
**An Investigation into the use of Fitts's Law
as a Discriminant for the Identification of
Dyslexia in Primary School Children**

Sam Dixon
40056761

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I, Sam Dixon, confirm that this dissertation and the work presented in it are my own achievement.

Where I have consulted the published work of others this is always clearly attributed;

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Abstract

This dissertation records and describes the process and evaluation undertaken while attempting to discern whether a Fitts's Law based application is a suitable test criteria for the identification of possible Dyslexia.

- Summary intro and context
- Summary Results and Evaluation
- Summary of Conclusion

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I would like to thank my dog, family and the pub.

1 Introduction

1.1 Background and Context

1.1.1 Dyslexia

Brief description of Dyslexia and the methods used for it identification

Dyslexia is present in around 10% of the British population to some degree; about 4% of the population have severe Dyslexia [1] [2]. While the understanding and acceptance of Dyslexia has improved greatly in recent years, the assessment of whether a person has Dyslexia has remained relatively stagnant. Dyslexia is one of the few learning difficulties which does not have an assessment funded by the NHS. The current and most accurate form of assessment remains in the form of traditional “pen-and-paper” tests. [3] [4]

1.1.2 Dot-to-Dot Test

Describe the Dot-to-Dot test. Bring attention to Jon’s observation of dyslexic children having different outcomes

The Dot-to-Dot Test is a system developed by Professor Jon Kerridge [ref]. The goal of the application is to measure a child’s ability to draw lines between a series of point as they appear on the screen. Kerridge hypothesises that a child with dyslexia will have measurably different results from a child that does not have dyslexia.

1.1.3 Fitts’s Law

Description of Fitts’s Law. Although mainly used by designers for ergonomics, the Dot-to-Dot test can easily be analysed with Fitts’s. Fitts’s Law is a form of analysis used to predict the “difficulty of movement” when using a digital input. Paul Fitts developed the theory in 1954, and it has since been utilised globally to aid in the design of ergonomic and easy-to-use computer interfaces.

As the Dot-to-Dot Test comprises of drawing lines between points - Fitts’s analysis can be applied to the results.

1.1.4 Aims and Goals

Outline the aims and goals of this project - deliverables

The goal of this project is to determine whether or not Fitts’s Analysis is valid method of dyslexia detection.

There are a number of precursors to determining whether Fitts’s is a suitable discriminant, including;

- Collecting Dot-to-Dot data from Dyslexic and Non-Dyslexic participants for use as a control group
- Fitts Analysis of Dyslexic and Non-Dyslexic data for significant differences
- Evaluation of Fitts's analysis via a third, experimental group

2 Literature Review

2.1 Introduction

Explain that there is very little existing literature for Dyslexia Diagnoses using Fitts's - but that it has been used to previously to identify other learning and congestive difficulties

While Fitts's Law has existed for around 60 years, its use as an identification tool in that time has been very limited, with most papers focusing on its original intention - Human Computer Interaction. There exists only a small number of papers where Fitts's Analysis has been used as an attempt to identify children with Cognitive Development and Motor Skill issues.

2.2 Disability Detection with Fitts's Law

Discuss and evaluate papers where Fitts's analysis is used for detection

2.3 Dyslexia Detection

Discuss and evaluate papers with novel Dyslexia detection methods?

2.4 Summery

Describe and discuss any common themes or oddities found

3 Methodology

Describe how processes were carried out

At the project initiation, a number of resources were already present and available, including; Prof. Kerridge's Dot-to-Dot Test and a database containing previously collected data from a number of Primary School children.

- Analysis of existing data
- Collection of new data (describe range of participants)
- Analysis of new data
- Identifying trends/patterns

4 Results and Evaluation

What was discovered - is it valid / accurate

5 Conclusion

Summarise findings

6 Reflection

What went well, what didn't - what would change if you did it again

References

- [1] British Dyslexia Association, “Frequently Asked Questions — British Dyslexia Association.”
- [2] NHS Choices, “Dyslexia - NHS Choices.”
- [3] British Dyslexia Association, “About the British Dyslexia Association — British Dyslexia Association,” 2016.
- [4] NHS Choices, “Dyslexia - Diagnosis - NHS Choices.”

Appendices