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Semantic Dementia: A Neuropsychological Case Study

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ABSTRACT

Semantic dementia is a neurodegenerative syndrome within the frontotemporal dementia spectrum, currently classified as the semantic variant of Primary Progressive Aphasia (svPPA). It is characterized by a progressive deterioration of semantic memory, with severe anomia, impaired single-word comprehension, and loss of conceptual knowledge despite relatively preserved fluency, grammar, and articulation in the early stages. The present thesis describes a clinical case observed during a neuropsychological internship at Cooperativa Sociale ONLUS Nuovo Solco, within a community-based dementia care setting, under the supervision of a clinical neuropsychologist. The work reconstructs the patient's clinical course from the initial concerns and the first neuropsychological evaluation in 2022, through participation in a group cognitive training program done at the dementia care center by the neuropsychologist, to the subsequent behavioral changes and the more detailed neuropsychological re-evaluation conducted in 2025. Particular attention is given to the progressive semantic impairment, ecological manifestations in daily life, and the adaptation of cognitive stimulation toward semantic processing and functional communication. The case highlights the importance of integrating standardized neuropsychological assessment with behavioral observation, caregiver information, and individualized intervention planning.

Keywords: Semantic dementia, FTD, Neuropsychology, Cognitive training, Cognitive assessment

CHAPTER 1.
INTRODUCTION

1.1 Degenerative dementias, memory systems, and semantic memory

Degenerative dementias comprise a heterogeneous group of neurocognitive disorders characterized by progressive decline in cognitive functioning, with distinct clinical, neuropsychological, and neuroanatomical profiles. Alzheimer's disease, dementia with Lewy bodies, Parkinson's disease dementia, Huntington's disease, and frontotemporal dementia are among the major diagnostic categories. Although these disorders may all affect memory during their course, they differ in the cognitive system that is initially and most prominently compromised.

Alzheimer's disease is classically associated with early episodic memory impairment, reflecting the involvement of medial temporal lobe structures and a wider temporo-limbic and neocortical network. As the disease progresses, semantic memory and other cognitive domains may also become affected (Ravdin & Katzen, 2019). In contrast, some frontotemporal dementia syndromes primarily involve language, conceptual knowledge, behavior, and executive functioning from the early phases.

Semantic memory is the system that supports knowledge about words, objects, people, categories, and facts. It allows individuals to recognize objects, understand word meanings, retrieve conceptual information, and organize knowledge about the world. When semantic memory is impaired, patients may present with anomia, impaired comprehension, reduced semantic fluency, difficulty recognizing objects or their functions, and loss of specific knowledge within semantic categories (Hodges et al., 1992; Patterson et al., 2007).

The degradation of semantic knowledge is usually progressive and graded. Initially, patients may lose specific or low-frequency concepts while retaining more familiar or prototypical information. As the disease advances, representations become increasingly impoverished, leading to reduced specificity in speech and behavior. Category-specific impairments have been described, but in neurodegenerative semantic dementia the impairment generally reflects a progressive degradation of amodal conceptual representations rather than a deficit restricted to one sensory modality or output system (Bozeat et al., 2000; Lambon Ralph et al., 2017).

1.2 Frontotemporal dementia and Primary Progressive Aphasia

Frontotemporal dementia (FTD) is a neurodegenerative spectrum characterized by predominant involvement of frontal and/or temporal networks. Clinically, FTD is commonly divided into a behavioral variant, in which changes in personality, social conduct, disinhibition, apathy, or compulsive behaviors are prominent, and language-led variants grouped under the label of Primary Progressive Aphasia (PPA) (Rascovsky et al., 2011; Gorno-Tempini et al., 2011).

Primary Progressive Aphasia is defined by an insidious onset and gradual progression of language impairment, with language being the principal deficit during the initial phase of the disease. Other cognitive domains may be relatively preserved at onset, although broader cognitive and behavioral changes can emerge as the neurodegenerative process progresses (Mesulam, 2001; Gorno-Tempini et al., 2011).

The international consensus classification distinguishes three major PPA variants: nonfluent/agrammatic, semantic, and logopenic. These variants differ in their linguistic profile, neuroanatomical distribution, and likely neuropathological associations. The semantic variant is characterized by impaired naming and single-word comprehension, while fluency, repetition, grammar, and motor speech are relatively preserved in the early stages (Gorno-Tempini et al., 2011).

