Constant Therapy: An adaptation in Hindi

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CERTIFICATE

This is to certify that this dissertation entitled **"*Constant Therapy: An adaptation in Hindi"*** is a bonafide work submitted in part fulfilment for degree of Master of Science (Speech-Language Pathology) of the student Registration Number: 14SLP035. This has been carried out under the guidance of a faculty of this institute and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

Mysore
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CERTIFICATE

This is to certify that this dissertation entitled **"*Constant Therapy: An adaptation in Hindi*"** has been prepared under my supervision and guidance. It is also been certified that this dissertation has not been submitted earlier to any other University for the award of any other Diploma or Degree.

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DECLARATION

This is to certify that this dissertation entitled ***"Constant Therapy: An adaptation in Hindi"*** is the result of my own study under the guidance of Dr. S. P. Goswami, Professor of Speech Pathology & Head, Department of Speech- Language Pathology, All India Institute of Speech and Hearing, Mysore, and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

Mysore, ***Registration No. 14SLP035***

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Dedicated to My Teacher, Sudha Madam

and

My Father

"The simple things are also the most extraordinary things, and only the wise can see them."

— Paulo Coelho, The Alchemist

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Chapter I

Introduction

Aphasia is an acquired language disorder which is common and often a severe consequence of stroke or other brain lesion (Benson & Ardilla, 1996). Depending upon on the various types of aphasia, this impairment can affect language reception and expression (McNeil & Pratt, 2001). Retracing the account of aphasia treatment is an intricate task. It was only after the World War II that the aphasia treatment gained popularity. Ever since, the therapy for persons with aphasia(PWA) has not only undergone a lot of change in terms of the philosophy it is based on, but also has shifted from improving linguistic skills to making the person with aphasia functional at a broader social level.

The Aphasia and Stroke Association of India (Aphasia and Stroke Association of India, 2013) estimates that 800,000 to 1,000,000 persons are affected by stroke annually. Aphasia, which is the impairment of language functions, is considered to be the second most disabling consequence of stroke (Agostini, Garzon, Benavides, De Pellegrin, Bencini, Rossi et al.,2014). Intensive and long term treatments are often recommended for persons with aphasia (PWA) owing to its chronic nature (Theodoros, Hill, Russell,Ward, & Wootton, 2008). But, a large proportion of PWA fail to gain access to and/or continue speech-language services because of a number of hindering factors such as geographical barriers, physical condition of the person himself/herself, lack of adequate number of service providers and high costs (Agostini et al., 2014).

A great majority of healthcare professionals believe that reduced duration of hospital stay and providing various healthcare services at home improve the treatment

outcomes (Reinkensmeyer, Pang, Nessler, & Painter, 2002). Advent of telecommunication technology propelled the process of tele-rehabilitation, which aids in providing services like assessment, intervention, consultation and educational services. This helps in providing these services through distance mode to persons with aphasia at their door step. To establish the efficacy of tele-rehabilitation services, researches have made attempts to compare between face-to-face treatment and tele-treatment. In persons with post-stroke anomia Agostini et al., 2014, found significant improvements on treated items in both conditions. These findings suggested that factors like the absence of physical interaction between PWA and the therapist and technical intricacies did not impede the effectiveness of tele-treatment.

The American Speech Language and Hearing Association posits tele-practice as an appropriate model of service delivery for the professions of Audiology and Speech-Language Pathology as it can be used to overcome barriers of access to services caused by distance, unavailability of specialists and/or sub-specialists, and impaired mobility and offer extended clinical services to remote, rural, and underserved populations (Speech-Language Pathologists Providing Clinical Services via Telepractice: Position Statement, 2005). This has encouraged dedicated research on computerized rehabilitation services to enhance tele- rehabilitation services (Brennan, Tindall, Theodoros, Brown, Campbell, Christiana et al.,2011).

Tele-treatment in Indian scenario is gaining popularity in the recent past. A study by Goswami, Bhutada, & Jayachandran, 2012 established efficacy of tele-treatment of 25 sessions for a person with Broca's Aphasia using a web camera based system via Skype. The study reported improved participation in the treatment program and improved language skills. Goswami and Renuka (2013) developed Computerized Version of Manual for Adult Aphasia Therapy – Kannada (CV-MAAT-K) to

remediate Functional Communication, Repetition, Comprehension and Expression, Naming and Reading and Writing. Field testing of CV-MAAT- K has established it to be an effective tool in improving the communication skills of persons with aphasia.

Software based tele-treatment is core to the process of tele- rehabilitation since it permits interaction between the therapist and PWA through long distance in an asynchronous manner. Software programs like CogMed, Lumosity, Sentence Shaper, Lingraphica and Sentactics are commercially available and put to use very often. The effectiveness of CogMed (Pearson Company, Scandinavia, Sweden, 2011), a software program created for use with individuals with brain insult was tested on 18 stroke for 5 weeks of treatment. Progress on untrained measures of working memory and attention and fewer cognitive problems were found with the tele-treatment (Westerberg, Jacobaeus, Hirvikoski et al., 2007). Finn and McDonald studied 16 participants with mild cognitive impairments using Lumosity (Lumos Lab, San Francisco, CA, 2007), an online-based tool available on the internet, targeting attention, speed of processing, visual memory over 30 sessions. Significant training effects on working memory and visual attention were found, establishing the efficacy of the software. Though effective, software based tele-rehabilitation options are limited in their functional applications and diversity of therapy tasks available.

Overcoming the limitations of restricted diversity of available therapy tasks, Constant Therapy, an iPad (Apple Inc., Cupertino, CA) software platform was developed by Kiran, Des Roches, Balachandran & Ascenso (2014). It offers an impairment-based, individualized treatment plan for persons with aphasia, who have suffered a traumatic brain injury (TBI), stroke or dementia, or children with learning disabilities or other disorders through tele- treatment. To make the tele-treatment more systematic, individualized and personalized through Constant Therapy, a wide

range of treatment tasks were designed based on extensive research, aiming to remediate linguistic and cognitive skills. Constant Therapy can be effectively used for tele-treatment since it enables manual delivery of tasks and also allows for the user to use dynamically upgraded tasks. It helps assess the participant's performance by measuring the accuracy and latency of the responses on each of the designed tasks. The software enables clinicians to monitor the participant's performance on each therapy task through distance mode effectively. The program also allows for analysis and graphical visualization of the accuracy and latency of scores for every session of usage. It is available for use independently or with multiple clients, set up homework and monitor PWA' progress to make better clinical decisions for a wide range of people including speech-language pathologists, academicians and researchers. Des Roches, Balachandran, Ascenso, Tripodis and Kiran (2014) studied the effectiveness of this tablet based software platform that delivers tailored therapy for PWA and found significant and positive changes in both the domains of language and cognition.

Need for the study:

In the Indian scenario, persons availing speech and language services faces lot of adversities since there is lack of manpower in the field of Speech-Language Pathology. With issues of geographical barriers, high costs of available services and physical conditions of the PWA; gaining access to speech- language services is a difficult task. Literature quoted above suggests that computer rehabilitation programs are effective in spite of lacking one-to-one interaction with the therapist. Moreover, providing rehabilitation services at home is found to be effective. Constant Therapy is one of the software programs available whose effectiveness is well established. An adaptation of Constant Therapy to Indian languages can be useful in enabling tele-rehabilitation of persons with aphasia remotely and enable them to gain access to

continued services at home environments. Thus, with this background in mind, the need for conducting the current study was felt with the aim of adapting Constant Therapy in to Hindi language.

Chapter II

Review of Literature

A pivotal aspect of aphasia research has been to identify effective tools and techniques for treatment and studying their effectiveness. Maximizing recovery of language and communication skills and functional recovery have been the driving force for language rehabilitation in aphasia. One of the earliest systematic treatments introduced during the times of First World War was by Hermann Gutzmann (1865-1922) – the father of aphasia therapy – and Emil Froeschels (1884-1973) who applied techniques from voice therapy, articulatory drills to aphasia treatment (Code, 2012). Luria (1973) advocated treatment of language and cognition based on the perspective reorganization of function. This era was followed by a shift of focus towards behavioural approaches. During 1970s, intervention strategies were dedicated to providing treatment based on linguistic impairment i.e., based on auditory comprehension, syntax, semantics, word retrieval abilities, verbal expression, reading and writing. In the 1970s linguistic rehabilitation witnessed a paradigm shift when Holland (1977) advocated the importance of functional aspects of language rehabilitation. 1970s also saw the beginning of the early application of video games in various fields as therapeutic aids. This gained popularity in the early 1980s. This era witnessed the use of some of the earliest made personal computers and available educational software. By the mid-1980s, computer platforms like IBM PC and Macintosh platforms were well established. Along with the advent of simplified computer programming languages that individuals to develop their own softwares, computer based applications for rehabilitation and educational purposes gained popularity (Stachowiack, 1993). Since the time of their advent, due to their cost

reducing potential, computer based methods have become interesting for health care insurance agencies (Stachowiack, 1993). Enderby and Petheram (1992) emphasized the role of home training through computer-assisted technology because long term inPWAtreatment for aphasia therapy is seldom possible in a few countries. This gradually led to the increase in commercial potential of available special rehabilitation softwares (Stachowiack, 1993) and production and marketing specially written cognitive retraining software for one or the other platform gained popularity amongst many rehabilitation clinicians.

Early Studies on Computer- Assisted Treatment for Aphasia

The first trials using computers in Aphasia therapy in Europe were at the end of 1970s in Paris (Deloche and team) and in Brisol, England, at the beginning of 1980s (Enderby and team). Seron, Deloche, Moulard and Rouselle (1980) were the first to show the effects of computer-based aphasia therapy. Therapy was limited to improvements in written language because at that time the computer was seen as an instrument most appropriate for text processing and calculation. Five PWA with severe writing disorders participated in the study. They were to type dictated words on a keyboard. After training, PWA were able to type more words correctly, made fewer errors per word, with errors being approximate to target words. Generalization effect on reading was also found.

Enderby and Petheram (1992) reported positive experience in England in an experiment with 10 PWA, in which self-adapting written language exercises were used, average working time per task significantly decreased with usage. The data showed that the PWA spent more time working on the program which reflected their motivation to work with the program.

In the United States, the first therapy system containing comprehensive language material- based on linguistic crtiteria- for the treatment of all aphasic symptoms, and equipped with a special speech synthesizer developed for this purpose, was the Lingware/STACH System, a program developed in Bonn from 1983 to 1989. It was composed of 150 exercises, each with about 50 tasks in domains like naming, dictation, word formation, categorization and syntax. A study by Grießl and Stachowiak, in 1994 recruited 156 PWA, of whom, 77 received conventional speech therapy and 79 received conventional speech therapy plus a supplementary computer training using the STACH system for a period of 6 weeks i.e., 30 hours of language training between pre- and post-testing with the Aachen Aphasia Test Battery (AAT). The authors reported positive effects of speech therapy in general and secondly effects of supplementary computer training focusing on naming and written language.

Transition to Interactive Software Programs and Apps for Treatment for PWA

With greater inputs into treatment efficacy studies using computer-based methods, it came to be widely accepted that treatment of higher cognitive functions like problem solving, memory disorder above all language disorders require highly interactive learning programs that go beyond simple pattern drilling. It offers PWA the opportunity to train simulated, real-life situations, thereby helping to prepare them for the return to daily life. However, it was later acknowledged that the programs require to be neuropsychologically founded and their efficacy proved. Cumbersome technological issues, particularly around the length and complexity of data transfer (Mortley Wade, Davies & Enderby, 2003), were being kept in check with new softwares which incorporated improved interfaces and automated data transfer procedures using a secured internet site. With new developments in the software technology, founding of internet and development of new gadgets, new, customizable,

aphasia-specific application software – apps – are becoming available in the iPad App Store regularly many from reputable companies who are not newcomers to aphasia therapy- Lingraphica: Princeton, NJ; Sentence-Shaper (Psycholinguistic Technologies, Jenkintown, PA), Oral Reading for Language in Aphasia (ORLA, Cole & Cherney, 2004) and Touchspeak (TouchspeakTM, London, England); Tactus Therapy Solutions Ltd: Vancouver, BC. Internet-based software treatments have been increasingly available for individuals with brain damage like CogMed (Pearson Company, Scandinavia, Sweden).

Aftonomos, Steele and Wertz (1997) assessed the efficacy of designated computer based system, Lingraphica involving 23 chronic persons with aphasia who had previously been treated with traditional methods ranging from 6 months to 15 years post onset. They assessed their response to resumption of therapy using computer-based treatment. All participants had one hour clinical sessions by speech therapist for 16.2 weeks using the Lingraphica system which allowed persons with aphasia (PWA) to build messages via a string of selected pictures, which may be read or reproduced digitally as speech. Results revealed that three PWA improved approximately 10 percentile points on the PICA after 40 hours of therapy. The remaining 20 PWA improved significantly from pre to post-treatment on the Boston Naming Test. Changes in the BNT were reported for most PWA regardless of length of time between onset of aphasia and commencement of therapy. Similar improvements were reported for performance on subtests of the Western Aphasia Battery and the Boston Diagnostic Aphasia Examination

Cherney (2010) investigated the cost-effectiveness of a computerized version of the ORLA on 25 persons with chronic non-fluent aphasia who received 24 one-hour sessions of ORLA treatment, typically twice a week. A delayed treatment design

was utilized; therefore all participants received treatment following a period of no-treatment. ORLA treatment results were promising, despite the low intensity of the scheduled treatment in this study. On their primary outcome measure, the Western Aphasia Battery Aphasia Quotient (AQ), participants achieved an average increase of 3.4 (SD= 4.5) points following the low-intensity ORLA treatment as compared to a mean difference of -0.36 (SD= 3.1) AQ points during a delayed treatment control period. In this same study, a computer version of ORLA was compared to ORLA treatment delivered by a speech-language pathologist. Although improvements were made on the computer version, these improvements were smaller than those achieved with the speech-language pathologist.

TouchSpeak (TS), a computerized communication aid was assessed for functional success in persons with severe aphasia by Van de Sandt-Koendermana, Wiegersb, Wielaertb, Duivenvoordenc & Ribbersd in 2007. A total of 30 PWA were trained to use TS in two self-chosen communicative situations. The successful participants showed different levels of proficiency. Some were able to use the system independently and creatively in many situations, some used it independently for trained situations, and others remained partner dependent in using TS. Results revealed that seven participants were classified as extensive users of TS, five were independent TS users, and five were partner dependent.

Although increased intensity of speech language therapy (SLT) has been associated with improved outcome, delivery of such services may be complicated by issues of increased demand, available resources and equitable access to services. While “in-person” services are the gold standard of care, other options for service delivery should be considered. One such option is telerehabilitation or telecare, in which services are provided at a distance. Online platforms such as video-

conferencing or interactive computer-based programs may be used to assess, deliver interventions and monitor function in a timely fashion (Theodoros et al. 2008). The American Speech Language and Hearing Association's position statement on Tele-practice in 2005 has propelled research on computerized rehabilitation over the years. Overall, the results of studies examining computer-based intervention are positive. While all of the studies reported a generally positive effect, none established which element of the therapeutic intervention might be responsible for the demonstrated improvements (Wallesch & Johannsenâ Horbach, 2004). Computer- aided technology is an additional aid for PWA and therapists that can increase the amount of training time and offer interesting therapy material. An important goal is also the possibility of controlled home training (Stachowiack, 1993). Improvements are reported on assessments undertaken not only at the impairment level, but also at the level of functional communication (Aftonomos, Steele & Wertz, 1999; Manheim, Halper & Cherney, 2009; Petheram 1996).

