishing how due to the fact that the brain/body is so immersed in the experience how hard it is to convince yourself to actually walk on the virtual plank. The crucial game mechanic that relates to how this could help with the preparation, or an integration of psychedelics is that when you fall off the plank you drop to your virtual death and experience a ‘white out’. This experience of ‘embodied letting go’ is particularly invaluable for the preparation of the 5meoDMT experience. In order to avoid trauma whilst ingesting this powerful entheogenic medicine it is fundamentally crucial to let go. Letting go is not a cognitive process but a very much embodied one so it is very important to practise this over and over again. Richie’s Plank Experience is therefore a fantastic example of a context-engineered cyberdelic environment that can help assist in stabilising the set and setting before a psychedelic-assisted therapy process begins.
6.2 Isness

Isness is a platform which is powered by a VR physics engine created by David Glowacki. Isness is a guided ritual, using additional hardware in the form of the mi.mu gloves (Freire 2010) to enable a game mechanism within the experience – the gloves are used to create a mudra: a mudra connects the universal consciousness (via the thumb) with the individual consciousness (via the finger). When the connection is made a point of light is generated within the darkness of the VR space. Other points of light start to appear in the space as other people in the space also create their mudras. Everyone then becomes connected through these points via the real time physics engine. This is an incredible way of dissolving boundaries and temporarily stripping away the ‘grand illusion’.

One of the most powerful parts of the ritual is when you are encouraged to move into the ground, suddenly this mirror world is revealed which makes tangible the power and potential of this technology for transformation beyond the physical constraints of the real world.

During the pandemic, Isness Distributed (Isness D) was developed in order to explore what could be achieved without having a single physical space.

The advantage of being ‘beyond the physical’ was the ability to step inside other people’s energy ‘cloud forms’, and then begin to merge those energies. This was very transformative, the sensation of not needing a physical space, but feeling like you were still in one. This ability to merge your energy with other participants qualifies as another Cyberdelic game mechanism. This is because it was reported to have regularly produced an altered state of consciousness (ASC) in the participants. (Glowacki 2020)

The next iteration of the project was called ‘Numadelic Flow’ which was less ritualised and more free-flowing, combining in this instance Qigong with breathwork. This iteration enabled the ability to share their breathing process with another person using 3D generated Buckminster Fuller ‘buckyballs’.

(Glowacki et al. 2021)

6.3 Eternal Return

Eternal Return is a composite work that uses VR technology, physical objects and performance to explore reality as speculative fiction. The work is composed of a reality matrix consisting of three intertwined digital replicas of historical buildings that are hyper-connected to sculptures and fragmented objects…. the piece unfolds as a series of encounters with physical and mental objects, augmented by the analogue touch of an unseen performer and digital code. (Lundahl & Seitl 2019).

This is one of the most powerfully transformative Cyberdelics which can be revealed by the number of game mechanics at work within the experience:

i) **Point-cloud interaction:** a matrix grid houses an object archive made of lidar scans. This object archive creates portals to other realities. Objects can also dissolve, implode or ‘spurt out a room’. For example, a piano workshop emerges out of a teacup, the workshop spirals around the visitor until they are fully immersed inside it. This has a powerful transformative effect in its unique phenomenology which is very unlikely to have been experienced before, (apart from maybe during a psychedelic experience).

ii) **Double Consciousness:** When the participant touches the interior in the virtual space, they simultaneously touch the ‘sculptural abstractions’ in the physical world. The physical and virtual are designed to conflict with each other, in the sense that it is ultimately up to the participants in which realm they are most present.

iii) **Virtual proxy:** participants interact through the analogue touch of unseen performers. (Machon 2019).

iv) **Freedom of movement:** this is a powerfully reinforcing mechanism as freedom of movement is related to the duration of the participants curiosity and attention.

v) **Uncertainty / Ambiguity principle:** While objects appear visually complete within the virtual space, if the participant tries to pick up certain objects then they will feel incomplete physically.

vi) **Trust:** trust is measured by the resonance between the performer and the participant, this game mechanic is made tangible whilst exploring the ‘connection to’ and the ‘influence over’ an environment.

vii) **Engaging multiple senses:** scent is also used to create the presence of water and soil.

viii) **Non-dual experience:** Another key transformative moment is achieved by dissolving physical boundaries to generate a non-dual experience. In order to achieve this the participant is instructed to touch a solid wall in the physical world and is at the same time
made to be convinced that it is made up by millions of subatomic particles in the virtual space. Participants are then asked to walk straight through the wall, the illusion is achieved because in the physical space the wall is simply moved out of the way but the point cloud of subatomic particles remains. The visual effect is again reinforced as the friction of passing through the wall is both felt and heard through a vibration.

