CHAPTER VI
SUMMARY AND CONCLUSIONS

The study on the nature of semantic memory has been studied extensively by researchers over the years. These studies differ in their stimuli, method and the group of participants. Results has also been varying in nature and the controversial findings have paved way for several models and assumptions on the nature and functioning of semantic memory. The current study was also aimed to focus on the pattern of content and process of semantic memory in persons with dementia and persons with aphasia. The current study included clinical and control groups. The neuro-typical control group included 109 participants from across four age groups (20-40; 41-60; 61-80 and > 80 years). Similarly, the aphasia group included 27 participants with varying age range. The dementia group included 29 participants from varying age and education background. A minimum of ten years of elementary education was considered for participant selection in both clinical and control group. The participants were screened for prior episodes of any neurological, psychological or cognitive decline. The participants were selected based on specific inclusionary and exclusionary criteria. Cognitive linguistic based stimuli were prepared, and these were subjected to feedback and rating by experienced SLPs. The final stimuli were framed under several tasks to assess the content and process of semantic memory. The stimuli were balanced in their complexity, familiarity and socio-cultural adaptability. The tasks were auditorly presented and the participants were expected to respond verbally. The responses were scored according to a scoring hierarchy taking into consideration the type of external cues (phonemic or semantic) used by the participants. These responses were tabulated and treated statistically. The analysis revealed several
results highlighting the performance of persons with aphasia and dementia on the semantic memory. The significant results and findings are as follows:

1. The confrontation task yielded better responses in the neuro-typical group when compared to the person with dementia or aphasia. It was also observed that the performance of persons with aphasia was comparatively poorer than neuro-typical and dementia participants.

2. The results displayed a significance difference for the content tasks i.e. confrontation naming, word association, propositional task and overall content total across the neuro-typical and aphasia; neuro-typical and dementia and between aphasia and dementia groups except for the propositional task which did not show a significance difference across aphasia and dementia group.

3. The content task depicted a significant difference across age groups with the older age groups (61-80 years and above) performing poorer than the younger age groups (20-40 and 41-60 years).

4. The process tasks (sentence inference task, generative category and phonemic naming an generative responsive naming) yielded a significant difference between all the groups. Thus, the process tasks have been critical and sensitive in eliciting a significant difference across all the three groups.

5. Findings reveal a significant difference across the age groups 20-40 & 61-80; 20-40 and> 81 years; 41-60 and 61-80 ; 41-60 and > 81 years for the inference task and generative naming task. Whereas, for the responsive naming task there was no significant difference across the neuro-typical age groups. The results clearly depict
the influence of older age on the inferencing, responsive naming and generative naming ability in neuro-typical individuals.

6. The content and process sub tasks yielded a significance difference between the control and the clinical groups. Several tasks such as the confrontation picture naming, syntagmatic and paradigmatic association tasks, and the generative phonemic task showed a significant difference between the aphasia and dementia groups.

7. The confrontation picture naming and generative naming (category & phonemic) tasks showed a declining trend across the older age groups.

8. The content and process tasks were found to perform significantly different from each other within all the groups. Within all the three groups, the ideation task showed relatively poorer performance than the other tasks. In the aphasia and dementia groups, the propositional tasks and conceptual performed better than the inference and ideation tasks.

9. The content and process subtasks differed with each other across all the age groups with the performance of content tasks better that the process tasks in each of the age groups. The mean difference between tasks increased progressively with age group indicating the poorer performance in the older age groups.

10. Within the neuro-typical group significant differences was observed between confrontation picture and object naming; paradigmatic and syntagmatic association; generative category and phonemic naming. Whereas, in the aphasia group, there was a significant difference only between the generative category and phonemic naming
task. The participants in the dementia group showed a significant difference between the word association task (paradigmatic and syntagmatic) and the propositional tasks (yes/no and sequential commands comprehension).

11. There is a significant difference between the mild-moderate and severe groups in both the aphasia and dementia groups. The content and process is comparatively worse in the severe group than the mild-moderate group in both aphasia and dementia group. These results clearly imply that the performance of the SM is greatly influenced by the severity level of the disorders.

12. The results depicted a significant difference in the facilitatory cues (semantic and phonemic) across the groups except between the aphasia and dementia group for phonemic cue. The correct responses were significantly different across the groups. The response frequency analyses displays interesting results regarding the use of semantic cues and phonemic cues as a facilitator across the groups especially the clinical groups. The semantic cue facilitated the dementia group more than the aphasia group. The participants in aphasia group comparatively used more of the phonemic cues and also made more incorrect responses as compared to the neurotypical and dementia group.