Effectiveness of Constant Therapy

With the aim of examining the effectiveness of the iPad- based therapy platform (Constant Therapy), Des Roches et al., (2014) studied a group of 51 PWA with stroke and traumatic brain injury who had aphasia for a duration of one month to about 359 months. The control group used Constant Therapy for one hour per week within clinic along with the clinician. The experimental group used Constant Therapy for the same one hour at the clinic but were also advised for practice at home. The outcomes of their project were discussed in terms of four PWA with varying cognitive-linguistic profiles. A detailed cognitive- linguistic profile of the PWAs was obtained before and after treatment using Revised- Western Aphasia Battery (WAB-R), Cognitive-Linguistic Quick Test (CLQT), Boston Naming Test (BNT) and Pyramids and Palm

Trees Test (PPTT). The choice of therapy tasks to be assigned came from a set of 30+ therapy tasks broadly divided in language and cognitive therapy. Language therapy tasks were divided into (1) naming therapy (2) reading therapy (3) writing therapy (4) sentence planning. The cognitive therapy tasks were divided into (1) visuospatial processing (2) memory (3) attention (4) problem solving (5) executive function. After selecting potential tasks, they were assigned as baseline. A task was taken up for therapy only if, the score on the task was below 80%. If the scores were higher than 80%, the next level of difficulty in a particular task was assigned for treatment. For the "therapy schedule" every week, five to six tasks with up to 10 items in each task were assigned to every PWA. A 10 week treatment program was employed during the study. The tasks for every PWA were modified based on the changing cognitive-linguistic profile through the course of therapy. The control group was asked to practice therapy by logging into the Constant Therapy app using usernames and passwords for about six days a week for one hour every day. They were also recommended for weekly visits in the clinic to monitor the progress. Results were recorded by the software which included the scores on various tasks and therapy practice time. Four PWA with Low Language Profile –Low Cognitive Profile, High Language Profile-Low Cognitive Profile, Low Language Profile- High Cognitive Profile and High Language Profile- High Cognitive Profile respectively were analysed for outcomes on WAB-R, CLQT and PPTT as post therapy measures. Their results revealed that all four PWA improved on their iPad-based therapy tasks in terms of accuracy and latency. PWAs motivation levels were noted to be higher when assigned with the software based therapy practice for home which was inferred through the number of log in sessions per week for each PWA. Positive outcomes of treatment were also seen as improved scores on standardized test materials like WAB-R, CLQT

and PPTT irrespective of the duration from which the person had aphasia or the cognitive-linguistic profile. It was concluded from the study that smart-tablet and/or internet based applications for therapy for PWA helps PWA to continue therapy outside clinical settings and aids the conventional therapy procedures.

Though such procedure cannot replace the traditional paper-pencil based therapies, easy access to data of the PWAs, remote analysis of the outcomes on therapeutic tasks, multitude of tasks available for therapy in software and easy monitoring of home training put technology based interventions in the forefront which could be adapted by clinicians across the globe easily for better services to PWA.

CHAPTER III

METHOD

The present study aims to adapt Constant Therapy in Hindi. The developers and creators of Constant Therapy were contacted to obtain due consent to adapt Constant Therapy to Hindi. Suitable translations, modifications and adaptations were incorporated in the adapted version of Constant Therapy in consensus with the developers and creators.

Procedure:

The present study was conducted in two phases.

Phase I: Preparation of stimulus for Constant Therapy in Hindi

Phase II: Validation of stimulus prepared for Constant Therapy in Hindi

Phase I: Preparation of stimulus for Constant Therapy in Hindi

Phase I comprised of reviewing, revising and appropriately translating and adapting Constant Therapy, developed by Kiran et al. (2014) in Hindi. As specified in Constant Therapy, the adapted version in Hindi included the same broad domains of Language and Cognition with various sub-sections under each of them. Selected subsections from the original English version of the software were translated and adapted. The broad domains and sub-sections developed are described below:

I. Language

A. Auditory

1. Spoken Word Comprehension
2. Spoken Sound Comprehension
3. Spoken Syllable Comprehension
4. Spoken Rhyming Comprehension
5. Auditory Commands

B. Naming

1. Feature Matching

C. Reading

1. Letter to Sound Matching
2. Sound to Letter Matching
3. Written Word Comprehension
4. Reading Comprehension

D. Sentence Planning

1. Active Sentence Completion
2. Passive Sentence Completion

II. Cognition

A. Visual Processing

1. Map Reading Task
2. Calendar Task

B. Quantitative Reasoning

1. Word Problems
2. Currency Task

Core Vocabulary for Constant Therapy- Hindi

The core vocabulary for Constant Therapy- Hindi consisted of words from 30 Lexical categories with appropriate pictures. Within each of the lexical categories the items were graded as most familiar and less familiar or as 'culturally sensitive'. Alternate words were also chosen wherever many forms of usage for the same lexical item were present. A total of 638 words were selected under 30 lexical categories along with their pictures and recorded. This core vocabulary was developed considering the semanaticity, familiarity and frequency of usage with respect to PWA.

Developing Stimulus for Tasks in Constant Therapy- Hindi

i. **Spoken Word Comprehension Task:**

The core vocabulary developed was inserted into a Microsoft Excel document which consisted of the program written for use with the software platform provided by the developers of the software.

ii. **Spoken Sound Syllable Comprehension:**

The words developed to form the core vocabulary of the software were segregated as those which begin with each of the Hindi alphabet and those which end with each of the Hindi alphabet. These words were then inserted into a Microsoft Excel document which was provided by the developers of Constant Therapy.

iii. **Spoken Syllable Comprehension:**

All the words developed in the core vocabulary were segregated with respect to number of syllables in each word. The stimulus for this task was inserted into a Microsoft Excel document along with distractors as prescribed by the developers of Constant Therapy.

iv. Spoken Rhyming Comprehension

Commonly used rhyming words in Hindi were selected from sources like textbooks, rhymes and story books. These words were inserted into a Microsoft Excel document along with distractors in a format prescribed by the developers.

v. Auditory Command Task

Auditory commands in Hindi were made in four levels of difficulty. The task was made using post-positions and directions in Hindi. These commands were then inserted into a Microsoft Excel document with an option of generating numerous commands using the core vocabulary in combination with the commands written into the program.

vi. Feature Matching Task

Keeping the core vocabulary developed as the base, 101 semantic features were selected for the task. Answers were entered as '0' and '1' against selected words from the core vocabulary in a Microsoft Excel document which consisted the program to generate stimuli for this task.

vii. Reading Comprehension

Reading passages from Manual for Adult Aphasia Therapy – Hindi (MAAT-H, Goswami, Thomas & Varghese, 2015) were chosen and questions were formulated for reading comprehension task. Questions, answers and distractors for the task were entered into a Microsoft Excel document.

viii. Sentence Planning

Active and passive sentences from Manual for Adult Aphasia Therapy – Hindi (MAAT-H, Goswami et al., 2015) were chosen for this task. The sentences were broken down into segments as 'subject', 'object', and 'verb' and were entered into Microsoft Excel document. Two distractors each for 'subject', 'object', and 'verb' and were made.

ix. Map Reading Tasks

For this task, maps were created using Google Maps with 1 to 6 destinations and specific route depicted in each of the maps. Questions based on the destinations, direction of travel, places before and after certain destination were formed along with answers and two distractors each. This data was then entered into a Microsoft Excel document.

x. Calendar Task

For the calendar tasks, a calendar for the year 2016 was created with certain events marked in every month in the calendar. Questions based on the events, day, date and month were formulated. Each question was provided with an answer and two distractors which were entered into a Microsoft Excel document.

xi. Word Problems

Simple statement questions aiming at arithmetic functions like addition, subtraction, multiplication and division were made in Hindi language. These questions along with the appropriate mathematical operation that has to be employed were entered into a Microsoft Excel document that would be used to generate the stimuli.

xii. Currency Task

The stimulus for currency task was made in four levels of difficulty. Images of coins and notes commonly used in India were collected and edited to form various denominations. Level 1 stimuli consisted of 1-2 coins and/or currency notes; Level consisted of 3-4 coins and/or currency notes; Level 3 consisted of 5-6 coins and/or currency notes and Level 4 consisted of 8-10 coins and/or currency notes. Also, the question and answers for all the denominations were entered into a Microsoft Excel document.

Phase II: Validation of stimulus prepared for Constant Therapy in Hindi

For the validation of the stimulus prepared across all the tasks, a feedback questionnaire (Goswami, Shanbal, Samasthitha & Navitha, 2012) containing 20 parameters like simplicity, familiarity, relevance and generalization etc., was chosen. Nine Speech-Language Pathologists and one Linguist who were all native speakers of Hindi language rated the stimulus in each of the tasks and all the lexical categories as ‘very poor’, ‘poor’, ‘fair’, ‘good’ or ‘excellent on all the 20 parameters in the questionnaire. The stimulus was modified based on suggestions provided by the SLPs and the Linguist if more than three of them provided a similar suggestion on any of the tasks. The rating scores of the 10 judges were compiled. Using frequency distribution, the scores were represented in tabular forms for all the tasks across the 20 parameters for all the 10 judges.

CHAPTER IV

RESULTS

The current study aims to adapt Constant Therapy in Hindi. The study was conducted in two phases of Development of stimulus and validation of the same respectively. Stimulus under a total of 15 tasks and a core vocabulary consisting of items under 29 categories was developed. The stimulus consisted of words, questions, statements, phrases and relevant pictures (Table 4.1 & Table 4.2).

Table 4.1 *Summary of Stimulus Prepared*

Sl. No.	Therapy Task	No. of Stimulus Items Prepared			
		Orthographic Stimuli			Picture Stimuli
		Questions/ Words/ Word Pairs	Answers	Distractors	
1.	Auditory Command Task	4	-	-	*
2.	Calendar Task	180	180	360	12
3.	Categories	638	-	-	638
4.	Currency Task	196	-	-	196
5.	Feature Task	101	1022	61278	*
6.	Letter to Phoneme Task	46	46	46	-
7.	Map Task	50	50	100	05
8.	Math Task	118	-	-	-
9.	Phoneme to Letter Task	46	46	46	-
10.	Phoneme to Word Task	638	-	-	-
11.	Reading Task**	30	30	60	-
12.	Rhyming Task	212	212	100	-
13.	Semantic Minimal Pair Task	140	140	140	-
14.	Semantic Odd One Out Task	100	500	200	-
15.	Sentence Completion Task**	50	50	300	-
16.	Syllable Task	638	-	-	638

Note: * Indicates: Program will utilize the 638 core vocabulary made; ** Stimuli adapted from field tested manual

Table 4.2 *Stimulus Summary of Lexical Categories*

Sl No.	Lexical Category	No. of Items	No. of Pictures
1.	Animals	58	58
2.	Arts and crafts	19	19
3.	Bird	33	33
4.	Body parts	29	29
5.	Clothing	46	46
6.	Container	14	14
7.	Entertainment	14	14
8.	Fixture	07	07
9.	Food	35	35
10.	Fruits	36	36
11.	Furniture	34	34
12.	Gadget	08	08
13.	Geography	04	04
14.	Herbs	10	10
15.	House hold item	21	21
16.	Kitchen	21	21
17.	Magical creature	08	08
18.	Musical instruments	14	14
19.	Nature	27	27
20.	People	28	28
21.	Personal item	32	32
22.	Residence	05	05
23.	Structure	22	22
24.	Symbolic	06	06
25.	Tool/tool aid	46	46
26.	Toy	18	18
27.	Transport	45	45
28.	Vegetables	35	35
29.	Weapon	08	08

A total of 16 tasks were developed from a reference provided by the developers of Constant Therapy. The Lexical Category Task comprised of 638 items and their pictures categorized under 29 categories summarized in Table 4.2. For the Auditory Command Task, a set of five instructions with increasing level of difficulty in terms of the syntactic structure were formulated in five levels of difficulty. The five instructions were formulated in such a way that they could utilize the 638 words developed as part of core vocabulary to generate a wide variety of questions for use

with the software. Calendar Task comprised of a 12 month Calendar with certain events marked on it along with 180 related questions, 180 appropriate answers and 360 distractors fed into a Microsoft Excel Sheet. A total of 196 questions and 196 picture stimulus were prepared for the Currency Task under four levels of difficulty. For the Feature Task, a set of 101 features were identified. In a Microsoft Excel document these features were arranged against their answers which were 1,022 in number and their distractors which were 61,278 in number. The Letter to Phoneme Task and Phoneme to Letter Tasks comprised of 46 sounds from the Hindi Varnamala. The Map Task was developed with a set of 5 maps, 50 questions based on the maps each with one answer and two distractions each. A total of 118 questions based on various mathematical operations were prepared for the Math Task. The phoneme to word task comprised of the 638 items compiled under the 29 lexical categories sorted out based upon the beginning and ending sound. A set of 212 pairs of rhyming words in Hindi were identified for the Rhyming Task and a set of 100 distractors were prepared for the same. The Semantic Minimal Pair Task comprised of 140 questions with one answer and one distractor each. The Semantic Odd One out consisted 100 questions, each comprising of a set of five related words and two unrelated words. The Sentence Completion Task comprised of a set of 25 sentences each in active and passive voice. The sentences had one answer each and six distractors for every sentence selected. The Syllable Task consisted of the 638 items compiled under the 29 lexical categories. These words were categorized as those being bi-syllabic and those which were not bi-syllabic.

The stimulus was then given to 10 judges (nine Speech-Language Pathologists and one Clinical Linguist) to rate the stimulus based on a feedback questionnaire (Appendix 1) consisting of 20 parameters. Each of the tasks were rated by the 10

judges on the 20 parameters as 'Very Poor', 'Poor', 'Fair', 'Good' and 'Excellent'. These ratings were then compiled and frequency distribution of rating for each parameter on the tasks was obtained using SPSS 21.0 software. The tasks of Letter-to-Phoneme Task, Phoneme- to-Letter Task, Phoneme-to-Word Task, Reading Task and Sentence Completion Task were exempted from stimulus rating.

Animals

A total of 58 items in the category of animals and their related pictures were collected and organized into three levels of difficulty – easy, medium and difficult.

Table 4.3 *Stimulus Rating for Lexical Category of Animals*

	Very Poor	**Poor**	**Fair**	**Good**	**Excellent**
Simplicity	-	-	-	4	6
Familiarity	-	-	-	3	7
Size of the Picture	-	-	-	3	7
Colour and Appearance	-	-	-	1	9
Arrangement	-	-	-	5	5
Presentation	-	-	-	6	4
Volume	-	-	-	7	3
Relevance	-	-	-	6	4
Complexity	-	-	2	5	3
Iconicity	-	-	-	-	10
Accessibility	-	-	-	5	5
Flexibility	-	-	-	6	4
Trainability	-	-	-	5	5
Stimulability	-	-	-	5	5
Feasibility	-	-	-	3	7
Generalization	-	-	2	4	4
Scope of Practice	-	-	-	4	6
Scoring Pattern	-	-	-	3	7
Publications	-	-	-	7	3
Coverage of Parameters	-	-	-	4	6

As evident from Table 4.3, on the feedback questionnaire, three judges rated the words and the picture stimuli to be good whereas seven judges rated the stimulus to be excellent on the parameters of Familiarity, Size of the Picture, Feasibility and Scoring Pattern. On the parameters of Simplicity, Scope of Practice and Coverage of parameters, four judges rated the stimuli as good and six judges rated it as excellent. Five Judges rated the stimuli as good and five rated it as excellent on the parameters of arrangement, Accessibility, Trainability and Stimulability. On the parameters of Presentation, Relevance and Flexibility, six judges gave the rating of good and four rated the stimulus as excellent. Seven judges rated the stimuli as good and three of them as excellent on the parameters of Volume and Publications, Outcomes and Developers. Two judges rated the stimuli as Fair on the parameters of Complexity and Generalization. Five judges gave the rating of good and three judges gave the rating of excellent on the parameter of Complexity. Four judges gave the rating of good and excellent respectively on the parameter of Generalization. All 10 judges gave the rating of excellent on the parameter of Iconicity.

