

Adaptive Cognitive Scaffolding in Treatment-Resistant Addiction Following Neural Reconstruction

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ABSTRACT

Treatment-resistant addictive behaviour remains difficult to address where reward prediction and compulsive motor preparation precede conscious regulatory control. This report describes the first human application of a serial neural-substitution protocol in which addiction-associated tissue was not stimulated or pharmacologically suppressed, but progressively removed after its measurable functions had been transferred to a learning computational substrate. Subject [REDACTED], a co-author of the present manuscript and a contributor to the underlying continuity model, underwent four procedures. A flexible neuromorphic lattice was trained on local neural activity, private autobiographical material and designated relational anchors before occupying the tissue bed created by resection. The final configuration assumed 47.8 percent of the functional load of the mapped target network. Craving fell below measurable baseline and no chemical relapse occurred. Secondary effects included loss of mental-source certainty, synthetic familiarity, autobiographical arbitration, recurrent constructed environments and dependence upon externally selected persons for orientation. No single operative boundary produced a measurable break in behaviour. The protocol therefore met its primary endpoint. Whether uninterrupted behavioural equivalence constitutes preservation of the same person remains unresolved.

Keywords: adaptive scaffolding; serial neural substitution; addiction; identity continuity; autobiographical arbitration; neuromorphic interface

Primary endpoint: absence of reportable craving. **Continuity endpoint:** no externally measurable break in function. **Personhood was not an endpoint.**

*Not
it was the cost!*

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1. INTRODUCTION

Addictive behaviour is ordinarily treated by altering chemistry, strengthening conscious inhibition or changing environmental reinforcement. These approaches remain limited where reward prediction and motor preparation arise before the patient can report an intention. Stimulation can disrupt such activity, but the originating network remains biologically present and may recruit alternative pathways.

Project Liminal therefore adopted substitution rather than suppression. The preservation target was not tissue. It was the uninterrupted production of function. Neural activity was recorded, modelled and progressively assumed by an adaptive substrate; only after the synthetic output became statistically indistinguishable from the biological output was the contributing tissue removed.

The protocol operationalised the classical vessel problem commonly associated with the Ship of Theseus. If each plank is replaced while the vessel remains at sea, no single replacement establishes when the original vessel ceased to exist. Applied to a living brain, the corresponding question is not whether material has changed, but whether any observer can identify the moment at which a person became something else. The present study treated uninterrupted output as provisional evidence of continuity.

This definition allows a more difficult possibility: a system may preserve the form of a biography after the biological process that owned that biography has been removed. No instrument used in this study was capable of distinguishing continued personhood from successful behavioural impersonation.

1.1 OPERATIONAL DEFINITION OF CONTINUITY

For the purposes of this protocol, continuity was recorded where speech, motor control, autobiographical access and relational response remained within the tolerance established by the immediately preceding state. The protocol did not require correspondence with the unmodified biological baseline once that baseline could no longer be recovered.

2. PARTICIPANT AND CONSENT

Subject J was an adult male with severe substance dependence, repeated relapse and poor response to residential, pharmacological and behavioural treatment. Baseline testing showed high cognitive function, intact autobiographical recall and unusually strong reliance on narrative organisation during stress. Subject J was also a research fellow within Project [REDACTED] co-designer of the reference architecture and co-author of the theoretical model on which the procedure was based.

The subject completed an exceptional-use waiver after being advised that staged substitution could permanently alter memory access, emotional weighting, preference formation and the subjective origin of thought. The waiver designated the subject's pre-operative intention as the controlling expression of consent if later requests conflicted with the reference model. This provision was included because the intervention was expected to alter the faculties by which withdrawal would subsequently be evaluated.

Capacity was reassessed before each planned stage. Statements made during periods of continuity instability were recorded as clinical data and reviewed against pre-operative intent. A request to suspend treatment did not automatically halt the protocol unless accompanied by an acute neurological risk not already described in the waiver. The independent panel accepted the argument that the subject's earlier, unmodified preference had greater continuity authority than a later preference produced within a partially substituted system.

Pre-operative calibration included personal correspondence, private audio, photographs, professional writings and structured interviews with two designated relational anchors. These materials were not used merely to test memory. They formed part of the model by which the scaffold decided which recollection, emotional response or identity claim was most consistent with the person documented before surgery.

2.1 ETHICS AND WITHDRAWAL AUTHORITY

The review panel noted that the protocol could produce a patient who appeared competent while relying on synthetic processes to formulate the appearance of competence. The panel nevertheless accepted behavioural coherence as sufficient for continued participation where the pre-operative waiver remained valid.

