LEGIBILITY STUDY ON SINHALA TYPEFACE FOR DIRECTIONAL INFORMATIVE SIGN BOARDS IN SRI LANKA

L.S. Eramudugolla

(188014 J)

Degree of Master in Science

Department of Integrated Design

Faculty of Architecture

University of Moratuwa

Sri Lanka

March 2021

DECLARATION

I declare that this is my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

Also, I hereby grant to University of Moratuwa the non-exclusive right to reproduce and distribute my thesis, in whole or in part in print, electronic or other medium. I retain the right to use this content in whole or part in future works (such as articles or books).

L. S. Eramudugolla

…….. ……..

Signature Date

The above candidate has carried out research for the Master's thesis under my supervision.

…….. …….

Supervisor: Dr. Sumanthri Samarawickrama Date

…….. …….

Supervisor: Prof. Gihan Dias Date

ABSTRACT

Sri Lanka is a multilingual country; Sinhala, Tamil and English languages are communicated by its representative scripts among various communication tools. Directional informative signboards (DISB) are a tool that assists in road safety and efficiency in driving. DISB in Sri Lanka communicates the destination through the three scripts, the distance through numerals, and direction through arrowheads and other icons. These signs guide the driver to take instant decisions within a short period while operating the vehicle. Therefore, the typefaces, numerals and icons on these boards need to be legible. Legibility and its' practices are discussed in this research. And highlight the importance and need of a unique typeface for DISB to achieve better legibility performance. Thus, this research examines the Sinhala typeface currently used in DISB of Sri Lanka, required type personality traits for DISB and anatomy as key contributors to increasing legibility performance.

Available data on the history of road signs presents the technological development, material (surface) improvements and elaborates on applying scientific methodologies specific to legibility performance. It is relevant to different scripts of different countries. Whereas within the context of Sri Lanka, discussed in the background study and literature survey, the Sinhala typeface used for DISB is a common typeface (DL-Araliya). It was mainly designed to communicate information through print-based material. Further, it was also noted that the typeface was not scientifically tested for the legibility performance of DISB. But DL-Araliya is adopted promptly based on its common usage and the country's rapid development of roads, expressways and national highways (after the end of the Civil war). Thus, the research addresses this gap and the need to identify the most suitable legibility test method, required personality traits for DISB within Sri Lanka. And its application to a Sinhala typeface and its anatomy (required typeface features for the proposed typeface) increases legibility performance.

The research presents the solution within the domain of typography. The literature survey on existing readability and legibility test methods identified the Reader's preference test (RPT) as the most appropriate legibility test method to identify the most suitable typeface features according to the personality traits of DISB. RPT incorporates the importance of having specific typeface personality traits for a specific purpose (communicating directional information). Thus, it also underlined the role of the anatomy of the typeface to enhance type personality and its' legibility. As a result of the literature survey, two variables were identified for the overall research—dependant variable; required typeface features for DISB and independent variable; required typeface personality for DISB. Thereafter the methodology was structured to identify required Sinhala typeface features for DISB. The research experiment was based on RPT and tested six Sinhala typefaces, including DL-Araliya, the currently used Sinhala typeface. The type personality traits were obtained as the findings of the literature survey, and they were based on Latin script. This was because a large amount of research was done within Latin script, and it was the only script discussed on road signs. Thereafter, stimuli were used for the experiments, which contained the six selected typefaces with adjective pairs, required type personality traits and city names where respondents marked their preference on a five-point Likert scale. The results were analysed on SPSS to confirm the size of the sample group. Microsoft Excel was used to analyse the mean value of the most significant personality traits of sample typefaces. Three out of the six typefaces that scored the highest were visually analysed under 33 anatomical features relevant to Sinhala within a set of 26 sample letters. This process was then drafted with the required typeface features and presented as a proposed typeface to increase legibility performance in Sri Lankan DISB. This draft typeface and the methodology of achieving is the main contribution of this research. Thus, the research presents typeface features for DISB to contain large counter spaces, establish a monolinear stroke width, and maintain an equal size ratio for ascender and descender, equal height with the width, to maintain vertical or horizontal terminals and to maintain a closed eye feature. However, since this research contains a one-way experiment test method and selected letters need to be tested on its legibility performance—the suggested test methods are the 'distance study method' and 'short exposure test method'. Even though there are two other scripts, numeral and icons, used on DISB, this research limits the Sinhala typeface. It focuses on legibility performance within the scope of typography research and typeface design.

Keywords: Legibility, Type personality traits, Sinhala type anatomy, Sinhala typeface, Directional informative sign-boards

ACKNOWLEDGMENT

Foremost, I express my sincere gratitude to my main supervisor Dr. Sumanthri Samarawickrama, Department of Integrated Design, Faculty of Architecture, University of Moratuwa, for the great opportunity and continuous support of my M.Sc. research, for her patience, motivation, enthusiasm, immense knowledge and offering me the short term Senet Research Grant. Her guidance facilitated me at all times during the research work and writing of this thesis.