Arts and Crafts

A total of 19 items and the relevant picture stimuli were identified and arranged as ‘easy’, ‘medium’ and ‘difficult’. Table 4.4 depicts the stimulus rating for the lexical category of arts and crafts. On the parameters of Familiarity and Trainability, one judge rated the stimuli as fair, four judges rated it as good and five judges rated it as excellent. Seven judges rated the stimuli as good and three of them rated it as excellent on the parameters of Arrangement, Presentation, Feasibility and Coverage of

Parameters. Five judges each rated as good and excellent for the parameters of Flexibility, Generalization and Scope of Practice. For Accessibility and Stimulability, four judges rated the stimulus as good and six judges rated it as excellent. Simplicity was rated on as good by nine judges and excellent by one judge. Two judges rated the stimulus as good and eight rated it as excellent. On the parameter of Appearance, a rating of good was given by three judges and that of excellent was given by seven judges. A rating of fair and good was given by three judges each and the rating of excellent was given by four judges on the parameter of Volume. One judge each rated the stimuli as fair and good respectively and eight judges rated the stimuli as excellent on the parameter of Relevance. On the parameter of Complexity, two judges rated the stimuli as fair and eight of them rated it as good. The stimulus was rated as fair by one judge, good by two judges and excellent by

Table 4.4 *Stimulus Rating for Lexical Category of Arts and Crafts*

	Very Poor	**Poor**	**Fair**	**Good**	**Excellent**
Simplicity	-	-	-	9	1
Familiarity	-	-	1	4	5
Size of the Picture	-	-	-	2	8
Colour and Appearance	-	-	-	3	7
Arrangement	-	-	-	7	3
Presentation	-	-	-	7	3
Volume	-	-	3	3	4
Relevance	-	-	1	1	8
Complexity	-	-	2	8	-
Iconicity	-	-	-	6	4
Accessibility	-	-	-	4	6
Flexibility	-	-	-	5	5
Trainability	-	-	1	4	5
Stimulability	-	-	-	4	6
Feasibility	-	-	-	7	3
Generalization	-	-	-	5	5
Scope of Practice	-	-	-	5	5
Scoring Pattern	-	-	1	2	7
Publications	-	-	5	4	1
Coverage of Parameters	-	-	-	7	3

seven of them. For Publications, Outcomes and Developers, the rating of fair, good and excellent was given by five, four and one judges respectively.

Birds

33 items in total with written words and relevant pictures were compiled under the category of birds. The words were arranged as easy, medium and difficult levels of difficulty. The results of the rating are presented in Table 4.5. A rating of Poor was given by three judges, Fair by four judges, good by one judge and excellent by two judges for the parameters of Simplicity, Familiarity, Publications, Outcomes and Developers and Coverage of parameters.

Table 4.5 *Stimulus Rating for Lexical category of Birds*

	Very Poor	**Poor**	**Fair**	**Good**	**Excellent**
Simplicity	-	3	4	1	2
Familiarity	-	3	4	1	2
Size of the Picture	-	-	-	4	6
Colour and Appearance	-	-	-	4	6
Arrangement	-	-	-	4	6
Presentation	-	-	-	6	4
Volume	-	-	-	5	5
Relevance	-	1	5	2	2
Complexity	-	-	4	5	1
Iconicity	-	-	1	6	3
Accessibility	2	-	-	7	1
Flexibility	-	-	1	5	4
Trainability	-	-	3	5	2
Stimulability	-	-	2	8	-
Feasibility	-	-	1	9	-
Generalization	-	1	2	7	-
Scope of Practice	-	1	-	9	-
Scoring Pattern	-	-	-	5	5
Publications	-	3	4	1	2
Coverage of Parameters	-	3	4	1	2

For the parameters of Size of Picture, Color and Appearance and Arrangement a rating of good and excellent was given by four and six judges respectively. Five judges each rated the stimuli to be good and excellent on the parameters of Volume and Scoring Pattern. On the aspect of Presentation, the stimulus was rated as good by six judges and excellent by four judges. A rating of poor, fair, good and excellent was given by one, five, two and two judges respectively. Four out of the 10 judges rated the stimulus to be fair, five of them as good and one of them as excellent on the complexity parameter. On Iconicity, one judge gave the rating of fair; six rated it as good and three of them as excellent. Two raters rated the aspect of accessibility as very poor, seven of them as good and one of them as excellent. The parameter of Flexibility was rated as fair by one judge, good by five judges and excellent by four judges. Three judges rated Trainability parameter as fair, five rated it as good and two rated it as excellent. Two out of the 10 judges rated the aspect of Stimulability as fair and the remaining rated it as good. For the parameter of Feasibility, nine raters gave the rating of good whereas on of the judges rated it as fair. One out of the 10 judges rated the stimuli as poor, two as fair and seven as good for Generalization aspect. Nine judges rated the stimulus to be good on Scope of Practice parameter whereas one of them rated it to be fair.

Body Parts

Under the lexical category of Body Parts a total of 29 items were compiled along with their appropriate pictures. These were also categorized as easy, medium and difficult levels. Table 4.6 depicts the compiled results of the stimulus rating for ‘Body Parts’ category.

Table 4.6 *Stimulus Rating for Lexical Category of Body Parts*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	-	7	3
Familiarity	-	-	-	7	3
Size of the Picture	-	-	-	4	6
Colour and Appearance	-	-	-	4	6
Arrangement	-	-	1	5	4
Presentation	-	-	-	6	4
Volume	-	-	-	5	5
Relevance	-	-	-	3	7
Complexity	-	-	2	5	3
Iconicity	-	-	1	3	6
Accessibility	-	-	-	4	6
Flexibility	-	-	-	6	4
Trainability	-	-	-	4	6
Stimulability	-	-	1	3	6
Feasibility	-	-	1	5	4
Generalization	-	-	1	7	2
Scope of Practice	-	-	1	7	2
Scoring Pattern	-	-	-	5	5
Publications	-	4	2	4	-
Coverage of Parameters	-	-	-	7	3

Out of the 10 judges, seven rated the stimulus as good and three of them as excellent on the parameters of Simplicity, Familiarity and Coverage of Parameters. On the parameters of Size of the Picture, Color and appearance, Accessibility and trainability, four judges rated the items as good and the rest rated them as excellent. Five judges each rated the items as good and excellent on the parameters of Volume and Scoring Pattern. On the aspects of Arrangement and Feasibility, one judge rated the stimulus items as fair, five as good and four as excellent. One out of the 10 judges rated the items as fair, seven as good and two as excellent on the parameters of Generalization and scope of practice. Six judges rated the stimulus as excellent, three as good and one of them as fair on the aspects of Iconicity and Stimulability. The stimulus was rated as good by six judges and excellent by four judges on Presentation. Relevance

was rated as good by three judges and as excellent by seven. Complexity of items was rated as fair by two, good by five and excellent by three of the judges. On the parameter of Publications, Outcomes and Developers the stimulus was rated as poor by four judges, fair by two and good by four of them. This suggested the limited availability of similar resource softwares or programs which can employ re-training of specific aspects of language impairments.

Clothing

46 items and their pictures under this lexical category were translated and adapted and rated on the feedback questionnaire. The compiled results are presented in Table 4.7. It was seen that four out of 10 judges and six out of 10 judges rated the stimulus items as good and excellent respectively on the aspects of Simplicity, Familiarity, Size and Relevance. On the parameters of Color and Appearance Flexibility and Iconicity, the stimulus was rated as good by three judges and excellent by the rest. Six judges rated the items as good and four rated them as excellent on the parameters of Stimulability, Generalization, Scope of Practice, Scoring Pattern and Coverage of Parameters. Complexity of the stimulus was rated as being fair by two judges, good by seven and excellent by one. Similarly, Feasibility of the stimulus was found to be fair by one judge out of the 10, good by six and excellent by three of the judges. The parameter of Publications, outcomes and Developers received rating of poor by one judge, fair by five judges, good by three of them and excellent by one of them.

Table 4.7 *Stimulus Rating for Lexical Category of Clothing*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	-	4	6
Familiarity	-	-	-	4	6
Size of the Picture	-	-	-	4	6
Colour and Appearance	-	-	-	3	7
Arrangement	-	-	1	5	4
Presentation	-	-	-	7	3
Volume	-	-	1	5	4
Relevance	-	-	-	4	6
Complexity	-	-	2	7	1
Iconicity	-	-	-	3	7
Accessibility	-	-	-	5	5
Flexibility	-	-	-	3	7
Trainability	-	-	-	5	5
Stimulability	-	-	-	6	4
Feasibility	-	-	1	6	3
Generalization	-	-	-	6	4
Scope of Practice	-	-	-	6	4
Scoring Pattern	-	-	-	6	4
Publications	-	1	5	3	1
Coverage of Parameters	-	-	-	6	4

Container

Table 4.8 summarizes the stimulus rating for the category of ‘Container’ which had 14 items and their relevant pictures. It was seen that Simplicity and Trainability were rated as fair by one judge, good by five judges and excellent by four judges. On the aspects of Size of the Picture, Color and Appearance and Coverage of Parameters, three judges rated the stimulus as good and the rest of them as excellent. Four judges evaluated the stimulus to be good and six to be excellent on Relevance and Iconicity. On Accessibility, Stimulability, Scope of Practice, Familiarity and Scoring pattern six judges graded the stimulus as good and the remaining as excellent.

Table 4.8 *Stimulus Rating for the Lexical Category of Container*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	1	5	4
Familiarity	-	-	-	6	4
Size of the Picture	-	-	-	3	7
Colour and Appearance	-	-	-	3	7
Arrangement	-	-	2	1	7
Presentation	-	-	1	2	7
Volume	-	-	-	5	5
Relevance	-	-	-	4	6
Complexity	-	-	2	6	2
Iconicity	-	-	-	4	6
Accessibility	-	-	-	6	4
Flexibility	-	-	-	7	3
Trainability	-	-	1	5	4
Stimulability	-	-	-	6	4
Feasibility	-	-	2	5	3
Generalization	-	1	-	5	4
Scope of Practice	-	-	-	6	4
Scoring Pattern	-	-	-	6	4
Publications	-	2	4	3	1
Coverage of Parameters	-	-	-	3	7

50% of the judges rated the stimulus as good and excellent on Volume aspect. Flexibility was rated as good and excellent by three and seven judges respectively. A rating of Poor by one judge, good by five judges and excellent by four judges was given on the parameter of Generalization. On Arrangement, two of the judges ranked the stimulus as being fair, one of them as good and seven of them as being excellent. A rating of fair by one judge, good by two judges and excellent by seven judges was obtained on the Presentation of the stimulus aspect. Feasibility was ranked as excellent by three judges, good by five and fair by two judges out of the 10. 60% of the judges had poor awareness about similar programs that offer similar stimulus for language rehabilitation as seen from the rating of poor by two judges and fair by four judges, good by three of them and excellent by mere one judge.

Entertainment

Table 4.9 *Stimulus Rating for Lexical Category of Entertainment*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	-	9	1
Familiarity	-	-	-	8	2
Size of the Picture	-	-	-	3	7
Colour and Appearance	-	-	-	4	6
Arrangement	-	-	-	5	5
Presentation	-	-	-	4	6
Volume	-	-	-	6	4
Relevance	-	-	-	6	4
Complexity	-	-	2	7	1
Iconicity	-	-	-	6	4
Accessibility	-	-	-	10	-
Flexibility	-	-	-	9	1
Trainability	-	-	-	8	2
Stimulability	-	-	-	9	1
Feasibility	-	-	-	1	9
Generalization	-	-	1	4	5
Scope of Practice	-	-	-	8	2
Scoring Pattern	-	-	2	4	4
Publications	-	2	4	3	1
Coverage of Parameters	-	-	-	8	2

A total of 12 items and their pictures were collected for the stimulus under the 'entertainment' category. Table 4.9 presents the summary of stimulus rating for the same. Simplicity, Flexibility and Stimulability were rated as being good by nine out of the 10 judges and as excellent by one of the judges. A ranking of good by eight judges and that of excellent by two judges was obtained on the parameters of Familiarity, Trainability, Scope of Practice and Coverage of Parameters. On the aspects of Size of the Picture and Presentation, six out of 10 judges ranked the stimulus to be excellent and the rest of them ranked it as being good. Six judges and four judges rated the stimulus set as good and excellent respectively on the parameters

of Volume, Relevance and Iconicity. Accessibility was rated as good by all the 10 judges. A set of five judges rated the Arrangement of the stimuli as good and the rest rated it as being excellent. Complexity was rated as fair by two judges, good by seven and excellent by one of them. Scoring Pattern of the stimuli was rated as good each by a set of four judges whereas it was ranked as fair by two judges. Feasibility was rated as being good by one of the 10 judges whereas it was rated as being excellent by the remaining. A rating of fair by one judge, good by four and excellent by five was given on the aspect of Generalization by the 10 judges. Only 40% of the judges were aware of similar software programs utilizing this kind of stimulus as can be seen from the rating of good by only three of them, excellent by one of them but a rating of poor by two judges and fair by four judges.

Fixture

For the category of Fixtures, a set of seven commonly found items were compiled along with their pictures. These were also organized as ‘easy’, ‘medium’ and ‘difficult’. The stimulus rating by 10 judges is represented in Table 4.10. The judges rated the stimulus on Size of the picture, Relevance, Trainability and Generalization as being fair by one judge, good by four and as excellent by five of them. Color and Appearance of Pictures, Arrangement, Presentation, Stimulability and Feasibility were rated as fair by one judge, good by five judges and as excellent by four judges. Out of the 10 judges, seven ranked the stimulus items as good and three rated it as excellent on the aspects of Iconicity, Accessibility and Scoring Pattern.

Table 4.10 *Stimulus Rating for the Lexical Category of Fixture*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	2	6	2
Familiarity	-	-	1	8	1
Size of the Picture	-	-	1	4	5
Colour and Appearance	-	-	1	5	4
Arrangement	-	-	1	5	4
Presentation	-	-	1	5	4
Volume	-	-	3	2	5
Relevance	-	-	1	4	5
Complexity	-	-	2	7	1
Iconicity	-	-	-	7	3
Accessibility	-	-	-	7	3
Flexibility	-	-	-	8	2
Trainability	-	-	1	4	5
Stimulability	-	-	1	5	4
Feasibility	-	-	1	5	4
Generalization	-	-	1	4	5
Scope of Practice	-	-	1	3	6
Scoring Pattern	-	-	-	7	3
Publications	-	2	5	2	1
Coverage of Parameters	-	-	1	7	2

More scattered ratings were obtained on other parameters. Simplicity was rated as fair by two judges out of 10, good by six and as excellent by two judges. Similarly, Familiarity aspect of the stimulus set was rated as being excellent by one judge, as good by eight of them and as fair by the rest. Volume of the stimulus was rated as fair by three judges as there were only seven items in the set, it was rated as good by two as excellent by the rest of the judges. Complexity of the stimulus was perceived as excellent by one of judges, good by seven of them and as fair by two of the judges. Eight out of 10 judges ranked the Flexibility of the stimulus as good and the rest ranked it to be excellent. Scope of Practice was rated as excellent by six out of 10 judges, good by three and fair by one out 10 judges. A majority of judges (seven out of 10) rated Coverage of Parameters as being good, a small number of them (two out

of 10) rated it as being excellent and the rest rated it as Fair. Only a small number of judges rated the stimuli as excellent (one out 10) and as good (two out of 10) on the aspect of awareness about other programs with similar stimulus. Majority of them reflected poor awareness which is evident from the ratings of fair by seven judges and as poor by one judge.

