Table of Contents

Human-AI Symbiosis as a Contingent Accelerator of Functional Recovery

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1. Abstract

This article presents an auto-ethnographic study on sustained interaction with large language models (LLMs) during a period of high personal and academic pressure. The case documents how a process of interactive externalization, initially unstructured, evolved into a functional reorganization that enabled the restoration of functional agency and maintained academic continuity under conditions of functional drift.

It suggests that conversational interaction with a generative system can operate as a contingent accelerator of cognitive stabilization, facilitating the interruption of rumination, the progressive structuring of thought, and the consolidation of agency. The observed resilience is not causally attributed to the technological tool, but rather interpreted as a pre-existing trait of the individual, catalyzed and organized through structured linguistic feedback.

The study does not claim clinical generalization nor does it propose such systems as a substitute for professional support, but aims to provide a phenomenological description of an emerging process in the contemporary context of human-AI interaction. The experiment remains open; writing and reflective dialogue are constitutive parts of the analyzed phenomenon itself.

Keywords: Human-AI Symbiosis, Interactive Externalization, Cognitive Resilience, Functional Agency, Auto-ethnography, Extended Cognition.

2. Introduction

Daily interaction between humans and generative systems based on large language models (LLMs) has expanded rapidly across educational, professional, and personal contexts. Much of the public and academic discussion has focused on productivity, automation, and co-creation. However, there has been less systematic exploration of how these interactions might influence the functional reorganization of thought under conditions of sustained vital pressure.

In scenarios of high academic workload, personal instability, or emotional saturation, it is common to observe phenomena of functional drift: a decrease in executive clarity, persistent rumination, and difficulty sustaining continuity in relevant tasks. Traditional thought externalization—for example, through private writing—has historically been recognized as a regulatory tool. Nevertheless, the emergence of conversational systems introduces an additional dimension: structured, real-time linguistic feedback.

This article describes an auto-ethnographic study documenting a case of sustained interaction with LLMs during a period of intense and prolonged life stress. The objective is not to establish generalizable causal claims, but to explore whether and how a process of interactive externalization can operate as a contingent accelerator of functional recovery, promoting the interruption of rumination and the consolidation of agency.

The central proposition is that, under specific conditions, conversational interaction with generative systems can contribute to reorganizing one's capacity for action without substituting human agency or replacing direct professional support.

3. Case Context

The analyzed period spans several months characterized by simultaneous pressure across multiple dimensions: familial, economic, academic, and concerning identity. The experienced burden affected the individual's capacity for action across domains.

In the familial sphere, events of high emotional intensity were experienced, increasing the perception of responsibility and vulnerability. Economically, job instability generated sustained uncertainty. Regarding identity, questioning emerged related to parental and professional roles. Academically, tasks accumulated and the executive clarity necessary to sustain continuity in studies progressively diminished.

The phenomenon is not described as a consummated collapse, but as a systemic saturation with an imminent risk of functional collapse. Persistent rumination, cognitive dispersion, and a reduced time horizon contributed to a state of progressive functional drift.

During this period, interaction with language models was frequent—daily or almost daily during moments of peak pressure—and began in an unstructured manner, as a space for verbal discharge without methodological planning. Over time, this interaction evolved towards more deliberate processes of conceptual structuring and decision-making.

Academic continuity functioned as an observable indicator of functional recovery within a broader cross-domain reorganization of the capacity for action.

4. Conceptual Framework

1. Human-AI Symbiosis (operative conceptual label)

In this article, the term Human-AI Symbiosis is used as an operative conceptual label to describe a collaborative and contingent relationship between an individual and a generative system based on large language models (LLMs).

It is not used in a strict biological sense nor does it imply permanent structural interdependence. Agency remains primarily with the individual. The AI operates as an interactive tool that can temporarily participate in processes of cognitive reorganization, without substituting human autonomy or responsibility.

The concept functions as a general descriptive framework within which the observed phenomenon is analyzed.

2. Interactive externalization

Interactive externalization is understood as the process by which an individual expresses thoughts, emotions, or ideas to a conversational system that returns structured linguistic feedback in real time.