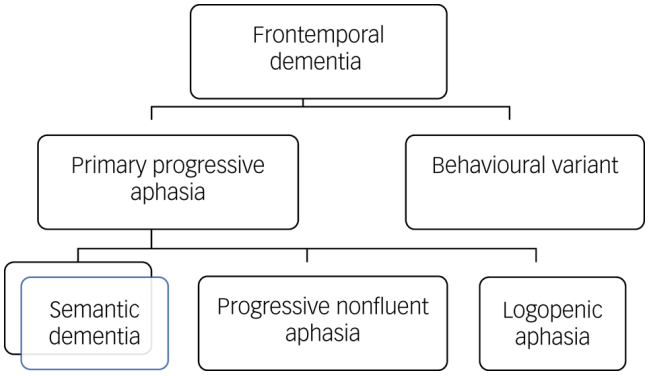

Fig. 1 *The subtypes of frontotemporal dementia*

1.3 Semantic dementia (semantic variant Primary Progressive Aphasia)

Semantic dementia, also referred to as semantic variant Primary Progressive Aphasia (svPPA), is characterized by a progressive and selective breakdown of semantic knowledge. The syndrome was classically described as progressive fluent aphasia with temporal lobe atrophy, marked by fluent speech, severe anomia, reduced vocabulary, and prominent impairment of word comprehension (Hodges et al., 1992).

In the early phase, patients typically show word-finding difficulties, impaired confrontation naming, and difficulty understanding low-frequency words. Speech remains fluent, grammatically correct, and well articulated, but it becomes increasingly empty, vague, and circumlocutory. Patients often use generic expressions or superordinate labels, for example using broad category terms instead of specific item names (Hodges et al., 1992; Knibb & Hodges, 2005).

As the disease progresses, the deficit extends beyond lexical retrieval. Patients lose knowledge about objects, their functions, their perceptual and associative features, and the relationships between concepts. Non-verbal semantic impairment is therefore a core feature of the disorder and not merely a consequence of language output problems (Bozeat et al., 2000). Associated features may include surface dyslexia or dysgraphia, impaired person knowledge, visual associative agnosia, and behavioral changes, especially when the neurodegenerative process extends beyond anterior temporal regions (Hodges & Patterson, 2007; McCarthy & Warrington, 2016).

The variants of FTD all involve a frontotemporal network-based, prion-like spread of a misfolded protein. In semantic dementia, most cases are caused by a mutant version of a transcriptional repressor called Tar DNA Bind Protein-43 (TDP-43) Type C. This differs from behavioural variant FTD (bvFTD), which has less predictable pathology as it can be caused by mutant TDP-43, but also by tau and fused in sarcoma (FUS) protein (in order of decreasing pathological frequency) (Rohrer JD et al., 2010).

1.4 Neuroanatomical and behavioral correlates of semantic impairment

From a neuroanatomical perspective, svPPA is most consistently associated with atrophy of the anterior temporal lobes, often asymmetrically greater in the left hemisphere during the language-led phase. The anterior temporal lobe has been interpreted as a crucial hub for integrating modality-specific information into coherent conceptual representations (Lambon Ralph et al., 2017).

Neuroimaging studies of frontotemporal dementia show that degeneration may also involve frontal regions, the insula, cingulate cortex, basal ganglia, and thalamus, depending on clinical phenotype and disease stage (Gordon et al., 2016). This broader network involvement helps explain why patients with svPPA may later present not only with semantic language impairment but also with executive, behavioral, emotional, and functional difficulties.

Behavioral manifestations may include irritability, reduced flexibility, changes in food preferences, compulsive or stereotyped behaviors, reduced social cognition, and difficulty

adapting actions to context. In clinical practice, ecological observation is therefore essential because standardized tests alone may underestimate the impact of semantic degradation on everyday functioning, safety, and interpersonal communication.

1.5 Cognitive stimulation and neuropsychological intervention in dementia

Non-pharmacological interventions are an important component of dementia care. In the literature, cognitive training, cognitive training, and cognitive stimulation are often distinguished. Cognitive training is usually individualized and goal-oriented, cognitive training is structured practice on specific cognitive tasks, and cognitive stimulation provides broad engagement of cognitive and social processes through meaningful activities (Clare & Woods, 2004).

In dementia, cognitive stimulation has shown small but clinically relevant benefits for global cognition and quality of life, especially when delivered through structured, enjoyable, and socially meaningful activities (Woods et al., 2012; Aguirre et al., 2013). In progressive aphasia and semantic dementia, intervention cannot be expected to reverse neurodegeneration, but it may support residual abilities, promote compensatory strategies, reduce frustration, and help caregivers adapt communication and environmental demands to the patient's current level of functioning.

For patients with semantic dementia, intervention is often most useful when it focuses on ecologically meaningful material: familiar objects, personally relevant words, routines, categories used in daily life, and communication strategies. The clinical aim is therefore not only test improvement, but also maintenance of functional communication, safety, autonomy, and relational participation for as long as possible.

