BRIEF IMMERSIVE TRAINING INTERVENTION TO FACILITATE SELF-KNOWLEDGE AND IDENTITY RECONSTRUCTION AFTER ACQUIRED BRAIN INJURY: EXPLORING FEASIBILITY WITH A CASE STUDY

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INTRODUCTION

People with Acquired Brain Injury (P-ABI) may experience a disruption in their personal identity and psychological continuity, as they struggle to reconcile their current self with their pre-injury identity [1].

Despite the emotional impact of ABI, **rehabilitation services** frequently prioritize physical recovery over psychological needs [2]. Furthermore, patients report a **lack of specialised psychological care** that holistically integrates cognitive, physical, and emotional aspects. Moreover, assessment tools for identity often fail to promote meaningful self-awareness or identity reconstruction from the patient's perspective.

Personal Construct Theory offers a constructive framework to explore individual identity and enable self-directed change [3]. Based on this foundation, we have developed an **Identity-Focused Immersive Training (IFIM)** using a Repertory Grid technique and Virtual Reality for a personalized exploration of the patient's views of self and others, with respect to the "self before the injury" and the "ideal self" [4,5].

If proven feasible, acceptable and effective, IFIM could **complement** current rehabilitation of P-ABI.

AIM

To explore the feasibility of an IFIM program to foster self-knowledge, identity reconstruction and psychological well-being in P-ABI.

METHODOLOGY

Participant. P01, male, 56-year-old, 10 years of education, train diriver pre-ABI, did not return to work post-ABI. Enrolled 16 months post-ABI due to a brain aneurysm.
His rehabilitation process included speech and language therapy, neuropsychological and pedagogical interventions. He reported moderate social and cognitive difficulties and moderate to severe emotional difficulties.

SELECTION OF INSTRUMENTS AND MATERIALS

- Patient Background form, Diagnostic Interview (ICD-11).
- **Psychological testing:** Depression, Anxiety, Stress Scales (DASS-21), Clinical Outcomes in Routine Evaluation-Short Form B (CORE-SFB), Rosenberg Self-Esteem Scale, Change Interview.
- **Neuropsychological testing:** Semantic and Letter Fluency, Stroop Word Color Test, Wechsler Adult Intelligence Scale WAIS-IV, Symbol Digit Test, Trail Making Test- A and B, Rey-Osterrieth Complex Figure, Hopkins Verbal Learning, Test de Barcelona (Commands), Boston Naming Test, Grooved Pegboard.

STUDY DESIGN AND INTERVENTION

The **study** consisted of four pre-post neuropsychological and psychological assessment sessions, seven **IFIM intervention sessions** and a 3-month follow-up session.

- **Session 1**: Problem Definition Form, exploring therapeutic goals (PDF), genogram construction to understand the patient's relational context, self-characterization as homework assignment.
- **Session 2**: Repertory Grid Technique (interview and rating task) to elicit P1's constructs (perceptions) about self and others.
- **Session 3 and 4:** Explore Your Meanings (EYME) + Virtual Reality personalized scenario (VR).
- **Session 5:** Two chair technique. A dialogue between the Current Self and Past Self.
- **Session 6:** Inclusion of his wife to provide relational insight and support. Use of metaphors to deepen the insight gained through the past sessions.
- **Session 7:** New administration of the Repertory Grid with EYME including VR exploration, and discussion of the changes achieved.

RESULTS

PSYCHOLOGICAL TESTS

Total scores on **DASS-21** showed a substantial pre-post intervention decrease from 20 (mild distress) to 4 (normal range): Depression (8 to 0), Anxiety (2 to 0), and Stress (10 to 4).
CORE scores remained in the normal range. **Self-esteem** showed a slight improvement (33 to 35, both in the high range).

REPERTORY GRID

1rst RGT	Mother	Father	Current	Pre-Injury	Couple	PNG	Ideal
Extroverted-Introverted	3	5	3	1	5	4	2
Kind – Selfish	2	3	4	1	1	5	1
Dependent Independent	6	6	4	7	6	5	6

Figure 1. Repertory Grid. Constructs elicited on left, elements above.