13. The strong correlation between the tasks across all the groups substantiate the positive influence of both content and process components on the overall performance of semantic memory in an individual. Likewise, in neurologically disordered populations, the positively correlated content and process components affect the performance of semantic memory.
Thus these findings yield the following outcomes of the hypothesis considered for the study.

Hypothesis 1: There is no significant difference in the performance of semantic memory content component among the neuro-typical participants, and persons with aphasia and persons with dementia.
Outcome: There is a significant difference in the performance of semantic memory content component among the neuro-typical participants, and persons with aphasia and persons with dementia. Thus, rejecting the null hypothesis.

Hypothesis 2: There is no significant difference in the performance of semantic memory process component among the neuro-typical participants, and persons with aphasia and persons with dementia.
Outcome: The hypothesis is rejected as the study revealed a significant difference in the performance of semantic memory process component among the neuro-typical participants, and persons with aphasia and persons with dementia.

Hypothesis 3: There is no significant difference in the performance of semantic memory content and process components within the neuro-typical participants, persons with aphasia and persons with dementia.
Outcome: The study revealed a significant difference in the performance of semantic memory content and process component within the neuro-typical participants, and persons with aphasia and persons with dementia. Thus, rejecting the null hypothesis.
6.1. Implications

The results of the study were compiled and following implications were made. The results of the present study were in correlation with the previous studies. The responses of each group of participants were scored and it was analyzed that the persons with aphasia and dementia perform poorer than the neuro-typical participants on both content and process tasks of semantic memory. Thus confirming the impairment of semantic memory in neurologically impaired groups. The pattern and level of deterioration is greater in the process tasks compared to the content tasks. Thereby implying a continuum hierarchy in the levels of deterioration of the semantic memory- i.e. initially certain delay and feedback errors (as in aging) followed by deterioration in the process tasks and later on the tasks of content also tend to deteriorate. The content and process tasks provide a sensitive tool to differentiate between the neurologically impaired population and neuro-typical individuals. The performance of the persons with dementia were relatively better than the performance of persons with aphasia. These have been attributed to the effect of severity and type of the disorder in both aphasia and dementia group. Also, the nature of responses differ in both these groups. Persons with aphasia perform more inconsistently suggesting the deficits are more at the lexical-semantic level whereas in persons with dementia the consistent responses at all level and tasks implying greater deficit at the higher conceptual-semantic level. The cues used by each group also indicate this different level of deterioration. The persons with aphasia benefitted more with the phonological cues thus implying that these individuals have an 'access' deficit. However, persons with dementia utilized more of the semantic cues thus supporting the deficit of SM 'storage' in them. The persons with dementia had degraded
semantic representations whereas persons with aphasia had accessibility difficulty with the knowledge retained. These distinctions were also noted in a study by Warrington and Cipolotti (1996). Thus, the content and process tasks of SM offer a promising diagnostic measure to assess on the differential diagnosis between neurologically impaired and neuro-typical individuals. Furthermore, these patterns of SM impairments provides inputs to different theoretical and clinical treatment remediation programmes.

6.2. The study was limited to

The study was designed and developed to assess the performance of SM in persons with dementia and aphasia with the neuro-typical group as controls. The type and severity of the conditions were not considered as a criteria for analysis. The tasks were majorly verbal tasks thus not tapping the overall SM performance. The scoring for nonverbal responses were not considered in the study owing to the large heterogeneity in the responses. The responses can be further analyzed according to type of error made in both the clinical groups and control group.

6.3. Future directions

Semantic memory is a complex cognitive system that needs to be studied further, both with the neuropsychological tests that are available today, and with new neuropsychological tests in the future. The present study can be further extended to study the central SM deficits in verbal and non-verbal tasks; and comparison with the syntactic structure of language. The findings across gender may also be interesting to investigate. The longitudinal and time series design study may also be promising especially in
persons with dementia. Treatment strategies may be refined and modified with these inputs to restitute word processing in aphasia following stroke and at the retention of language functions in persons with dementia. Further the timed tasks and analysis of the speed of processing may also be implemented as diagnostic markers. Semantic memory is a vast cognitive-linguistic domain whose content and functions may be investigated using recent neuro-imaging studies, neuropsychological and cognitive-linguistic tasks and models. To conclude, comparison studies using these tasks in persons with varying etiology and severity such as in persons with dementia and aphasia should be encouraged as it offers rich data in the field of cognitive, linguistic and neuropsychology.