Death literacy: At a crucial point in the Eternal Return journey, participants are led towards a decomposing body (which appears to be a lidar scan of a forensic scene, which Scanlab specialise in). (Shaw 2014). The participant is then asked to crawl inside the corpse of light. What happens next is arguably the most powerful part of the entire experience as the participant then ‘drops’ around 10 meters (virtually) into the floor stimulating both an OBE and a rapid descent into the underworld which is a motif of all the ancient mystery schools practises.

| Cyberdelic content producers | Direct to consumer | Clinical Research | Retreat/Exhibit |
|------------------------------|--------------------|-------------------|-----------------|
| RICHIE’S PLANK EXPERIENCE    | X                  |                   |                 |
| ISNESS                       | X      | X                |                 |
| NEUROSCAPE                   | X                  |                   |                 |
| TREE HUGGER                  | X                  |                   |                 |
| ETERNAL RETURN               | X                  |                   |                 |

Table 1: Cyberdelics Experiences

6.4 Tree Hugger

Tree Hugger is an early piece by the Marshmallow Laser Feast VR studio. This exhibition took place in a large warehouse with a foam structure in the middle of the space. Whilst wearing a VR headset the foam structure is transformed into a lidar scan of a giant sequoia tree. The participant is then able to explore the inner systems of the tree from the perspective of the water.

Some game mechanisms involved in Tree hugger include:

Perspective shifting: One of our human conditions is that we often lose perspective. Humans have a habit of thinking that we are at the top of the food chain and as a result this causes all kinds of problems. We are fundamentally disconnected from the nested ecology around us, not knowing the smaller scale of what we depend on. We therefore don’t see the consequences of our actions. When you have the experience of being water moving through a tree you have the potential for a lasting change in perspective.

Time distortion: this powerful game mechanic is enacted when your individual sense of time is placed in relation to the temporality of a 3000-year-old sequoia tree.

Merging inside and outside: You can be outside the tree hearing the rain fall or inside the tree watching the inner mechanisms come to life.

Out of Body Experience (OBE): As the water moves through the tree the participant starts to rise off the virtual ground, inducing an immediate OBE.

Perception shifting: By showing you the world beyond your senses and changing your perceptions of reality you may come back transformed.

Macroscopic vision: Experiencing a forest in which you could fly and yet be able to explore every detail with a form of infinite zoom.

Behaviour shifting: Having a connection to a place that is fast disappearing might enable local and global behaviour change.

Figure 3: Experiencing a giant sequoia tree from the perspective of the water running through it.

7. CONCLUSION

Our hypothesis is that the use of context-engineered virtual and augmented environments
can assist in stabilising the insights precipitated through the psychedelic-assisted therapy process. Psychedelics are experiential, and thus contextual medicines, and there is much to learn about what contextual factors and psychological incentives will lead to the best outcomes in each individual patient (Carhart-Harris 2018). By combining Psychedelics with Cyberdelics we can perhaps support optimal outcomes and minimise adverse or unsettling experiences. Tailored immersive environments may increase psychological safety and facilitate exploration. This could be achieved through the ‘awe-inspiring’ experience of visual immersion, the specificity of modular ‘in-game’ experiences and the ability to customise aspects of the environment to an individual’s physiology and personal perspective.

![Diagram: Psychedelic-assisted therapy vs Virtual Reality]

**Figure 2: Synergies between PAT and VR**

A recent paper on VR as a moderator of psychedelic-assisted psychotherapy concluded:

“We suggest virtual reality (VR) as a full-spectrum tool able to capitalise on and catalyse the innately therapeutic aspects of the psychedelic experience, such as detachment from familiar reality, alteration of self-experience, augmentation of sensory perception and induction of mystical-type experiences.” (Sekula 2022)

However, Sekula and his team do not seem to also address the risk factors.

Cyberdelics in themselves are already a powerful mind-altering tool before they are combined with Psychedelics. Two powerful mind-altering tools combined needs a lot of investigation. We don’t have a firm grasp on either of them individually yet.

A major risk is do these interventions whether Cyberdelic or Psychedelic aid the imagination or atrophy it? We need to be very careful not to degrade the role of the imagination i.e. we do not replace imagination with computer animation.

Finally, another concern is designing for positive transformation in the first place. Transformation design is a problematic activity because arguably you can provide the means for transformation but not the subjective experience of the transformation itself.

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