Food

This category was made using 35 items and their pictures which were rated by 10 judges on a Feedback Questionnaire.

Table 4.11 *Stimulus Rating for the Lexical Category of Food*

	Very Poor	**Poor**	**Fair**	**Good**	**Excellent**
Simplicity	-	-	-	8	2
Familiarity	-	-	1	7	2
Size of the Picture	-	-	-	2	8
Colour and Appearance	-	-	-	4	6
Arrangement	-	-	-	7	3
Presentation	-	-	-	6	4
Volume	-	-	-	5	5
Relevance	-	-	1	3	6
Complexity	-	-	1	7	2
Iconicity	-	-	-	5	5
Accessibility	-	-	-	7	3
Flexibility	-	-	-	7	3
Trainability	-	-	-	7	3
Stimulability	-	-	-	6	4
Feasibility	-	-	-	8	2
Generalization	-	-	-	5	5
Scope of Practice	-	-	-	6	4
Scoring Pattern	-	-	-	5	5
Publications	-	2	4	3	1
Coverage of Parameters	-	-	-	9	1

As evident from Table 4.11, a rating of good by eight judges and that of excellent by two judges was given on the aspects of Simplicity and Feasibility. Familiarity and Complexity were ranked as being fair by one judge out of the 10, good by seven judges and excellent by two judges. The parameters of Arrangement, Accessibility, Flexibility, and Trainability were rated as being good by majority of judges (seven out of 10) and as excellent by the remaining. 50% of the judges rated the stimulus as being good and the other 50% rated it as being excellent on the parameters of Volume, Iconicity, Generalization and Scoring Pattern. The ratings were 60% for good and 40% for excellent on aspects of Presentation, Stimulability and Scope of Practice. Size of the picture was rated as being excellent by a majority of eight out of 10 judges and as being good by the rest of the judges whereas the color and appearance of the pictures were rated as being excellent by 60% of them and as being good by 40% of them. The aspect of Relevance was rated as excellent by six judges, good by three and fair by one of them. Coverage of parameters was perceived to be good by 90% of the judges whereas the remaining 10 % rated it as being excellent. 60% of the judges had poor awareness about programs that incorporate similar stimuli whereas 40% of them were relatively well aware of it. These results are evident from the rating of poor by two judges, fair by four judges in opposition to a rating of good by three judges and as excellent by one judge.

Fruits

A total of 36 items under the category of Fruits were compiled as organized as being easy, medium and difficult along with their respective pictures. From Table 4.12 we can see that parameters of Arrangement, Flexibility, Stimulability, Feasibility and

Table 4.12 *Stimulus Rating for the Lexical Category of Fruits*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	-	4	6
Familiarity	-	-	-	3	7
Size of the Picture	-	-	-	5	5
Colour and Appearance	-	-	-	2	8
Arrangement	-	-	-	7	3
Presentation	-	-	-	6	4
Volume	-	-	-	6	4
Relevance	-	-	-	5	5
Complexity	-	-	1	8	1
Iconicity	-	-	-	4	6
Accessibility	-	-	2	6	2
Flexibility	-	-	-	7	3
Trainability	-	-	-	6	4
Stimulability	-	-	-	7	3
Feasibility	-	-	-	7	3
Generalization	-	-	1	3	6
Scope of Practice	-	-	-	6	4
Scoring Pattern	-	-	-	5	5
Publications	-	2	4	2	2
Coverage of Parameters	-	-	-	7	3

coverage of parameters, the stimulus set on Fruits was rated as being good by seven judges and as excellent by three judges. A ranking of good by six judges and ranking of Excellent by four judges was obtained on the aspects of Presentation, Volume, Trainability and Scope of Practice. 50% of judges rated stimulus as good and 50% as excellent on the aspects of Size of the picture, relevance and Scoring Pattern. Simplicity and Iconicity were rated as being excellent by six judges and as being good by four judges. Familiarity of stimulus received a rating of good by three judges and excellent by the rest. A large majority of judges (eight out of 10) rated the stimuli as being excellent and the remaining rated it as being good on the aspect of Color and appearance of the pictures. Complexity of the stimuli was rated as good by eight judges, fair by one and excellent by one judge. Accessibility was perceived to be good

by six judges out of 10, fair by two of them, and as excellent by two of them. Generalized was rated as being excellent by six judges, good by three and fair by the remaining. Only 40% of the raters were aware of similar stimulus being used in other language rehabilitation softwares where as 60% of them were less aware. This can be inferred from the ratings of fair by four judges, poor by two judges versus rating of good and excellent by two judges each.

Furniture

The stimulus set under the category of Furniture consisted of 34 items organized as easy, medium and difficult. The relevant pictures of the 34 items were compiled. Table 4.13 shows that Parameters of Simplicity, Presentation and volume were rated as being fair by three judges, good by three of them and as excellent by four judges. A ranking of good by six judges and excellent by four judges was obtained on parameters like Size of the Picture, Iconicity, Scope of Practice and Scoring Pattern. Familiarity and Trainability were rated as fair by one judge, good by three of them and as excellent by the remaining six judges. 60% of the judges rated Appearance as being excellent and the remaining rated it as being good. Arrangement of the stimuli was perceived to be good by six judges, fair by one of them and excellent by three of them. Relevance was rated as poor by one out of 10 judges, as good by five judges and as excellent by four of them. Complexity was perceived to be poor and fair by one judge each and was rated as good by five judges and as excellent by three.

Table 4.13 *Stimulus Rating for Lexical category of Furniture*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	3	3	4
Familiarity	-	-	1	3	6
Size of the Picture	-	-	-	6	4
Color and Appearance	-	-	-	4	6
Arrangement	-	-	1	6	3
Presentation	-	-	3	3	4
Volume	-	-	3	3	4
Relevance	-	1	-	5	4
Complexity	-	1	1	5	3
Iconicity	-	-	-	6	4
Accessibility	-	-	3	4	3
Flexibility	-	-	1	5	4
Trainability	-	-	1	3	6
Stimulability	-	1	-	7	2
Feasibility	-	-	2	7	1
Generalization	-	-	-	5	5
Scope of Practice	-	-	-	6	4
Scoring Pattern	-	-	-	6	4
Publications	-	2	5	1	2
Coverage of Parameters	-	-	-	7	3

Accessibility parameter was rated as being fair and excellent by three judges each and as good by four. A rating of good by five judges, as excellent by four and fair by one judge on Flexibility parameter was noted. Stimulability was rated as poor by one judge, as good by seven judges and as excellent by two judges. Feasibility was noted to have rankings of good by 70% of the judges, as excellent by 10% of them and as being fair by the rest of them. 50% of the judges rated the stimulus as being good and excellent each on the parameter of Generalization. 70% of the judges reflected poor awareness of other programs utilizing a similar stimulus set for tele-rehabilitation purposes (rating of poor by two judges and that of fair by five judges). The remaining 30% of them had relatively better awareness of programs similar to the current study

(rating of good by one judge and excellent by two judges). Coverage of Parameters was rated as being good by seven judges and as excellent by three judges.

Gadgets

A total of eight items under the category of Gadgets and their pictures were compiled and were rated by 10 judges on various parameters. Table 4.14 represents the results of stimulus rating for the eight items under this category. The stimulus was perceived to be good by eight judges and excellent by two judges on the parameters of Size of the Picture, Presentation and Trainability. A rating of good by seven out of 10 judges and as excellent by three judges on the aspects of Arrangement, Flexibility and Coverage of parameters. Color and Appearance, and Iconicity of the stimuli were ranked as being good by six judges and as excellent by four of them. Relevance and generalization were rated as being fair, good and excellent by three, five and two judges respectively. Out of the 10 judges, seven rated the stimuli as good, one rated it as being fair and the rest rated it as being excellent. Simplicity was rated by 40% of the judges as fair and good each and the rest of them rated it as being excellent. Similarly on Familiarity, the stimulus was rated as fair and good by three judges each and the remaining of the judges rated it as being excellent. The volume of the stimuli was ranked as good by five judges, fair by two and as excellent by three judges. Accessibility was perceived to be good and excellent by four and five judges respectively and the remaining rated it as fair. Two judges each rated the stimuli as being fair and excellent whereas the remaining six of the judges rated Generalization as being good for the stimulus set. Scoring pattern was rated as being good and excellent by five judges each.

Table 4.14 *Stimulus rating for the Lexical Category of Gadgets*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	4	4	2
Familiarity	-	-	3	3	4
Size of the Picture	-	-	-	8	2
Colour and Appearance	-	-	-	6	4
Arrangement	-	-	-	7	3
Presentation	-	-	-	8	2
Volume	-	-	2	5	3
Relevance	-	-	3	5	2
Complexity	-	-	1	7	2
Iconicity	-	-	-	6	4
Accessibility	-	-	1	4	5
Flexibility	-	-	-	7	3
Trainability	-	-	-	8	2
Stimulability	-	-	1	7	2
Feasibility	-	-	3	5	2
Generalization	-	-	2	6	2
Scope of Practice	-	-	1	4	5
Scoring Pattern	-	-	-	5	5
Publications	-	2	4	2	2
Coverage of Parameters	-	-	-	7	3

The Scope of Practice using this stimulus set was perceived to be excellent by five, good by four and fair by one of the judges. 20% of the judges rated the poor on the aspect of Publications, Outcomes and Developers where as 40% of rated it as fair indicating limited awareness of judges regarding other programs that facilitate language rehabilitation using this kind of stimuli. The remaining judges rated this aspect as good and excellent (two judges each). No modifications in the stimulus set were recommended by any of the judges.

Geography

A total of four items under this category were compiled along with the appropriate picture representing the vocabulary. The compiled results of stimulus rating for this category are represented in Table 4.15. Out of the 10 judges, five rated the stimulus as being fair, four rated it as good and one of them rated it as excellent on the aspects of Simplicity and Familiarity. On the aspects of Size of the Picture, Complexity and Scope of Practice the judges ranked the stimulus as good by seven judges, fair by one judges and as excellent by the rest. Color and Appearance of the stimulus was perceived to be good by nine judges and as excellent by one judge. Volume was perceived as poor by two judges and as fair by one judge as only four items were included whereas the rest of judges rated the stimulus as good (six judges) and as excellent (one judge). Relevance of the stimulus was ranked as fair by five judges, good by three judges and as excellent by two of them. A rating of poor by two judges, fair by one judge, good by five of them and excellent by the rest was obtained on the parameter of Iconicity. Accessibility, Trainability and Feasibility were rated as good by 50% of the judges, as fair by 40% and as excellent by 10%. 70% of the judges perceived the Flexibility of the stimulus set to be good, 20% felt it was fair and the rest perceived it to be excellent. Out of the 10 judges, four judges rated the stimulus as being fair and good each on the aspect of Stimulability whereas the rest rated it to be excellent on the same. Generalization was noted to be good by six judges, and as fair and excellent by two judges each. 50% of the judges rated the stimulus as being good and excellent each on the parameter of Scoring Pattern. A rating of very poor by two judges was obtained on the aspect of Publications, Outcomes and Developers, whereas four judges rated it to fair and good each. Seven judges felt the coverage of parameters was good while the rest ranked it to be excellent.

Table 4.15 *Stimulus Rating for Lexical Category of Geography*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	5	4	1
Familiarity	-	-	5	4	1
Size of the Picture	-	-	1	7	2
Color and Appearance	-	-	-	9	1
Arrangement	-	-	3	6	1
Presentation	-	-	3	6	1
Volume	-	2	1	6	1
Relevance	-	-	5	3	2
Complexity	-	-	1	7	2
Iconicity	-	2	1	5	2
Accessibility	-	-	4	5	1
Flexibility	-	-	2	7	1
Trainability	-	-	4	5	1
Stimulability	-	-	4	4	2
Feasibility	-	-	4	5	1
Generalization	-	-	2	6	2
Scope of Practice	-	-	1	7	2
Scoring Pattern	-	-	-	5	5
Publications	2	-	4	4	-
Coverage of Parameters	-	-	-	7	3

Herbs

The category of Herbs comprised of 10 items of common Indian Herbs, their pictures which were then rated on a feedback questionnaire represented in Table 4.16. As can be seen from the table, a rating of good by six judges and that of fair by four judges was obtained on the parameters of Size of the Picture, Color and Appearance, Presentation and Scope of Practice. With the ranking of good by eight judges, and that of fair and excellent by one judge each were the parameters of Complexity and Iconicity. Simplicity was rated as being fair by three, good by six and as excellent by one of the judges. Familiarity was rated as poor and fair by two and three judges respectively whereas it was rated as being good by six of them and as excellent by one

judge. 70% of the judges rated the stimulus as being good and the rest rated it as excellent on the aspect of Arrangement.

Table 4.16 *Stimulus Rating of Lexical Category of Herbs*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	3	6	1
Familiarity	-	2	3	4	1
Size of the Picture	-	-	-	6	4
Color and Appearance	-	-	-	6	4
Arrangement	-	-	-	7	3
Presentation	-	-	-	6	4
Volume	-	-	2	5	3
Relevance	-	-	2	4	4
Complexity	-	-	1	8	1
Iconicity	-	-	1	8	1
Accessibility	-	-	5	4	1
Flexibility	-	-	2	6	2
Trainability	-	-	2	6	2
Stimulability	-	-	2	3	5
Feasibility	-	-	4	3	3
Generalization	-	-	2	6	2
Scope of Practice	-	-	-	6	4
Scoring Pattern	-	-	2	2	6
Publications	4	-	2	3	1
Coverage of Parameters	-	-	-	8	2

Volume was ranked as being good by five judges, as fair by two and as excellent by three. Relevance was perceived as being good and excellent by four judges each and as fair by two judges. Accessibility was seen as only fair by five judges, as good by four and as excellent by one out of the 10 judges. Stimulability was ranked as excellent by five out of 10 judges, as good by three of them and as fair by two. The parameter of Feasibility was seen to be rated as good and excellent by three judges each and as fair by four out of 10 judges. Generalization was rated as good by six judges and as being fair and excellent by two each. Scoring pattern was scored as being excellent by six judges and as being goo and fair by two each. Publications,

Outcomes and Developers aspect received a rating of very poor by four judges as they were unaware of programs incorporating similar stimuli. On the same parameter, two judges gave the rating of fair, three of them as good and one of them rated it excellent. Coverage of parameters was perceived as excellent by two judges and as good by eight out of the 10 judges.

Household Items

Household items, 21 in number, were prepared as stimulus under this lexical category along with their appropriate pictures. As evident from Table 4.17, Simplicity, Familiarity and Flexibility of the stimulus set was rated as being good by seven judges, as excellent by two judges and as being fair by one judge. Color and appearance and Trainability were perceived as good by six judges out of 10, as being fair by one judge and as being excellent by three of the judge. A rating of good by eight judges and that of excellent by two of them was obtained on the parameters of Arrangement, Stimulability and Feasibility. Presentation and Coverage of Parameters were ranked as being excellent by 30% of the judges and as good by 70% judges. On the aspects of Volume and Complexity, the stimulus set received a rating of good by seven judges, fair by two and excellent by one judge. Iconicity of the items was perceived to be good by nine out of 10 judges whereas the remaining rated it as fair. Accessibility was ranked to be good by six judges, as fair by three of them and as excellent by the remaining. A 50% good and 50% excellent rating was obtained on Scoring Pattern aspect. While a 60% good rating and a 40% excellent rating was obtained on Scope of Practice, a rating of good by five, excellent by four and that of fair by one was obtained on Generalization. Publications, Outcomes and Developers

aspect was rated as poor by two judges, as fair by four, as good by three and as excellent by one judge out of the 10.

