Update from the RERC on Workplace Accommodations

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RESNA 2011

Rehabilitation Engineering Research Center on Workplace Accommodations (Work RERC)

Identifies, develops and promotes new technologies that maximize independence and participation of people with disabilities, including aging workers, in the workplace

Reasonable Accommodation

"Any change in the work environment or in the way things are customarily done that enables an individual with a disability to enjoy equal employment opportunities." (Source: EEOC)

Work RERC survey respondents:

- 75% could not perform all of their job duties without workplace accommodations

- 15% had been fired or laid off in the past because they had not been able to get the accommodations they needed

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Characteristics of Past Workplace Accommodation Research

- Practice Based Evidence (case studies)

- Few describe trends by people within / across user groups

- Few describe outcomes

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Presentation Overview

Sample of Work RERC projects:

- Research on Accommodation Use

- Development of Assessment Tools

- Research on Workplace Participation

- Development of Context-Aware Technologies

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Characteristics of Workplace Accommodation Use for those with Physical Limitations

Maureen Linden, Karen Milchus

RESNA 2011

Purpose

To examine the relationships between functional ability, job requirements, and characteristics of accommodation use.

Presentation Focus:

Accommodation used by those with physical limitations.

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Methods

- Survey relating characteristics of the individual to the accommodation

  - Administered dominantly electronically

  - Marketed through consumer lists, national publication lists, social networking venues.

  - Inclusion Criteria:
    - Individual has 1 or more functional limitations
    - Individual is currently employed or volunteers

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Job Characteristics

- EEOC Categorization

- Relationship to Employer

- Location of Work

- Pay Rate and Hours/wk

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Functional Limitations

Broad functional limitation categories were selected from the ICF and further delineated by specific activities.

Example: Mobility Limitation

"I can walk, but have difficulty bending, sitting, standing, or climbing stairs."

Accommodations Characteristics

- Use of specific types of accommodations –
  - Universal features
  - Adaptations
  - Help or Assistance
  - Assistive Technology

- Satisfaction, Importance, Frequency of Use
  - Reported by nominal Likert scale

- Unmet Accommodation Needs.

Functional Limitation Distribution

373 respondents to the overall survey.

- 56% report mobility impairments (n=210)

- 28% report upper extremity impairments (n=104)

- 218 respondents reported physical limitations

Limitation Group	% of those with Physical Limitations
Hearing	7 %
Vision	13 %
Speech	9 %
Mental Function	17 %

Population Demographics

60 % female; 43% over 55 years

88% Caucasian; 7% Hispanic origin

Completed education:

- 5% diploma /GED

- 39% have graduate degrees.

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Population Job Characteristics

Job Type

One full-time	60 %
One part-time	22 %
Multiple Jobs	18 %

Employment Type

Employee	78 %
Self – Employed	13 %
Volunteer	9 %

Work Location

Home	10%
Same Place	62%
Home / Worksite	17%
Travelling	11%

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Population – EEOC Job Category