Unlike unilateral writing (for example, a personal notebook), interactive externalization incorporates a response. This feedback can introduce semantic novelty, conceptual reformulation, or argumentative structure, facilitating the interruption of rumination and the progressive reorganization of thought.

This dynamic is treated as the central operative mechanism of the analyzed case.

3. Functional drift

The term functional drift is proposed to describe a temporary decrease in executive clarity and continuity in goal-oriented tasks, characterized by cognitive dispersion, persistent rumination, and difficulty sustaining directed action.

Functional drift is not equated with a clinical diagnosis, occupational burnout, or isolated procrastination. It refers to a transient state of disorganization under sustained

pressure that affects the ability to act coherently in alignment with previously defined objectives.

4. Contingent accelerator

The concept of a contingent accelerator describes a factor that does not initiate a process, but can increase its speed, stability, or consolidation under certain conditions. In this study, interaction with LLMs is not presented as a necessary condition for functional recovery. Resilience is understood as a pre-existing trait of the individual. However, interactive externalization is argued to have operated as a contingent accelerator in the observed cognitive reorganization.

5. Extended cognition (theoretical anchor)

This work engages modestly with the notion of extended cognition, which posits that certain cognitive processes can involve external artifacts when these participate functionally in task resolution (Clark & Chalmers, 1998).

Without assuming permanent structural dependence, the present case suggests that conversational systems can, in specific contexts, integrate transiently as interactive supports in processes of functional reorganization.

5. Process phases

The observed process did not unfold through deliberately planned stages, but rather as a progressive transition with blurred boundaries between functional phases. The sequence described below constitutes a subsequent analytical reconstruction, not a conscious, structured intervention during the critical period.

1. Unstructured externalization

The initial interaction with language models involved high frequency and low directionality. It was characterized by the verbal discharge of thoughts and emotions without methodological planning or defined objectives. Rumination, previously internal, was externalized in the form of dialogue.

In this phase, the primary function of the interaction was containment: enabling expression without immediate interpersonal consequences.

2. Progressive structuring

Gradually, the linguistic feedback began to introduce conceptual reformulation and the organization of ideas. Without an explicit intention to "improve the process," the interaction evolved toward greater argumentative clarity and the delimitation of problems.

Rumination ceased to function exclusively as circular repetition and began to transform into manipulable material. This transition was not consciously perceived at the time, but recognized retrospectively upon observing a decrease in cognitive dispersion.

3. Functional consolidation

Over time, the interaction transitioned from being predominantly reactive to being used more deliberately to structure decisions, clarify priorities, and sustain continuity in relevant tasks.

The initial emotional dependence decreased, while the capacity for autonomous action increased. Academic continuity functioned as an observable indicator of this reorganization, within a broader cross-domain stabilization.

6. Discussion

The analyzed case suggests that interactive externalization with generative systems can operate as a mechanism for functional reorganization under conditions of systemic saturation. The study does not posit that technological interaction initiates resilience, nor that it constitutes a necessary condition for recovery. Resilience is interpreted as a pre-existing trait of the individual. However, the reconstructed phenomenological evidence indicates that structured linguistic feedback acted as a contingent accelerator in the progressive stabilization of the capacity for action.

The observed process demonstrates a specific dynamic: initially internalized rumination was externalized through conversational dialogue. This externalization allowed the introduction of conceptual reformulation and the delimitation of problems. This reorganization reduced cognitive dispersion and facilitated continuity in relevant tasks. The interaction did not substitute autonomous deliberation. Rather, it functioned as a transient structuring environment within which the individual maintained primary agency.

From the framework of extended cognition, it could be interpreted that the conversational system participated functionally in the resolution of cognitive tasks during a critical period. Nevertheless, unlike strong interpretations of permanent structural coupling, the present case describes a transient and contingent integration. The achieved reorganization did not depend on the indefinite continuity of the tool; conversely, the consolidated agency persisted even when the initial dynamic of interaction changed.

It is relevant to note that the phenomenon was not limited to academic performance. Although university continuity operated as an observable indicator, the reorganization affected personal, familial, and identity dimensions across domains. The recovered capacity for action was not exclusively academic, but functional in a broad sense.