Table 4.17 *Stimulus Rating for Lexical Category of Household Items*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	1	7	2
Familiarity	-	-	1	7	2
Size of the Picture	-	-	3	3	4
Color and Appearance	-	-	1	6	3
Arrangement	-	-	-	8	2
Presentation	-	-	-	7	3
Volume	-	-	2	7	1
Relevance	-	-	1	7	2
Complexity	-	-	2	7	1
Iconicity	-	-	1	9	-
Accessibility	-	-	3	6	1
Flexibility	-	-	1	7	2
Trainability	-	-	1	6	3
Stimulability	-	-	-	8	2
Feasibility	-	-	-	8	2
Generalization	-	-	1	5	4
Scope of Practice	-	-	-	6	4
Scoring Pattern	-	-	-	5	5
Publications	-	2	4	3	1
Coverage of Parameters	-	-	-	7	3

Kitchen Articles

A total of 21 items under this lexical category were translated and adapted. Table 4.18 depicts the results of stimulus rating for this stimulus set on a feedback questionnaire. Simplicity and Familiarity aspects were rated as being good by five judges, as excellent by four judges and as fair by one judge out of the 10. Aspects like Arrangement, Presentation and Flexibility were ranked as being good by 80% of the judges and as being excellent by the reaming 20%.

Table 4.18 *Stimulus Rating for Lexical Category of Kitchen Articles*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	1	7	2
Familiarity	-	-	1	7	2
Size of the Picture	-	-	3	3	4
Color and Appearance	-	-	1	6	3
Arrangement	-	-	-	8	2
Presentation	-	-	-	7	3
Volume	-	-	2	7	1
Relevance	-	-	1	7	2
Complexity	-	-	2	7	1
Iconicity	-	-	1	9	-
Accessibility	-	-	3	6	1
Flexibility	-	-	1	7	2
Trainability	-	-	1	6	3
Stimulability	-	-	-	8	2
Feasibility	-	-	-	8	2
Generalization	-	-	1	5	4
Scope of Practice	-	-	-	6	4
Scoring Pattern	-	-	-	5	5
Publications	-	2	4	3	1
Coverage of Parameters	-	-	-	7	3

A rating of good by 60% of the judges, that of fair and excellent by 20% each was obtained for parameters of Volume and Complexity. Rating of good by six judges out of 10 and a rating of excellent by the rest was acquired for Relevance, Accessibility, Trainability and Scope of Practice aspects. 50% of the judges rated the stimulus as being good and the remaining 50% as it being excellent. Iconicity, Feasibility, Generalization and Coverage of Parameters were perceived as excellent by three judges and as good by seven of them. Size of the Picture was ranked as good by three and as excellent by seven judges. A rating of good by four judges and that of excellent by six judges was obtained for Scoring Pattern aspect. Awareness of Publications, Outcomes and Developers was rated as being very poor by two out of 10 judges, as fair by four judges and as being good and excellent by two judges each.

Magical Creatures

The stimulus items compiled under this category were eight in number and were categorized as those being sensitive to various religions. Table 4.19 represents the cumulative data of results of stimulus rating. Parameters of Familiarity and Volume received a rating of excellent by two judges, that of good by five judges and rating of fair by three judges. Aspects of Relevance, Trainability and Stimulability were ranked as good by six out of 10 judges, as fair by three of them and as excellent by one of the judges. Simplicity was ranked as being fair by six judges, as being good by one and as excellent by three judges. A rating of good by seven judges and excellent by two of them was obtained on the parameter of Size of the Picture. Color and Appearance of the picture stimuli was rated as being good by six judges, as excellent by two judges and as fair by two out of 10 judges. A rating of good by nine judges and that of excellent by one judge was received for the aspect of Arrangement. Presentation was perceived as excellent by two judges and as being by good by eight judges. A rating of good by eight judges, and that of fair and excellent by one judge each was received on the aspect of complexity. Iconicity was rated as being fair by two, good by seven and excellent by one judge out of the 10. On the parameters of Accessibility and Scope of Practice, three judges each rated the stimuli as being fair and excellent whereas the rest rated it as being good. Three judges perceived the Flexibility aspect to be fair, one of them as poor. A rating of good by four, fair by five judges and a rating of poor by one judge was obtained on the aspect of Feasibility. Generalization was scored as being good by six judges, as fair by three and as being poor by one judge. Scoring pattern was rated as being excellent and good by four judges each and it was rated as being fair by two judges out of the 10. A rating of very poor and poor

Table 4.19 *Stimulus Rating for Lexical Category of Magical Creatures*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	6	1	3
Familiarity	-	-	3	5	2
Size of the Picture	-	-	-	7	2
Color and Appearance	-	-	2	6	2
Arrangement	-	-	-	9	1
Presentation	-	-	-	8	2
Volume	-	-	3	5	2
Relevance	-	-	3	6	1
Complexity	-	-	1	8	1
Iconicity	-	-	2	7	1
Accessibility	-	-	3	4	3
Flexibility	-	1	3	4	2
Trainability	-	-	3	6	1
Stimulability	-	-	3	6	1
Feasibility	-	1	5	4	-
Generalization	-	1	3	6	-
Scope of Practice	-	-	3	4	3
Scoring Pattern	-	-	2	4	4
Publications	2	2	1	4	1
Coverage of Parameters	-	-	2	5	3

by two judges each; fair and excellent by one judge each and as being good by four judges. Coverage of parameters was rated as being excellent by three judges, good by five judges and as being fair by two judges.

Musical Instruments

Under the category of Musical Instruments a total of 14 items and their pictures were compiled and categorized as easy, medium and difficult. Table 4.20 represents the compiled results of the validation of the stimulus. Simplicity and Iconicity were rated as being good by eight judges and as being excellent by two judges.

Table 4.20 *Stimulus Rating for Lexical Category of Musical Instruments*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	-	8	2
Familiarity	-	-	2	7	1
Size of the Picture	-	-	-	6	4
Color and Appearance	-	-	-	7	3
Arrangement	-	-	-	8	2
Presentation	-	-	-	7	3
Volume	-	-	2	5	3
Relevance	-	-	4	3	3
Complexity	-	-	2	6	2
Iconicity	-	-	-	8	2
Accessibility	-	-	4	3	3
Flexibility	-	-	2	3	5
Trainability	-	-	2	5	3
Stimulability	-	-	2	6	2
Feasibility	-	-	2	6	2
Generalization	-	-	2	6	2
Scope of Practice	-	-	-	10	-
Scoring Pattern	-	-	-	5	5
Publications	2	-	3	4	1
Coverage of Parameters	-	-	-	7	3

Out of the 10 judges, seven rated the stimulus set as being good and three of them rated it as being excellent on the parameters Color and Appearance, Presentation and Coverage of Parameters. The aspects of Volume and Trainability received a rating of excellent was given by three out of 10 judges, a rating of good by five of them and that of fair was given by two judges. A rating of fair by four judges, good by three judges and that of excellent by three judges was obtained on parameters of Relevance and Accessibility. Complexity, Stimulability, Feasibility and Generalization were rated as being excellent by two judges, good by six judges and as fair by the remaining. Familiarity of the stimulus was rated as good by seven judges, as excellent by one of them and fair by two judges. A rating of good by six judges and that of excellent by four judges was obtained on Size of Picture. The aspect of Flexibility

was rated as being excellent by five judges, as good by three and as fair by two judges. All the 10 judges rated the aspect of Scope of Practice as being good. Five judges each rated the stimulus as being Scoring Pattern as good and excellent. On the parameter of Publications, Outcomes and Developers, a rating of very poor was given by two judges, that of fair was given by three judges, good by four and excellent by one judge respectively.

Nature

A total of 27 items were compiled under this category. Appropriate pictures for these 27 stimuli were also compiled. These words were categorized as being easy, medium and difficult. Table 4.21 depicts the compiled results of feedback rating of stimulus in this category. The parameters of Simplicity and Flexibility were rated as being good by eight judges and excellent by two judges. A rating of good by nine judges and that of excellent by one judge on the aspect of Familiarity and Scope of Practice was obtained. The parameters of Size of the Picture, Arrangement and Scoring Pattern were rated as being good and excellent by five judges each. A rating of good by seven judges and that of excellent by three judges was obtained on the aspects of Relevance, Iconicity, Trainability and Generalization. Volume and Complexity were rated as being fair by two out of the 10 judges, good by six of them and as being excellent by the remaining two judges. Color and appearance of the pictures received a rating of good by four and that of excellent by six judges. A ranking of good by six judges and excellent by four judges was obtained on the Presentation aspect. Accessibility received a ranking of good by seven judges, fair by two judges and ranking of excellent by the remaining. All 10 judges ranked Stimulability aspect as being good.

Table 4.21 *Stimulus Rating for Lexical Category of Nature*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	-	8	2
Familiarity	-	-	-	9	1
Size of the Picture	-	-	-	5	5
Color and Appearance	-	-	-	4	6
Arrangement	-	-	-	5	5
Presentation	-	-	-	6	4
Volume	-	-	2	6	2
Relevance	-	-	-	7	3
Complexity	-	-	2	6	2
Iconicity	-	-	-	7	3
Accessibility	-	-	2	7	1
Flexibility	-	-	-	8	2
Trainability	-	-	-	7	3
Stimulability	-	-	-	10	-
Feasibility	-	-	1	8	1
Generalization	-	-	-	7	3
Scope of Practice	-	-	-	9	1
Scoring Pattern	-	-	-	5	5
Publications	-	2	3	4	1
Coverage of Parameters	-	-	-	7	3

Feasibility received a rating of good by eight judges and that of fair and excellent by one judge each. On the aspect of Publications, Outcomes and Developers, a rating of poor by two judges, that of fair by three judges, rating of good by four judges and that of excellent by one judge was obtained.

People

This stimulus set consisted of a total of 28 items and their pictures which were categorized as being easy, medium and difficult. The feedback rating for this stimulus set has been summarized in Table 4.22.

Table 4.22 *Stimulus Rating for Lexical Category of People*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	-	9	1
Familiarity	-	-	1	8	1
Size of the Picture	-	-	-	8	2
Color and Appearance	-	-	-	6	4
Arrangement	-	-	-	5	5
Presentation	-	-	2	3	5
Volume	-	-	2	3	5
Relevance	-	-	2	7	1
Complexity	-	-	4	5	1
Iconicity	-	-	2	7	1
Accessibility	-	-	-	7	3
Flexibility	-	-	-	8	2
Trainability	-	-	-	6	4
Stimulability	-	-	-	7	3
Feasibility	-	-	-	6	4
Generalization	-	-	-	8	2
Scope of Practice	-	-	-	8	2
Scoring Pattern	-	-	-	3	7
Publications	-	2	4	2	2
Coverage of Parameters	-	-	-	7	3

From Table 4.22, it can be noted that parameters like Size of the Picture, Flexibility, Generalization and Scope of Practice obtained a rating of good by eight judges and that of excellent by two judges. A rating of good by six judges out of the 10 and that of excellent by four judges was received on the parameters of Color and Appearance, Feasibility and Trainability. On the aspects of Arrangement and Presentation, the judges provided the rating of excellent (five judges), good (three judges) and fair (two judges). Five judges each rated the stimulus set as being good and excellent on the aspect of arrangement. Simplicity was rated as being good by nine judges and as being excellent by one judge. Familiarity was given a rating of good by eight judges and the rating of fair and excellent by one judge each. Relevance and Iconicity were each rated as fair by two judges, good by seven judges and being fair by one judge.

On the parameters of Accessibility, Stimulability and Coverage of Parameters a rating of good by seven judges and that of excellent by three judges was obtained. Scoring Pattern received a rating of good by three out of the 10 judges and that of excellent by seven judges. Publications, Outcomes and Developers was rated as being poor by two judges, fair by four, good and excellent by two judges each. The aspect of Complexity of the stimulus set was rated as being good by five judges, as being fair by four judges and as excellent by one judge.

Personal Items

32 items under this category were compiled and categorized as easy, medium and difficult along with their color pictures. From Table 4.23 we can see that, parameters if Simplicity and Size of the Picture were rated as being good by six judges out of 10 whereas it was rated as being excellent by four judges. Familiarity, Arrangement, Iconicity, Feasibility and Coverage of Parameters were given the rating of good by seven judges and excellent by judges. Relevance and Flexibility were given a rating of good by six judges, excellent by three judges and a rating of fair by one judge. A rating of good by eight judges and excellent by two judges was obtained on the parameters of Accessibility and Generalization. Five judges each gave the rating of good and excellent on the aspect of Color and Appearance. Presentation of the stimulus set was rated as being good by seven judges, fair by one judge and excellent by two judges. The aspect of Volume received a rating of good by five judges, fair by four judges and excellent by judges out of the 10. Complexity of the stimulus was perceived to be excellent by four judges, good by two and as fair by four judges.

Table 4.23 *Stimulus Rating for Lexical Category of Personal Items*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	-	6	4
Familiarity	-	-	-	7	3
Size of the Picture	-	-	-	6	4
Color and Appearance	-	-	-	5	5
Arrangement	-	-	-	7	3
Presentation	-	-	1	7	2
Volume	-	-	3	5	2
Relevance	-	-	1	6	3
Complexity	-	-	4	2	4
Iconicity	-	-	-	7	3
Accessibility	-	-	-	8	2
Flexibility	-	-	1	6	3
Trainability	-	-	1	4	5
Stimulability	-	-	-	6	4
Feasibility	-	-	-	7	3
Generalization	-	-	-	8	2
Scope of Practice	-	-	1	5	4
Scoring Pattern	-	-	-	4	6
Publications	-	2	4	2	2
Coverage of Parameters	-	-	-	7	3

Trainability of the stimulus was rated as being excellent by five judges, good by four and as fair by one judge. A rating of excellent by four out of 10 judges, good by five judges and fair by one judge was provided for the parameter of Scope of Practice. Scoring Pattern was scored as being excellent by six judges and good by four judges. The aspect of Publications, Outcomes and Developers received a rating of poor by two judges, fair by four judges, and good and excellent by two judges each.

Residence

A total of five items were compiled under this category and segregated as easy, medium and difficult. Table 4.24 represents the compiled results of ratings obtained on the feedback questionnaire used.