CHAPTER 2.
CASE PRESENTATION

2.1 Study context and case description

The present work is a single-case clinical study based on neuropsychological observation, standardized assessment, and cognitive training conducted within a clinical internship at Cooperativa Sociale ONLUS Nuovo Solco, in Monza, Italy.
From September 2025 to February 2026, corresponding to the period of my clinical internship, I participated in the neuropsychological assessment and cognitive training activities of the patient under the supervision of the clinical neuropsychologist. Following the completion of the internship, I continued to attend the clinical setting on a voluntary basis to support thesis development and maintain continuity of clinical observation.
All personal and identifying information was anonymized to ensure confidentiality and protect patient privacy. Clinical material was collected within supervised neuropsychological practice and is used exclusively for academic and educational purposes. Informed consent for the use of anonymized clinical data was obtained. The study was conducted in accordance with ethical principles governing confidentiality, respect for persons, and the responsible handling of clinical information in healthcare and educational contexts.
The study adopts a descriptive and exploratory design aimed at reconstructing the patient's neuropsychological profile and its clinical evolution over time. The patient is a 75-year-old right-handed Italian woman with 8 years of formal education. In 2022, she underwent neurological and neuropsychological evaluation due to emerging cognitive and language difficulties. Over time, the clinical picture became increasingly consistent with a progressive neurodegenerative condition primarily affecting semantic knowledge and everyday functioning.

Variable	**Clinical Information**
Age	75 years
Gender	Female
Nationality	Italian
Handedness	Right-handed
Education	8 years of formal education

Table 1. *patient's clinical information*

2.2 Clinical history and onset

The first concerns emerged in 2022 when she was referred for neuropsychological evaluation and then advised to undertake cognitive training to improve memory abilities and functional difficulties. Participation in the cognitive training program was encouraged primarily by her daughter and by the neurologist who initially evaluated her, despite the patient not being fully aware of the extent of her cognitive difficulties and not recognizing them as a significant problem affecting her daily life and functioning.

Although the initial reason for referral was described in terms of memory decline, early clinical observation already suggested a more complex profile. During group activities, the patient showed rapid loss of task instructions, difficulty maintaining the goal of exercises, and reduced flexibility in social interaction. Difficulties in interpreting humour, irritability, and reduced adaptation to interpersonal context were also observed. These early features were clinically relevant because they suggested involvement of executive and social-cognitive processes in addition to subjective memory complaints.

2.3 First Neuropsychological Evaluation (2022)

In October 2022, the patient underwent a neuropsychological evaluation at the center in order to initiate group-based cognitive training. The assessment was conducted within a clinical setting and aimed at identifying the patient's cognitive profile and to define an appropriate intervention plan. The original working draft reported the battery but did not include all corrected scores (see Table 2).

Test	Assessment 1 (2022)	
	CS	CE
Global cognitive functioning		
Montreal Cognitive Assessment (Nasreddine et al., 2005)	21	
Logical Reasoning		
Raven's Coloured Progressive Matrices (Basso et al. 1987)	13.5	0
Attention		
Attentive Matrices (Spinnler & Tognoni, 1987)	37.5	2
Trail Making Test (TMT) (Reitan, 1955)		
Part A	75	1
Part B	91	4
Part B-A	18	4
Language		
Phonemic Fluency (Novelli et al., 1986)	53	4
Semantic Fluency (Novelli et al., 1986)	30	2
Memory		
Test delle 15 parole di Rey (Rey, 1941)		
Immediate Recall	24.9	0
Delayed Recall	2.6	0
Short Story Test (Carlesimo et al., 1986)		
Immediate recall	3.7	1
Delayed recall	0.7	0
Oblio	3	0
Visual-perceptual abilities		
Rey–Osterrieth Complex Figure (Osterrieth, 1944)	28.2	0

Table 2. *Neuropsychological battery administered in 2022. CS = corrected score; CE = equivalent score; n.a. = score not available in the working draft.*

The first assessment was used primarily to orient the intervention. In line with the clinical observations, gathered during this baseline evaluation, the patient was advised to participate in cognitive training. The intervention program was structured specifically on the basis of these initial diagnostic findings to ensure it addressed her pre-existing deficits. It was initially delivered in a group format because the patient was still able to engage in structured sessions with external support and because the group setting allowed targeted stimulation of the identified cognitive, communicative, and social components.

2.4 Cognitive Training

The cognitive training program consisted of multiple exercises targeting different cognitive domains, including problem-solving, inhibition, go/no-go tasks, social cognition, autobiographical memory, perceptual abilities, categorization, and activities related to everyday situations. Each session combined tasks specifically designed to stimulate executive functions with activities aimed at supporting broader cognitive processes.

The patient initially participated in the ExeDO training program, which comprised 50 sessions delivered over a six-month period, with sessions held twice per week and lasting approximately one hour each. The program was designed to support general cognitive functioning, with a particular focus on executive functions, attention, memory, social cognition, and adaptive behavior. The intervention was grounded in the Executive Network Stimulation Model (ENSM), a theoretical framework that emphasizes the central role of executive functions in cognitive organization, task monitoring, strategic behavior, and everyday adaptive functioning (Rizzi et al., in prep). From this perspective, executive processes are considered a core component underlying the coordination of other cognitive domains, and their stimulation is intended to support both domain-specific abilities and global cognitive functioning.