My sincere thanks to my co-supervisor, Prof. Gihan Dias, Department of Computer Science Engineering, Faculty of Engineering, for offering me the research grant opportunity at the National Language Processing Centre University of Moratuwa and for the encouragement, insightful comments and constructive criticisms to complete this research.

I express my gratitude to my subject expertise, Prof. Ann Bessemans, Faculty of Architecture and Art, Hasselt University-Belgium, for the extended discussions and expert advice, which have been invaluable throughout all stages of the work.

I am grateful to the former Head of Department of Integrated Design, Archt. Sithumini Rathnamalala and the current Head of Department of Integrated Design; Ms. Melanie Dissanayake, former Director of Post Graduate Studies Division; Dr. Thanuja Ramachandra and current Director of Post Graduate Studies Division; Dr. Shaleeni Coorey Faculty of Architecture University of Moratuwa.

I appreciate the support given by the volunteering research coordinators Ms. Ruwandika Senanayake and Ms. Inoka Samarasekara, for conducting my progress reviews and valuable comments for improvements.

I thank Dr. Kutila Gunesekara, who conducted the Skill for Research module and Dr. Dilum Bandara the coordinator MBA IT, Department of Computer Science Engineering, Faculty of Engineering, for offering me the Skill for Research module.

Special thanks are due to Dr. S. J. Vidanapathirana, Deputy Director, Highway Designs Division, RDA, for providing details of the placement of road signs; Mr. R. A. Sudath, Deputy Director (planning III) Network Planning and Road Safety Section RDA for provide the most valuable details of road signs and introducing resource personnel; Executive engineers Mr. Sisira Wijepala, Avisawella RDA, Mr. E. M. K. N. Jayaweera, Kadugannawa RDA and Ms. Achala Rodrigo, Assistant of RDA Museum Peradeniya for providing historical data on road and road signs in Sri Lanka.

Besides Engineers from RDA, I reserve my special thanks to Eng. Indika Karunasekara and Eng. Abesinghe, Government Factory Kolonnawa, provides data on the manufacturing process of road signs in Sri Lanka.

My sincere thanks also extend to Mr. Pathum Egodawatta, and other Akuru collective members for sharing their generous insight on Sinhala typography.

I am grateful to level 2 and level 3 (2018 and 2019) undergraduates from the Department of Integrated Design, Faculty of Architecture, University of Moratuwa, for contributing their valuable time to my experiments. My thanks are extended to Mr. Supun Gunawardhane and Ms. Rashandi Porambage for helping with the sketches, to Mr. Abdhul Rahuman for providing images of road signs in North-East province, and Mr. Ruchira Abeyagoonawardana for providing images of rare road signs in Laggala-Pallegama area.

Also, I thank Ms. Priyanwada Thalis and Mr. Ruwan Attanayake, Post Graduate Unit, Faculty of Architecture for their patience and assistance from the beginning to the end of my M.Sc.

Lastly but not least, I thank my family; the person with the greatest indirect contribution to this study is my mother, who always encourages me to follow my childhood dream; My father, as well as my brother and sister-in-law for spiritually supporting me throughout my life.

LIST OF RESEARCH PUBLICATIONS

- Conference presentation (Abstract)- Design code 2018

Eramudugolla L.S (2018), *Study on legibility of Sinhala fonts: test based on continuous reading*, 26-27. Design code 2018, Colombo, Sri Lanka

- Abstract published –FARU 2018

Eramudugolla L.S (2018), *Study on legibility of selected Sinhala fonts based on font size and weight: test based on continuous reading*. 42. Faculty of Architecture Research Unit, 7th December 2018, Galle, Sri Lanka

- Conference presentation (Full research paper) -Typoday 2019

Eramudugolla L.S (2019), *Identify personality of Sinhala font on road informative signboards: Test based on reader's preferences.* Typography day 2019, 2nd to 4th March, Industrial Design Centre, Indian Institute of Technology, Mumbai, India

- Full research paper-10th Typography Meeting 2019

Eramudugolla Shyanika and Subasinghe Ravindu (2019), *Atomic vs Anatomic Features of Sinhala Fonts.* 39. 10th Typography Meeting 2019, Constantino Nery Theatre, Matosinhos, Portugal

- Conference presentation (Full research paper) - FARU 2019

Eramudugolla L.S (2019), *Personality traits of Sinhala fonts on Road informative Sign Boards: On Readers' Preferences Test*. 429-436. Faculty of Architecture Research Unit 2019, 3rd December 2019, Institute of Technology University of Moratuwa, Diyagama, Homagama, Sri Lanka

-

CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

(DISB): Directional Informative Sign-boards

(RPT): Reader's Preference Test

(AAA): American Automobile Association

(RDA): Road Development Authority

(Clearview HWY): Clearview High-way

(FHWA): Federal Highway Administration published a slandered alphabet, namely

(MUTCD): Manual on Uniform Traffic Control Devices for Streets and Highways

(MCQ): Multiple-Choice Questions

(GRE): Graduate Record Exam

(VAT): Visual Accuracy Thresholds

(SPSS): Statistical Package for Social Sciences Software

(KMO): Kaiser-Meyer –Olkin