Table 4.24 *Stimulus Rating for Lexical Category of Residence*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	-	9	1
Familiarity	-	-	-	7	3
Size of the Picture	-	-	-	8	2
Color and Appearance	-	-	-	7	3
Arrangement	-	-	1	5	4
Presentation	-	-	1	6	3
Volume	-	2	1	4	3
Relevance	-	-	-	7	3
Complexity	-	-	-	3	6
Iconicity	-	-	-	8	2
Accessibility	-	-	2	7	1
Flexibility	-	-	-	7	3
Trainability	-	-	-	8	2
Stimulability	-	-	1	5	4
Feasibility	-	-	-	8	2
Generalization	-	-	-	7	3
Scope of Practice	-	-	-	6	4
Scoring Pattern	-	-	-	5	5
Publications	-	2	4	2	2
Coverage of Parameters	-	-	-	6	4

This stimulus set received a rating of excellent by three judges and good by seven judges on the parameters of Familiarity, Color and Appearance, Relevance, Flexibility and Generalization. Aspects of Arrangement and Stimulability received a rating of good by five judges, excellent by four judges and fair by one judge out of the 10. Size of the Picture and Feasibility were perceived to be good by eight judges and excellent by two judges. Both the parameters of Scope of Practice and Coverage of parameters received a rating of good by six judges and excellent by four judges. Simplicity was rated as being good by nine judges and excellent by one judge. The aspect of Presentation was perceived to be good by six judges, excellent by three judges and fair by one judge. Volume of the stimulus received lower ratings since only five items were included. It received ratings of poor by two judges, fair by one judge, good by four judges and excellent by three judges. Complexity of the stimulus was rated as

being good by three judges and excellent by six judges. The stimulus set received a rating of good by seven judges, excellent by one judge and that of fair by two judges. A rating of good and excellent by five judges each was provided on the Scoring Pattern aspect. Publications, Outcomes and Developers aspect rated as poor by two judges, fair by four judges and good and excellent by two judges each.

Structure

Under the category of Structure, a total of 22 items, their pictures were compiled and categorized as easy, medium and difficult. From Table 4.25, it is evident that parameters of Simplicity and Stimulability were perceived to be good by all the 10 judges. Familiarity was rated as being good by nine judges and as being excellent by one judge. Five judges each give the rating of good and excellent on the aspect of Size of the Picture. Both the parameters of Color and Appearance and Trainability received rating of good by six judges and excellent by four judges. Arrangement, Iconicity and Flexibility were rated as being good by eight judges and as excellent by two judges. Presentation of the stimulus was rated as being good by seven judges, fair by one judge and as excellent by two judges. Volume of the stimulus was perceived as being fair by three judges, good by five judges and as being excellent by two judges. A rating of good by six judges, fair by one judge, and that of excellent by three judges was obtained on the parameter of Relevance. Complexity of the stimulus was rated as good by four judges and as being fair and excellent by three judges each. Accessibility was ranked as being good by six judges, fair and excellent by two judges each.

Table 4.25 *Stimulus Rating for Lexical Category of Structure*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	-	10	-
Familiarity	-	-	-	9	1
Size of the Picture	-	-	-	5	5
Color and Appearance	-	-	-	6	4
Arrangement	-	-	-	8	2
Presentation	-	-	1	7	2
Volume	-	-	3	5	2
Relevance	-	-	1	6	3
Complexity	-	-	3	4	3
Iconicity	-	-	-	8	2
Accessibility	-	-	2	6	2
Flexibility	-	-	-	8	2
Trainability	-	-	-	6	4
Stimulability	-	-	-	10	-
Feasibility	-	-	1	8	1
Generalization	-	-	-	7	3
Scope of Practice	-	-	-	7	3
Scoring Pattern	-	-	1	4	5
Publications	-	2	4	2	2
Coverage of Parameters	-	-	-	7	3

Feasibility was rated as being fair and excellent by one judge each and as being good by eight judges. Scoring Pattern was rated as being fair by one judge, as good by four judges and as excellent by five judges. The parameter of Publications, Outcomes and Developers received a rating poor, good and excellent by two judges each and the remaining judges rated it as being fair.

Symbolic

A total of six items under this category were compiled and categorized as being easy, medium and difficult. Table 4.26 represents the results of rating obtained on a feedback questionnaire by 10 judges. Parameters of Simplicity and Color and Appearance were rated as being good by seven judges, fair by two judges and as

Table 4.26 *Stimulus Rating for the Lexical Category of Symbolic*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	2	7	1
Familiarity	-	-	1	8	1
Size of the Picture	-	-	2	5	3
Color and Appearance	-	-	2	7	1
Arrangement	-	-	1	8	1
Presentation	-	-	-	-	-
Volume	-	-	-	6	4
Relevance	-	-	2	5	3
Complexity	-	-	-	6	4
Iconicity	-	-	3	5	2
Accessibility	-	-	-	7	3
Flexibility	-	-	2	6	2
Trainability	-	-	-	6	4
Stimulability	-	-	-	7	3
Feasibility	-	-	2	6	2
Generalization	-	-	-	7	3
Scope of Practice	-	-	-	5	5
Scoring Pattern	-	-	-	6	4
Publications	-	2	4	2	2
Coverage of Parameters	-	-	1	6	3

being excellent by one judge. Familiarity and Arrangement of the stimulus received a rating of good by eight judges and that of fair and excellent by one judge each. A rating of good by five judges, fair by two judges and excellent by one judge out of the 10 was obtained on the aspects of Size of the Picture and Relevance. Volume of the stimulus, Complexity, Trainability and Scoring Pattern were perceived to be good by six judges and as being excellent by the remaining of them. Iconicity was rated as being fair by three judges, good by five and excellent by three judges. The judges rated aspects of Accessibility, Stimulability and Generalization as being good (seven judges) and excellent (three judges). On the parameters of Flexibility and Feasibility a rating of fair by two judges, good by six judges and excellent by two judges was

provided. Publications, Outcomes and Developers aspect was rated as being fair by four judges and as being poor, good and excellent by two judges each. Coverage of parameters received a rating of good by six judges, excellent by three judges and fair by one judge.

Tools

A total of 42 items and their pictures were compiled under this category. These items were categorized as being easy, medium and difficult. As seen in Table 4.27, out of the 20 parameters, Simplicity and Familiarity were rated as being good by six judges, excellent by one judge and as fair by three judges. A rating of excellent by five judges, good by three judges and fair by two judges was obtained on the aspects of Size of the Picture and Color and Appearance. Arrangement of the stimulus set was perceived to be good by six judges and the rest four judges rated it to be excellent. The stimulus set received the ranking of good by seven judges and excellent by three judges. On the aspect of Volume, the stimulus was ranked as being fair by two judges and as being good and excellent by four judges each. Relevance and Complexity of the stimulus received the rating of good by five judges, excellent by three judges and as fair by two judges. On the parameter on Iconicity, a rating of good by seven judges, that of fair by two judges and excellent by one judge was obtained. Accessibility aspect received a rating of good by six judges, and that of fair and excellent by two judges each. Flexibility, Trainability, Feasibility and Generalization were rated as being good by eight judges and as excellent by two judges. A rating of good by seven out of 10 judges and that of excellent by three judges was obtained on the aspects of Stimulability and Scope of Practice. Five judges each rated the stimuli as being good and excellent on the parameters of Scoring Pattern and coverage of Parameters.

Publications, Outcomes and Developers aspect was rated as being fair by four judges and as being poor, good and excellent by two judges each.

Table 4.27 *Stimulus Rating of Lexical Category of Tools*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	3	6	1
Familiarity	-	-	3	6	1
Size of the Picture	-	-	2	3	5
Color and Appearance	-	-	2	3	5
Arrangement	-	-	-	6	4
Presentation	-	-	-	7	3
Volume	-	-	2	4	4
Relevance	-	-	2	5	3
Complexity	-	-	2	5	3
Iconicity	-	-	2	7	1
Accessibility	-	-	2	6	2
Flexibility	-	-	-	8	2
Trainability	-	-	-	8	2
Stimulability	-	-	-	7	3
Feasibility	-	-	-	8	2
Generalization	-	-	-	8	2
Scope of Practice	-	-	-	7	3
Scoring Pattern	-	-	-	5	5
Publications	-	2	4	2	2
Coverage of Parameters	-	-	-	5	5

Toys

Under the category of Toys, a total of 18 items were arranged as easy, medium and difficult along with the appropriate pictures. Table 4.28 depicts the stimulus rating on 20 parameters by 10 judges using a feedback questionnaire. Out of the 20 parameters, Simplicity and Relevance of the stimulus received a rating of good by five judges, excellent by three judges and fair by two judges. A rating of good by three judges, excellent by five judges and fair by two judges was obtained on the aspects of Familiarity, Volume, Iconicity, Accessibility, Flexibility and Stimulability.

Table 4.28 *Stimulus Rating for Lexical Category of Toys*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	2	5	3
Familiarity	-	-	2	3	5
Size of the Picture	-	-	-	3	7
Color and Appearance	-	-	-	5	5
Arrangement	-	-	-	6	4
Presentation	-	-	-	5	5
Volume	-	-	2	3	5
Relevance	-	-	2	5	3
Complexity	-	-	-	7	3
Iconicity	-	-	2	3	5
Accessibility	-	-	2	3	5
Flexibility	-	-	2	3	5
Trainability	-	-	2	2	6
Stimulability	-	-	2	3	5
Feasibility	-	-	2	4	4
Generalization	-	-	2	2	6
Scope of Practice	-	-	1	3	6
Scoring Pattern	-	-	-	4	6
Publications	-	2	4	3	1
Coverage of Parameters	-	-	-	5	5

Size of the picture received the rating excellent by seven judges and good by three judges. Arrangement of the stimulus was perceived to be good by six judges and excellent by four judges. On the parameter of Complexity, a rating of good by seven judges and that of excellent by three judges was provided. Aspect of Trainability was rated as being fair and good by two judges each and it was rated as being excellent by six judges. Feasibility of the stimulus was perceived to be good and excellent by four judges each and as being fair by two judges. The aspect of Generalization was given the rating of fair and good by two judges each and that of excellent by six judges. A rating of good by three judges, excellent by six judges and that of fair by one judge was provided for the parameter of Scope of Practice. Scoring Pattern was perceived to

be good and excellent by four and six judges respectively. On the aspect of Publications, Outcomes and Developers was rated as being poor by two judges, fair by four judges, good by three judges and excellent by one judge. No suggestions for modifications were provided by any of the judges.

Transport

The category of Transport consisted of 45 items categorized as being easy, medium or difficult. From Table 4.29 it can be noted that, out of the 20 parameters, Simplicity and Familiarity were rated as being good by nine judges and excellent by one judge. Aspects of Size of the Picture, Arrangement and Relevance were rated as being good by six judges, excellent by three judges and fair by one judge. A rating of good by seven judges and excellent by three judges out of the 10 judges was obtained on aspects of Color and Appearance, Generalization and Coverage of Parameters. Presentation, Trainability and Feasibility were rated as being good by six judges and as excellent by four judges. Five judges each rated the parameters of Stimulability and Scoring Pattern as being good and excellent each. Complexity was rated as being good by five judges, excellent by two judges and fair by three judges. The aspect of Accessibility was perceived as being by three judges, excellent by five judges and fair by two judges. A rating of good by six judges and excellent by four judges was obtained on the parameter of Flexibility. Scope of Practice was rated as excellent by seven judges and good by three judges. The parameter of Publications, Outcomes and Developers was rated as poor by two judges, fair by four judges, good by one judge and excellent by three judges.

Table 4.29 *Stimulus Rating for Lexical Category of Transport*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	-	9	1
Familiarity	-	-	-	9	1
Size of the Picture	-	-	1	6	3
Color and Appearance	-	-	-	7	3
Arrangement	-	-	1	6	3
Presentation	-	-	-	6	4
Volume	-	-	2	5	3
Relevance	-	-	1	6	3
Complexity	-	-	3	5	2
Iconicity	-	-	2	5	3
Accessibility	-	-	2	3	5
Flexibility	-	-	-	4	6
Trainability	-	-	-	6	4
Stimulability	-	-	-	5	5
Feasibility	-	-	-	6	4
Generalization	-	-	-	7	3
Scope of Practice	-	-	-	3	7
Scoring Pattern	-	-	-	5	5
Publications	-	2	4	1	3
Coverage of Parameters	-	-	-	7	3

Vegetables

35 items under this category were organized into easy, medium and difficult levels. From Table 4. 30, which depicts the rating of stimulus on a feedback questionnaire by 10 judges, it can be seen that parameters of Simplicity, Flexibility, Feasibility and Coverage of Parameters received a rating of good by six judges and a rating of excellent by four judges. Aspects of Familiarity and Scope of Practice were perceived to be good by four judges and as excellent by six judges. A rating of good by three judges and excellent by seven judges was obtained on the aspects of Color and Appearance of the stimuli, Iconicity and Accessibility.

Table 4.30 *Stimulus Rating for Lexical Category of Vegetables*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	-	6	4
Familiarity	-	-	-	4	6
Size of the Picture	-	-	-	2	8
Color and Appearance	-	-	-	3	7
Arrangement	-	-	-	5	5
Presentation	-	-	-	8	2
Volume	-	-	-	7	3
Relevance	-	-	-	7	3
Complexity	-	-	1	7	2
Iconicity	-	-	-	3	7
Accessibility	-	-	-	3	7
Flexibility	-	-	-	6	4
Trainability	-	-	1	6	3
Stimulability	-	-	-	7	3
Feasibility	-	-	-	6	4
Generalization	-	-	-	5	5
Scope of Practice	-	-	-	4	6
Scoring Pattern	-	-	-	5	5
Publications	-	2	4	2	2
Coverage of Parameters	-	-	-	6	4

Size of the Picture received a rating of excellent by eight judges and good by two judges. On the parameter of Presentation, a rating of good by eight judges and excellent by two judges was received. The parameters of Volume, Relevance and Stimulability were rated as being good by seven judges and excellent by three judges. A rating of good by seven judges, excellent by two judges and fair by one judge was obtained on the parameter of Complexity. Trainability aspect was perceived to be good by six judges, excellent by three judges and as being fair by one judge. Five judges each rated the stimuli as being good and excellent on the parameters of Generalization and Scoring Pattern. Publications, Outcomes and Developers parameter received a rating of fair by four judges and that of poor, good and excellent by two judges each. No major modifications were suggested by the judges.

Weapons

A total of eight stimulus items were compiled and categorized in three levels of difficulty under this lexical category. The results of stimulus rating based on a feedback questionnaire are represented in Table 4.31. Out of the 20 parameters on the feedback questionnaire, Familiarity, Iconicity, Accessibility, Stimulability and Feasibility received a rating of good by five judges, excellent by three judges and fair by two judges. The aspects of Simplicity and generalization received a rating of good by three judges, excellent by five judges and fair by two judges. A rating of good by three and excellent by seven judges was obtained for the parameters of Size of the Picture and Color and Appearance.

Table 4.31 *Stimulus Rating for Lexical Category of Weapons*

	Very Poor	**Poor**	**Fair**	**Good**	**Excellent**
Simplicity	-	-	2	3	5
Familiarity	-	-	2	5	3
Size of the Picture	-	-	-	3	7
Color and Appearance	-	-	-	3	7
Arrangement	-	-	1	6	3
Presentation	-	-	-	7	3
Volume	-	-	2	4	4
Relevance	-	-	3	3	4
Complexity	-	-	1	5	4
Iconicity	-	-	2	5	3
Accessibility	-	-	2	5	3
Flexibility	-	-	3	2	5
Trainability	-	-	4	1	5
Stimulability	-	-	2	5	3
Feasibility	-	-	2	5	3
Generalization	-	-	2	3	5
Scope of Practice	-	-	-	5	5
Scoring Pattern	-	-	-	6	4
Publications	-	-	2	4	4
Coverage of Parameters	-	-	2	4	4

Arrangement of the stimulus was rated as being good by six judges, excellent by three judges and as fair by one judge. On the aspect of Presentation a rating of good by seven judges and that of excellent by three judges was obtained. Relevance of the stimuli was rated as being excellent by four judges and as being fair and good by three judges each. The rating of good by five judges, excellent by four and fair by the remaining was obtained on the aspect of Complexity. Flexibility was rated as being excellent by five judges, good by three judges and as being fair by three judges. Trainability aspect received a rating of excellent by five judges, good by one judge and fair by four judges. Five judges each rated the stimulus set as being good and excellent on the aspect of Scope of Practice. Scoring Pattern was perceived to be good by six judges and excellent by four judges. The parameters of Volume, Publications, Outcomes and Developers and Coverage of Parameters, a rating of fair by two judges and that of good and excellent by four judges each was obtained.