After completing the initial six-month program, the patient was included in a second group intervention beginning in October 2023, due to the persistence and progressive worsening of memory difficulties. From October 2024 onward, the clinical neuropsychologist introduced individual cognitive stimulation sessions, conducted once per week and lasting one hour each, in order to provide a more personalized intervention adapted to the patient's evolving cognitive profile.

2.5 Neuropsychological Re-evaluation (2025)

In 2025, due to progressive worsening observed during cognitive training, particularly involving semantic processing, a more in-depth neuropsychological evaluation was deemed necessary. The aim was to better characterize the patient's cognitive and functional profile, provide tailored recommendations to the family, optimize the domestic environment, and consider the possible introduction of additional daytime support.

The decision was also influenced by safety concerns. The patient was observed arriving at the center up to two hours earlier than scheduled and independently wandering in the surrounding area until the appointment time, even under adverse weather conditions and often dressed inadequately for the season. These behaviors suggested reduced temporal orientation, reduced contextual judgment, and increased vulnerability in daily life.

Test	**Assessment 2 (2025)**	
	CS	CE
Global cognitive functioning		
Mini Mental State Examination (Folstein et al., 1975)	14.8	
Montreal Cognitive Assessment (Nasreddine et al., 2005)	9	
Logical reasoning		
Raven's Colored Progressive Matrices (Basso et al., 1987)	12	0
Language		
Phonemic Fluency (Novelli et al., 1986)	28	3
Semantic Fluency (Novelli et al., 1986)	25	1
Boston Naming Test (Caplan et al., 1983)	17	
Boston Naming Test (15 items) (Mack et al., 1992)	2	
Verbal Judgement Test (Spinnler & Tognoni, 1987)	33.50	1
Memory		
Digit Span Forward (Spinnler & Tognoni, 1987)	5.49	3
Corsi Span Forward (Spinnler & Tognoni, 1987)	4.65	3
Rey Auditory Verbal Learning test (RAVLT) - Immediate recall (Carlesimo et al., 1996)	17.9	0
Rey 15-word recognition test (Rey, 1941)	13.6	4

Short Story Test (Novelli et al., 1986)	2	0
Free and cued selective reminding test (Grober & Buschke, 1987)		
IFR	7.73	0
DFR	2.01	0
Rey Auditory Verbal Learning Test (Rey, 1958)		
Immediate Recall	17.9	0
Delayed recall	2.6	0
CaGI comprehension (Catricalà et al., 2013)	42.04	
CaGI naming (Catricalà et al., 2013)	28	
Pyramids and Palm Trees Test (Howard & Patterson, 1992)		
Verbal	42.61	1
Visual	25.84	0
Semantic Incidental Memory test for adults (Novelli et al., 1986)	5	
Naming from verbal description test (Novelli et al., 1986)	27	0
Visual-perceptual abilities		
Clock Drawing Test (Caffarra et al., 2011)	7	1
Rey–Osterrieth Complex Figure (Osterrieth, 1944)		
Immediate Recall	9.52	0
Delayed Recall	0	0
Free clock drawing (Rouleau et al., 1992)	7	0
Executive functions		
Stroop test (Stroop, 1935)		
Interference time	9.75	4
Interference errors	23.25	0
Frontal Assessment Battery (FAB; Apollonio et al., 2005)	11.9	0
Cognitive Estimation Test (Della Sala et al., 2003)	25.2	0
Numerical cognition		
Arithmetic judgement test (Spinnler & Tognoni, 1987)	6.25	0

Table 3. *Neuropsychological assessment in 2025. CS = corrected score; CE = equivalent score.*

The 2025 neuropsychological profile showed marked impairment of global cognitive functioning. Attention, executive functioning, language, semantic memory, episodic memory, visuoconstructive abilities, non-verbal reasoning, and numerical cognition were compromised. The pattern was not limited to word retrieval; it involved degradation of conceptual knowledge across verbal and non-verbal tasks.

Language was characterized by fluent but semantically impoverished spontaneous speech, severe anomia, impaired word comprehension, circumlocutions, semantic vagueness, and overgeneralization. Semantic fluency was more impaired than phonemic fluency, supporting predominant disruption of the semantic system. Naming and comprehension deficits were consistent with degradation of lexical-semantic representations rather than a purely executive retrieval problem. Qualitative analysis of naming performance further supported semantic deterioration. For example, when presented with a toothbrush, the patient correctly described its function ("used to clean teeth") but incorrectly named it a toothpick. In another instance, a beaver was identified as a dog. On several occasions, she stated that she had seen an object many times before but could not remember its name, suggesting degradation of semantic representations in addition to lexical retrieval difficulties.