CHANGES IN THE MENTAL MAP

EYME 1: Most satisfying traits: extroverted, friendly, family-oriented, and organized. Positive self-concept and identification with others. However, the Current self is seen as dependent and aligned with other **undesirable** traits, placing it near the Persona Non Grata (PNG).Future self is also close to Current Self, reflecting a cautious stance toward future expectations.

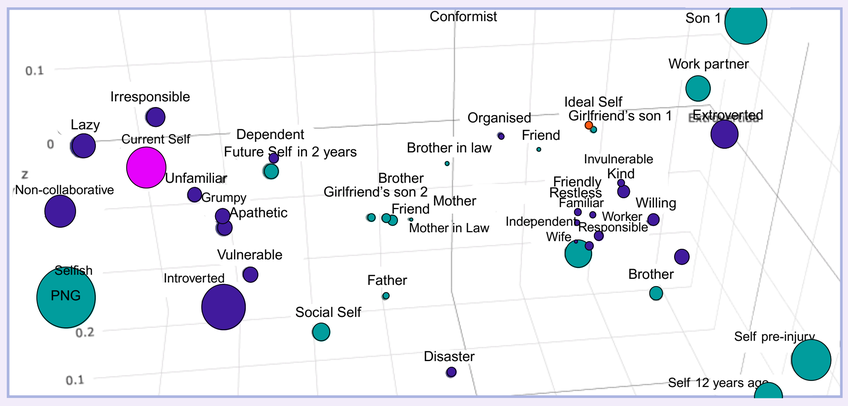

Figure 2. First results of the 3-Dimension environment (EYME) to explore P01. Green spheres represent self elements and significant others, and blue spheres represent constructs. Distance shows how similar or different they are, and size indicates their importance or impact on identity.

Additionally, there were no implicit dilemmas between constructs. However, areas of **self-disorientation emerged,** with uncertainty in 7 constructs (e.g., uncertainty between being kind or selfish), indicating an unclear sense of self.

EYME 2: Current Self was perceived more positively in these constructs: extroverted, willing to help, kind, conformist, happy and strong. Compared to EYME1, Current self appeared in a position closer to family members and more distant from the PNG (bigger size), as observed in Figure 3. An implicit dilemma appeared indicating that **dependent** (a characteristic very distant from the ideal self) was associated to **being conformist** (a desired characteristic, expressing acceptance of adversities).

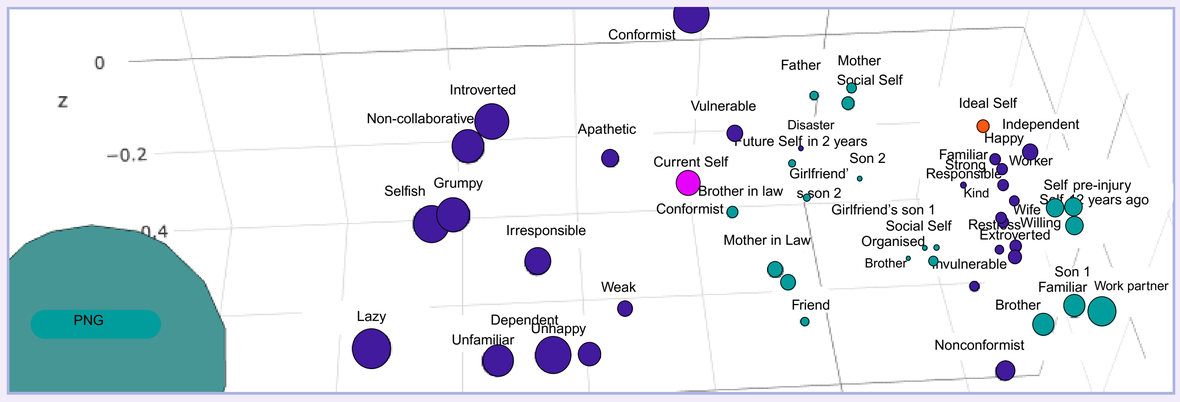

Figure 3. Second results of the 3-Dimension representation of the inner view constructed by P01. The constructs of strong–weak and happy–unhappy were added.