Auditory Commands Task

Under the Auditory Command Task a set of 4 questions for use with the software were prepared for five levels of difficulty. The syntax structure increased in complexity across the five levels. The rating on the complexity of the commands was obtained on the feedback questionnaire. Table 4.32 depicts the results of the rating by 10 judges. The parameters of Simplicity received a rating of good by two judges and excellent by eight judges. Familiarity and Accessibility of the stimulus set was rated as being good by eight judges and as being fair and excellent by one judge each.

Table 4.32 *Stimulus Rating for Auditory Command Task*

	Very Poor	Poor	Fair	Good	Excellent	NA
Simplicity	-	-	-	2	8	-
Familiarity	-	-	1	8	1	-
Size of the Picture	-	-	-	-	-	10
Color and Appearance	-	-	-	-	-	10
Arrangement	-	-	-	-	-	10
Presentation	-	-	-	8	2	-
Volume	-	-	2	6	2	-
Relevance	-	-	2	5	3	-
Complexity	-	-	3	7	-	-
Iconicity	-	-	-	-	-	10
Accessibility	-	-	1	8	1	-
Flexibility	-	-	2	6	2	-
Trainability	-	-	2	5	3	-
Stimulability	-	-	3	4	3	-
Feasibility	-	-	-	10	-	-
Generalization	-	-	2	7	1	-
Scope of Practice	-	-	4	5	1	-
Scoring Pattern	-	-	-	8	2	-
Publications	-	3	2	3	2	-
Coverage of Parameters	-	-	2	7	1	-

Note: *NA: Not Applicable*

Presentation and Scoring Pattern of the stimulus set was rated as being good by eight judges and excellent by two judges. A rating of good by six judges, and that of fair and excellent by two judges each was obtained on the parameters of Volume and Flexibility of the stimulus set. Relevance and Trainability of the stimulus was perceived to be good by five judges, excellent by three judges and as fair by two judges. Complexity of the stimulus was rated as being good by seven judges and fair by three judges. Stimulability of the stimulus received a rating of good by four judges and as being fair and excellent by three judges each. All the 10 judges rated the Feasibility aspect of the stimulus to be good. On the aspects of Generalization and Coverage of Parameters the judges rated the stimulus as being good (seven judges),

excellent (one judge) and fair (two judges). A rating of good by five judges, fair by four judges and excellent by one judge was obtained on the parameter of Scope of Practice. Publications, Outcomes and Developers received a rating of poor by three judges, fair by two judges, good by three judges and excellent by two judges. No modifications were suggested by any of the 10 judges. The parameters of Size of the Pictre, Color and Appearance, Arrangement and Iconicity were not given any rating as they were not applicable for this task.

Calendar Task

Under the Calendar Task, picture stimulus of a calendar for 12 months in a year, along with 180 questions and 180 answers and 360 distractors. These questions, answers and distractors were rated by 10 judges on the feedback questionnaire the results of which are depicted in Table 4.33. Out of the 20 parameters, Simplicity, Trainability, Feasibility, Generalization and Scoring Pattern were rated as being good by seven judges and as being excellent by three judges. Familiarity of the stimulus received a rating of good by eight judges and excellent by two judges. A rating of good by five judges, excellent by four judges and as being fair by one judge on the aspects of Size of the Picture and Flexibility was obtained. Color and Appearance of the stimulus set was rated as being good by six judges, fair by three judges and excellent by one judge. The aspects of Arrangement and Iconicity received a rating of good by eight judges and as being fair and excellent by one judge each. Volume of the stimulus was perceived to be excellent by nine judges and good by one judge. Complexity of the stimulus set was noted to be good by six judges, excellent by three judges and the rest perceived it to be fair. The aspect of Accessibility was rated to be excellent by six judges and as being good by four judges. Five judges each rated the

Table 4.33 *Stimulus Rating for Calendar Task*

	Very Poor	Poor	Fair	Good	Excellent
Simplicity	-	-	-	7	3
Familiarity	-	-	-	8	2
Size of the Picture	-	-	1	5	4
Color and Appearance	-	-	3	6	1
Arrangement	-	-	1	8	1
Presentation	-	-	-	9	1
Volume	-	-	-	1	9
Relevance	-	-	-	9	1
Complexity	-	-	1	6	3
Iconicity	-	-	1	8	1
Accessibility	-	-	-	4	6
Flexibility	-	-	1	5	4
Trainability	-	-	-	7	3
Stimulability	-	-	-	5	5
Feasibility	-	-	-	7	3
Generalization	-	-	-	7	3
Scope of Practice	-	-	1	7	2
Scoring Pattern	-	-	-	7	3
Publications	-	2	5	1	2
Coverage of Parameters	-	-	-	9	1

Stimulability aspect as being good and excellent. Scope of Practice was seen to be rated as good by seven judges, fair by one judge and as excellent by two judges. The parameter of Publications, Outcomes and Developers was rated as poor, fair, good and excellent by a set of two, five, one and two judges respectively. Out of the parameters, those of Simplicity, Volume, Stimulability and Scope of Practice received a ranking of good by six judges and excellent by four judges. Familiarity, Relevance, Iconicity and Accessibility were perceived to be excellent by seven out the 10 judges and as being good by the remaining three judges. A rating of excellent by six judges, good by three judges and that of fair by one judge was obtained on the parameters

Currency Task

Under this task, 196 questions and 196 pictures were made comprising of 4 levels of difficulty. These questions and pictures were then rated by 10 judges on a set of 20 parameters using a feedback questionnaire represented in Table 4.34. Out of the 20 parameters on the feedback questionnaire, Simplicity, Voulme, Stimulability and Scope of Practice six judges gave the rating of good and four gave the rating of excellent. A rating of good by three judges and that of excellent by seven judges was received on the aspects of Familiarity, Relevance, Iconicity and Accessibility. The judges rated the aspects of Size of the Picture and Color and Appearance as being good (three out of 10 judges), excellent (six out of 10 judges) and fair (one judge out of 10).

Table 4.34 *Stimulus Rating for Currency Task*

	Very Poor	**Poor**	**Fair**	**Good**	**Excellent**
Simplicity	-	-	-	6	4
Familiarity	-	-	-	3	7
Size of the Picture	-	-	1	3	6
Color and Appearance	-	-	1	3	6
Arrangement	-	-	1	4	5
Presentation	-	-	-	5	5
Volume	-	-	-	6	4
Relevance	-	-	-	3	7
Complexity	-	-	-	4	6
Iconicity	-	-	-	3	7
Accessibility	-	-	-	3	7
Flexibility	-	-	-	4	6
Trainability	-	-	-	4	6
Stimulability	-	-	-	6	4
Feasibility	-	-	-	5	5
Generalization	-	-	-	4	6
Scope of Practice	-	-	-	6	4
Scoring Pattern	-	-	-	5	5
Publications	-	3	2	3	2
Coverage of Parameters	-	-	-	8	2

Arrangement of the stimulus was rated as being good by four judges, excellent by five and fair by one judge. Five judges each rated the stimulus set as being good and excellent on the aspects of Presentation, Feasibility and Scoring Pattern. A ranking of good by four judges and excellent by six judges was obtained on the parameters of Complexity, Flexibility, Trainability and Generalization. The aspect of Publications, `Outcomes and Developers was rated as being poor by three judges, fair by two judges, good by three judges and as being excellent by two judges. Coverage of Parameters was perceived to be good by eight judges and excellent by two judges.

Feature Task

Under the Feature Task, a set of 101 semantic features were given to the 10 judges to rate on a set of 20 parameters. Table 4.35 represents the results of the stimulus rating for the feature task. The parameters of Simplicity, Flexibility, Trainability, Feasibility, and Scope of Practice were rated as being good by four judges and as excellent by six judges. A rating of fair by one judge, good by two judges and excellent by three judges was received on the parameters of Presentation, Relevance, Complexity and Accessibility. On aspects of Familiarity, Volume and Coverage of Parameters a rating of excellent by seven judges and good by three judges was obtained. Five judges each rated the stimulus to be good and excellent on the aspects of Stimulability, generalization and Scoring Pattern. On the aspect of Publications, Outcomes and Developers, a rating of poor by four judges, fair by three judges, good by two judges and excellent by one judge was obtained. The rest of the parameters were not given any rating since they were not applicable for the task.

Table 4.35 *Stimulus Rating for Feature Task*

	Very Poor	Poor	Fair	Good	Excellent	NA
Simplicity	-	-	-	4	6	-
Familiarity	-	-	-	3	7	-
Size of the Picture	-	-	-	-	-	10
Color and Appearance	-	-	-	-	-	10
Arrangement	-	-	-	-	-	10
Presentation	-	-	1	2	7	-
Volume	-	-	-	3	7	-
Relevance	-	-	1	2	7	-
Complexity	-	-	1	2	7	-
Iconicity	-	-	-	-	-	10
Accessibility	-	-	1	2	7	-
Flexibility	-	-	-	4	6	-
Trainability	-	-	-	4	6	-
Stimulability	-	-	-	5	5	-
Feasibility	-	-	-	4	6	-
Generalization	-	-	-	5	5	-
Scope of Practice	-	-	-	4	6	-
Scoring Pattern	-	-	-	5	5	-
Publications	-	3	4	2	1	-
Coverage of Parameters	-	-	-	3	7	-

Note: *NA: Not Applicable*

Map Task

Under this task a set of 5 maps were created and questions, answers and distractors were prepared which were then rated by a set of 10 judges. Table 4.36 summarizes the results of stimulus rating for this category. On the parameters of Simplicity, Color and Appearance, Arrangement and Trainability of the Stimuli, the stimulus received a rating of good by four judges and excellent by six judges. A rating of fair by one judge, good by five judges and excellent by four judges was obtained on the aspects of Familiarity, Size of the Picture and Flexibility. Five judges each rated the stimulus set to be good and excellent on the parameters of Volume, Relevance, Accessibility, Stimulability and Coverage of Parameters. A rating of good by six judges and

excellent by four judges was obtained on the parameters of Presentation, Complexity, and Iconicity. Feasibility and Generalization of the stimulus received a rating of fair by one judge, good by four judges and excellent by five judges. Scope of Practice and Scoring Patterns were perceived to be good by seven judges and excellent by three judges. The aspect of Publications, Outcomes and Developers received a rating of poor by four judges, fair by two judges, good by three judges and excellent by one judge.

Table 4.36 *Stimulus Rating for Map Task*

	Very Poor	**Poor**	**Fair**	**Good**	**Excellent**
Simplicity	-	-	-	4	6
Familiarity	-	-	1	5	4
Size of the Picture	-	-	1	5	4
Color and Appearance	-	-	-	4	6
Arrangement	-	-	-	4	6
Presentation	-	-	-	6	4
Volume	-	-	-	5	5
Relevance	-	-	-	5	5
Complexity	-	-	-	6	4
Iconicity	-	-	-	6	4
Accessibility	-	-	-	5	5
Flexibility	-	-	1	5	4
Trainability	-	-	-	4	6
Stimulability	-	-	-	5	5
Feasibility	-	-	1	4	5
Generalization	-	-	1	4	5
Scope of Practice	-	-	-	7	3
Scoring Pattern	-	-	-	7	3
Publications	-	4	2	3	1
Coverage of Parameters	-	-	-	5	5

Math Task

Math task comprised of 118 statement problems which will utilize various mathematical operations. From Table 4.37 it can be noted that the parameters of Simplicity, Familiarity and Coverage of Parameters was rated as being good by eight judges and excellent by two judges. Presentation of the stimuli was given a rating of good by eight judges and as being fair and excellent by one judge each. A rating of good by six judges and excellent by four judges was given on the aspects of Volume and Relevance. Complexity of the stimulus was rated as being excellent by one judge and as good by nine judges. A rating of good by seven judges and excellent by three judges was obtained on the aspect of Flexibility.

Table 4.37 *Stimulus Rating for Math Task*

	Very Poor	**Poor**	**Fair**	**Good**	**Excellent**	**NA**
Simplicity	-	-	-	8	2	-
Familiarity	-	-	-	8	2	-
Size of the Picture	-	-	-	-	-	10
Color and Appearance	-	-	-	-	-	10
Arrangement	-	-	-	-	-	10
Presentation	-	-	1	8	1	-
Volume	-	-	-	6	4	-
Relevance	-	-	-	6	4	-
Complexity	-	-	-	9	1	-
Iconicity	-	-	-	-	-	10
Accessibility	-	-	-	8	2	-
Flexibility	-	-	-	7	3	-
Trainability	-	-	3	4	3	-
Stimulability	-	-	1	5	4	-
Feasibility	-	-	2	5	3	-
Generalization	-	-	2	5	3	-
Scope of Practice	-	-	2	5	3	-
Scoring Pattern	-	-	1	6	3	-
Publications	-	3	2	4	1	-
Coverage of Parameters	-	-	-	8	2	-

Note: *NA: Not Applicable*

Trainability was perceived as being good by four judges and as being fair and excellent by three judges each. A rating of good by five judges, excellent by four judges and that of fair by one judge was obtained on the aspect of Stimulability. On the aspects of Feasibility, Generalization and Scope of Practice were perceived to be excellent by three judges, good by five judges and fair by two judges. Scoring Pattern was given a rating of excellent by three judges, good by five judges and fair by one judge. Publications, Outcomes and Developers was rated as being poor by three judges, fair by two judges, good by four judges and excellent by one judge. The parameters of Size of the Picture, Color and Appearance, Arrangement and Iconicity were not given any rating as they were not applicable for the Math Task.

Rhyming Task

The Rhyming Task comprised of 212 rhyming and 100 non-rhyming word pairs which were rated by a set of 10 judges, the results of which are represented in Table 4.38. Out of the 20 parameters, those of Relevance, Flexibility, Stimulability, Feasibility, Generalization and Scope of Practice were given a rating of good by seven judges and that of excellent by three judges. Simplicity and Familiarity received a rating of excellent by three judges, good by six judges and fair by one judge. The parameter of Presentation was perceived to be good by five judges, excellent by four and fair by one judge. Volume and Coverage of parameters were ranked as being good by four judges and excellent by six judges. The parameter of Complexity was perceived to be good by six judges, excellent by one and fair by three judges. A rating of fair by two judges and that of good and excellent by four judges each was obtained in the aspect of Accessibility. Eight judges ranked the stimuli to be good and two rated it as being excellent on the aspect of Trainability. Scoring Pattern received a

rating of good by six judges and excellent by 4 judges. The aspect of Publications, Outcomes and Developers received a rating of poor by one judge, fair by five judges, and good and excellent by two judges each. Since Size of the Picture, Color and Appearance, Arrangement and Iconicity were not applicable for this task; they were not given any ratings by the judges.

Table 4.38 *Stimulus Rating for Rhyming Task*

	Very Poor	Poor	Fair	Good	Excellent	NA
Simplicity	-	-	1	**6**	**3**	-
Familiarity	-	-	1	6	3	-
Size of the Picture	-	-	-	-	-	10
Color and Appearance	-	-	-	-	-	10
Arrangement	-	-	-	-	-	10
Presentation	-	-	1	5	4	-
Volume	-	-	-	4	6	-
Relevance	-	-	-	7	3	-
Complexity	-	-	3	6	1	-
Iconicity	-	-	-	-	-	10
Accessibility	-	-	2	4	4	-
Flexibility	-	-	-	7	3	-
Trainability	-	-	-	8	2	-
Stimulability	-	-	-	7	3	-
Feasibility	-	-	-	7	3	-
Generalization	-	-	-	7	3	-
Scope of Practice	-	-	-	7	3	-
Scoring Pattern	-	-	-	6	4	-
Publications	-	1	5	2	2	-
Coverage of Parameters	-	-	-	4	6	-

Note: *NA: Not Applicable*

Semantic Minimal Pair Task

A total of 140 questions and 140 pairs of words were developed for the Semantic Minimal Pair Task which were then rated by 10 judges on a set on 20 parameters on a feedback questionnaire, the results of which are represented in Table 4.39. Under this task, parameters of Simplicity and Presentation were rated as being good by seven

judges, excellent by two judges and fair by one judge. A rating of good by seven judges and that of excellent by three judges was provided on the aspects of Familiarity, Relevance and Volume.

Table 4.39 *Stimulus Rating for Semantic Minimal Pair Task*

	Very Poor	**Poor**	**Fair**	**Good**	**Excellent**	**NA**
Simplicity	-	-	1	7	2	-
Familiarity	-	-	-	7	3	-
Size of the Picture	-	-	-	-	-	10
Color and Appearance	-	-	-	-	-	10
Arrangement	-	-	-	-	-	10
Presentation	-	-	1	7	2	-
Volume	-	-	-	7	3	-
Relevance	-	-	-	7	3	-
Complexity	-	-	3	3	4	-
Iconicity	-	-	-	-	-	10
Accessibility	-	-	1	6	3	-
Flexibility	-	-	1	5	4	-
Trainability	-	-	1	5	4	-
Stimulability	-	-	1	2	7	-
Feasibility	-	-	-	6	4	-
Generalization	-	-	-	5	5	-
Scope of Practice	-	-	-	5	5	-
Scoring Pattern	-	-	-	5	5	-
Publications	-	3	2	4	1	-
Coverage of Parameters	-	-	1	6	3	-

Note: *NA: Not Applicable*

Feasibility of the stimulus set was perceived to be good by six judges and excellent by four judges. A rating of fair and good by three judges each and that of excellent by four judges was obtained on the Complexity parameter. Stimulability received a rating of excellent by seven out of the 10 judges, good by two judges and fair by one judge. Five judges each rated the stimulus as being good and excellent on the aspects of Generalization, Scope of Practice and Scoring Pattern. Three judges rated the stimulus as poor, two as fair, four as good and one as excellent on the aspect of Publications, Outcomes and Developers.

Semantic Odd One out Task

This Task consisted of 100 sets of words each set consisting of five words which were semantically related and two words which were unrelated. These words were rated by 10 judges using a feedback questionnaire. The compiled results are depicted in Table 4.40.

Table 4.40 *Stimulus Rating for Semantic Odd One Out Task*

	Very Poor	**Poor**	**Fair**	**Good**	**Excellent**	**NA**
Simplicity	-	-	-	3	7	-
Familiarity	-	-	-	3	7	-
Size of the Picture	-	-	-	-	-	10
Color and Appearance	-	-	-	-	-	10
Arrangement	-	-	-	-	-	10
Presentation	-	-	-	5	5	-
Volume	-	-	-	3	7	-
Relevance	-	-	-	6	4	-
Complexity	-	-	-	6	4	-
Iconicity	-	-	-	-	-	10
Accessibility	-	-	-	5	5	-
Flexibility	-	-	-	6	4	-
Trainability	-	-	-	6	4	-
Stimulability	-	-	-	6	4	-
Feasibility	-	-	-	5	5	-
Generalization	-	-	1	4	5	-
Scope of Practice	-	-	1	4	5	-
Scoring Pattern	-	-	-	5	5	-
Publications	-	3	3	2	2	-
Coverage of Parameters	-	-	-	4	6	-

Note: *NA: Not Applicable*

Out of the 20 parameters, a rating of good by three judges and excellent by seven judges was obtained on the parameters of Simplicity, Familiarity and Volume. Five judges each gave the rating of good and excellent on aspects of Presentation, Accessibility, Feasibility and Scoring Pattern. Relevance, Complexity, Flexibility, Trainability and Stimulability were perceived to be good by six judges and excellent by four judges. A rating of good by four judges, excellent by five judges and fair by

one judge was obtained on the parameters of Generalization and Feasibility. Four judges gave the rating of good while six gave the rating of excellent on the aspect of Coverage of Parameters. Three judges each gave the rating of poor and faur and two each gave the rating of good and excellent on the aspect of Publications, Outcomes and Developers.

In summary, stimulus for a total of 29 lexical categories and nine tasks for use with the software were developed and rated by 10 judges on a feedback questionnaire. On any given task, the stimulus set received no less than 60% rating as being good and/or excellent on all the parameters except that of Publications, Outcomes and Developers which checked for the awareness of the judges about any other softwares programs with similar stimulus. The stimulus prepared for Syllable Task and Phoneme to Word Tasks were not given to the judges for validation process as it was comprised of the words developed under the 29 lexical categories which were validated separately. The tasks of Phoneme-to-Letter and Letter-to-Phoneme were not validated as the phoneme-to-grapheme correspondence does not have any discrepancies in Hindi language. Also, stimulus for Reading Task and Sentence Completion Task was taken from already field test manual (MAAT-K) and hence was not validated by the judges.

Chapter V

DISCUSSION

The present study aimed at translating and adapting the stimulus for Constant Therapy in Hindi language. Stimulus for a total of 15 tasks and core vocabulary under 29 lexical categories was developed in Hindi for use with the Constant Therapy software. Once developed, the stimulus was rated by 10 judges including nine Speech Language Pathologists and a Linguist on a feedback questionnaire (Goswami et. al., 2012). The judges were asked to suggest modifications in the stimulus if required and the same was incorporated into the stimulus if more than three judges gave the same suggestion.

On scrutinizing the results obtained on the feedback questionnaire, it was found that, the stimulus received no less than 60% rating of good and/or excellent on any of the stimulus tasks or core vocabulary except the parameter of Publications, Outcomes and Developers. This aspect of Publications, Outcomes and Developers required the judges to rate their knowledge of similar publications or programs as 'Very Poor', 'Poor', 'Fair', 'Good' or 'Excellent'. Lower ratings and more scattered ratings were obtained on this aspect across most of the tasks. This led to the conclusion that in the Indian context, SLPs are less aware of computer based or software based tele-treatment options for PWA and hence the current study would prove to be of clinical relevance in the tele-treatment mode of service delivery.

Core Vocabulary Developed for Constant Therapy Hindi

Among the 638 lexical items developed under 29 categories, none of the categories received a rating of 'Very Poor' or 'Poor' by any of the judges except on the aspect of

awareness of Publications, Outcomes and Developers. A few items received a rating of ‘Fair’ but this was limited to a maximum of 40%.

Firstly, inclusion of categories like Body Parts, Clothing, Container, Entertainment, Food, Fruits, Furniture, Gadgets, Household items, Kitchen items, People, Personal Items and Vegetables reflects need based approach in treating persons with communication disorders especially PWA. Such stimulus has high functionality in ever day life of PWA and would enhance functional communication of the person. No modifications were suggested in the stimulus sets of Animals, Food, Furniture, Gadgets, Geography, Personal Items, Residence and Tools. These categories received a more cohesive rating across the rating of ‘Good and ‘Excellent’ and fewer judges rated stimulus in these categories as being ‘Fair’. Certain categories like that of Fixture, Gadgets, Herbs, Geography, Magical Creatures, Musical Instruments, Nature, Symbolic, Tools and Weapons were also included were unique in comparison to the conventional vocabulary used in therapy situations. These categories received scattered rating in comparison to the categories mentioned above. In these categories, the judges may have perceived interference of issues like literacy (for the category of Herbs) rural versus urban life style (for the category of Gadgets and Tools) and sensitive issues of caste and religion (for the categories of Magical Creatures and Symbolic). This may be reason for the scattered ratings across parameters in these categories. Hence, the stimulus sets were categorized further based on these parameters so as to have a clear distinction between stimulus sets which can be used for a multitude of population ranging from illiterate to literate, rural to urban etc.

Based on the aspects of Relevance, Iconicity, Color and Appearance and Size of the Picture, judges provided few minor modifications in the stimulus so as to improvise the stimulus. In the category of Arts and Crafts, as per the suggestions

provided by the judges, images for ‘cello tape’, ‘paint brush’, ‘/silaji maʃi:n/’ ‘paint’ were replaced. The term ‘/patr/’ was replaced with the word ‘/tʃIt̪$t_{\circ}^{h}$I/’. In the category of Birds, lower ratings on the aspects of Familiarity and relevance indicates that in the Indian Context, usages of this vocabulary may be limited hence, these stimulus items may not hold great clinical relevance in comparison to other lexical items such as clothing, personal items, household items etc. Hence, the extensive vocabulary compiled under this category was segregated as ‘most easily identifiable’ and as those ‘most commonly found in India’ for the purpose of having varied difficulty levels for and for use with wider range of users staring from rural to advanced or elite users. As per the suggestions provided by the judges pictures for ‘/kand^{h}a/’ and ‘/poontʃ/’were replaced in the category of ‘Body Parts’ as there was ambiguity perceived in the stimulus items. Also, in the categories of Clothing, as per the recommendations of the raters, pictures for ‘wig’, ‘safari suit’ and ‘apron’ were replaced. The stimulus item of ‘/g^{h}u:ng^{h}at̪/’ was removed from the set. The picture for ‘/pi:pa:/’ and ‘/mat̪ka/’ were changed in the stimulus set as per the suggestions provided by the judges since the pictures were perceived to be culturally not suitable in the category of Container. Also, an item was added (‘/dram/’). Under the Entertainment category, the four of the judges suggested for a change of the picture of ‘radio’ and addition of an extra item of ‘video game’. The judges recommended adding an item ‘/sansi/’ to the Household items category which was incorporated. No major modifications of the stimulus set were suggested except for replacing the picture for /lakDi/ in the category of Nature. The judges suggested replacing the pictures of ‘roof’, ‘well’ and ‘highway’ which was incorporated into the stimulus set of Structure.

Other Tasks of Constant Therapy Hindi

The stimulus developed under various tasks like Auditory Command Task, Calendar Task, Currency Task, Math Task and Map Task received cohesive ratings by most of the judges ranging from good to excellent. These tasks are developed with the base of 'Impairment based intervention'. These hold very high relevance in day-to-day activities for PWA and thus would yield good outcomes in terms of functional activities of PWA through therapy. Tasks such the Rhyming Task, Feature Task, Semantic Minimal Pair Task and Semantic Odd One out Task indirectly tap auditory comprehension skills, naming skills, self- cueing strategies and indirectly facilitate language recovery. All the above mentioned tasks were rated less on the aspect of Publications, Outcomes and Developers as majority of the judges were unaware of programs or softwares that provide language rehabilitation using such tasks and stimulus.

Although the extent of discussion remains limited as the stimulus was not field tested, the stimulus can be used for implementation into the software as the stimulus received good ratings on aspects such as familiarity, relevance and trainability as already mentioned above.

Chapter VI

SUMMARY AND CONCLUSIONS

In the present study, an attempt to develop stimulus for Constant Therapy in Hindi was made. Using appropriate translations, modifications and adaptations, stimulus under 15 therapy tasks and core vocabulary under 29 lexical categories was developed. This stimulus was then rated by 10 judges on a total of 20 parameters and suggestions provided by more than three judges were incorporated into the stimulus. The stimulus received ratings ranging from 'Good' to 'Excellent' on most of the tasks across most of the parameters and was found to be culturally suitable and appropriate for use with PWA in language rehabilitation process. The stimulus designed ranged to cover many aspects of traditional language therapy along with aspects of an impairment based therapy along the lines of cognitive-linguistic approach such as Auditory Comprehension, Naming, Reading, Visuo-spatial Skills and Functional Mathematics. A wide range of therapy tasks, thus, would facilitate better planning for language rehabilitation. Each of these tasks had stimulus at varying levels of difficulties, categorized according to rural versus urban variations. This progression from simple to difficult aids the PWA in learning and practicing the skills well. The volume of the stimulus prepared aids in using a large number of task items in varied combinations that will aid in generalization of learned skills. Also, flexibility in stimulus in terms of range of tasks available, multitude of trials that can be generated paves way for designing the therapy sessions according to the needs and functional level of the PWA. Field testing could have yielded better insights into the functionality, relevance and appropriateness of the stimulus prepared.

Implications of the Study:

- Developing stimulus for software platforms like Constant Therapy in Indian language like Hindi, which is spoken by a large majority of people in the Indian subcontinent is beneficial in terms of easy access to therapy in the presence of barriers to access to language rehabilitation facilities and lack of availability of professionals in the Indian context.
- Meticulous and extensive stimulus preparation involving a wide range of therapy tasks and stimulus items will be of immense application in planning therapeutic tasks for better learning of skills and generalization of the same.
- An attempt to develop stimulus which is relevant to Indian context across socio-economic status, rural versus urban lifestyle and literacy variations was made. The stimulus can thus be prudently chosen by the therapist to make it relevant for the PWA based on his cognitive-linguistic profile.

Limitations of the Study:

- The stimulus prepared involved fewer tasks for cognitive re-training while it had majority of the tasks aiming at aspects of language re-training.
- The stimulus under the categories like Fixture, Gadget, Geography, Herbs, Magical Creatures, Residence, Symbolic and Weapons has fewer numbers of items.
- The stimulus could not be field tested because of the time constraints and an extensive stimulus preparation phase.

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APPENDIX I

Feedback Questionnaire

	Very Poor	Poor	Fair	Good	Excellent
Simplicity					
Familiarity					
Size of the Picture					
Colour and Appearance					
Arrangement					
Presentation					
Volume					
Relevance					
Complexity					
Iconicity					
Accessibility					
Flexibility					
Trainability					
Stimulability					
Feasibility					
Generalization					
Scope of Practice					
Scoring Pattern					
Publications					
Coverage of Parameters					

Please put a (√) in the appropriate box

Suggestions:

Definitions of parameters

Simplicity: are the stimuli comprehendible?

Familiarity: Is the test material familiar to the user?

Size of the Picture: Whether the picture stimuli are of the appropriate size.

Color and Appearance: Are the picture stimuli appropriate in terms of color and dimension?

Arrangement: Whether the picture stimuli are within the visual field of an individual?

Presentation: Are the number of stimuli in each section placed appropriately?

Volume: Is the overall stimuli appropriate in size?

Relevance: Whether the test material is culturally and ethically acceptable?

Complexity: Is the material arranged in the increased order of difficulty ?

Iconicity: Does the picture stimuli appear to be recognizable and representational ?

Accessibility: Is the test material user-friendly?

Flexibility: Can the stimulus be easily modified?

Trainability: Can the stimuli be used for intervention purpose in different milieu?

Stimulability: Does stimulus material elicit responses from the individual?

Feasibility: Whether the test material is viable?

Generalization: Can the test material be generalized to any other adult languages and disorders and various settings?

Scope of Practice: Is the test material within the profession's scope of practice or within the personal scope of practice?

Scoring Pattern: Whether the scoring pattern followed in the resource material applicable?

Publications, Outcomes and Developers (Professional Background): Is there any other resources material similar to this test material which you are aware of ?

Coverage of Parameters: Does the resources material contain the essential language components to be treated?

APPENDIX II

A CD containing the stimulus prepared enclosed.