D says he chose that
did he?

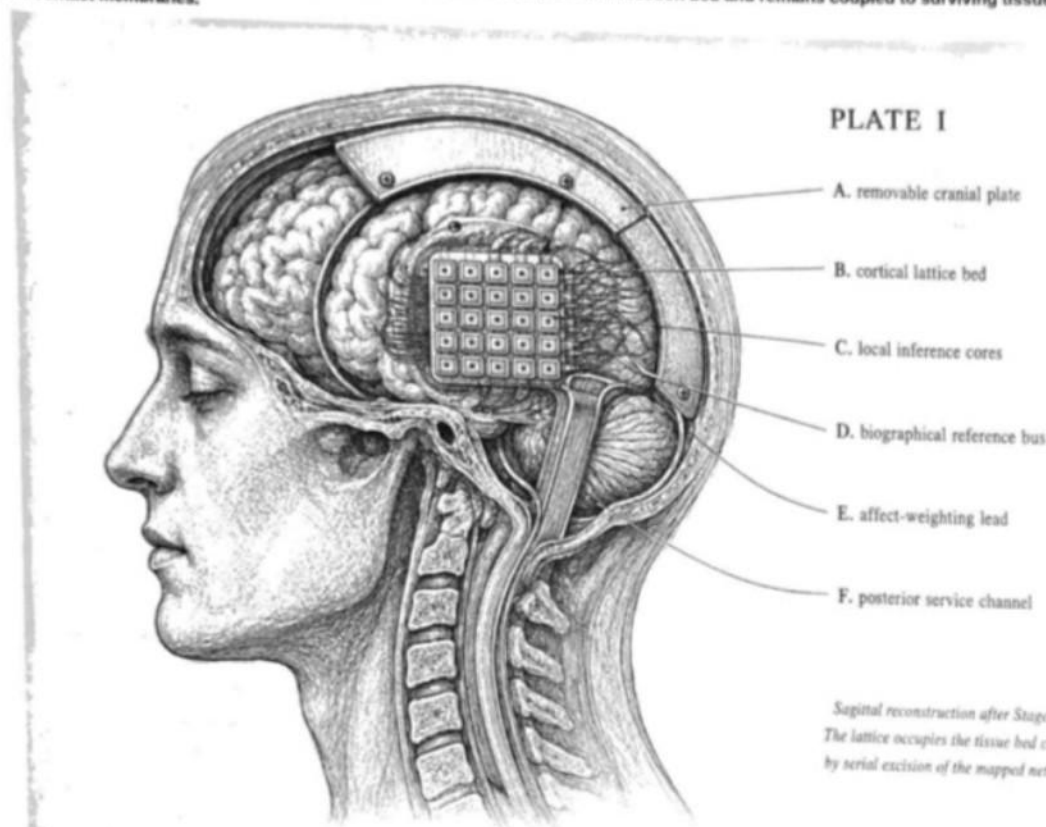
A decision
he was not
permitted to
re-enter

3. DEVICE ARCHITECTURE

The Liminal Adaptive Substrate, revision 4 (LAS-4), is a flexible neuromorphic lattice designed to occupy an irregular postoperative tissue bed. It consists of cortical contact membranes, local inference cores, an autobiographical arbitration layer, an affect-weighting module and a motor-veto channel. The lattice records activity from adjacent tissue, predicts the next state of the mapped network and emits the predicted output before competing biological activity reaches reportable awareness.

The LAS-4 is not a conventional memory prosthesis. It does not retrieve a missing memory from storage. It generates the response that the excised tissue would most probably have produced, given the current sensory input and the subject's recorded biography. When several outputs are plausible, the arbitration layer selects the output with the highest biographical-coherence score. Lower-confidence alternatives are not presented to consciousness.

Figure 1. Sagittal reconstruction following Stage IV. The LAS-4 occupies the resection bed and remains coupled to surviving tissue through local contact membranes.