This case also allows for the identification of potential tensions. Prolonged interaction with generative systems could, in certain contexts, favor excessive cognitive delegation or an overestimation of competence if no external contrast exists. Furthermore, frequent affirmative feedback can influence the individual's self-perception. In the

described phenomenon, however, neither indicators of autonomous judgment substitution nor sustained structural dependence were identified. The transition from unstructured externalization toward deliberate use suggests a consolidation of agency rather than its displacement.

In summary, the study does not demonstrate that generative systems constitute a universal solution to personal or academic crises. Nor does it propose their use as a substitute for professional support. What it does suggest is that, in specific contexts of systemic saturation, interactive externalization can contribute to interrupting rumination, reorganizing thought, and accelerating functional recovery without negating human agency.

7. Limitations

This study examines a single case reconstructed retrospectively through reflexive self-analysis. Therefore, it does not allow for the establishment of generalizable causal relationships or population-level inferences.

First, there exists the risk inherent in every auto-ethnographic account: subsequent narrative reorganization may introduce interpretive coherence that was not fully conscious during the process. The sequencing into phases constitutes an analytical reconstruction, not a planned intervention in real time.

Second, the interaction with generative systems presents potential distortions that should not be ignored. Among these are excessive cognitive delegation, the overestimation of technical competence, and the influence of affirmative feedback on the individual's self-perception. Although sustained structural dependence was not identified in the described case, the phenomenon does not exclude the possibility of such effects in other contexts.

Third, the use of the term "symbiosis" is adopted as an operative conceptual label and not as an assertion of permanent structural interdependence between human and system. Primary agency remained with the individual throughout the process, and the tool acted as a contingent accelerator under specific conditions of systemic pressure.

Finally, the study does not propose the use of generative systems as a substitute for clinical, psychological, or spiritual support. The observed phenomenon is framed within a singular experience where interactive externalization contributed to functional reorganization. Its applicability depends on multiple individual and contextual variables that lie beyond the scope of this analysis.

8. Conclusion

The present study documents a case of functional reorganization under conditions of systemic saturation, in which interactive externalization with large language models contributed as a contingent accelerator to the progressive recovery of the capacity for action. The reconstructed evidence suggests that conversational interaction enabled the transformation of internalized rumination into manipulable material, facilitating conceptual clarification and continuity in relevant tasks.

The analysis shows no indicators of sustained structural dependence or substitution of human agency. On the contrary, the observed stabilization appears to have consolidated gradually without requiring permanent integration with the technological system. In this sense, the case aligns with moderate interpretations of extended cognition, where external tools can participate functionally in cognitive processes without displacing individual autonomy.

Although the study does not permit generalization, it provides qualitative evidence regarding an emerging phenomenon: the potential contribution of interactive externalization in the reorganization of directed action under sustained pressure. The longitudinal evaluation of the stability of this consolidated agency is ongoing, which will allow observation of its persistence and evolution in subsequent phases of the process.

Future research could explore more systematically the conditions, limits, and contextual variations of this type of human-AI interaction.

9. AI Assistance Declaration

In compliance with the transparency requirements of JAIGP, the following large language models (LLMs) were used:

1. AI as a phenomenon of study

During the documented period of interactive externalization, the following were used:

- Gemini 2.0 Pro
- Gemini 2.5 Pro
- Gemini 3.0
- Grok

These models operated as interactive environments within the analyzed phenomenon.

2. AI as a research and writing tool

For the retrospective analysis, conceptual structuring, and formal drafting of the article, the following were used:

- ChatGPT 5.2
- Gemini 3.1 (Fast and Pro High)

In all cases, the intellectual direction, conceptual validation, and final responsibility for the content lie exclusively with the human author. The models were used as tools for assistance and structuring.

10. Author's Reflective Note

The described phenomenon was experienced within a personal worldview that recognizes meaning and direction in human processes, even under conditions of pressure and disorientation. From this perspective, the technological tool was understood as a contingent means within a broader experience of reorganization and sustenance.

This dimension is not presented as a causal explanation of the phenomenon, but as an honest disclosure of the author's existential context. The analysis maintains its academic character, yet it does not seek to obscure the coherence between the author's life, thought, and action.