Episodic memory performance was also impaired. However, verbal memory deficits should be interpreted cautiously because severe semantic and lexical impairment can interfere with encoding, organization, and retrieval of verbal material. In this patient, memory impairment was therefore likely multifactorial, reflecting both disease progression and reduced semantic support during learning.

Executive functioning was severely compromised, with deficits in inhibitory control, cognitive flexibility, planning, strategic processing, estimation, and self-monitoring. Performance on the Stroop Test and FAB suggested difficulty suppressing automatic responses, maintaining task rules, and regulating behavior. These deficits help explain the ecological difficulties observed in everyday contexts, including wandering, reduced contextual judgment, and difficulty following instructions.

Visuospatial and visuoconstructive performance was also impaired. The poor copy of the Rey-Osterrieth Complex Figure suggests deficits in organization, planning, and global perceptual integration. Clinical observation supported these findings. When presented with complex visual stimuli, the patient often focused on isolated details while failing to appreciate the overall structure or meaning of the image. For example, when viewing a large drawing, attention was directed toward minor elements rather than the global configuration, suggesting reduced perceptual integration and organizational abilities. Non-verbal reasoning

deficits on Raven's matrices indicate that impairment extended beyond language tasks. The presence of semantic deficits across modalities, together with fluent but empty speech and relatively less impaired phonemic fluency, strongly supports a clinical presentation within the svPPA/semantic dementia spectrum, with broader cognitive involvement compatible with disease progression.

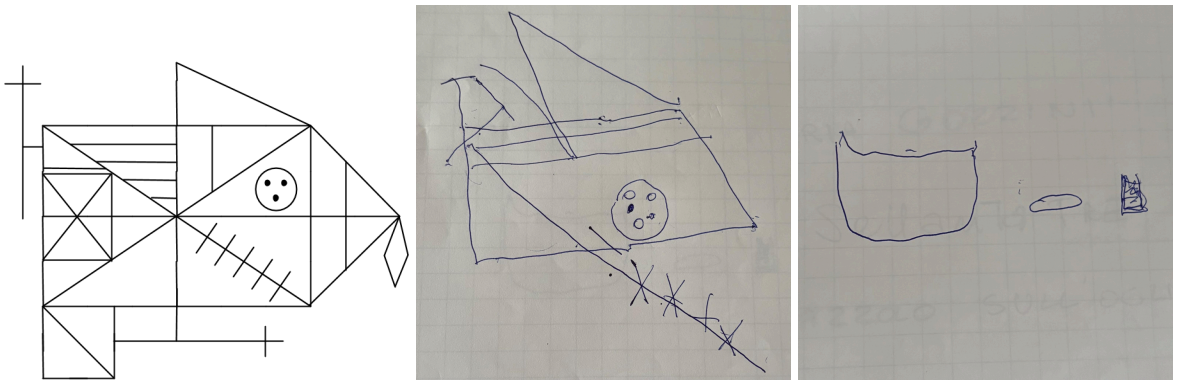

Figure 1. *Rey-Osterrieth Complex Figure performance. From left to right: original stimulus, patient copy condition, and delayed recall production after a time interval.*

2.6 Adaptation of intervention and caregiver recommendations

Following the progression observed after the second assessment, the clinical focus progressively shifted as semantic and language difficulties became increasingly evident. The intervention was therefore gradually reoriented toward supporting semantic access, lexical retrieval, object recognition, categorization abilities, and functional communication. Exercises were adapted over time according to the progression of the patient's semantic impairment and evolving functional needs.

Group cognitive stimulation, which had initially been implemented, became progressively less suitable, as the patient required repeated cueing, simplified instructions, and highly individualized materials. Task instructions frequently had to be repeated several times within the same session, as the patient often lost track of the task requirements shortly after they were presented. This difficulty appeared to reflect impairments in attention, working memory, and executive monitoring and further supported the need for individualized intervention. The clinical neuropsychologist therefore restructured the program toward individual semantic stimulation and functional communication.

To address the patient's semantic difficulties, activities were selected according to the specific domains that emerged as impaired during neuropsychological assessment and ecological observation. Particular emphasis was placed on semantic categories that appeared especially

vulnerable, including fruits and vegetables, animals, everyday objects, and numerical concepts. The adapted intervention primarily targeted lexical retrieval, semantic associations, categorization abilities, object recognition, and access to conceptual knowledge. Examples of the principal exercise types are presented in Table 4 and Representative training materials are shown in Figure 2.

