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**BROAD SPECTRUM LIGHT  
AND NIGHTTIME COGNITIVE PERFORMANCE:  
EFFECTS OF  
INTENSITY, DISTANCE, AND DURATION**

A thesis completed in partial fulfillment of the requirements for the degree of  
Master of Arts

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## ABSTRACT

The main purpose of the present investigation was to find out if changes in intensity of a bright light source differentially affected nighttime performance when the intensity was varied at the source compared to moving participants in relation to the source. Previous research has not studied distance from source specifically as an independent variable. The present study also attempted to find out if duration of light exposure would influence performance tasks as previous findings suggest (McIntyre et al., 1989; Lewy et al., 1980). Duration of exposure had not been systematically examined as an independent variable until Baker (1999) studied the effects of both 15-min and 60-min durations on mental performance. Light levels of baseline (>100-lux, normal room lighting), 1,000, and 2,000 lux were paired with 2 different duration conditions (15-min prior and 60-min continuous), and two different distance conditions (Fixed and Moved distance). Twenty volunteers completed tests of mathematical reasoning, logical reasoning, vigilance, memory recall, and memory recognition between 2400 hrs and 0100 hrs once a week for six consecutive weeks. The results showed that the method of varying light intensity does seem to matter if only for the 2,000-lux intensity and, overall, the 15-min duration condition resulted in better performance than the 60-min duration condition. The present study produced inconclusive results in regard to the duration of exposure and in regard to the method of varying light intensity. However, it is possible to conclude that the method of varying light intensity probably does impact performance. Furthermore, the present study raises two serious methodological concerns in regards to the speed-accuracy tradeoff problem and in regard to the standardisation of task type.

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# TABLE OF CONTENTS

	Page
<b>ABSTRACT</b>	ii
<b>ACKNOWLEDGEMENTS</b>	iii
<b>TABLE OF CONTENTS</b>	iv
<b>LIST OF TABLES</b>	vii
<b>LIST OF FIGURES</b>	viii
<b>INTRODUCTION</b>	
<u>Background</u>	1
<u>Underlying Theories</u>	3
The Physiology Underlying Circadian Rhythms	3
Circadian Rhythms	5
Melatonin and the Pineal Gland	7
Dr. Alfred Lewy and the Discovery of Bright Light Effects	8
Seasonal Affective Disorder and Bright Light Therapy	11
Circadian Rhythms, the Sleep/Wake Cycle, and Shiftworkers	13
The Sleep/Wake Cycle and Performance	15
Shiftworkers and Bright Light	17
The Present Study	23
<b>METHOD</b>	
<u>Participants</u>	27
<u>Design</u>	27
<u>Apparatus</u>	30

<u>Measures</u>	34
Subjective Sleepiness	34
Temperature	34
Performance Measures	35
Word Recall Task	36
Word Recognition Task	37
Mathematical Sums Task	37
Letter Cancellation Task	38
Critical Thinking Task	39
<u>Procedure</u>	40
<u>Statistical Analysis</u>	41

## RESULTS

<u>Speed-Accuracy Trade-off</u>	43
<u>Performance Tasks</u>	45
Word Recall Task	45
Word Recognition Task	47
Mathematical Sums Task	49
Letter Cancellation Task	53
Critical Thinking Task	57

## DISCUSSION AND CONCLUSIONS

<u>Distance Effects</u>	62
<u>Duration Effects</u>	71
<u>Limitations of the Study</u>	78
Performance Tasks	78
Recognition and Recall	79

Methodology	80
<u>Further Research</u>	80
<b>REFERENCES</b>	83
<b>APPENDICES</b>	
Appendix A – Order of Exposure to Experimental Conditions Across the 12-week Period	88
Appendix B – Sleepiness and Demographic Questionnaire and Temperature and Test Scoring Form	89
Appendix C – Information for Participants	92
Appendix D – Consent Form	96
Appendix E – Standardised Instructions	97
Appendix F – Examples of Performance Tasks	101

## LIST OF TABLES

Table 1	Seating Distance (cms) from the Light Source for the Fixed and Moved Distance Conditions	32
Table 2	Correlations Between Speed and Accuracy for Mathematics, Letter Cancellation, and Critical Thinking, Collapsed Across all 12 Sessions and Both Durations	44
Table 3	Word Recall Task Mean and Standard Deviation Percentage Scores for all Intensity, Duration, and Distance Conditions	46
Table 4	Word Recognition Task Mean and Standard Deviation Percentage Scores for all Intensity, Duration, and Distance Conditions	48
Table 5	Mathematical Sums Task Mean and Standard Deviation Percentage Scores for all Intensity, Duration, and Distance Conditions	50
Table 6	Mathematical Sums Task Completion Time Mean and Standard Deviation Scores for all Intensity, Duration, and Distance Conditions	52
Table 7	Letter Cancellation Task Mean and Standard Deviation Percentage Scores for all Intensity, Duration, and Distance Conditions	54
Table 8	Letter Cancellation Task Completion Time Mean and Standard Deviation Scores for all Intensity, Duration, and Distance Conditions	56
Table 9	Critical Thinking Task Mean and Standard Deviation Percentage Scores for all Intensity, Duration, and Distance Conditions	58
Table 10	Critical Thinking Task Completion Time Mean and Standard Deviation Scores for all Intensity, Duration, and Distance Conditions	60



## LIST OF FIGURES

Figure 1	Midsagittal Section of the Human Brain showing the Pineal Gland, Suprachiasmatic Nucleus, and Hypothalamus	4
Figure 2	Light Box and Participant Positioning	31
Figure 3	ThermoScan Thermometer, DSE Digital Lux Meter, and DSE Digital Stopwatch	33
Figure 4	Two-way Interaction between Intensity and Duration for the Mathematical Sums Task (collapsed across duration)	51
Figure 5	Intensity by Distance Interaction for the Letter Cancellation Task Completion Time for the 15-min Group	55
Figure 6	Intensity by Duration Interaction for the Critical Thinking Task (collapsed over the distance condition)	59
Figure 7	Interaction between Distance and Duration at 1,000-lux Intensity for Critical Thinking Completion Time	61