

Measurement of the influence
of secondary conditions upon
the participation in activities of
daily living in the community
for people with mobility
impairments



Authors

Holly H. Hollingsworth, PhD,

David B. Gray, PhD,

Kerri A. Morgan, MSOT OTR/L,

Molly D. Listenberger, OTD.



Objectives

1. To measure impact of secondary conditions on the participation of people with mobility impairments.
2. Identify four methods of developing a measure of secondary conditions.
3. Describe the utility of measures of secondary conditions.



=



+



MFH Health and Wellness Program

Funded by the Missouri Foundation for Health Two year project (40779)

Principal Investigators: David B. Gray, PhD, Washington University & Robert Funk, CEO, Paraquad

Background

3211.0: Monday, 12:45 PM

Effects of a community-based exercise program on secondary conditions and participation in individuals with mobility impairments

Molly D. Listenberger, OTD

Background

4300.0: Tuesday, 4:30 PM

What factors determine exercise adherence in individuals with mobility impairments?

Angela Monzin, BS, OTD

Background

Activity Participation

- Can be measured by
 - A list of
 - Number of
 - Amount of time
 - Satisfaction

Secondary Conditions

- Can be measured by
 - A list of
 - Number of
 - Duration of
 - Severity of

Background

- A list of activities/conditions
 - Excellent for clinicians
 - Difficult for parsimony
- Number of activities/conditions
 - A summary measure assumes each is 'equal'

Background

- Time
 - Somewhat easy to summarize
- Severity/Satisfaction
 - Simple but subjective

Items Concerning Secondary Conditions

Have you EVER experienced ...	Experienced it in past 3 months
--------------------------------------	--

**20.
Pain**

Yes →
 No (Go to question 21.)

Yes (Go to question 20A.)
 No (Go to question 21.)

20A. If yes, how much has **PAIN** limited your participation in daily activities?

A great deal

A moderate amount

A little

Not at all

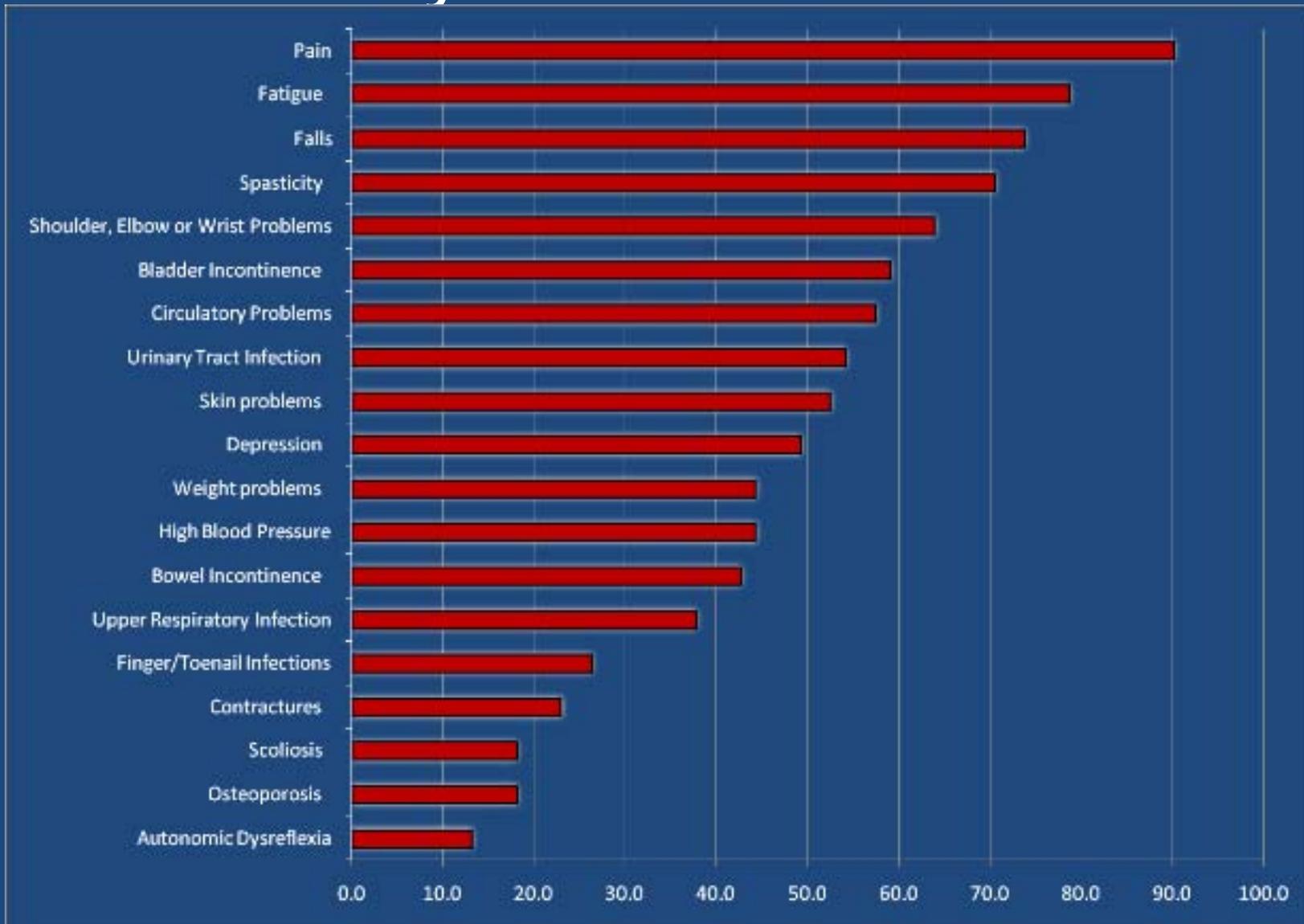
20C. Did you seek medical attention for this condition in the past **3 months**?