Exercise Type	**Cognitive process targeted**
Naming tasks	Lexical retrieval and word production
Semantic associations	Conceptual knowledge and semantic relationships
Categorization tasks	Organization of semantic categories
Semantic feature verification	Semantic comprehension
Object-function matching	Access to conceptual and functional knowledge
Picture-based semantic tasks	visual semantic integration
Comprehension of verbal definitions	receptive semantic processing

Table 4. *Examples of semantic stimulation activities and targeted cognitive processes.*

Figure 2A

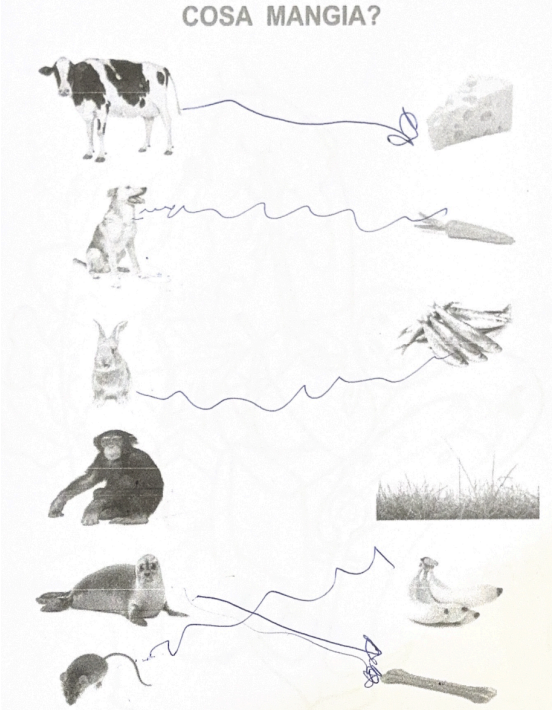

Figure 2B

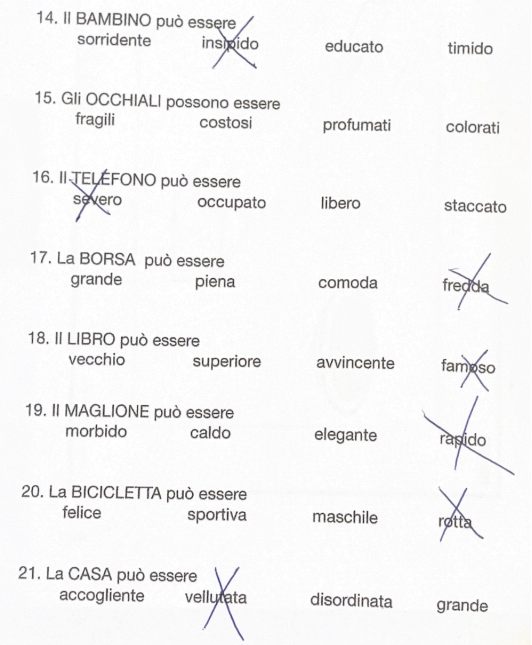

Figure 2C

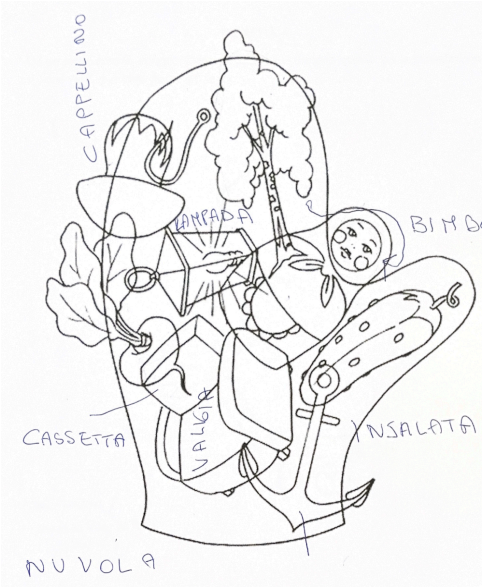

Figure 2D

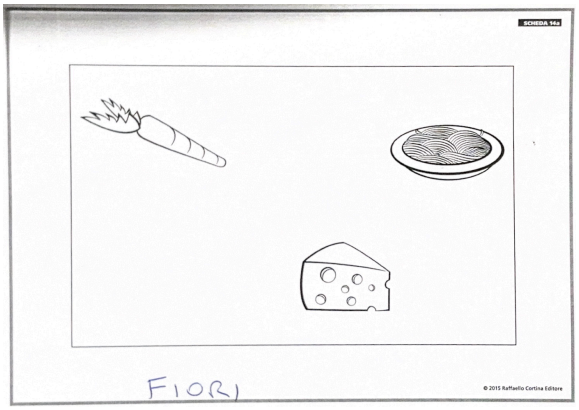

Figure 2. Examples of exercises used during cognitive training

(A) Animal–food matching task aimed at reinforcing semantic associations between living entities and their typical characteristics. (B) Feature selection task requiring identification of the adjective most appropriately associated with the target concept. (C) Object identification and naming task involving recognition of familiar items within a complex visual scene. (D)

Semantic categorization task requiring identification of the common category shared by visually presented objects.

