

Effects of the Transition to Powered Mobility on Occupational Performance

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A Research Slide Lecture

from the website of Wheelchair University
(<http://www.wheelchairnet.org/>)

which is a project of the Rehabilitation Engineering Research
Center (RERC) on Wheeled Mobility

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Abstract

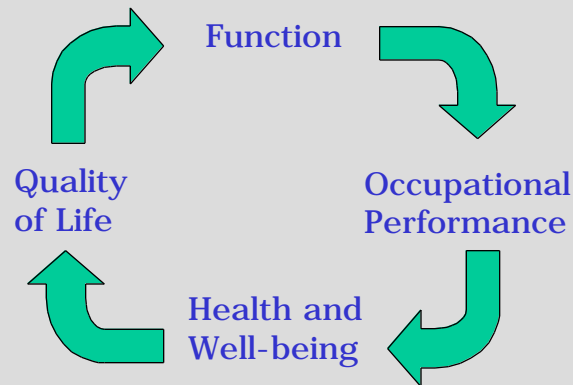
- Persons with mobility impairments who use wheelchairs view the change from manual to power mobility device (PMD) in negative terms—as a sign that their condition is worsening or that they are losing function. Using a structured interview format, this study compares changes in occupational performance, life roles and quality of life of eight people with various diagnoses who had previously used manual wheelchairs but changed to PMDs. The Occupational Performance History Interview and the Psychosocial Impact of Assistive Device Scale were used to measure the effect of the PMD. The results indicate that PMDs are associated with a significant increase in adaptive performance in everyday life.

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Where Occupational Performance fits



Moyers, P. A. (1999).

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What is Occupational Performance?

This is an OT concept however it represents ideas with which you are familiar.

The goal of Rehabilitation is to restore function.

- Once function is re-established through: restoration of control, strength, ROM or endurance, adaptive equipment
- Occupational Performance is restored: interests, activities, assumption of responsibility, and enactment of roles.
- This creates a sense of health and well-being in the World Health Organization sense
- Which becomes an important element of quality of life.

The Premise...

- If a mobility device...
 - meets an individual's needs
 - matches their environment.
- It should allow:
 - engagement in meaningful activities
 - enactment of the roles of everyday life.

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So when we evaluate a client with a motor impairment and we recommend a wheelchair the desired outcome should be: a good match with a wheelchair that:

- meets user's needs
- matches their environments
- and
- allows or supports occupational performance.

When Mobility Needs Change

- **Because of:**
 - Progressive Impairments
 - Cumulative Trauma Disorders
- **Powered mobility devices (PMD) can provide independent mobility.**

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Our clients may start out with a manual wheelchair but that may change over time because of:

- Change in health status
- Normal aging
- Change in level of impairment with a progressive diagnosis
- Acquired over-use syndromes or Cumulative Trauma Disorders such as carpal tunnel or rotator cuff injury.

When Mobility Needs Change

- Power mobility often accepted reluctantly
 - Change represents diminishing capacity.
 - Loss of a familiar means of mobility.
 - Reimbursement difficulties.
 - Additional environmental modifications required
 - Complex adjustments in the human and non-human environments:
 - battery maintenance, ramps, power lifts, etc.