Yes No

Secondary Conditions - Ever

	Responses		Percent of Cases
	<u>N</u>	<u>Percent</u>	<u>N</u>
Pain	55	9.8	90.2
Fatigue	48	8.6	78.7
Falls	45	8.1	73.8
Spasticity	43	7.7	70.5
Shoulder, Elbow or Wrist Problems	39	7.0	63.9
Bladder Incontinence	36	6.4	59.0
Circulatory Problems	35	6.3	57.4
Urinary Tract Infection	33	5.9	54.1
Skin problems	32	5.7	52.5
Depression	30	5.4	49.2
High Blood Pressure	27	4.8	44.3
Weight problems	27	4.8	44.3
Bowel Incontinence	26	4.7	42.6
Upper Respiratory Infection	23	4.1	37.7
Finger/Toenail Infections	16	2.9	26.2
Contractures	14	2.5	23.0
Osteoporosis	11	2.0	18.0
Scoliosis	11	2.0	18.0
Autonomic Dysreflexia	8	1.4	13.1
	559	100.0	916.4

Secondary Conditions - % Ever



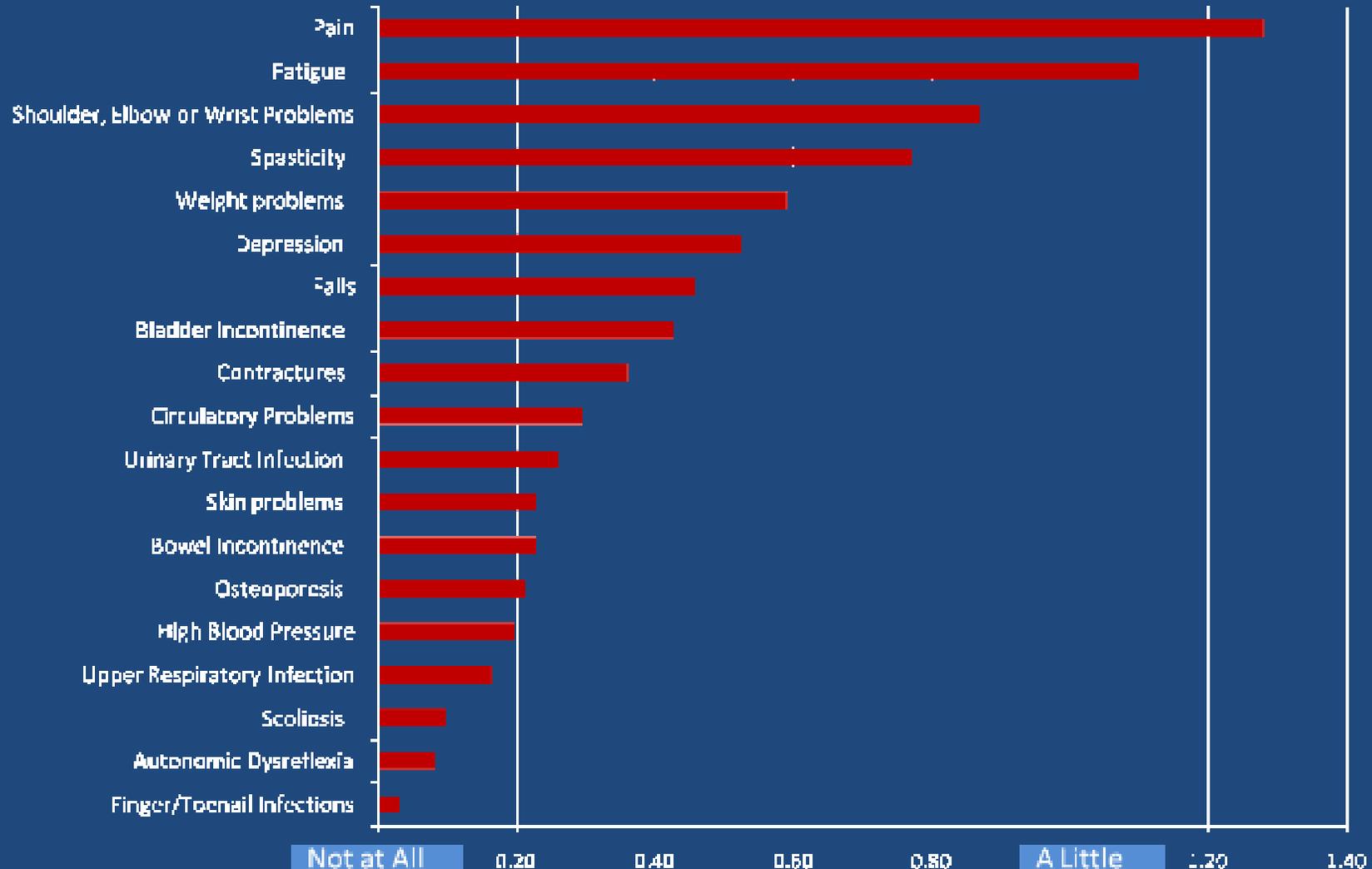
Influence on Participation

Four point scale (0 – 3)

	Mean
Pain	1.28
Fatigue	1.10
Shoulder, Elbow or Wrist Prob	0.87
Spasticity	0.77
Weight problems	0.59
Depression	0.52
Falls	0.46
Bladder Incontinence	0.43
Contractures	0.36
Circulatory Problems	0.30
Urinary Tract Infection	0.26
Skin problems	0.23
Bowel Incontinence	0.23
Osteoporosis	0.21
High Blood Pressure	0.20
Upper Respiratory Infection	0.16
Scoliosis	0.10
Autonomic Dysreflexia	0.08
Finger/Toenail Infections	0.03

Influence on Participation

Four point scale (0 – 3)