Mobility Limitations

No device use 35%

Walking aids 15%

Wheelchair, Scooter 50%
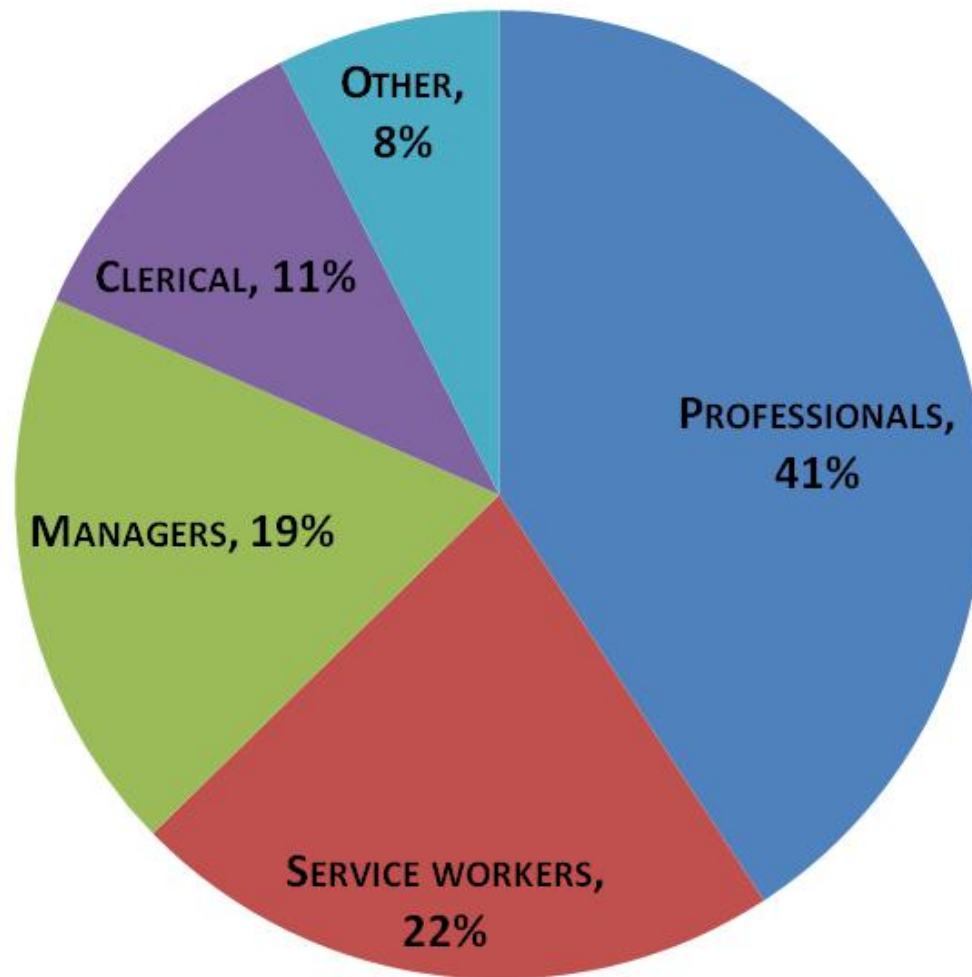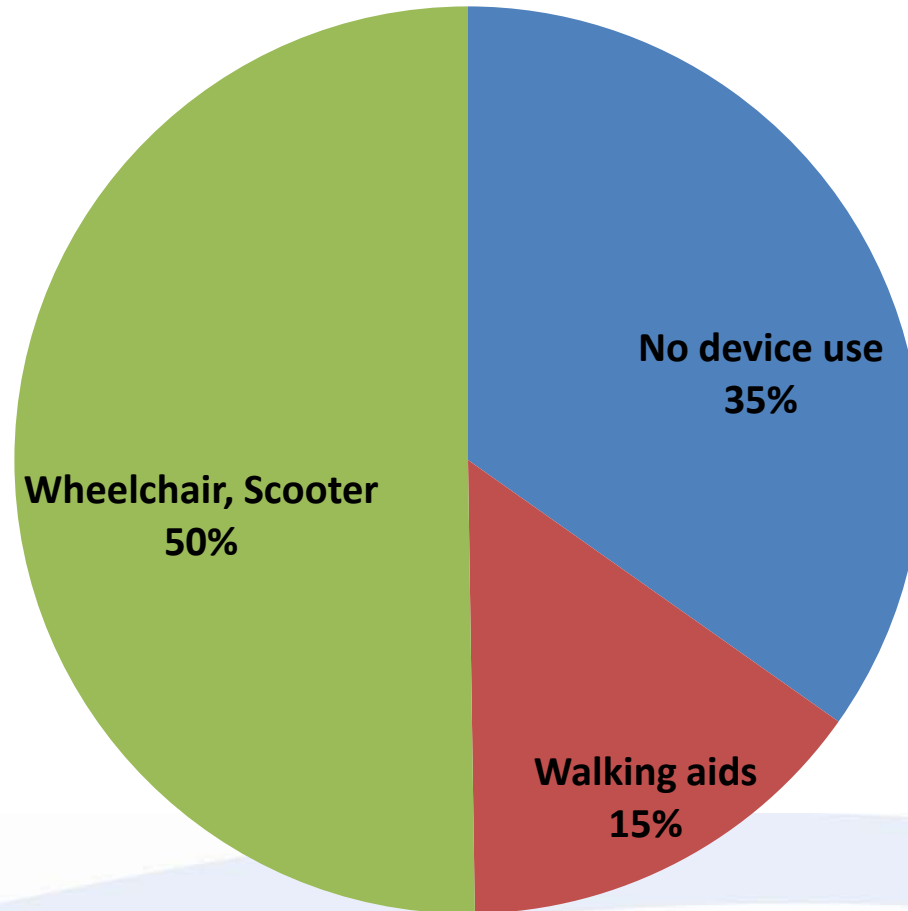
Upper Extremity Limitations