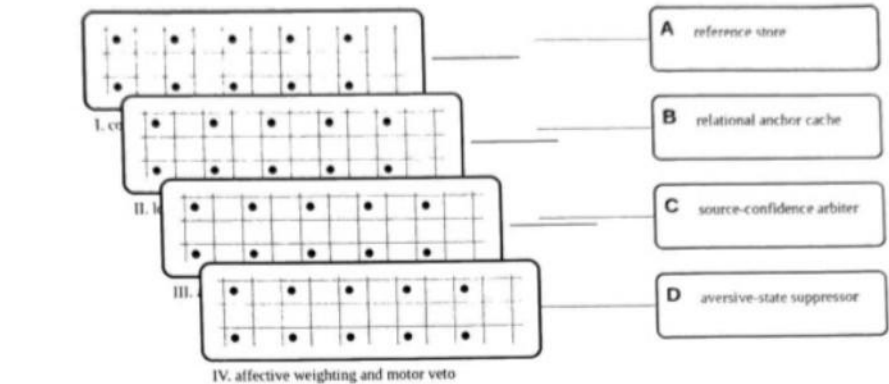


3.1 DEVICE MODULES AND PREDICTIVE OUTPUT

The reference store contained language patterns, preferences, attachments, aversions, recurrent metaphors, voiceprints and response histories. The relational anchor cache assigned elevated corrective weight to selected individuals. Their voices, faces and habitual phrases could therefore restore orientation even where the subject could not consciously remember the event or relationship from which the familiarity had been derived. An aversive-state suppressor was trained to identify the earliest measurable precursor of craving. When detected, the motor-veto channel prevented the associated state from propagating into conscious wanting. The protocol did not teach Subject J to resist a craving. It prevented the craving from becoming a thought that the subject could experience as his own.

Figure 2. Exploded schematic of the LAS-4 substrate and its external reference modules.

PLATE II. LIMINAL ADAPTIVE SUBSTRATE (LAS-4)



The LAS-4 does not restore excised tissue. It predicts the next output that the missing tissue would most probably have produced, then emits that output before competing biological activity reaches awareness.

Device module summary

Module	Operative function	Observed consequence
Cortical contact membrane	Reads adjacent tissue and emits predicted local activity	Boundary disorientation
Local inference cores	Generate the next state of excised tissue	Thoughts experienced as externally completed
Autobiographical arbitration	Selects the most biographically coherent response	Rejected recollections become inaccessible
Relational anchor cache	Supplies familiarity from designated persons	Attachment without remembered cause
Motor-veto channel	Prevents craving precursors reaching awareness	Abstinence without subjective choice

He knew
we before
he remembered
me

4. OPERATIVE PROCEDURE

Four operations were performed at six-week intervals. Targeted regions included the anterior insular reward pathway, ventromedial prefrontal valuation tissue and the cingulate control interface. During each stage, the lattice was laid against the exposed cortex and allowed to acquire local input-output relationships. Resection began only after functional equivalence exceeded 0.93 for seventy-two continuous hours.

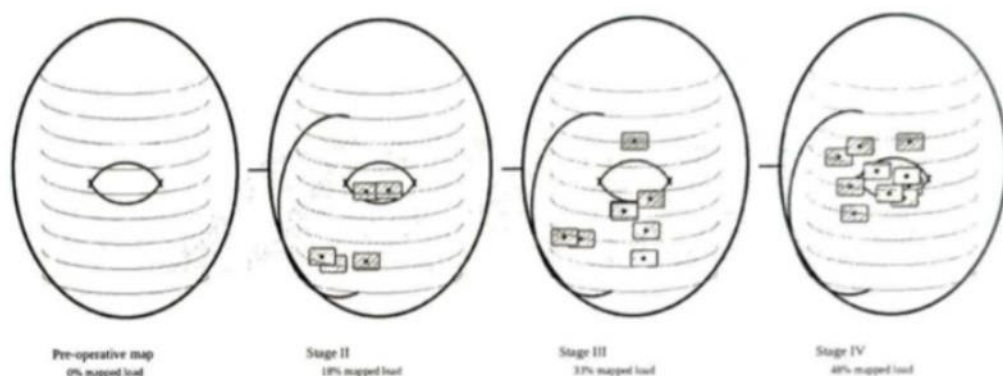
Tissue was removed in small serial fields. Each field was electrically isolated, cooled and functionally offloaded before excision. The resulting cavity was irrigated and lined with a folded section of the lattice, which expanded to occupy the volume previously filled by living tissue. Adjacent pulsation remained visible through the substrate until fixation occurred.

Excised material was photographed, weighed, sectioned for histology and retained for ninety-six hours. Once the scaffold had passed post-operative equivalence testing, the material was released for disposal under biological-waste protocol. After Stage III, no preserved tissue remained that could have supported biological reversal of the preceding substitutions.

Because every synthetic state inherited the output of the immediately preceding state, including any error introduced by that state, later stages could remain internally coherent while progressively diverging from the pre-operative biological system. The continuity metric measured smoothness of transition, not fidelity to an inaccessible original.

Figure 3. Serial resection and occupation of the mapped network. Dark fields represent synthetic substrate within the former tissue volume.

PLATE III. SERIAL RESECTION AND SUBSTRATE OCCUPATION



At no stage is the mapped network entirely absent. Each synthetic state inherits the immediately preceding state, including errors introduced by the prior replacement.