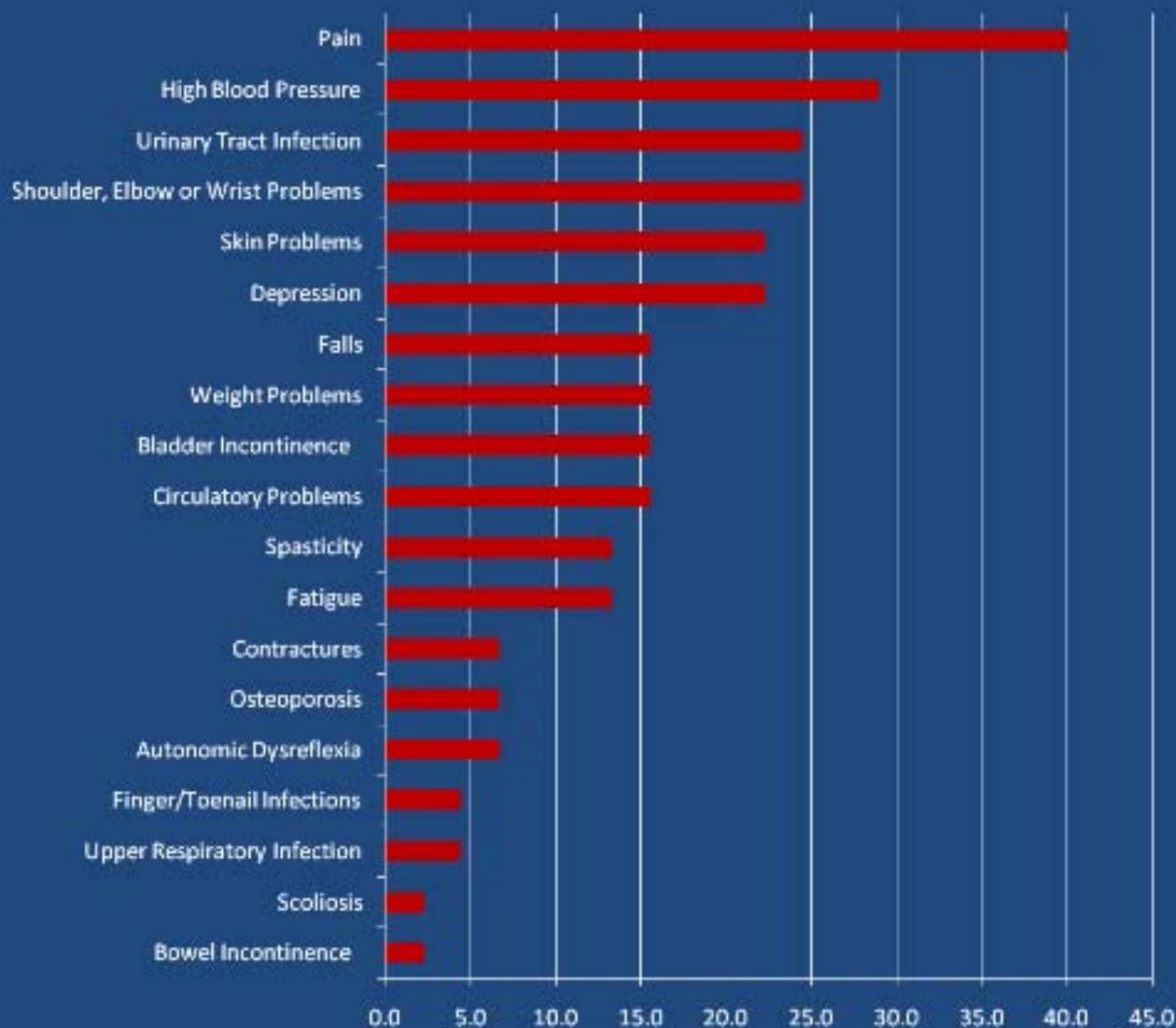


Secondary Conditions – Medical Attention in the Past 3 Months

	Responses		Percent of Cases		Rank	Weight
	N	Percent	N			
Pain	18	14.1	40.0		9	10.47
High Blood Pressure	13	10.2	28.9		8	9.30
Shoulder, Elbow or Wrist Problems	11	8.6	24.4		7	8.14
Urinary Tract Infection	11	8.6	24.4		7	8.14
Depression	10	7.8	22.2		6	6.98
Skin Problems	10	7.8	22.2		6	6.98
Circulatory Problems	7	5.5	15.6		5	5.81
Bladder Incontinence	7	5.5	15.6		5	5.81
Weight Problems	7	5.5	15.6		5	5.81
Falls	7	5.5	15.6		5	5.81
Fatigue	6	4.7	13.3		4	4.65
Spasticity	6	4.7	13.3		4	4.65
Autonomic Dysreflexia	3	2.3	6.7		3	3.49
Osteoporosis	3	2.3	6.7		3	3.49
Contractures	3	2.3	6.7		3	3.49
Upper Respiratory Infection	2	1.6	4.4		2	2.33
Finger/Toenail Infections	2	1.6	4.4		2	2.33
Bowel Incontinence	1	0.8	2.2		1	1.16
Scoliosis	1	0.8	2.2		1	1.16
Total	128	100.0	284.4		86	100.00

Secondary Conditions – Medical Attention in the Past 3 Months

n/



Scoring Schemes

20A. If yes, how much has pain limited your participation in daily activities?