		Right UE limitation				
		RSI	Reading Diff.	Dexterity Diff	Reaching, Dexterity Diff.	difficulty on this side
Left UE limitation	RSI	23	0	2	5	3
	Reading Diff.	4	5	3	3	1
	Dexterity Diff	3	2	13	1	3
	Reaching, Dexterity Diff.	0	2	2	20	2
	No difficulty on this side	0	1	0	4	2

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Upper Extremity Limitations

		UE Limit - Side two				
		RSI	Reading Diff.	Dexterity Diff	Reaching, Dexterity Diff.	difficulty on this side
UE Limit - Side One	RSI	23				
	Reading Diff.	4	5			
	Dexterity Diff	5	5	13		
	Reaching, Dexterity Diff.	5	5	3	20	
	No difficulty on this side	3	2	3	6	2

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Upper Extremity Limitations

		UE Limit - Side two				
		RSI	Reading Diff.	Dexterity Diff	Reaching, Dexterity Diff.	difficulty on this side
UE Limit -Side One	RSI	23				
	Reading Diff.	4	5			
	Dexterity Diff	5	5	13		
	Reaching, Dexterity Diff.	5	5	3	20	
	No difficulty on this side	3	2	3	6	2

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Commonly-Used Accommodations: Mobility Impairments

78%*   Built-in Features

52%*   Adj. Work Sched.

49%   Flexible Work Schd.

48%*   Co-Worker Help

37%^   Mod. Work Surface

34%^   Different Work Area

29%*   Adj. Seating & Supp

*P < .01; ^P < .05

Common Accommodations for Mobility Impairment

Legend: No Aids, Walking Aids, Wheeled Mobility

Categories: Built-in Features, Adj. Work Sched., Flexible Schd., Co-worker Help, Mod. Work Surface, Diff Work Area, Adj Seat & Supp
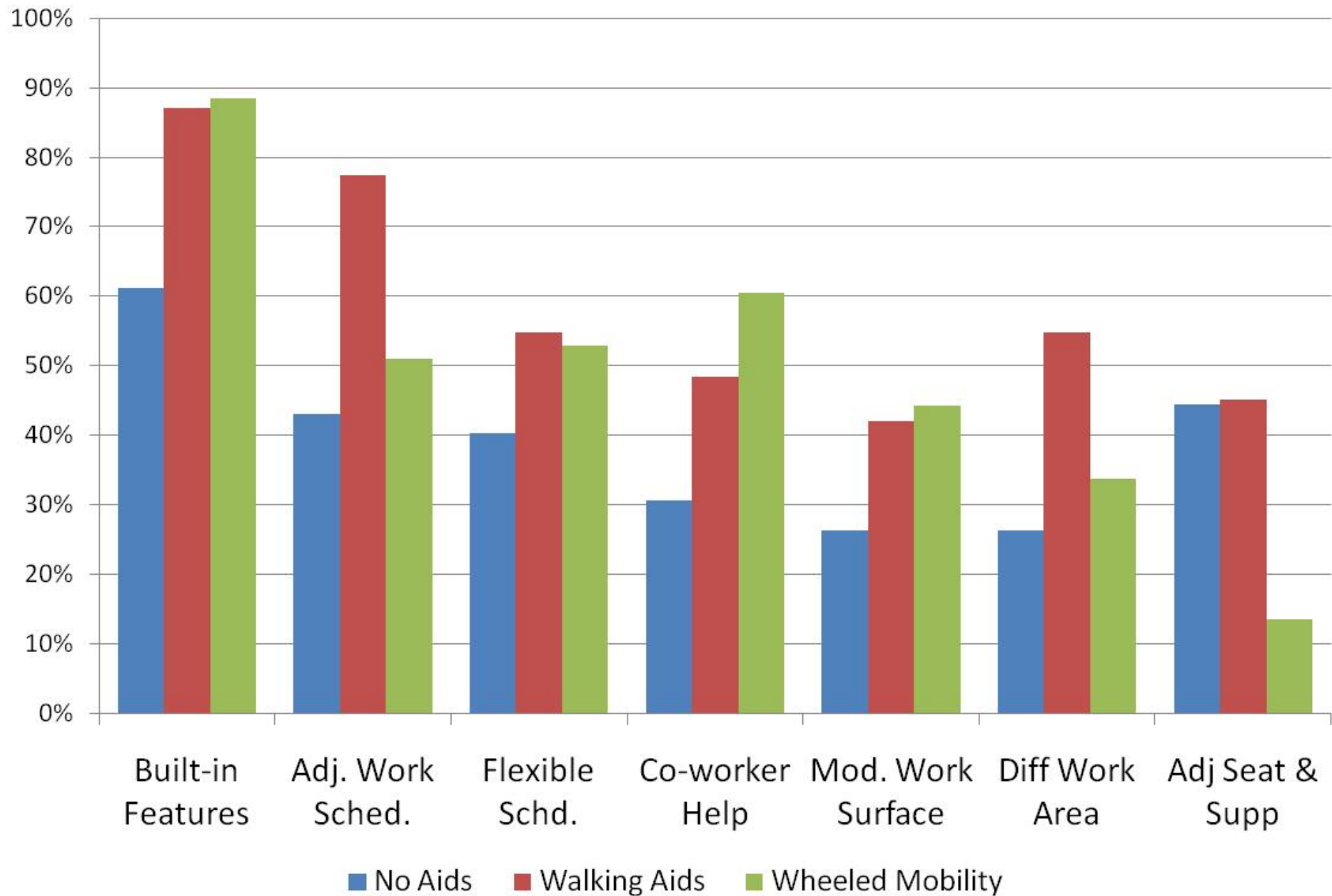
Commonly Use Accommodations: Upper Extremity Impairments