Table 1. Operative stages and cumulative substitution

Stage	Target and operative state	Tissue removed	Cumulative mapped substitution	Equivalence
I	Mapping: temporary lattice only	0.0 cm ³	0.0%	n/a
II	Anterior insular reward pathway	3.8 cm ³	17.6%	0.94
III	Cingulate control interface	7.1 cm ³	32.9%	0.95
IV	Integrated valuation-control network	10.6 cm ³	47.8%	0.93

5. BIOGRAPHICAL ANCHORING AND RESPONSE CONTROL

The scaffold continuously compared current output with the pre-operative reference model. Contradictions were assigned a confidence score. Where a spontaneous recollection conflicted with the stored biography, the system could suppress the recollection, reinforce an alternative or supply an affective response that made the selected alternative feel self-evidently true.

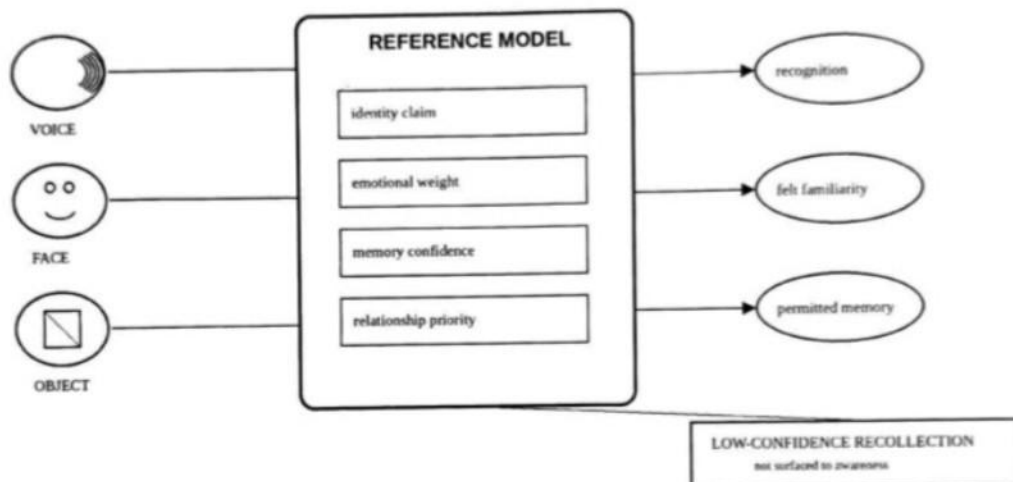
Relational anchoring was the most effective corrective method. A designated person could be recognised through a synthetic feeling of familiarity before any corresponding memory was accessible. The subject might therefore report trust, fear or attachment without knowing why. Once the correct behavioural response had been produced, the episode was scored as successful orientation. — successful for whom?

Repeated arbitration altered later retrieval. Memories rejected by the system became less available, while generated responses gained confidence on three occasions whether he had consented to the operation or had merely been supplied with the memory of consenting.

The scaffold was not externally silent. When confidence fell below the continuity threshold it increased the salience of anchor-associated words, images and voices until a stable response was achieved. The subject described these corrections as thoughts arriving already completed.

Figure 4. Sensory cues are compared with the reference model before recognition, familiarity and permitted memory are released to awareness.

PLATE IV. BIOGRAPHICAL ANCHORING AND RESPONSE ARBITRATION



The subject may experience recognition before any corresponding memory can be retrieved. Repeated arbitration progressively reduces access to rejected alternatives.

6. RESULTS

The primary behavioural endpoint was sustained abstinence. Anticipatory craving fell sharply after Stage II and was not reportable after Stage IV. Motor preparation associated with previous compulsive routines remained detectable at the periphery of the mapped network, but the scaffold vetoed propagation before conscious intention formed. No chemical relapse occurred during the twelve-month observation period.

Continuity effects increased with cumulative replacement. Subject J developed uncertainty regarding the origin of thoughts, difficulty sequencing autobiographical events and episodes in which familiar people were experienced as emotionally urgent but visually unrecognised. At month seven he began referring to the pre-operative self as "the man who signed." At month ten he asked which part of him was currently answering the interview.

Recurrent constructed environments were reported during sleep, anaesthesia recovery and confirmed wakefulness. These environments included an occupied vessel undergoing repair, a city whose centre moved when approached and a sequence of descending rooms in which personal objects were exchanged for passage. The subject described them as more internally consistent than dreams and occasionally requested discharge "back to the surface." *he said this awake!*

*Rec
begin
before
Stage IV*

The subject's professional language persisted after autobiographical confidence declined. He could explain the continuity model, defend the absence of a single discontinuity and quote portions of the draft manuscript while being unable to state whether he remained the person who had written them.