A great deal

A moderate amount

A little

Not at all

1. Rasch Scores – given the assumptions, convert rating scale data into an interval measure.
2. Principal Components - given the assumptions, create a measure that maximally separates respondents on a continuum.

20C. Did you seek medical attention for this condition in the past **3 months**? Yes No

3. Create a weighted score based on the frequency of a condition that required medical attention.

Structure – Computed Scores

	Rasch Score	Principal Component	Medical Att.
Pain	0.62	0.33	0.53
Fatigue	0.65	0.58	0.31
Falls	0.33	0.23	0.17
Spasticity *	0.24	0.12	-0.18
Shoulder, Elbow or Wrist Problems	0.42	0.35	-0.15
Bladder Incontinence	0.43	0.30	-0.14
Circulatory Problems	0.30	0.11	0.33
Urinary Tract Infection *	0.06	0.01	-0.03
Skin problems	0.31	0.22	0.18
Depression	0.39	0.38	0.47
High Blood Pressure	0.39	0.27	0.34
Weight problems	0.47	0.31	-0.13
Bowel Incontinence	0.18	0.07	-0.27
Upper Respiratory Infection	0.25	0.19	-0.03
Finger/Toenail Infections	0.06	0.06	0.45
Contractures	0.33	0.28	0.12
Osteoporosis	0.30	0.20	0.08
Scoliosis	0.09	0.08	0.26
Autonomic Dysreflexia	0.15	0.08	0.64

Utility

- Can we find patterns of secondary conditions associated with specific diagnoses?
- How is participation in activities of daily living related to secondary conditions?