60%   Built-in Features

48%   Adj. Work Schedules

47%   Co-worker help

43%   Flexible Schedules

43%   Computer Input

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Common Accommodations for Upper Extremity Impairment

Legend: B RSI, B Reaching, B Dexterity, B. Dexterity/Reach, Uni Full Function

Categories: Built-in Features, Adj. Work Sched, Co-worker help, Flexible Sched., comp_input
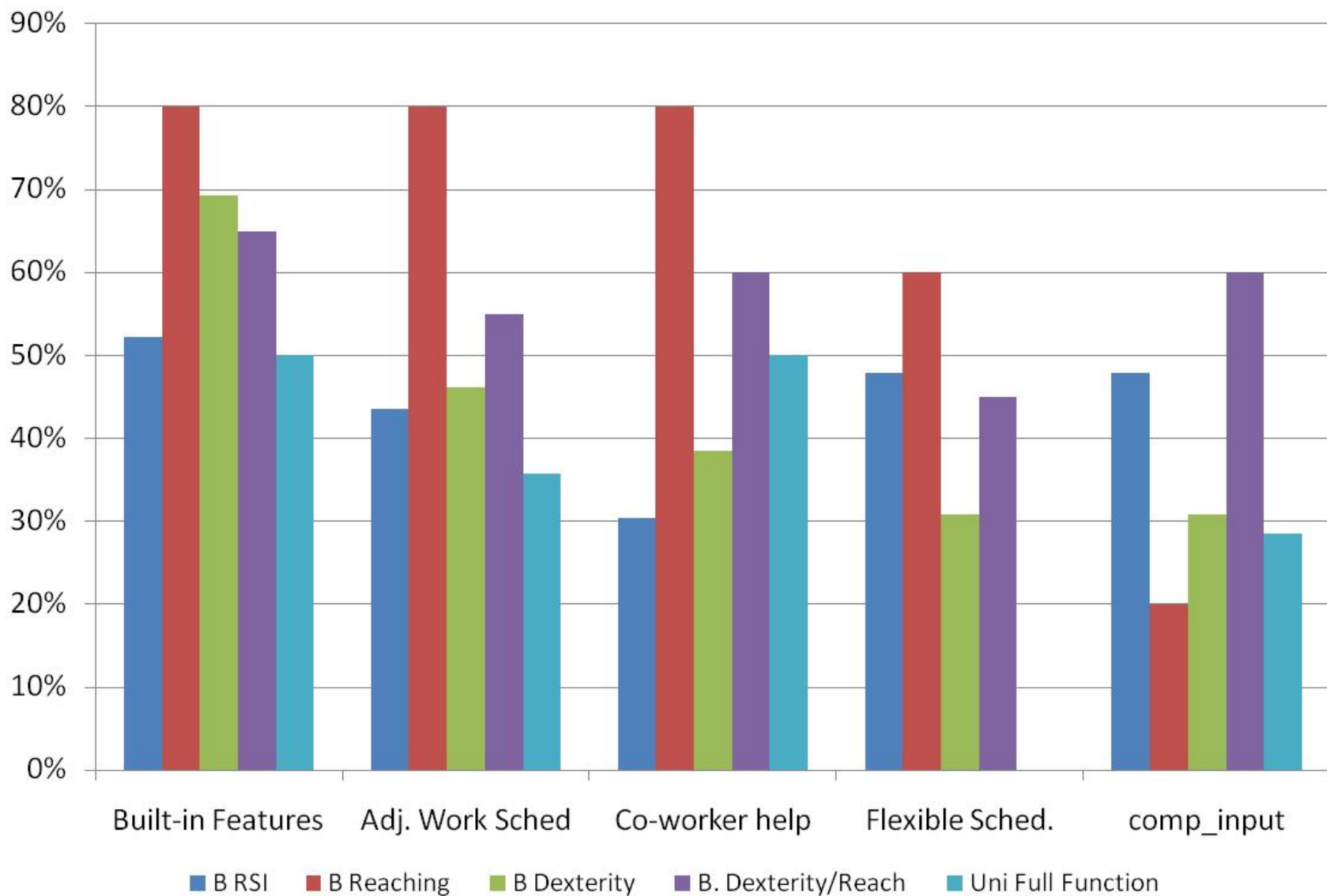
Satisfaction with Accommodations

