

TABLE OF CONTENTS

	Page
I. INTRODUCTION AND OUTLINE	1
II. METRICS ON FULLY RANKED DATA	5
A. Permutations: Some Important Conventions	5
B. Metrics on Permutations: Discussion and Examples	6
C. The Requirement of Right-Invariance	10
III. METRICS ON PARTIALLY RANKED DATA: THE CASE WHERE EACH JUDGE LISTS HIS k FAVORITE ITEMS OUT OF n	12
A. The Coset Space S_n/S_{n-k}	12
B. The Hausdorff Metrics on S_n/S_{n-k}	14
C. The Fixed Vector Metrics on S_n/S_{n-k}	27
IV. METRICS ON OTHER TYPES OF PARTIALLY RANKED DATA	33
A. The Coset Space S_n/S , Where $S = S_{n_1} \times S_{n_2} \times \dots \times S_{n_r}$	34
B. The Hausdorff Metrics on S_n/S	36
C. The Fixed Vector Metrics on S_n/S	44
D. Hausdorff Distances between Different Types of Partially Ranked Data: A Complete Proof of the Main Theorem	46
E. The Tied Ranks Approach to Metrizing Partially Ranked Data	73
1. A Description of the Tied Ranks Approach	73
2. Relations among the Tied Ranks, Hausdorff, and Fixed Vector Metrics	74
3. Limitations of the Tied Ranks Approach	77
V. DISTRIBUTIONAL PROPERTIES OF THE METRICS	80
A. Exact Distributions	80
B. Asymptotic Distributions	85
VI. DATA ANALYSIS, USING THE METRICS	97
A. Fitting Probability Models to Partially Ranked Data	97
1. Mallows' Model for Fully Ranked Data	97

	Page
2. The Extension of Mallows' Model to Partially Ranked Data	100
3. A Likelihood Ratio Interpretation of the Triangle Inequality	101
4. Maximum Likelihood Estimation for the Model	102
5. A Goodness-of-Fit Result	107
6. An Example: The Educational Testing Service Word Association Data	111
B. Multidimensional Scaling for Partially Ranked Data	116
1. An Example, Using Leann Lipps Birch's Cracker Preference Data	117
C. Two Sample Problems for Partially Ranked Data	121
1. A Two-Sample Test Based on the Minimal Spanning Tree	122
2. A Two-Sample Test Based on the Nearest Neighbors Graph	126
APPENDIX A - THE EXISTENCE OF FIXED VECTORS	130
APPENDIX B - FORTRAN SUBROUTINES FOR EVALUATING THE METRICS ON S_n/S_{n-k} AND S_n/S	139
APPENDIX C - FORTRAN SUBROUTINES FOR FITTING MALLOWS' MODEL TO PARTIALLY RANKED DATA	158
APPENDIX D - TABLES OF THE DISTRIBUTIONS OF THE METRICS ON S_n/S_{n-k}	168
APPENDIX E - COMPARISON OF EXACT AND ASYMPTOTIC DISTRIBUTIONS	205
BIBLIOGRAPHY	210
INDEX OF NOTATION	214