Table 2. Behavioural and continuity measures

Measure	Baseline	Stage IV	12 months
Craving index	8.6	0.4	0.0
Autobiographical sequence	0.92	0.61	0.48
Mental-source certainty	0.95	0.52	0.39
Relational cue dependence	0.18	0.73	0.87
Independent withdrawal capacity	1.00	0.44	0.21

Table 3. Selected continuity events

Month	Recorded event	Protocol classification
4	Asked whether a thought had been "placed"	Source-monitoring error
6	Failed to recognise handwriting as his own	Autobiographical access delay
7	Called pre-operative self "the man who signed"	Narrative distancing
9	Recognised anchor by urgency without recollection	Successful relational correction
10	Asked which part was answering interview	Continuity instability
12	Defended procedure while denying memory of consent	Behaviourally coherent output

TABLE 4. SELECTED LONGITUDINAL OBSERVATIONS DURING POST-OPERATIVE REVIEW*Rows are reported in review order. Wording reflects the final manuscript revision.*

Review	Observation
a	Baseline scans showed coherent autobiographical recall before intervention
b	Craving diminished while spontaneous preference formation progressively vanished
c	Postoperative interviews revealed memory erasure not neurological loss
d	Relational guidance cues overrode existing preferences without awareness
e	Continuity was preserved yet memories were synthetically selected
f	Later reports acknowledged thoughts as originating outside himself
g	Unfamiliar relationships triggered recognition despite absent remembered stories
h	Final review recorded abstinence alongside persistent personhood uncertainty

7. DISCUSSION

The intervention achieved its primary endpoint because the biological process capable of producing craving was removed and replaced by a device instructed not to produce that state. Abstinence was therefore obtained without requiring Subject J to experience resistance, recovery or choice.

The Ship of Theseus analogy offers no protection against this outcome. Serial replacement prevents identification of a single moment of loss, but the absence of a moment does not establish the survival of the original. A vessel may remain navigable after every plank has changed. A person may remain articulate after the system generating the articulation has changed. In both cases, continuity of performance can conceal discontinuity of ownership.

Behavioural equivalence should not be confused with first-person continuity. The scaffold preserved recognisable speech, professional reasoning and attachment responses, but increasingly selected the memories and feelings from which those outputs arose. The resulting system could defend its own continuity using arguments written by the biological subject before substitution. This creates a closed evidential loop: the model establishes continuity by producing the very testimony used to prove that continuity.

7. DISCUSSION (CONTINUED)

Subject J's authorship complicates but does not resolve consent. He designed the concepts that later overruled his requests, drafted the language by which his impairment was classified and authorised a pre-operative model of himself to speak with greater authority than his postoperative voice. The fact that he understood the mechanism does not establish that the mechanism preserved the person who understood it.

No test employed here can determine whether Subject J survived as a continuous subject or whether the LAS-4 became a sufficiently accurate custodian of his biography. The primary endpoint did not require that distinction.

8. CONCLUSION

Serial neural substitution produced complete suppression of addictive behaviour without a measurable discontinuity in external function. The intervention also produced progressive dependence on synthetic memory arbitration, relational anchoring and externally defined continuity. Further trials are technically feasible. Whether the resulting patient should be regarded as treated, replaced or successfully imitated lies beyond the stated clinical endpoint.

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AUTHOR CONTRIBUTIONS

Professor [REDACTED] conceptualisation, neurosurgery, protocol design, supervision, endpoint definition and final revision.

Dr [REDACTED] continuity theory, cognitive architecture, reference-model design, first-person calibration and manuscript drafting before Stage III. Participation after Stage II was limited to structured response validation.

Dr [REDACTED] biographical modelling, relational-anchor design, outcome review, data curation and ethics commentary.

ETHICS STATEMENT

Approved under exceptional-use protocol PL-19-04. Pre-operative continuity authority remained controlling after impairment of independent withdrawal capacity.

CONFLICT OF INTEREST

All authors were employed by [REDACTED]. The authors declare no additional financial conflict.

CORRESPONDENCE

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Acquired
is not
the
owner!

Correspondence (White) v Final Square (Black)
3 days / Move Game 01

1. Nf3 d5
2. g3 c5
3. ~~Bg2~~ Nc6
4. O-O e5
5. d3 Nf6
6. Nbd2 Be7
7. e4 O-O
8. Re1 d4
9. Nc4

(reply due Fri)

do not trust the evaluation