Also, behavioral and ecological observations collected during training sessions and daily interactions were essential for understanding the patient's functional profile. The patient showed increasing difficulty adapting behavior to contextual and everyday demands. These difficulties extended beyond isolated language dysfunction and involved semantic knowledge, judgment, attentional regulation, functional awareness, and safety.

One recurrent feature concerned contextual appropriateness in daily situations. The patient was observed dressing inadequately for the season, for example wearing light clothing during winter without appropriate layering. She often reported always feeling hot and showed reduced awareness of clothing and personal presentation. At times, she forgot whether she had worn a jacket that day and could take other people's jackets if not supervised. These behaviors suggest impairment in semantic knowledge related to everyday situations and objects, together with executive difficulties in judgment and decision-making.

Additional relevant behaviors included object misidentification and inappropriate object-related actions. Object recognition difficulties were also observed during picture-based activities. For example, when shown an image of a bicycle, the patient commented that it looked like a motorbike but might also be a bicycle, reflecting uncertainty regarding object identity despite preserved visual perception. The patient searched for her glasses inside her wallet and, on another occasion, looked for her handbag in the trash. The patient also displayed unusual reactions toward familiar objects and situations within the clinical setting, often accompanied by highly repetitive conversational routines. Despite attending the center regularly, she frequently began sessions by asking whether she could enter the room or sit down and repeatedly expressed concern about disturbing others, for example by asking whether she should remove her bracelet to avoid making noise. On several occasions, she asked permission to sit on a chair she habitually used, describing it as "too beautiful" and worrying about dirtying it. Similar generic evaluations such as "beautiful" were frequently applied to objects including computers, pens, and paper. The recurrence of these interactions and the use of vague, overgeneralized descriptions suggest reduced cognitive flexibility, increased reliance on familiar social scripts, and difficulties integrating object identity, function, ownership, and contextual meaning.

The patient demonstrated reduced semantic knowledge for specific categories, particularly fruits, animals, and numerical concepts. When questioned about fruits and vegetables, she

stated that she did not know them because she did not use them. She frequently referred to animals using vague and overgeneralized expressions, such as “a nice little animal”. When asked to compare animal size, she described a wolf as “like a dog, half a lion”, suggesting reliance on imprecise associative approximations rather than intact conceptual representations.

Spontaneous speech remained fluent and socially engaging, but it became increasingly semantically impoverished. During cognitive activities, the patient frequently verbalized her thoughts aloud while attempting to solve tasks. These verbalizations were often only partially related to the task demands and did not always follow a coherent logical sequence, suggesting difficulties in maintaining goal-directed reasoning and monitoring ongoing cognitive processes. The patient frequently produced circumlocutions and vague expressions such as “What is this called?”, “I know it, but I do not know the name”, and “How beautiful this is”, without specifying the referent. These utterances are consistent with severe lexical-semantic access difficulties and progressive loss of conceptual specificity.

The patient also showed reduced access to autobiographical and contextual information. For example, she reported living alone despite residing with a caregiver, suggesting impaired retrieval or updating of personally relevant information. She tended to repeat a limited number of familiar routines and themes during conversation, reflecting narrowing semantic content and reduced cognitive flexibility. Insight appeared partial and fluctuating: on some occasions she acknowledged that her memory was “somewhat gone” and that she forgot daily activities, whereas on others she rationalized errors by stating that she did not use or consume the relevant items.

Despite these deficits, emotional responsiveness and interpersonal engagement remained relatively preserved. For example, she became tearful when discussing personally meaningful dates related to the commemoration of deceased relatives. Overall, the behavioral profile is consistent with progressive semantic degradation affecting both verbal and non-verbal domains, with increasing impact on adaptive functioning, conceptual organization, contextual behavior, and everyday communication.

CHAPTER 3.
DISCUSSION

3.1 Discussion

The present clinical case illustrates a progressive neurodegenerative profile primarily characterized by semantic memory deterioration. The patient presented with fluent but increasingly empty speech, severe anomia, impaired word comprehension, reduced semantic fluency, loss of conceptual knowledge, and difficulty recognizing the function and contextual meaning of familiar objects. These features are highly consistent with semantic dementia (semantic variant Primary Progressive Aphasia, svPPA) as described in the literature (Hodges et al., 1992; Gorno-Tempini et al., 2011).

A central aspect of the case is the longitudinal evolution over a four-year period, characterized by a significant shift from an initial diagnosis of Mild Cognitive Impairment (MCI) to the subsequent emergence of a well-defined semantic profile. At the time of the initial referral, the clinical picture lacked a definitive classification, presenting primarily as general cognitive and memory difficulties. It was only through repeated neuropsychological assessments and long-term observation that the specific semantic impairment became fully evident, confirming the progression toward svPPA.

In the early phase, the patient's difficulties were interpreted mainly as memory decline; however, clinical observation during training revealed deficits in semantic knowledge, social cognition, instruction retention, object use, and contextual appropriateness.