CHANGES PERCEIVED

(1) Getting closer to pre-injury self, (2) Recognizing personal progress, (3) Being more open and willing to participate, (4) Seeing goodness in others, (5) Enjoying the moment, Being happy, (6) Breaking taboos, (7) Reconciliation of inner parts.

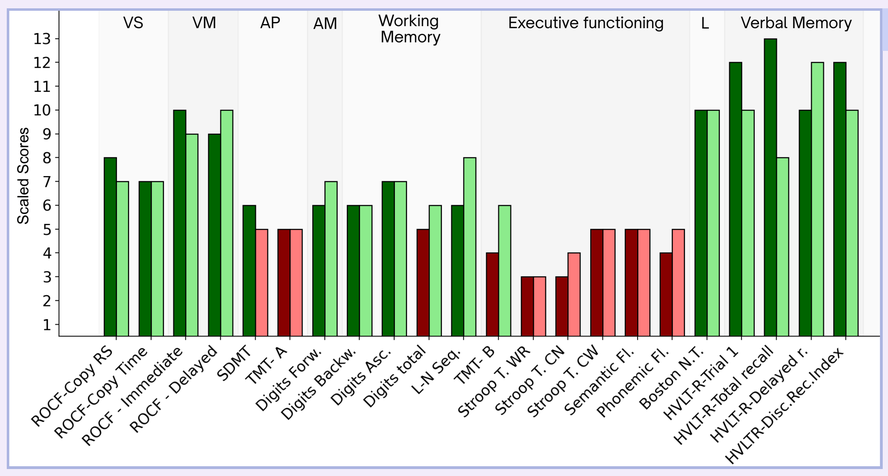

Figure 4. Cognitive scaled scores pre- (dark colors) and post- (lighter colors) intervention. Scores index deficits (red) and within normal range performance (green). Tests are grouped by cognitive domains: VS=Visuo-spatial, VM=Visual memory, AP=Attention/ processing speed, AM=Attention/ short-term memory, L= Language. Unavailable scaled scores for Stroop Interference, Test de Barcelona (commands) (both within normal range) and Groove Pegboard (impaired).

NEUROPSYCHOLOGICAL TESTS

Pre-post intervention performance showed minimal fluctuation or no variation except for tests tapping cognitive flexibility which require shifting across mental sets (Letter-Number Sequencing, TMT-B). These tests showed a substantial improvement (+2 scaled scores) as shown in Figure 4.

DISCUSSION AND CONCLUSION

- Our **preliminary findings** suggest a **reduction** after the intervention on **symptoms of depression** and **stress**, as indicated by DASS21**.**
- The **internal reconstruction** observed on P01 allows us to assess how the **perception of different self-representations** and significant others **shifts** from the beginning to the end of the intervention, highlighting the absence of areas of self-disorientation in the second EYME, which suggests a **clearer** and **more integrated sense of self.** Additionally, both the Current Self and Future Self moved closer to the Ideal Self and family members, reflecting **positive changes in self-perception** and relational positioning. **Through the intervention**, the sense of mourning for the lost self is explored in depth, along with P01 sense of a loss of power linked to their experience following the injury. This aligns with the observed trait of dependence as an unsatisfactory emerging characteristic. The **emotional expression, openness,** and deeper appreciation for life and progress were regarded as **relevant** and **important** outcomes by P01, who also considered them **unlikely** to have occurred without the intervention (IFIM).
- Notably, P1 showed a **consistent numerical improvement** in two neuropsychological tests drawing on **executive abilities (cognitive flexibility)** from **pre** to **post-intervention.** Although preliminary, the observation of secondary positive cognitive gains together with psychological improvements following our intervention deserves further research in larger sample studies.
- This **study claims** for a novel **constructivist therapeutic** approach to promote psychological **well-being** through identity reconstruction in P-ABI. Uniquely, it also explores how this process may positively **impact cognitive** functioning—an innovative perspective rarely assessed in therapeutic processes, yet potentially crucial for P-ABI. Additional cases are currently being studied to gather further insights into these improvements. **Future research** is considered to evaluate the effects of the intervention in P-ABI. Such studies can help to determine if the intervention can help to enhance the psychological well-being of P-ABI, promote a deeper understanding of their biopsychosocial context, and support their **active involvement in desired activities** in all areas of life.

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