Mobility

- Neutral Satisfaction for:
  - Built-in Features
  - Adj. Seating and Supports
  - Different work Areas

- "Satisified" to "Extremely Satisfied" with policy based accommodations

Upper Extremity

- "Satisfied" with each of the top 5 accommodations.

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Perceived Importance of Accommodations

Mobility

- Built-in features (P< 0.01)
  - Neutral importance for non device users
  - Important to Very Important for device users

Upper Extremity

- Computer Access devices were rated very important

- Other accommodations were "important"

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Unmet Needs

3% of those with Mobility Impairment reported mobility related unmet needs.

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Unmet Needs

3% of those with Mobility Impairment reported mobility related unmet needs.

28 % of those with Upper Extremity impairment reported related unmet needs.

- 14% need computer input devices
- 14% need built-in features

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Conclusions

Those with mobility limitations reported few unmet needs, even though they reported "neutral" satisfaction with common based accommodations.

Technologies are not high on the list of common accommodations.

Difference in the rate of unmet needs

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Making Accommodation Decisions: Developing Assessment Tools

Workplace Remote Assessment Protocol

- Problem: Accommodation experts are few, and they spend too much of their time traveling to remote work sites to conduct assessments

- Solution: Develop a protocol for rehab professionals to conduct workplace assessment remotely, using telerehabilitation technology

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Workplace Remote Assessment Protocol

- Using technology previously used for remote home assessments

- Investigated use of 3D modeling system with U. of Pittsburgh (RERC on Telerehab)

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Workplace Accommodation Wizard

- Problem: Employers and employees are making accommodation decisions, with limited knowledge about accommodations.

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Provision of Accommodations

	Involved in Accommodation Decisions
Employee	83%
Employer	61%
Medical Prof. (MD, OT, PT, SLP)	20%
Vocational Rehab.	27%
Insurance (private, workers comp)	1.5%
Family, Friends	11%

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Workplace Accommodation Wizard

- Problem: Employers and employees are making accommodation decisions, with limited knowledge about accommodations.

- Develop web-based tool that will enable employers to assess employees' needs and identify solutions for workplace accommodations

- Suggest accommodations, linking users to entries in Assistivetech.net

  – Office occupations (FIP - #H133G070063)

  – Manufacturing / distribution jobs (RERC)

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Accommodation Wizard Limitations

- Difficulty with walking, climbing stairs, bending, sitting, or standing
- Problems reaching, grasping, pinching, or controlling hand/finger motion
- Problems with seeing even WITH glasses or contacts
- Problems hearing when NOT using a personal assisted listening device
- Problems producing speech or thinking of the right words to say
- Problems with remembering things, processing information, expressing thoughts or appropriate behaviors, or perceiving information

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Accommodation Wizard Tasks (Office)

- Using Doors (exterior and interior)
- Moving Between Building Levels
- Moving Around the Workplace
- Using the Restroom
- Using the Workspace
- Communicating Face-to-Face
- Accessing Print / Multimedia
- