Development and Validation of Long Term Memory Scale

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Introduction:

Mental changes also happen in old age, causes of changes in mental abilities are pathological condition and lack of stimulation. The mental changes are different in individual. In generally, those of higher intellectual levels experience relatively less decrease in mental efficiency than those of lower levels. The changes acquire in skills they are learning, reasoning, creativity, memory, recall, reminiscing, vocabulary, mental rigidity, and sense of humor. Memory is the means by which we draw on our past experiences in order to use this information in the present' (Sternberg, 1999).Memory is the term given to the structures and processes involved in the storage and subsequent retrieval of information. Memory is essential to all our lives. Without a memory of the past, we cannot operate in the present or think about the future. We would not be able to remember what we did yesterday, what we have done today or what we plan to do tomorrow (Howard, 2004). The long-term memory system consists of declarative (or) explicit memory and non- declarative memory (or) implicit memory. Declarative memory is the knowledge that we have conscious access to, and consists of semantic and episodic memory. Non-declarative memory is the knowledge that we have no conscious access to. Procedural memory is a part of non-declarative memory (Gazzaniga et al., 2002).

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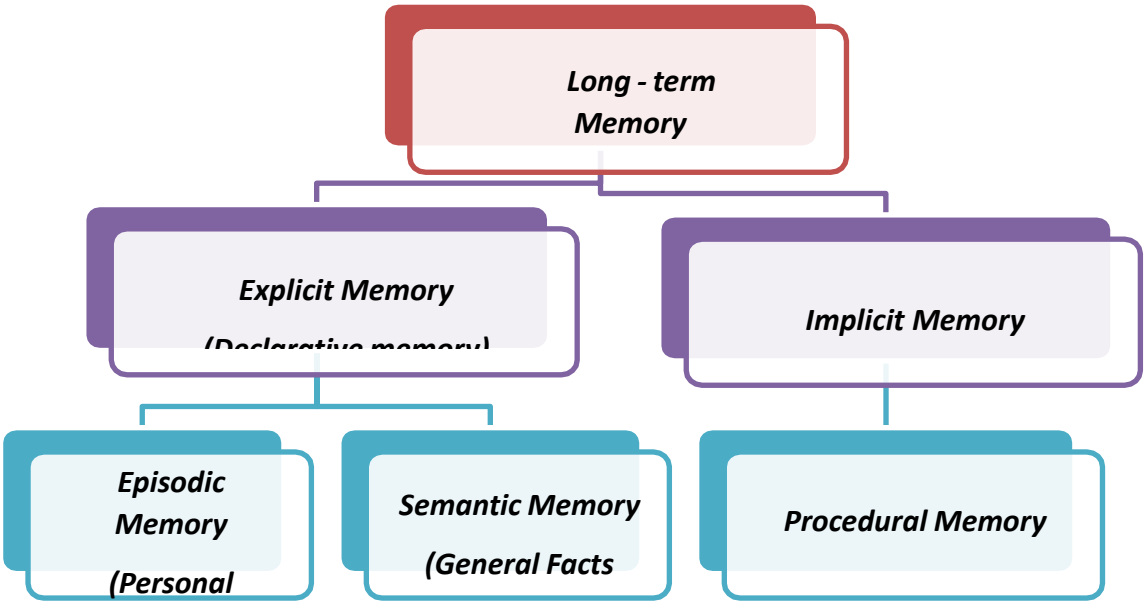

Figure 1: Long- term memory flow chart

Explicit memory

Explicit memory is also known as declarative memory. Episodic and se-mantic memory can be viewed as parallel and partially overlapping information processing systems (Tulving, 1972).Semantic and episodic memory differs from each other in that episodic memory contains information about personal events and episodes which are time and space specific. Episodic memory cannot be shared with others in the sense that everyone has direct access onlyto their own personal memories. Semantic memory, on the other hand, contains factual information. It is not related to the occasion of learning, as is episodic memory. Rather it concerns the specific information that was learned during the occasion. Semantic knowledge can be shared with others in the sense that semantic memory is not related to any personal memories (Laatu, 2003). Explicit long-term memory is conventionally thought to comprise two different types of knowledge, episodic and semantic (Tulving, 1972). Semantic memory refers to decontextualized general world knowledge and facts, for instance the meanings of words, the capital of France, or what a fork is used for. Episodic memory on the other hand, involves personally experienced events that can be tied to a spatial and temporal context. These two types of memory have been distinguished from each other based on reports of brain injured patients with episodic, but not semantic memory deficits (Rosenbaum et al., 2005; Vargha-Khadem et al., 1997).

In declarative memory there are two types.

Episodic memory

Episodic memory is specific to an individual. Episodic memory refers to the ability to recall specific events, situations, and experiences that have occurred at a particular place and time. It's atype of long-term memory that involves remembering autobiographical details of past events, such as what happened, where it happened, and when it happened. Episodic memory allows us to mentally travel back in time and relive past experiences. i.e. the person can answer the question like what is your

marriage date or joining date for job? What is their partner birthday date? Episodic memory refers in part to storage and recollection of autobiographical information and specific events and generally shows a continuous linear decline from early adulthood. However, task performance that involves episodic memory varies depending on the testing method and the nature of the material. Further acceleration in late old age may signal further cognitive decline (Cook &Marsiske, 2006; Jessen et al., 2007; Rosen et al., 2002). Episodic memory refers to the ability to recall specific events and is typically measured by either recognition or recall of materials presented in the laboratory. Age effects on memory for autobiographical events occurring outside the laboratory have received less attention, and involve less controlled techniques, such as asking subjects to generate memories in response to cue words, and examining the distribution of memories across the lifespan. In a series of studies, Rubin and colleagues (Rubin &Schulkind, 1997a, 1997b; Rubin et al.,1986).

Semantic memory

Semantic memory refers to the general world knowledge or factual knowledge. Semantic memory is concerned with the meanings of words, concepts, and factual information that is not tied to a particular time or place. Semantic memory refers to a major division of long-termmemory that includes knowledge of facts, events, ideas, and concepts. Thus, semantic memory covers a vast cognitive terrain, ranging from information about historical and scientific facts, to details of public events and mathematical equations, to the information that allows us to identify objects and understand the meaning of words. Older adults commonly complain of subjective semantic memory problems when, for example, they report difficulty recalling the names of common objects or other well learned information. Semantic memory is the recollection of facts gathered from the person is young; the information is not associated with emotion or personal experience. I.e. how to use scissors? How to use cell phone? It can be seen as our personal knowledge bank (Tulving, 1972).

Implicit memory

Non declarative, or implicit, memory describes the memory system that allows learning outside of conscious awareness. It is generally divided into procedural memory and priming,each hypothesized to be mediated by a distinct neurobiological system. In general, non declarative systems are relatively spared across the adult life span, particularly compared to episodic memory, which shows the greatest aging effects. Procedural memory is also referring as 'implicit memory'; it helps to remember past experience without thinking about them. Burke & Light et al., (1981) found in their studies, that age-related memory decline is impaired recall of single items, such as a list of common words. In such experiments, older adults typically recall significantly fewer items than younger adults. As the person grows older their experience,physiological changes that can causes glitches in brain function. It takes longer to learn and recallinformation.

Procedural memory

Procedural memory Procedural or skill learning is one type of non - declarative (or) implicit memory that refers to the non - conscious acquisition of motoric sequences. Procedural memory guides the processes we perform, and most frequently resides below the level of conscious awareness. When needed, procedural memories are automatically retrived and utilized for execution of the integrated procedures involved in both cognitive and motor skills, from tying shoes, to reading, to flying an airplane. Procedural memories are accessed and used without the need for conscious control or attention. Procedural memory is created through procedural learning , or repeating a complex activity over and over again until all of the relevant neural system work together to automatically produce the activity. Initially, a novice driver needs to recollect consciously how to control each aspect

of the automobile and the sequence in which to do so. With practice, the individual skill required to operate the vehicle enters into procedural memory, and control becomes relatively more automatic.

Procedural memory is the unconscious memory of skills and how to do certain things, particularly the use of object or movements of the body. i.e. how to use stapler, how to tie shoelace, how to riding bike etc. These memories are typically acquired through repetition and practice. Once learned these body memories allow us to carryout ordinary motor action.

Procedural memory is formed when repeated signals reinforce synapses. Although a procedural memory can be basis as forming a connection between two nerve cells in the person fingertip, other procedural memories are more complex and take longer to form. Memory decline is a natural part of ageing (Laatu, 2003).Craik et al., (1994) older adults tend to exhibit a decline in the ability to recover specific event details, but display relatively intact memory for more general aspects of previous events.

Perceptual priming

Perceptual priming is a phenomenon in psychology where exposure to a stimulus influences the processing of subsequent related stimuli. Essentially, it's when encountering a stimulus once makes it easier to recognize or process similar stimuli later on. This can occur across various sensory modalities, such as visual, auditory, or tactile. Perceptual priming is believed to be the result of altered perceptual processing or the activation of particular brain pathways as a result of previous exposure. It is frequently linked to implicit memory, which is the process by which prior experiences shape behavior even when those eventsare not consciously remembered. It can happen without conscious knowledge. When it comes to perceptual priming, such as the visual cortex, studies utilizing neuro imaging techniques have demonstrated that older persons exhibit intact or even improved neural activation, even while they may have deficits in certain cognitive abilities, such as working memory. This implies that methods of perception priming might be largely unaltered as people age. When compared to younger ages, perceptual priming is typically maintained or even improves in middle adulthood. This is due to the fact that middle-aged adults have a great deal of life experience and knowledge that serves as a strong basis for

perceptual priming effects.

Scope and Justification

Long term memory is a type of memory which refers to the process in the brain that takes information from the short-term memory store and create long lasting memory. A well-designed scale would provide a standardized and reliable way to assess the various aspects of long-term memory, which includes episodic memory (specific events), semantic memory (general knowledge), and procedural memory (skills) and perceptual priming. The researcher in present study aimed to develop a scale which may be used as a screening tool to determine who is most likely to experience age-related memory problems. A validated measure would be helpful for studies examining how different elements affect memory function, how long-term memoryworks, and how to create new tactics for improving memory.

Deterioration in long-term memory is a crucial component and it frequently serves as a precursor to neurological disorders. A reliable scale can help with early identification and treatment, which could slow down the course of serious illness. There are many scales and tools to assess the working memory, short-term memory and cognitive ability but a scale for assessing long term memory is not yet available. So the long term memory scale can be used to monitor changes in memory function over time, giving medical professionals the ability to evaluate treatment plans' efficacy and make necessary

adjustments. In order to compare results across studies and develop a deeper understanding of how long-term memory functions, standardized scales are essential for memory research.

Objectives

Primary objectives:

Development and Validation of Long Term Memory Scale.

Secondary objectives:

To know the socio-demographic profile among selected adults and elderly people.

To develop long term memory scale and to process it for validation.

To asses long term memory among Adults and Elderly.

To analyses the association of independent variables on long term memory.

According to the study, the elderly group's performance on episodic memory tasks was considerably worse than that of the younger group. In addition, the older group showed less trait anxiety than the younger groups did. Nevertheless, there was no discernible relationship between trait or state anxiety levels and episodic memory performance **Sophie Schumm et.al** (2013).

Lars Nyberg et.al, (1999) conducted a study on age difference in episodic memory, semanticmemory and priming: relationships to demographic, intellectual and biological factors. The sample size of this study is 1,000 adults of both gender of age 40 and above. The simple correlation between age and memory performance was significant for all episodic and semantic memory tests, but not for priming. Education may be an indirect marker of many different factors, ranging from strategy use to socioeconomic status. It is therefore difficult to come up with a specific explanation as to why higher level of education is associated with higher memory performance.

Tina Chen and Moshe Naveh – Benjamin (2012) conducted a study on assessing the associative deficit of older adults in long – term and short term memory. 24 older adults age range from 65 – 79 from central Missouri have enrolled. The short-term and long-term retention periods for item and association recognition memory were studied. Evidence from the study suggests that associative memory impairments occur in older persons even in short- term/working memory tasks. The understanding of age-related cognitive changes is enhanced by these findings, which also have significance for developing therapies to improve older persons' cognitive function.

Methodology

The area selected for the present study was Coimbatore, Andhra Pradesh and some parts of north India. The age group of the samples were 40 and above through purposive sampling method.

Construction of the tool:

A self-prepared questionnaire on “Long Term Memory Scale” was used to find out the long term memory among adults and elderly. The tool was prepared by referring available international tools like memory assessment scale- MAS (Michael Williams) meant for adolescence to old age composed of visual, hearing and verbal. The researcher also referred cognitive assessment tool kit meant for clinical samples, online tool, the MyCognition Quotient (MyCQ) for daily functioning among clinical subjects where it tracks progress and helps determine which cognitive domains require most training. However our tool statements constructed based on memory models and theories. The tool has four dimensions

namely episodic memory, semantic memory, procedural memory and perceptual priming memory, in episodic memory 10 items were framed, semantic memory 12, procedural memory 10 items and in perceptual priming 8 items. In total there are 40 items for the tool which assesses their level of memory. The maximum score for the tool is 120 and minimum is 40. The Cronbach'salpha value for the 40 items is (.785). the tool was validated by 4 experts and one from CBR- Central Brain Research, Bengaluru, two psychology professors and one from Human Development

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Table-1

Long term memory subscales and items

Domain sub-sets	*Proposed domains*	*Items*
Episodic memory	*Every day events, personal facts and specific events and experiences*	*1,5*,9*,13,17,21*,24,27*,31,36**
Semantic memory	*General knowledge, skills, tasks*	*2,6*,10,14,18*,20,25,28,33*,34,37,39**
Procedural memory	*Procedural learning, the process of doing particular activity*	*3,7*,11,15*,19,22,26,29,32*,38*
Perceptual priming	*Seeing the things and remembering*	*4,8,12*,16,23*,30*,35,40*

****signifies the negative items***

a) Scoring: "Long term memory scale" was prepared with 40 statements, each to be ratedon three-point Likert scale (from 1-3) YES, SOMEHOW, NO and awarded as 3,2,1 respectively. Among 40 items, 15 are negative and 25 items are positive. The positive items were scored as YES =3, SOMEHOW=2 and NO=1, and the negative items were scored as YES=1, SOMEHOW=2, NO=3.

Table-2

Score range for long term memory scale

Category	*Score Range*
Good	*94 to 120*
Average	*67 to 93*
Poor	*40 to 66*

Higher score indicates good memory and lower score indicated poor memory.

Dimension wise scores range:

Table-3

Dimension 1- Score range for Episodic memory

Category	*Score Range*
Good	*24 to 30*
Average	*17 to 23*
Poor	*10 to 16*

Table-4

Dimension 2- Score range for Semantic memory

Category	*Score Range*
Good	*29 to 36*
Average	*21 to 28*
Poor	*12 to 20*

Table-5

Dimension 3- Score range for Procedural memory

Category	*Score Range*
Good	*24 to 30*
Average	*17 to 23*
poor	*10 to 16*

Table-6

Dimension 4 - Score range for Perceptual priming

Category	*Score Range*
Good	*20 to 24*
Average	*14 to 19*
Poor	*8 to 13*

b) Reliability method:

Research reliability refers to whether research methods can reproduce the same resultsmultiple times. Our research methods can produce consistent results, then the methods are likely reliable and not influenced by external factors. This valuable information can help us todetermine if the research methods are accurately gathering data which we can use to support the present objectives of the study. The researcher used **test re-test** method for different group of people for two times for a gap of three weeks.

Reliability and validity can both help researchers assess the quality of a project. Whilesimilar, these two concepts measure slightly different things:

Reliability: Reliability measures the consistency of a set of research measures.

Validity: Validity focuses on the accuracy of a set of research measures.

c) Validation method:

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The most often used measures of validity, construct validity, criterion validity, and content validity, have to be validated for instruments to be considered reliable. Any measuring device that researchers use in their studies has to meet two quality requirements: validityand reliability. The psychometric qualities of health-related measuring instruments need to be subjected to a process of modification and validation in order to assure their validity and reliability. To ascertain the caliber of the measurements generated by these devices, all of this is necessary. "The degree to which elements of an assessment instrument are relevant to, and representative of, the targeted construct for a particular assessment purpose" is the definition of content validity. Present study conducted validity under following methods.

Content validity

Content Validity Index

Item analysis

These aspects were explained in the result and discussion chapter.

Conduct of the study:

The study was conducted among the middle adult and elderly after getting their prior permission. An assurance of confidentiality was given to these people, so that they could share their responses without any hesitation. The samples are taken from the people who were willing to participate in this study. The questions were administered in 15 – 20 minutes and participation was voluntary. The same questionnaire was administered after a period of three weeks The statistical package SPSS was used for data analysis.

Analysis of data:

Data analysis is considered to be important step and heart of the research in research work. Analysis is a process enters into research in the form or the other, from the very beginning in the selection of the problem, in the determination of methods and in the interpreting and drawing conclusion from data gathered. Analysis of data means studying the organized material in order to discover inherent facts. The collected data was consolidated, coded, score and tabulated accordingly providing a raw data which were made ready to be analyzed. The raw data which were entered into the MS excel were imported into SPSS software and analyzed statistically to yield the desired results.

Item analysis helps to examine the responses of the test items (questions) in order toassess the quality of the items and it can be used to eliminate the misleading items.

Frequency and percentage were used to interpret the demographic characteristics i.e., age, gender, education, occupation, area of living, type of family, type of residence, marital status, number of children, dependency, working status, and time spend in the evening.

t-test were used to know the difference between demographic characteristics i.e., age, gender, type of family, type of residence, marital status and working status with the help of the formula.

Anova were used to know the comparison of three or more independent sample difference between education, occupation, area of living, number of children, dependency

Results and Discussion:

Table – 7

The relevance rating on the item scale by four experts

Item	*Expert 1*	*Expert 2*	*Expert 3*	*Expert 4*
Q.1	*1*	*1*	*1*	*1*
Q.2	*1*	*1*	*1*	*1*
Q.3	*1*	*1*	*1*	*1*
Q.4	*1*	*0*	*1*	*1*
Q.5	*1*	*1*	*1*	*1*
Q.6	*1*	*1*	*1*	*1*
Q.7	*1*	*1*	*1*	*1*
Q.8	*1*	*1*	*1*	*1*
Q.9	*1*	*1*	*1*	*1*
Q.10	*1*	*1*	*1*	*1*
Q.11	*1*	*1*	*1*	*1*
Q.12	*1*	*0*	*1*	*0*
Q.13	*1*	*1*	*1*	*1*
Q.14	*1*	*1*	*1*	*1*
Q.15	*1*	*1*	*1*	*1*
Q.16	*1*	*0*	*1*	*1*
Q.17	*1*	*1*	*1*	*1*
Q.18	*1*	*1*	*1*	*1*
Q.19	*1*	*1*	*1*	*1*
Q.20	*1*	*1*	*1*	*1*
Q.21	*1*	*1*	*1*	*1*
Q.22	*1*	*1*	*1*	*1*
Q.23	*0*	*1*	*0*	*0*
Q.24	*1*	*1*	*1*	*1*
Q.25	*1*	*1*	*1*	*1*
Q.26	*1*	*1*	*1*	*1*
Q.27	*1*	*1*	*1*	*0*
Q.28	*1*	*1*	*1*	*1*

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Q.29	***1***	***1***	***1***	***1***
Q.30	***1***	***1***	***1***	***1***
Q.31	***1***	***1***	***1***	***1***
Q.32	***1***	***1***	***1***	***1***
Q.33	***1***	***1***	***0***	***1***
Q.34	***1***	***0***	***1***	***1***
Q.35	***1***	***1***	***1***	***1***
Q.36	***1***	***1***	***1***	***1***
Q.37	***1***	***1***	***1***	***1***
Q.38	***0***	***0***	***1***	***0***
Q.39	***1***	***1***	***1***	***1***
Q.40	***1***	***1***	***1***	***1***
Total score	***0.95***	***0.87***	***0.95***	***0.96***

Table 7 represents experts rating for each item from 0-1. Zero indicates the items are not suitable and 1 indicates items are reliable/ acceptable for the purpose. Each experts total score was added and divided by number of items to get the CVI value. Then all four experts value was added and divided by four to get actual CVI value for the scale.

CVI=0.95+0.87+0.95+0.96=3.73/4=0.93CVI=0.93

Item analysis

Table- 8

Item analysis of long term memory scale

Item number	*Mean*	*SD*	*Scale mean*	*Scale variance*	*Item –total correlation*	*Cronbach's alfa value*
1.	***2.66***	***.693***	***89.49***	***111.526***	***.324***	***.779***
2.	***2.27***	***.857***	***89.88***	***111.513***	***.249***	***.781***
3.	***2.15***	***.974***	***90.00***	***111.564***	***.206***	***.783***
4.	***2.02***	***.882***	***90.13***	***108.049***	***.432***	***.773***
5.	***1.62***	***.868***	***90.54***	***105.612***	***.582***	***.767***
6.	***1.81***	***.898***	***90.34***	***107.327***	***.463***	***.772***

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7.	*2.31*	*.912*	*89.84*	*113.140*	*.143*	*.785*
8.	*2.60*	*.754*	*89.55*	*109.570*	*.418*	*.775*
9.	*1.85*	*.918*	*90.31*	*109.952*	*.309*	*.778*
10.	*2.82*	*.488*	*89.34*	*115.493*	*.097*	*.785*
11.	*2.55*	*.823*	*89.60*	*108.636*	*.433*	*.774*
12.	*2.32*	*.842*	*89.83*	*119.703*	*-.199*	*.797*
13.	*2.61*	*.702*	*89.54*	*113.437*	*.188*	*.783*
14.	*2.98*	*.208*	*89.18*	*116.026*	*.152*	*.784*
15.	*1.75*	*.921*	*90.41*	*107.779*	*.425*	*.773*
16.	*2.35*	*.883*	*89.80*	*109.570*	*.346*	*.777*
17.	*2.42*	*.888*	*89.73*	*110.176*	*.310*	*.778*
18.	*1.86*	*.949*	*90.29*	*109.665*	*.311*	*.778*
19.	*2.69*	*.665*	*89.46*	*112.035*	*.304*	*.779*
20.	*2.52*	*.770*	*89.64*	*110.749*	*.334*	*.778*
21.	*1.92*	*.985*	*90.24*	*108.685*	*.346*	*.777*
22.	*2.11*	*.967*	*90.05*	*106.293*	*.478*	*.771*
23.	*2.23*	*.887*	*89.93*	*118.538*	*-.133*	*.796*
24.	*2.58*	*.757*	*89.57*	*110.340*	*.367*	*.777*
25.	*2.72*	*.599*	*89.44*	*112.435*	*.311*	*.779*
26.	*2.43*	*.877*	*89.72*	*113.235*	*.147*	*.785*
27.	*2.07*	*.926*	*90.08*	*113.211*	*.136*	*.786*

Over all cronbach's value : .785

Table -9

Frequency distribution of Socio demographic profile of the respondents

Variables	*Category*	*Frequency (n=300)*	*Percentage (%)*
Age	*40 – 60*	*183*	*61.2*
	61 – 80	*117*	*38.8*
Gender	*Male*	*156*	*52.2*

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	Female	***144***	***47.8***
Education	***Illiterate***	***38***	***12.7***
	Primary	***28***	***9.4***
	High school	***48***	***16.1***
	12th	***27***	***9.0***
	Graduate	***100***	***33.4***
	Post- graduate	***54***	***18.1***
	P.H.D	***5***	***1.3***
Occupation	***Primary***	***131***	***43.8***
	Secondary	***76***	***25.4***
	Tertiary	***57***	***19.1***
	Quaternary	***36***	***11.7***
Area of Living	***Rural***	***151***	***50.5***
	Urban	***92***	***30.8***
	Semi-urban	***57***	***18.7***
Type of family	***Nuclear***	***234***	***78.3***
	Joint	***66***	***21.7***
Type of Residence	***Home***	***243***	***81.3***
	Old age home	***57***	***18.7***
Marital status	***Married***	***292***	***97.7***
	Unmarried	***8***	***2.3***
Number of children	***0***	***18***	***6.0***
	1	***32***	***10.7***
	2	***208***	***69.6***
	3	***34***	***11.4***
	4	***8***	***2.3***
Dependency	***Self***	***167***	***55.9***
	Partner	***76***	***25.4***
	Children	***37***	***12.4***

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	NGO	***14***	***4.7***
	Others	***6***	***1.7***
Working status	***Still working***	***144***	***48.2***
	Retired	***73***	***24.4***
	house wife	***82***	***27.4***
I spend my time in the evening	***walking with friends***	***70***	***23.4***
	Watching T.V	***77***	***25.8***
	Reading books	***21***	***7.0***
	Talkingover phone withfamily	***28***	***9.4***
	Playing games	***0***	***0***
	Spending time with children	***60***	***20.1***
	Spending time withgrand-children	***36***	***12.0***
	Sleeping	***8***	***2.3***

Table 9 represents socio-demographic profile of the respondents.

Table-10

Mean, standard deviation, and t-value of long term memory by age of the respondent(N= 300)

Age	*Mean*	*SD*	*t-value*	*p- value*
40 – 60	*183*	*10.684*	*4.125*	*.000***
61 – 80	*117*	*10.270*		

***significant at 0.01% level.*

Table 10 indicates the mean, SD and t value of long term memory among respondents basedon age groups.

With regard to the age , the obtained mean and SD values of age group (40 – 60) were 183 and 10.684 respectively, where as the age group (61 – 80) were 117 and 10.270 respectively. The calculated t – value is 4.125 and p – value is .000 which is significant. this represents that there is a significance difference between the two age groups.

The study by Pershad (1979) investigated whether younger subjects aged 20-40 yrs. and elderly subjects aged 41-70 yrs. differed with regard to acquisition, retention recall (forgetting), and learning dissimilar pairs of words. Both retention and retentive recall were poor in elderly subjects, and both groups differed significantly with regard to initial learning on a paired-associate tasks.

Table – 11

Mean score of long term memory scale by area of living (N= 300)

Area of living	*Mean*	*SD*	*f- value*	*p- value*
Rural	*89.89*	*10.426*		
Urban	*96.22*	*10.917*	*10.538*	*.000***
Semi – urban	*91.59*	*9.842*		

*** significant at.00% value*

The results in the above table-11 shows that with regard the area of living of the respondents the mean and SD value rural people are 89.89 and 10.426, urban 96.22 and10.917, and semi – urban 91.59 and 9.842 respectively. The f- value is 10.538 with the p-value .000 which is significant which indicates that urban people are having good memory when compared to other people. Hence the table shows that the significance difference is found between the area of living of the respondents.

Table – 12

Mean score of long term memory scale by dependency (N=300)

Dependency	*Mean*	*SD*	*f- value*	*p- value*
Self	*93.28*	*10.726*		
Partner	*93.54*	*9.995*		
Children	*87.08*	*10.864*	*4.279*	*.002***

NGO	***85.93***	***10.557***		
Others	***88.60***	***12.137***		

*****significant at .002% value***

The result in the above table-12 shows that with regard to the dependency of the respondents the mean and SD value for self is 93.28 and 10.726, partner 93.54 and 9.995, children 87.08 and 10.864, NGO 85.93 and 10.557, and others 88.60 and 12.137 respectively.The f- value is 4.279 with the p – value .002 which is significant. Hence the table shows that the significance difference is found between the dependency of the respondents.

Conclusion

A long-term memory scale's creation and validation represent a substantial undertaking that is necessary for gaining a thorough understanding of cognitive functioning and memory processes. By means of methodological techniques and empirical investigations,this scale functions as an invaluable instrument for evaluating the aspects within the long- term memory. During the validation process, the content validity index and effectiveness of the scale in measuring long-term memory constructs and differentiating them from other related constructs were evaluated. The comprehensive validation procedure enhances the validity and usefulness of the scale, thereby promoting its extensive acceptance and application in research and practical settings. In present study the researcher validated the'Long term memory scale' and obtained good to excellent values in all the items with respect to validation process.

With regard to subjects, majority from the age group 41-60 years who are are not depending on others and living in urban area residence found to have better memory than other counter parts. The results also proved that majority of these respondents proved to have average episodic memory and semantic memory followed by good procedural memory and semantic memory. Meanwhile these respondents have poor inperceptual priming.

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