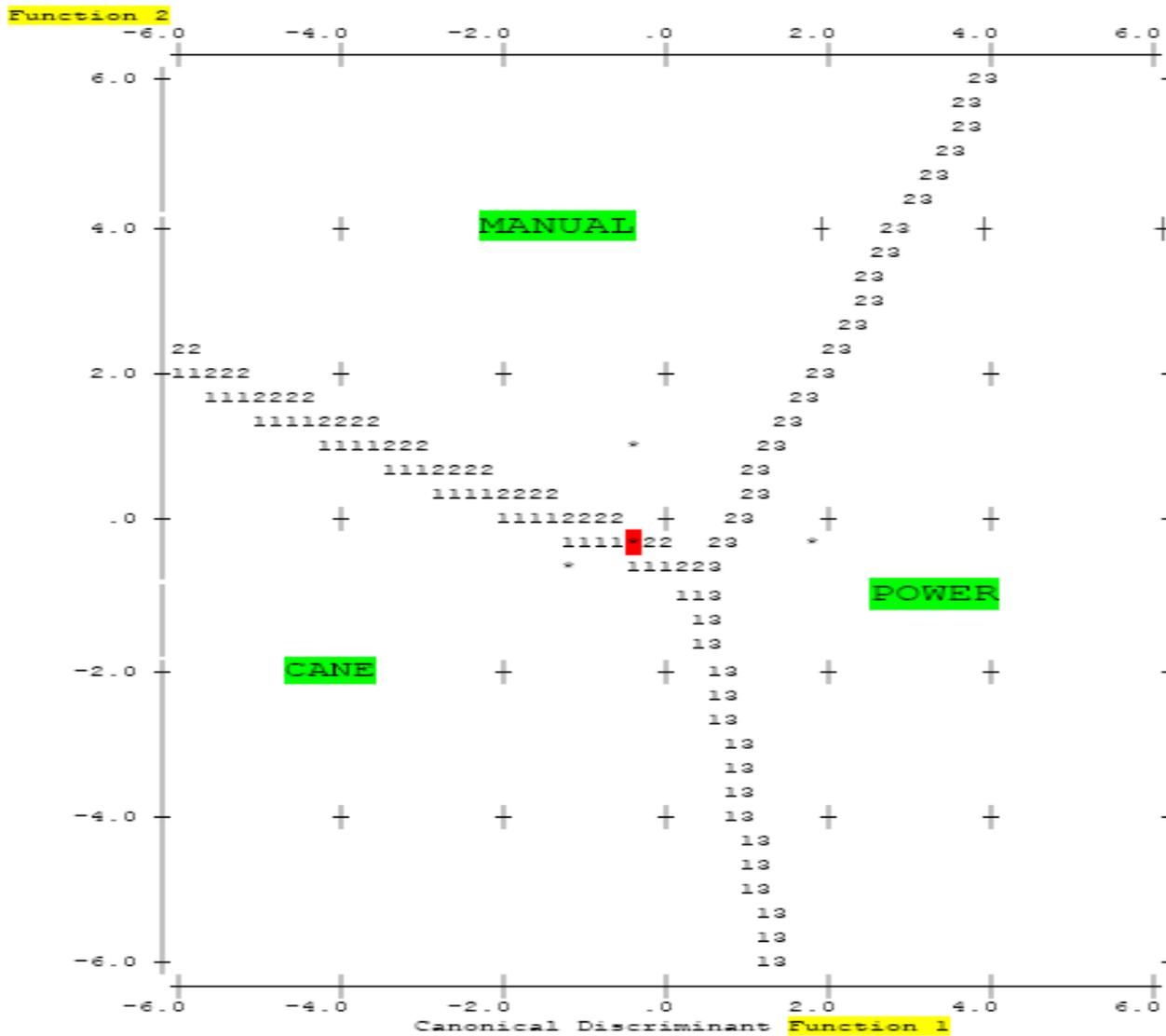
Classification

- Discriminant Analysis:
 - Independent variable – Mobility Device
 - Cane/Crutch/Walker
 - Scooter
 - Manual Wheelchair
 - Power Wheelchair
 - Dependent variables – Influence of secondary conditions on participation.

Summary of Canonical Discriminant Functions

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	1.518	66.4	66.4	.776*
2	.537	23.5	89.9	.591
3	.231	10.1	100.0	.433

* $p = .049$



Structure – Discriminant Analysis

	Function 1	Function 2	Function 3
Pain	-0.24	0.10	0.34
Fatigue	-0.38	-0.13	-0.07
Falls	-0.08	-0.37	-0.20
Spasticity	0.16	0.15	-0.34
Shoulder, Elbow or Wrist Problems	-0.18	0.17	0.17
Bladder Incontinence	0.06	0.19	-0.04
Circulatory Problems	-0.23	0.12	0.31
Urinary Tract Infection	0.28	0.05	0.19
Skin problems	0.15	-0.07	-0.19
Depression	-0.07	-0.23	0.01
High Blood Pressure	-0.21	-0.49	0.38
Weight problems	-0.09	-0.14	0.05
Bowel Incontinence	0.35	-0.05	0.21
Upper Respiratory Infection	-0.05	-0.01	0.20
Finger/Toenail Infections	0.24	-0.10	0.08
Contractures	0.11	0.00	-0.06
Osteoporosis	-0.07	0.06	0.02
Scoliosis	0.34	-0.14	0.12
Autonomic Dysreflexia	0.03	-0.12	0.18

Relationships

- Is there a secondary condition score that can summarize the relationship between conditions and participation?

Correlations within Scores

	Rasch Score	Principal Comp.	Medical Att.	Discriminant Score
Rasch Score	1.00	0.74	0.47	-0.03
Weighted Influence		1.00	0.46	-0.42
Medical Att.			1.00	-0.04
Discriminant Score				1.00

Correlations with Participation

	Rasch Score	Principal Comp.	Medical Att.	Discriminant Score
Domestic Life Interpersonal	-0.28	-0.32	-0.11	0.16
Major Life	-0.33	-0.37	-0.11	0.14
Self Care	-0.35	-0.19	-0.06	-0.08
Mobility	-0.47	-0.48	-0.16	0.15
Social	-0.53	-0.50	-0.29	0.15

Merci