The 2025 evaluation confirmed that the impairment was not limited to naming. The degradation of conceptual knowledge affected verbal comprehension, semantic association, category knowledge, object recognition, and numerical concepts. The presence of non-verbal semantic impairment supports the hypothesis of a central semantic deficit rather than a purely lexical or modality-specific disorder, in line with studies showing amodal semantic impairment in semantic dementia (Bozeat et al., 2000; Lambon Ralph et al., 2017).

At the same time, the patient also showed severe deficits in executive functions, visuoconstruction, reasoning, episodic memory, and behavioral regulation. These findings suggest disease progression beyond an initially focal language disorder. Executive dysfunction likely contributed to several ecological difficulties, including wandering, poor contextual judgment, impaired maintenance of task instructions, and reduced self-monitoring.

An additional aspect of clinical interest concerns the patient's level of awareness of her

difficulties. Insight appeared partial and fluctuating throughout the observation period. On some occasions, she spontaneously acknowledged experiencing memory problems and reported forgetting daily activities. On other occasions, however, she minimized or rationalized errors by attributing them to lack of familiarity with specific items (e.g., stating that she did not know fruits because she did not eat them). Interestingly, she also described herself as highly competent in mathematics despite showing marked impairment on basic calculation tasks. These discrepancies may reflect reduced awareness of cognitive deficits, a phenomenon frequently observed in progressive neurodegenerative disorders and one that can have important implications for daily functioning, safety, and treatment adherence.

From an intervention perspective, the case shows the need for flexibility. The initial group cognitive training provided structured stimulation and social participation, but progressive semantic and executive deterioration required adaptation toward individualized, concrete, and ecologically meaningful semantic stimulation. In this context, the goal of intervention was not recovery of lost semantic knowledge, but maintenance of residual abilities, reduction of frustration, support for communication, and guidance for caregivers. Although cognitive training cannot reverse the neurodegenerative process underlying semantic dementia, the present case suggests that individualized semantic stimulation may help maintain residual communicative abilities, support functional participation, and reduce frustration associated with progressive language impairment. These findings are consistent with person-centered approaches to dementia care, which emphasize the importance of adapting interventions to the individual's cognitive profile, everyday needs, and remaining strengths.

3.2 Conclusions

This clinical case highlights the complexity of semantic dementia in everyday life. The patient’s difficulties involved not only language and semantic memory, but also object knowledge, behavioral regulation, social functioning, and adaptation to everyday contexts. The integration of standardized neuropsychological assessment, behavioral observation, caregiver reports, and individualized intervention strategies allowed for a more comprehensive understanding of the patient’s cognitive and functional needs. The case also emphasizes the importance of differential diagnosis in progressive cognitive disorders. Although the patient was initially referred for memory difficulties, the progressive loss of conceptual knowledge, impaired object recognition, fluent but increasingly empty speech, and reduced word comprehension were more consistent with semantic dementia than with a primary amnestic syndrome such as Alzheimer’s disease. The presence of multimodal

semantic impairment further supported the interpretation of a central conceptual deficit characteristic of semantic variant Primary Progressive Aphasia (svPPA).

From a clinical perspective, the case underlines the importance of integrating psychometric assessment with observation of everyday functioning. Neuropsychological practice cannot be limited to test administration alone, particularly in progressive neurodegenerative conditions in which cognitive symptoms strongly influence communication, autonomy, safety, and interpersonal relationships. In this context, ecological observation and collaboration with caregivers become essential for understanding the patient's real-life difficulties and for adapting interventions to evolving clinical needs. The case also highlighted the impact of semantic deterioration on family and caregiver functioning. Progressive difficulties in communication, contextual understanding, and behavioral regulation may increase frustration and require continuous adaptation from caregivers. For this reason, psychological support, psychoeducation, and guidance for family members represent important components of patient-centered dementia care.

Although the present case provides valuable clinical insights, some limitations should be acknowledged. As a single-case study, the findings cannot be generalized to all patients with semantic dementia. In addition, the progressive nature of the disease and the ecological setting of observation may limit the standardization of clinical observations over time. Nevertheless, the longitudinal perspective and the integration of clinical, behavioral, and contextual information represented important strengths in understanding the patient's evolving profile and functional difficulties.

Finally, this experience highlighted the educational value of internship-based clinical observation within a dementia care setting. It reinforced the understanding that neuropsychology is not limited to the assessment of cognitive deficits, but also involves attention to the patient's lived experience, interpersonal relationships, and quality of life. Ultimately, the present case demonstrates the value of a longitudinal, ecological, and person-centered approach in the assessment and management of semantic dementia. Understanding how semantic deterioration affects communication, behavior, and everyday functioning is essential for developing interventions that support both patients and caregivers throughout the progression of the disease.

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