Measuring Environmental Factors that Influence Community Participation

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1

Presentation Overview

1. **Developing Environmental Factor Measures for Persons with Stroke, TBI and SCI**
2. **Measuring the Impact of the Environment on the Participation of Children and Youth**
3. **Measuring the Impact of the Environment on Home, Community and Work Participation for People with Cognitive Disabilities**

2

Developing Environmental Factor Measures for Persons with Stroke, TBI and SCI

Allen Heinemann, PhD

A Project Funded by the NATIONAL INSTITUTE ON DISABILITY AND REHABILITATION RESEARCH NIDRR

Rehabilitation Research and Training Center on Improving Measurement of Medical Rehabilitation Outcomes (H133B090024)

Presentation Objectives

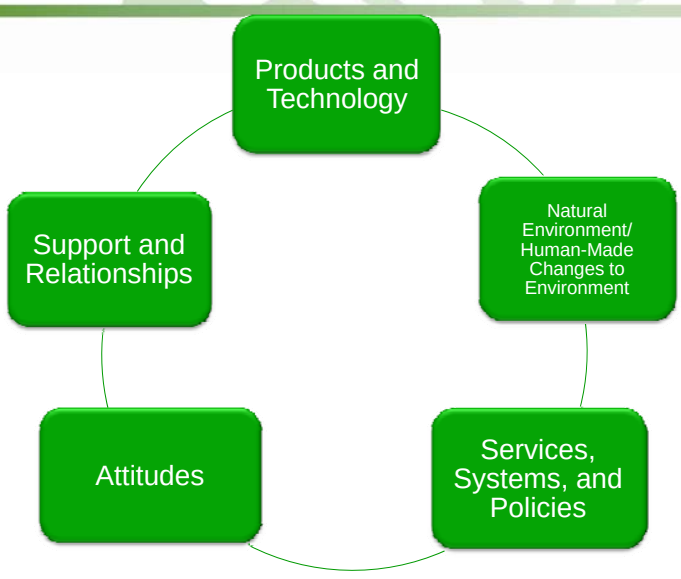
1. Discuss concepts of person, environment and occupation
2. Discuss issues in operationalizing environmental factors
3. Describe efforts to develop measures of environmental factors that influence participation
4. Determine if an item response theory approach to characterizing participation facilitators and barriers yields suitable measures.

International Classification of Functioning, Disability and Health (ICF)

Body Functions & Structures	Activities & Participation	Environmental Factors
		
Functions **Structures**	**Capacity** **Performance**	**Barriers** **Facilitators**

5

ICF Environmental Factors Taxonomy



6

Chapter 1: Products and Technology

Includes Assistive Technology: "Any product, instrument, equipment or technology adapted or specifically designed for improving the functioning of a disabled person"

Sub domains:

Personal use (Mobility, ADLs, Transportation)
Work and Education
Recreation and Building products (public/ private)
Spirituality and Religion
Land development
Assets and Other (specified/unspecified)

7

Chapter 2: Natural Environment and Human Made Changes to Environment

Animate and Inanimate elements of the natural and physical environments

Modified by people or characteristics of people

Population
Natural and human events
Time
Light and sound
Vibration
Air quality
Other (specified/unspecified)

8

Chapter 3: Support and Relationships

Physical and Emotional Support

Nurturing …at Home

Protection and Assistance …at Work

Relationships to others …in the Community

Family

Friends

Acquaintances

Authoritative and subordinate persons

Strangers

Health professionals

Domesticated animals

Other (specified/unspecified)

9

Chapter 4: Attitudes

Attitudes influence individual behavior and social life at all levels

Attitudes are those of the external person; categorized by the kinds of relationships listed from Chapter 3 (Support and Relationships)

Listed as Individual and Societal Attitudes of…

Family

Friends

Acquaintances

Authoritative and subordinate persons

Personal care providers and PAs

Strangers

Health professionals

Social Norms/Practice/Ideology

Other (specified/unspecified)

10

Chapter 5: Services, Systems and Policies

Services in society designed to meet the needs of individuals

Public		individuals
Private	led by….	associations/organizations
Voluntary		agencies/governments

Systems are designed to organize, control and monitor 'services'

Administrative control	instituted by…	Local, Regional, National
Organizational mechanisms		& International levels

Policies govern and regulate the 'systems' that organize, control and monitor 'services'

Rules		
Regulations	instituted by….	Local, Regional, National
Conventions		& International levels
Standards		

11

Legacy Environmental Factors Instruments

1. Facilitators and Barriers to Participation by Mobility Limited People (FABS/M)
2. The Measure of the Quality of the Environment (MQE)
3. Craig Hospital Inventory of Environmental Factors (CHIEF)
4. Home and Community Environment Instrument (HACE)

12

RRTC Project Specific Aims

Aim 1: Develop item banks of environmental barriers and facilitators.

Aim 2: Evaluate promising new environmental factor instruments.

Aim 3: Evaluate alternative methods of computer-assisted testing administration.

13

Methods

- Sample: Focused on persons with stroke, TBI and SCI
- Design: Mixed model – qualitative, quantitative
- Analytic Approach: Does an item response theory approach to measuring participation facilitators and barriers yield item banks extends classical test theory approaches?
- Modeling: Do measures of environmental factors allow us to predict social health and participation for people with long term disabilities?

14

Progress

- Year 1
  - Analyzed existing focus group data
  - Reviewed environmental factors literature
  - Developed conceptual framework
  - Pooled, binned, winnowed, wrote items
- Year 2
  - Completed several rounds of cognitive testing
  - Completed pilot data collection
  - Data analysis in progress

15

Initial Conceptual Framework

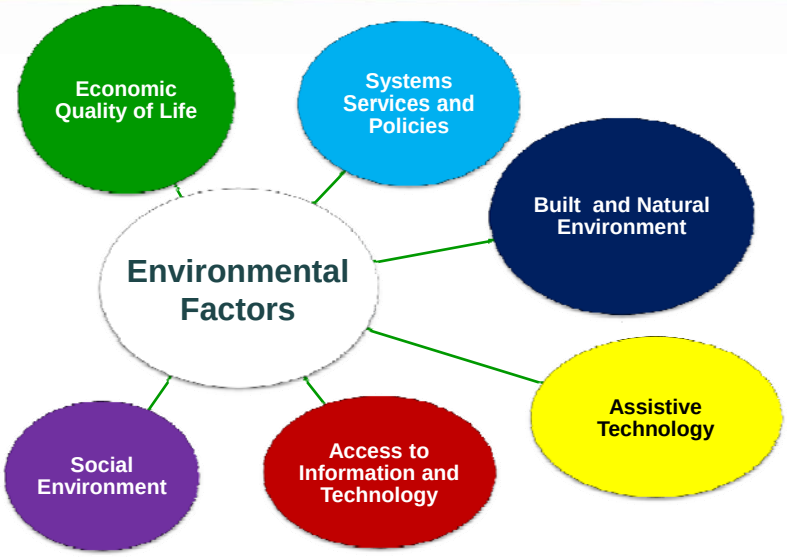
16

Binned and Winnowed Items

Domain	Binned	Winnowed	Draft Items
Built Environment	605	51	51
Natural Environment	79	37	24
Assistive Technology	178	104	24
Social Supports & Attitudes	710	59	65
Systems, Services & Policies	411	35	40
Economic /Financial	42	35	44
Transportation	136	28	21
Access to Information & Technology	112	37	32
Total	2273	386	301

17

Revised Conceptual Framework



18

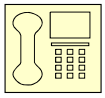
Comparison of ICF and RRTC Conceptual Framework

ICF: Environmental Factors (5)	RRTC Project EF Domains (6)
Products and Technology	*Access* to Information and Technology
Natural Environment and human-made changes to environment	*Assistive Technology*
Support and Relationships	Built and Natural Environment
Attitudes	Systems, Services and Policies
Services, Systems and Policies	*Social Environment*
	Economic Quality of Life

19

Domain 1: Access to Information and Technology

Includes devices and technology to transmit and receive information



cell phone
land lines
computer
email
internet services

Usability of information

ability to access
understand information
literacy
transparency
information finding.

Sample Items:

I have easy access to the internet if I want to use it.

Health information is easily available to me if I need it.

Websites are available in a format I can use easily if I need them.

My telephone is easy to use.

Information about community resources is easily available to me if I need it.

My doctors, nurses and other health care professionals give me written information in ways I can understand.

In case of a health emergency I can get the information I need easily.

20

Domain 2: Assistive Technology

Four sub-sets:

- Mobility
- Personal care
- Vision/Hearing
- Communication

Includes:

- Availability
- Quality
- Impact

Sample Items:

My device is easy to use.

My device is reliable.

My device is can be easily repaired.

My device gives me more control over my daily activities.

My device helps me be more independent.

My device allows me to participate in activities that I enjoy.

21

Domain 3: Built and Natural Environment

Features of:

- Home
- Buildings
- Outdoors

How much difficulty do you have...?

Environmental ?

Non-environmental ?

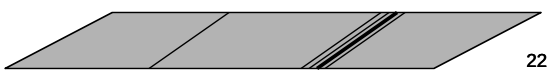
Sample Items:

How much difficulty would you have feeling safe in your home during an emergency?

The difficulty I have feeling safe is due to problems getting out or getting help in an emergency. (yes – no)

How much difficulty do you have hearing sounds such as voices and music in buildings in your community?

The difficulty I have hearing sounds is due to background noise. (yes – no)



22

Domain 4: Systems, Services and Policies

Affect on participation:

- Home
- Community
- Work

Five sub-sets:

- Managing health
- Living situation
- Community participation
- Work
- Transportation

Sample Items:

Rehabilitation services and therapies are available when I need them.

Affordable housing is available in my community if I need it.

Assistance to pay for utilities is available if I need it.

My community offers support groups I can use.

My community offers information on low or no cost activities and things to do.

Disability accommodation services and supports are available at my work or school.

Public transportation in my area is reliable.

Overall, I have access to reliable transportation when I need it.

23

Domain 5: Social Environment

Social Support:

- Companionship
- Emotional Support
- Informational Support
- Instrumental Support

Perceived Positive & Negative Disability-related Attitudes & Behaviors

from:

- Family/Friends
- Community
- Society / Public

including:

- Acceptance
- Stigma
- Marginalization

Sample Items:

The people in my life are willing to accommodate my disability.

People are patient when I take extra time to do things because of my disability.

Criminals see people with disabilities as easy targets.

Because of my disability, my family complains that I am too needy.

Society respects the need for disability accommodations.

Society limits my opportunities because of my disability.

People with disabilities are encouraged to participate in my community.

24

Domain 6: Economic Quality of Life

Financial influence on:

Satisfaction with income level

Comfortable living situation

Adequate and affordable health services

Adequate and affordable food

Affordable community recreational activities

Family and friend financial assistance

Sample Items:

I can afford to eat out when I want.

I can afford to pay my bills.

I have delayed getting health care because I couldn't pay for it.

I can afford internet service.

I have skipped taking my medication(s) because I couldn't pay for them.

I have had services cut because I couldn't pay my bills.

I have access to extra money in case of an emergency.

I am satisfied with the control I have over spending my money.

25

Cognitive Interviewing

General Information:

- 5 people per impairment group
- Interviews recorded for transcription purposes
- Follow-up questions asked intentionally after each question
  - Comprehension
  - Opinions
  - Recommendations

My *health care providers* give me written information in ways I can understand.

'Health care providers' elicited too narrow a response; 'Doctors and nurses' named explicitly.

My *doctors, nurses and other health care professionals* give me written information in ways I can understand.

In case of *an emergency*, I can get the information I need easily.

'Emergency' was too broad; broke item up into personal health/environmental

In case of *a natural disaster*, I can get the information I need easily.

In case of *a health emergency*, I can get the information I need easily.

26

Preliminary Pilot Test Results

Domain/ Rating Scale Categories	N of Items	Reliability (Criterion <.8)	Misfitting Items	Weakly Correlated Items	Residual Variance (Criterion <10%)	CFA Results
Access to Information & Technology/4	25	**.82**	10 fax 11 phone easy	11 phone easy use 12 phone reliable 17 radio available 18 radio reception	10.2%	Multidimensional
Assistive Technology-Mobility/5	14	.73	9 Replace device	None	12.2%	Multidimensional
Assistive Technology-Personal Care/4	14	.66	26 Variety places	None	15.0%	Multidimensional
Built & Natural/5	18	.72	None	4 conversations @ home 15 hear sounds outdoors	7.6%	Promising

27

Preliminary Pilot Test Analyses, cont.

Domain/Rating Scale Categories	N of Items	Reliability (Criterion <.8)	Misfitting Items	Weakly Correlated Items	Residual Variance (Criterion <10%)	CFA Results
Systems Services Policies: Health/4	11	.72	None	3 Emergency medical	11.2%	Multidimensional
Systems Services Policies: Home/4	20	**.84**	22 Food	None	**9.4%**	Multidimensional
Systems Services Policies: Community/4	11	**.85**	37 Legal	None	**7.2%**	Multidimensional
Systems Services Policies: Work, Learn, 4	12	.75 .	43 Library 51 SSDI	43 Library	**9.4%**	Multidimensional
Systems Services Policies: Transport/4	11	.74	57 Air travel 58 Car access	None	12.9%	Multidimensional
Systems Services Policies: Alt Transport/4	8	.59	None	None	11.7%	Multidimensional

Preliminary Pilot Test Analyses, cont.

Domain/ Rating Scale Categories	N of Items	Reliability (Criterion <.8)	Misfitting Items	Weakly Correlated Items	Residual Variance (Criterion <10%)	CFA Results
Social Environment: Personal/4	26	**.95**	24 Encouraged 32 Criminals 34 "Special" 63 Unhelpful 64 Public	32 Criminals 64 Public	**5.7%**	Promising
Social Environment: Societal/4	56	**.94**	70 Criminals 78 Underestimates	70 Criminals	**8.2%**	Promising
Economic Quality of Life/5	37	**.92**	17 Meds 26 Utilities 33 6 months 34 Improve 36 $ important	13 HVAC 17 Meds 26 Utilities 34 Improve 36 $ important	**4.8%**	Promising

29

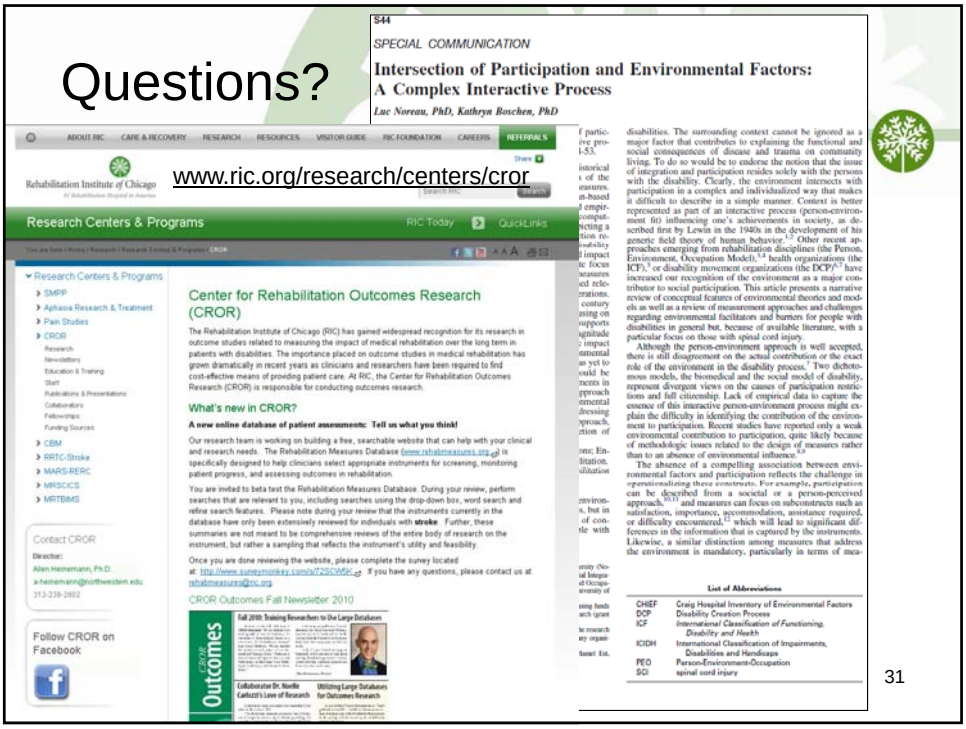
Next Steps

- Complete Data Analysis with Full Sample
  - Collapse rating scale categories
  - Explore dimensionality of domains
  - Explore differential item functioning by impairment group
- Field Testing
  - Recruit 200 subjects for each targeted disability group (n=600)
  - Administer EF item banks

30

Questions?

www.ric.org/research/cror



31

Measuring the Impact of the Environment on the Participation of Children and Youth

Wendy Coster, PhD, OTR/L

BOSTON UNIVERSITY · Tufts University · McMaster University

National Institute on Disability and Rehabilitation Research Field-initiated Grant # H133G070140

32

Why Develop Another Measure?

- Need for instruments feasible for population level research
  - Can be completed independently without need for interview
    - Existing instruments are lengthy (e.g., CAPE, LIFE-H) and/or completed by individual interview
  - Covers a wide age range of children and youth
    - Some measures designed only for a narrow age span (e.g. CPQ 4-6 yrs.)
  - Questions are relevant for children and youth with all types of disabilities
    - Most research on the environment has focused on children with physical disabilities

33

Participation and Environment Measure for Children and Youth (PEM-CY)

- Caregiver report survey suitable for population level research
- Examines:
  - Participation in home, school and community activities
  - Environmental factors that support or hinder participation in these settings

34

Phase 1 Development Activities

- Instrument review
- Focus groups and interviews with parents of children and youth with disabilities
- Cognitive interviews of draft instrument

35

PEM-CY: Design Decisions

- Follow the dimension definitions of ICF but not the chapter structure
- Examine both participation and environment within the same instrument
- Participation and Environment constructs do not meet criteria for IRT
  - Both constructs are multi-dimensional
  - No logical hierarchy of life situations (types of activities)
  - No logical hierarchy of environmental supports or barriers
- Pragmatically-based (clinimetric) summary scores are the better alternative
- Parent-report suited for population-level studies

36

Participation Component

- Items represent general categories or *types* of activities
  - Based on literature review and interviews with parents of children with and without disabilities
  - Items are specific to each setting:
    - Home (e.g., indoor play and games, watching TV, household chores; socializing using technology); 10 items
    - School (e.g., classroom activities, school-sponsored teams, clubs and organizations, getting together with peers outside of class); 5 items
    - Community (e.g., neighborhood outings, unstructured physical activities, classes and lessons); 10 items

37

Participation Component

- Three types of ratings for each item:
  - **Frequency:** *How often does your child participate in one or more activities of this type?*
    - 0 (Never) to 7 (Daily)
  - **Involvement:** T*ypically, how involved is your child when doing these activities?*
    - 1 (Minimally) to 5 (Very involved)
  - **Desire for Change:** W*ould you like your child's participation to change in this type of activity?*
    - Yes or No;
    - If yes: indicate type of change desired (more or less frequency, more or less involvement, more or less variety)

38

Environment Component

- After completing the Participation section for a particular setting, the parent is presented with corresponding Environment section
- Includes items that are specific to and common in that setting
- Examples:
  - physical layout
  - demands of activities
  - attitudes and actions of others
  - adequate and available services
  - transportation
  - safety
  - financial resources
  - support from others
  - having time to support the child's participation

39

Environment Component

- *Do the following things help or make it harder for your child to participate in activities at home?*

- Two types of ratings (depending on item focus):
  - **Degree of support**
    - Not an issue
    - Usually helps
    - Sometimes helps /Sometimes makes harder
    - Usually makes harder
  - **Having available or adequate resources**
    - Not needed
    - Usually yes
    - Sometimes yes/sometimes no
    - Usually no

40

Field Study

- Data collected from the US and Canada via internet survey
  - 576 children and youth
  - Ages 5 to 17 years (M=11.16; SD=3.08)
  - 54% male; 46% female
- Children and youth with (49%) and without 51%) disability
  - Broad range of diagnoses and of functional limitations represented included in sample with disability (e.g., cerebral palsy, autism spectrum disorder, speech and language disorder, chronic health conditions)
- Respondent characteristics
  - Mothers (91%)
  - Caucasian (81%)
  - Mean household income > $60,000.
  - 81% completed college or university.
  - Living in major urban (45%) or suburban areas (33%)

41

Psychometric Properties

Internal consistency: moderate to very good

- Participation Frequency: 0.59 to 0.70
- Participation Involvement: 0.72 to 0.83
- Environment Supportiveness: 0.83 to 0.91

Test-retest reliability: moderate to very good (ICC = 0.58 to 0.95)

- Participation Frequency (% maximum possible): 0.58 to 0.84
- Participation Involvement (average of items): 0.69 to 0.76
- Desires participation change (% of “yes” responses): 0.76 to 0.89
- Environment Supportiveness (% maximum possible): 0.85 to 0.95

42

Differences between Children With and Without Disabilities Across Home, School & Community

PEM-CY Scores	HOME Disability Mean (SD)			SCHOOL Disability Mean (SD)			COMMUNITY Disability Mean (SD)		
	Yes	No	ES*	Yes	No	ES*	Yes	No	ES*
Participation Frequency	83.01 (11.55)	88.03 (7.20)	.54	65.29 (15.68)	72.11 (10.83)	.51	54.50 (13.15)	63.29 (9.94)	.76
Participation Involvement	3.44 (0.79)	3.89 (0.54)	.67	3.35 (1.03)	4.21 (0.70)	.99	3.53 (0.93)	4.16 (0.56)	.84
Desires Participation Change	67.18 (26.54)	53.51 (25.97)	.52	70.36 (29.80)	38.82 (31.85)	1.02	63.19 (26.01)	38.00 (26.15)	.97
Environment Supportiveness	**70.07 (14.91)**	**86.43 (11.48)**	**1.24**	**72.89 (12.40)**	**87.55 (10.71)**	**1.27**	**66.37 (14.15)**	**88.05 (10.87)**	**1.73**

43

Future directions

- Descriptive analysis of responses within each setting
  - Which activity types show lower rates of participation by children with disabilities?
  - What is relation between environmental supportiveness and participation?
- Analysis of relation between child's functional limitations and perceptions of impact of specific environmental features
- Predictive analysis: what combination of person and environment factors best predicts participation?
- Design of new interventions that target changing environments to better support participation

44

Limitations to be Addressed in the Future

- Data were collected exclusively over the Internet.
  - Would the same results be obtained from a paper-and-pencil survey?
- Re-test sample was relatively small
  - Reliability should be re-checked with larger sample and using paper-pencil version
- The overall sample was large, but SES was skewed.
  - What pattern would we see if we gathered data from families with fewer resources?
- Results reflect parent/guardian's views; children's perspectives are not fully represented.

45

Project Publications

- Bedell, G., Khetani, M.A., Cousins, M., Coster, W., & Law, M. (in press). Parent perspectives to inform development of measures of children's participation and environment. *Archives of Physical Medicine and Rehabilitation.*
- Coster, W., Bedell, G., Law, M., Khetani, M.A., Teplicky, R., Liljenquist, K., et al. (Under revision). Psychometric evaluation of the Participation and Environment Measure for Children and Youth (PEM-CY). *Developmental Medicine & Child Neurology.*
- Coster, W., Law, M., Bedell, G., Khetani, M., Cousins, M., & Teplicky, R. Development of the Participation and Environment Measure for Children and Youth (PEM-CY): Conceptual basis. *Manuscript under review.*
- Bedell, G., Khetani, M.A., Coster, W.J., Law, M., & Cousins, M. (in press). Community, social and civic life. In A. Majnemer, Ed. *Measures for children with developmental disabilities: Framed by the ICF-CY.*
- Khetani, M.A., Bedell, G., Coster, W., Cousins, M., & Law, M. (in press). Environmental factors: Physical, social and attitudinal environment. In A. Majnemer, Ed. *Measures for children with developmental disabilities: Framed by the ICF-CY.*
- Bedell, G., & Coster, W.J. (2008). Measuring participation of school-age children with traumatic brain injuries: Considerations and approaches. *Journal of Head Trauma Rehabilitation, 23,* 220-229.

- **Contact information: wjcoster@bu.edu**
- **http://www.bu.edu/kidsincontext**

46

Examining the Impact of the Environment on Home, Community and Work Participation for People with Cognitive Disabilities

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47

Participation in Context Research

- Two concurrent studies with same participatory methodology across 3 states
  - With people who had a stroke (n=89)
    - Stroke RRTC
  - With people aging with intellectual and developmental disabilities (I/DD) (n=146)
    - Aging with I/DD RRTC
- Both focused on examining environmental barriers & supports to participation experienced by people with cognitive disabilities across everyday contexts of living

48

Demographics

	I/DD (n=146)	Stroke (n=89)	Total n (%)
Age	45.2 (21-84)	54.9 (23-79)	49.0 (21-84 range)
Gender: Male	61	35	96 (40.9%)
Female	84	54	138 (58.7%)
Race/ethnicity			
African American	75	44	119 (50.6%)
White	33	39	72 (30.6%)
Hispanic & Latino	34	4	38 (16.7%)
Employment			
Full or part-time	127*	11	138 (58.6%)
Not working	9	57	66 (28.1%)
Retired	5	20	25 (10.6%)
Economic Status			
<$12,000/yr.	142	17	159 (57.4%)
$12-30,000/yr.	4	12	16 (6.1%)
>$30,000/yr.	0	17	17 (6.1%)
Living Situation			
Community home/apt.	77	89	166 (70.6%)
Group home	69	0	69 (29.4%)

49

Participatory Methodology

- Participatory participation audits (n=525 audits)
  - Participants identified key participation goals they had given up or had great difficulty doing now but wanted to be doing
    - Also completed impairment & functional assessments
  - Went on 3 visits with ADA/OT access specialist & peer mentors (from a pool trained by the Great Lakes ADA Center) to evaluate barriers to participation and strategize supports
    - Home audit (all)
    - Community & work (2 of choice)
      - Done as full trips from home, including getting there, participating in space, getting back
  - Per audit, completed
    - Barriers & supports checklist of issues most influencing participation
    - PhotoVoice pictures and stories of what worked/didn't work
    - Rating of whether met goal or not, what helped them do so, and action plan to continue doing in future

50

Documenting Barriers & Supports

- Public, web-based outcomes database & reporting system in "Consumer Reports" style for community use

III. Participation Barriers & Supports Summary

Key for Barriers and Support Reports

	0%	0.01-24.99%	25-49.99%	50-74.99%	75-100% or more
Barriers	○	◔	◑	◕	●
Supports	○	◔	◑	◕	●

Percentages are calculated as the number of times that barrier was selected divided by the number of goals participants selected in each goal category (column). The percentage could be greater than 100% if the barrier was chosen more than once for the same goal.

A. Participation Barriers

111. Environmental Barriers

	Home Access Audit (n=160)	Use Local Businesses (n=137)	Transportation (n=107)	Information and Learning (n=33)
Bathrooms: Accessibility	◔	◔	◔	◔
Cognitive: Access	◔	◔	◔	◑
Physical: Access and safety related to community mobility	◕	◑	◔	◕
Physical: Access to assistive tech (consistently has it, works, etc)	◔	◔	◔	◔
Physical: Auditory cues	◔	○	◔	○
Physical: Conditions- noise, temperature, air quality, congestion, events	◔	◔	◔	◔
Physical: Lighting	◔	◔	○	○
Physical: Visual cues	◔	◔	◔	◔
Physical: Weather conditions	◔	◔	◔	◔
Resources: Accessible information available	◔	◔	◔	◑
Resources: Financial resources	◔	◑	◔	◔
Social: Allowing for degree of risk vs. protective safety	◔	◔	○	○
Social: Awareness and use of disability rights community groups	◔	○	○	○
Social: Communication accessible to people with disabilities	◔	◔	○	◔

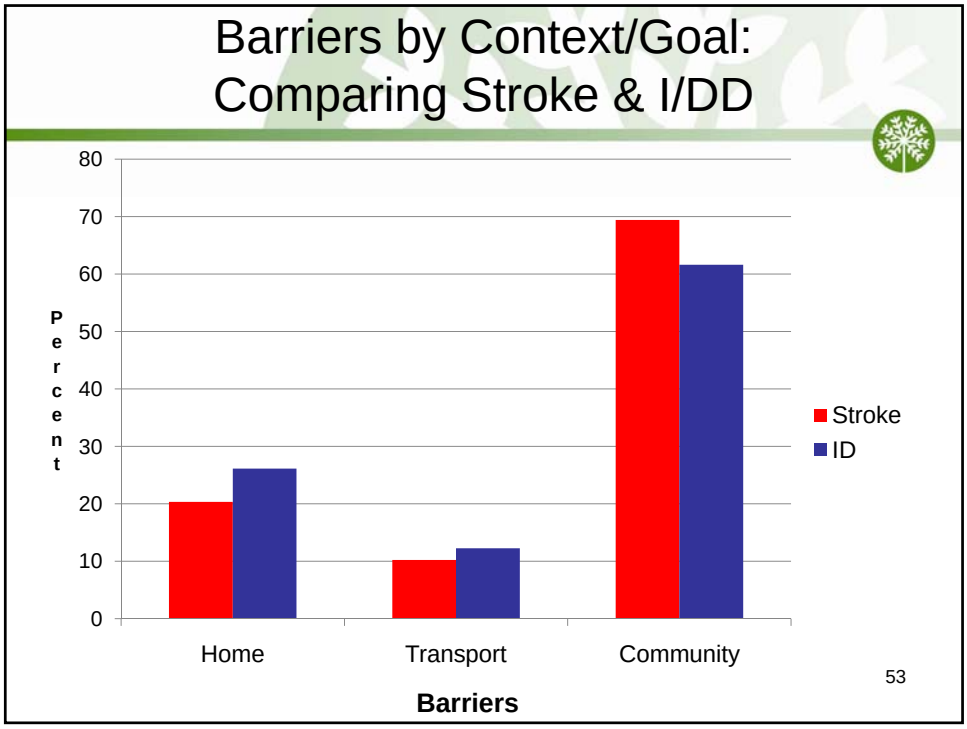
51

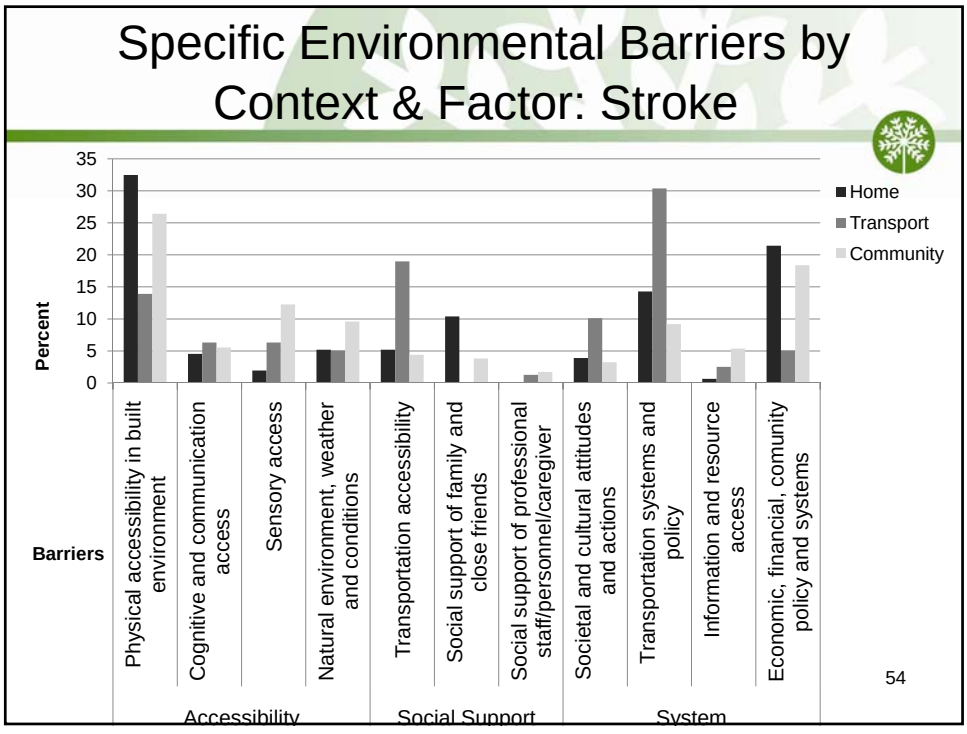
Documenting Barriers & Supports

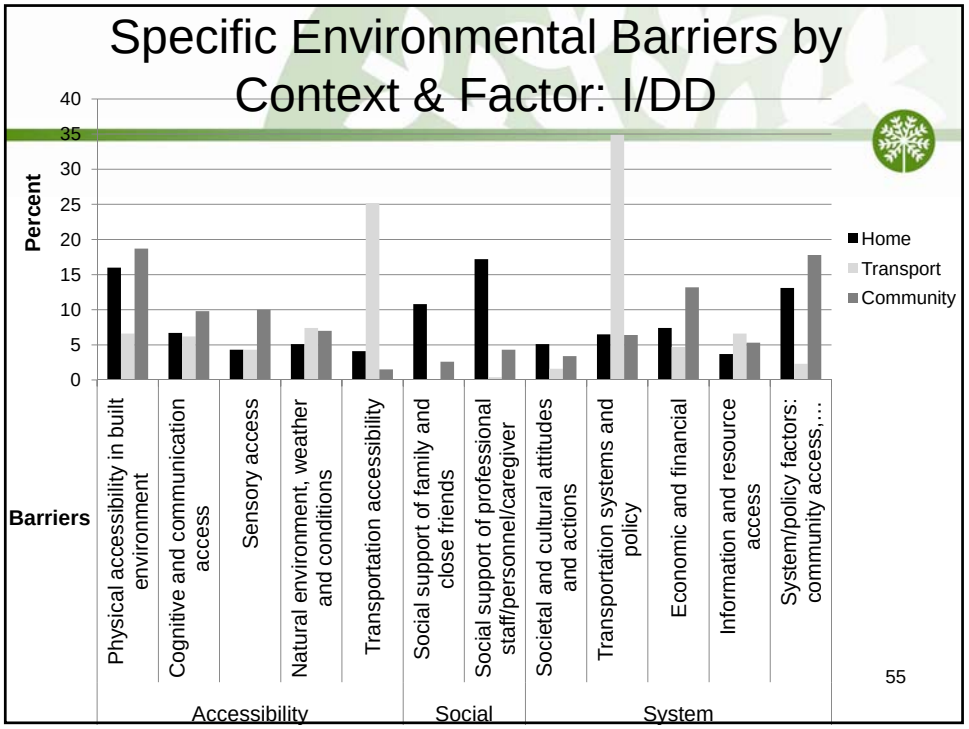
- PhotoVoice library of barriers & supports also served as communication book for participants for future participation

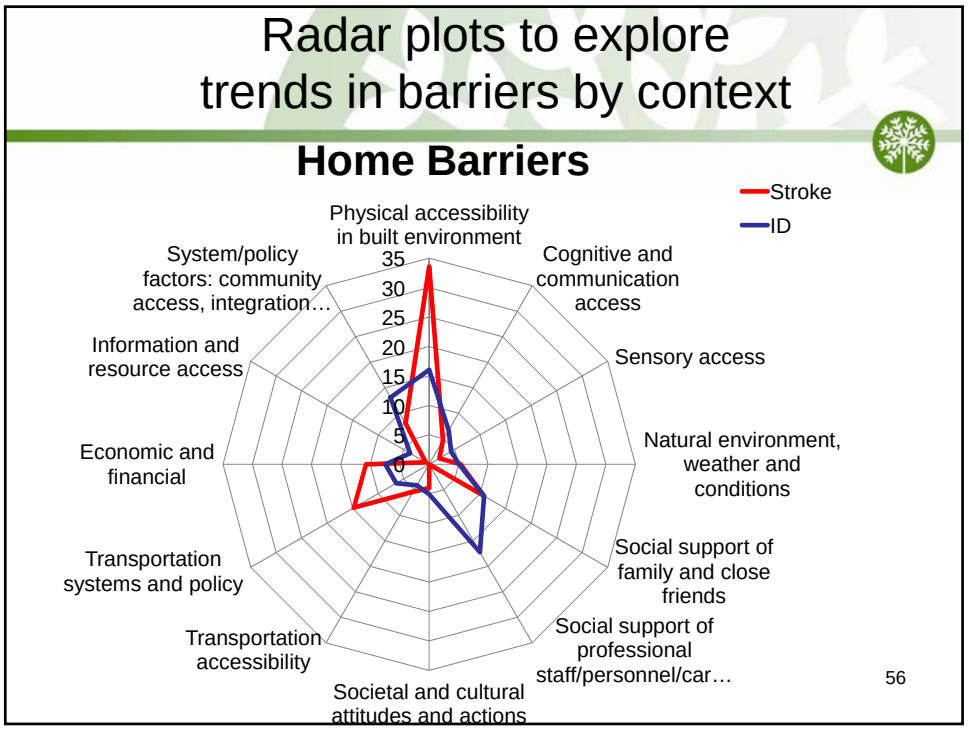



52


Barriers by Context/Goal: Comparing Stroke & I/DD
80
70
60
50
40
30
20
10
0
Percent
Home
Transport
Community
Barriers
Stroke
ID
53

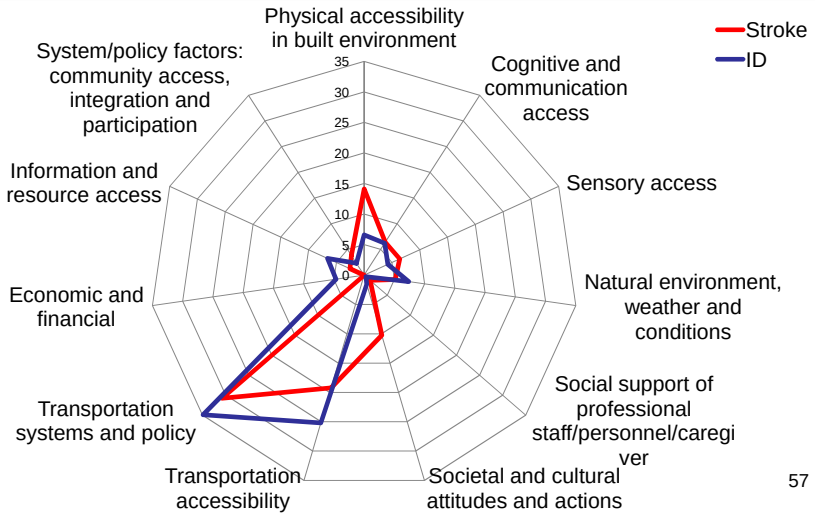

Specific Environmental Barriers by Context & Factor: Stroke
35
30
25
20
15
10
5
0
Percent
Barriers
Physical accessibility in built environment
Cognitive and communication access
Sensory access
Natural environment, weather and conditions
Transportation accessibility
Social support of family and close friends
Social support of professional staff/personnel/caregiver
Societal and cultural attitudes and actions
Transportation systems and policy
Information and resource access
Economic, financial, comunity policy and systems
Accessibility
Social Support
System
Home
Transport
Community
54


Specific Environmental Barriers by Context & Factor: I/DD
Percent
40
35
30
25
20
15
10
5
0
Home
Transport
Community
Barriers
Physical accessibility in built environment
Cognitive and communication access
Sensory access
Natural environment, weather and conditions
Transportation accessibility
Social support of family and close friends
Social support of professional staff/personnel/caregiver
Societal and cultural attitudes and actions
Transportation systems and policy
Economic and financial
Information and resource access
System/policy factors: community access,…
Accessibility
Social
System
55


Radar plots to explore trends in barriers by context
Home Barriers
Stroke
ID
Physical accessibility in built environment
Cognitive and communication access
Sensory access
Natural environment, weather and conditions
Social support of family and close friends
Social support of professional staff/personnel/car…
Societal and cultural attitudes and actions
Transportation accessibility
Transportation systems and policy
Economic and financial
Information and resource access
System/policy factors: community access, integration…
35
30
25
20
15
10
5
0
56

Radar plots to explore trends in barriers by context

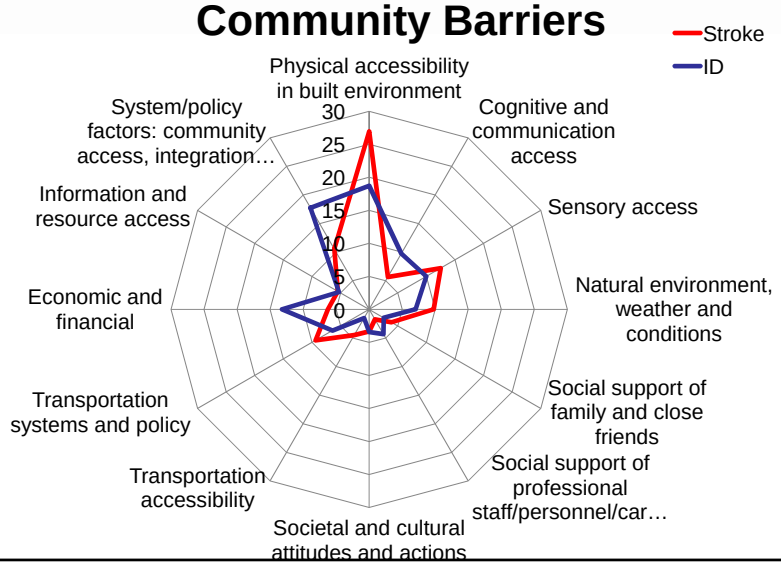
Transportation/Community Mobility Barriers



57

Radar plots to explore trends in barriers by context

Community Barriers



58

Barriers differ by context: Stroke

	Home	Transport	Community	Total	Odds : home to transport	Odds : home to community
1. Physical access & safety	**50**	11	138	199	**0.287***	0.694
2. Cognitive & communication access	7	5	29	41	1.255	1.175
3. Sensory access	3	**5***	**64***	72	**3.013***	**6.714***
4. Natural environment, weather and conditions	8	4	50*	62	0.861	1.840
5. Social support of family and close friends	**16**	0	20	36	**0.000***	**0.325***
6. Social support of staff/personnel/caregiver	0	1	9	10	-	-
7. Societal and cultural attitudes and actions	6	**8***	17	31	**2.453***	0.790
8. Transport. accessibility	8	**15***	23	46	**3.750***	**0.213***
9. Transport systems & policy	22	**24***	48	94	**2.256***	**0.574***
10. Info/resource access	1	**2***	**28***	31	**3.531***	**8.273***
11. Economic & system	**23**	8	86	85	**0.561***	1.062

Barriers differ by Context: I/DD

	Home	Transport	Community	Total	Odds: Home to Transport	Odds: Home to Community
Physical access & safety	**82**	17	**234**	333	**0.369***	**3.105***
Cog & commun. access	34	16	122	172	0.928	1.517
Sensory access	22	11	**125**	158	0.990	**2.470***
Natural environment	26	19	88	133	1.483	1.413
Social support of family and close friends	**55**		32	87	**0.000***	**0.218***
Social support of staff/personnel/caregiver	**88**	1	54	143	**0.019***	**0.217***
Societal and cultural attitudes and actions	**26**	4	43	73	**0.294***	0.665
Transportation access	21	**65**	19	105	**7.858***	**0.360***
Transportation systems and policy	33	**90**	80	203	**7.760***	0.990
Economic and financial	**38**	12	**165**	215	**0.607***	**2.501***
Info & resource access	19	17	66	102	1.827	1.443
System/policy	**67**	6	222	295	**0.158***	1.431

Does it matter? Taking action to address barriers & enable supports

- Probability of taking actions on barriers
- Question: what stage of action was the participant at in addressing barriers? (Prochaska Transtheoretical Model of Change Theory)
  1. No action taken
  2. Thinking/talking about it (problem solving)
  3. Trying out strategies for first time (exploration)
  4. Using effectively/able to flexibly monitor & adapt to ongoing changes in environment (maintenance, flexibility)

61

Does it matter? Probability of taking action on barriers

STROKE	Barriers (N= individuals)	Mean	Std. Deviation
Number of barriers encountered (F=10.99, df=2,139, p<.001)			
Home	44	3.43	2.64
Transport	20	3.95	3.25
Community*	78	6.87	4.98
Total	142	5.39	4.45
Number of support mechanisms cited (F=12.54, df=2,159, p<.001)			
Home	57	5.79	3.27
Transport	21	4.48	2.71
Community*	84	9.92	7.42
Total	162	7.76	6.18
Effectiveness in addressing the barriers (F=4.32, df=2,139, p=.016)			
Home	44	1.36	0.48
Transport	20	1.22	0.44
Community*	78	1.12	0.40
Total	142	1.21	0.44

62

Does it matter? Probability of taking action on barriers

I/DD	Barriers (N = individuals)	Mean	Std. Deviation
Number of barriers encountered (F=16.967 df=2,275, p<.001)			
Home	84	6.67	6.61
Transport	55	4.67	2.72
Community*	139	9.50	5.68
Total		7.69	5.86
Number of support mechanisms cited (F=57.272, df=2,287, p<.001)			
Home	93	7.78	4.05
Transport	58	4.97	3.88
Community*	139	13.28	6.70
Total		9.86	6.43
Effectiveness in addressing the barriers (F=4.086, df=2,275, p=.018)			
Home	84	1.34	0.40
Transport	55	1.24	0.34
Community*	139	1.20	0.32
Total		1.25	0.35

63

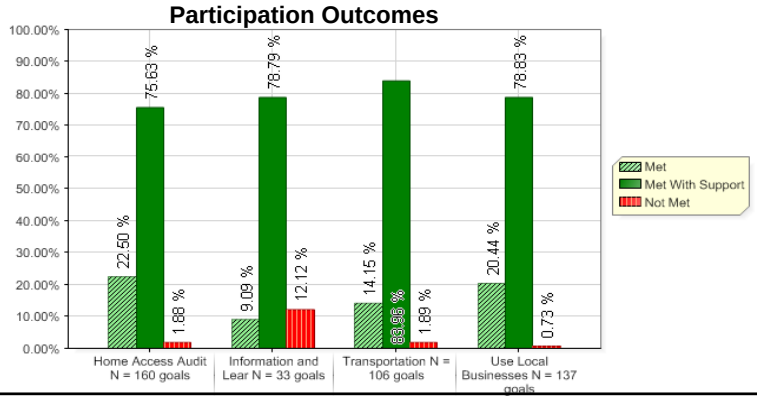
Action implications

- Regardless of disability/impairment,
  - People with cognitive disabilities encountered more barriers in the community, tried more support strategies, but were less effective in taking actions to strategize barriers in the community.
  - That is, they have more difficulties in effectively problem-solving barriers in the community.
    - Something not focused on as much in rehabilitation, yet influences key participation outcomes
- Need for
  - Accessible assessments to ID barriers & participation disparities experienced by people with cognitive disabilities
    - Especially environmental access, social & system/policy issues
  - Accessible outputs that can be used by community to take actions (radar plots, consumer reports, etc.)
  - Environmental interventions to attack community barriers, including social/community level advocacy skill building

64

Action Implications

- A peer mentoring social learning approach coupled with in-context access audit was effective in meeting participation goals & improving outcomes = now the basis for two environmental management interventions



65

Acknowledgments

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- RRTC on Aging with Developmental Disabilities: Lifespan Health and Function (H133B080009)
- Great Lakes ADA Center (H133A060097)

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66