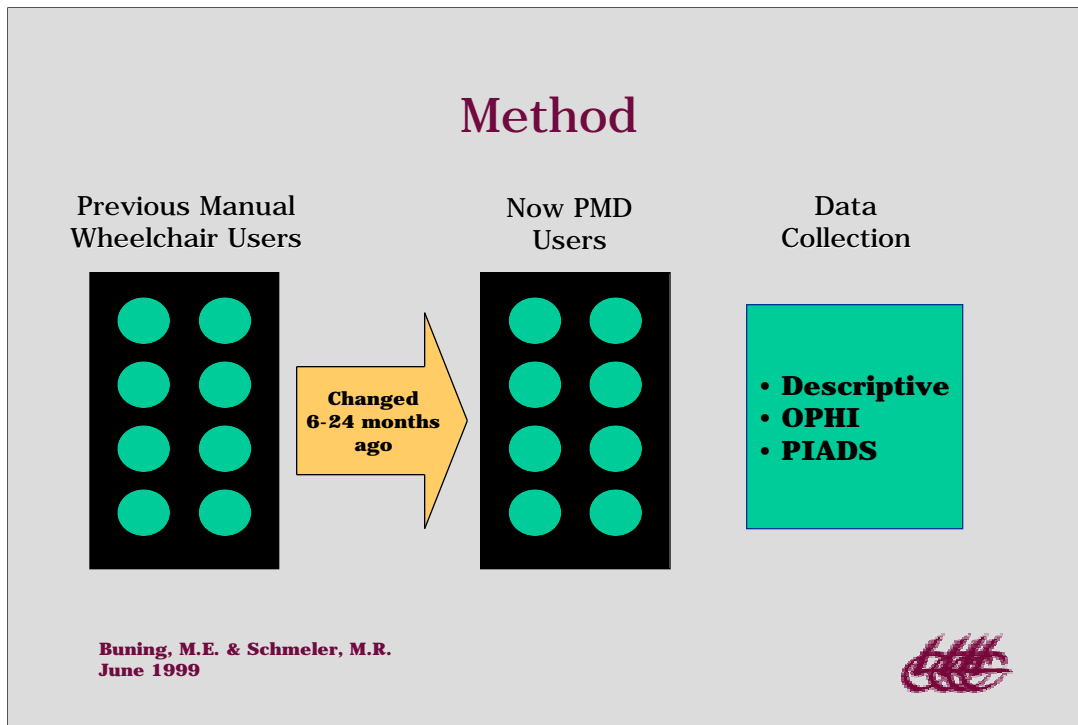
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Many manual wheelchair user's have a difficult time making the transition to a form of powered mobility:

- A power wheelchair
- A scooter

For the purpose of this study we are referring to both as a Power Mobility Device.



This diagram provides a graphic to explain the method used in this study. A group of previous manual wheelchair users with a combination of progressive diagnoses and other diagnoses made the transition to a powered mobility device.

We collected demographic data, administered a structured interview (the OPHI) and administered the PIADS.

Research Questions

- This descriptive study asked three questions:
 1. Does the transition to a PMD effect occupational performance (i.e., the ability to assume or resume personally valued responsibilities, interests, and roles)?
 2. Does the adaptability of the non-human environment change as a result of the introduction of a PMD?
 3. What is the impact of a PMD on an individual's adaptability, competence and self-esteem?

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Instruments

- **Occupational Performance History Interview (OPHI):**
 - Assumption of responsibilities
 - Enactment of roles
 - Pursuit of interests
 - The human and non-human environment.
- **Psychosocial Impact of Assistive Device Scale (PIADS).**
 - Adaptability
 - Competence
 - Self-Esteem

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Information about the new version of the Occupational Performance History Interview can be gotten from the Model of Human Occupation Clearing House (<http://www.uic.edu/hsc/acad/cahp/OT/MOHOC/>) at the University of Illinois at Chicago.

More information about the PIADS can be gotten either from the Assistive Technology Outcomes website at the University of Toronto: (<http://www.utoronto.ca/atrc/reference/atoutcomes/PIADS.html>) or from : Jeffrey Jutai, Ph.D., C.Psych. Assistant Director of Research, Bloorview MacMillan Centre, Research Department, 350 Rumsey Road, Toronto, Ontario Canada M4G 1R8, Telephone: 416-425-6220 ext.3509, Fax: 416-425-1634, email: jjutai@bloorviewmacmillan.on.ca

Subjects

- **Recruitment criteria**
 - 18 years or older
 - No acute illness
 - Changed to PMD 6 to 24 months ago
 - Live in the community
 - Had ability to compare life experiences with and without power mobility.

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Results: Subjects

- From a convenience sample of 15
 - Eight participants between the ages of 27 and 52.
 - Diagnoses:
 - muscular dystrophy (2)
 - multiple sclerosis (2)
 - spinal cord injury with CTD (2)
 - Hemiplegia secondary to TBI
 - Cardio-pulmonary insufficiency

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Results: Descriptive

Variable	Min	Max	Mean	SD
Age	27	52	41.5yrs.	8.6 yrs.
Months using manual W/C	36	432	173.0 mos./14.4 yrs.	122.2 mos.
Months using PMD	6	24	13.6 mos./1.1 yrs.	7.4 mos.
Satisfaction w manual W/C	1	4	2.6 out of 5.0	1.19
Satisfaction w PMD	4	5	4.7 out of 5.0	.46
% of day in manual W/C	10	100	79.1%	30.10
% of day in PMD	65	100	85.0%	13.36

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Results: OPHI

Variable	Mean	SD	T-Test
OPHI pre score	34.88	7.24	P= .001
OPHI post score	43.63	6.50	
OPHI Non-human environment pre	2.75	.71	P= .001
OPHI Non-human environment post	4.50	.53	

Results with Wilcoxon Matched-pairs Signed ranks test for ordinal data

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Because the data was ordinal we analyzed it with the Wilcoxon Matched-Pairs Signed-Ranks test.

The results support a significant difference in the pre and post scores on both

- The Total OPHI score.
- The Human and Non-human environment sub score.

Results: PIADS

Competence (12 items)	Mean	Adaptability (6 items)	Mean	Self-esteem (8 items)	Mean
Competence	2.25	Well-being	1.63	Happiness	2.63
Independence	3.00	Willingness to take chances	2.00	Self-esteem	1.75
Adequacy	2.38	Ability to participate	2.13	Security	1.13
*Confusion	-0.63	Eagerness to try new things	2.13	*Frustration	-1.38
Efficiency	2.13	Ability to adapt to ADLs	2.63	Self-confidence	2.25
Productivity	2.13	Ability to take advantage of opportunities.	2.63	Sense of power	2.38
Usefulness	2.25			Sense of control	2.13
Expertise	1.00			*Embarrassment	-0.75
Skillfulness	1.88				
Capability	2.38				
Quality of life	2.75				
Performance	2.63				
Total	24.13		13.13		10.13
Median	24.00		14.00		9.50
SD	4.58		4.09		3.80
Avg. item	2.01		2.19		1.27

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The data did not support a correlation between the OPHI Total Post score and the PIADS ($p = .21$) because of a small sample.

The PIADS did support the positive impact of the PMD on the feelings of:

- Competence
- Adaptability and
- Self-Esteem

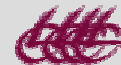
The traits most affected ($> +2.63$) in this sample were:

- Independence
- Quality of Life
- Performance
- Ability to adapt to the Activities of Daily Living
- Ability to take advantage of opportunities
- Happiness

Results

- Correlation between scores on the PIADS and post scores on the OPHI could not be supported ($r = .21$).
- PIADS results do show a positive impact for PMDs and data compares well with PIADS database of all power wheelchair users.

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Discussion

- The difference in pre-post OPHI scores was consistent with positive effects of PMD.
 - Able to pursue previously valued interests, assume responsibility and enact old and new roles.
- Greatest increases in: independence, quality of life, happiness, performance, ability to adapt to the Activities of Daily Living, and ability to take advantage of opportunities.

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Discussion

- **Meaning in their lives came from roles.**
 - Father, mother, student, advocate, volunteer, entrepreneur, parental care taker, organizer, friend or peer counselor.
- **Increased ability to enact previously valued roles and some assumed new roles.**

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•Example: one participant, a recent immigrant, took on a role as teacher of English to other immigrants in her community. In her homeland she had been a math teacher. From her response on the interview it was clear that the return to the valued role of teacher, enabled by use of a PMD, increased her self-esteem and her feeling of importance in the community. With lift-equipped public buses she went independently to the community center she taught her classes.

•With powered mobility another participant , was now able to go to the zoo, a very hilly location, with her children and enjoy herself. With her PMD she could act autonomously in her role as mother with her two young daughters and no longer had to plan ahead to invite someone else along to push her in her manual wheelchair when she engaged in an outdoor, child-centered activity.

•A 3rd participant was able to enact his new role as father. He took on the role of picking their son up from day care, taking him on his lap for walks in the park and caring for him until his wife came home from work. Prior to the PMD he had never grocery shopped but with it he took on this role for the family allowing his wife to spend some quality time with their child.

Discussion

- PMD supports or constrains performance depending on accessibility of environment.
- Functional limitations reduced through:
 - appropriate combined use of PMDs,
 - accessible environments,
 - attendant care and social supports.

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The presence of an accessible environment was key to successful use of the PMD.

- Ramps, lifts, door openers, sufficiently wide hallways and doors, turning radius in rooms.
- Accessible Public Transportation
- Personal Care Assistants to help with placing in chair, charging batteries, etc.

In a rural location:

- Accessible van or private vehicle

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- The published version of this research can be found:

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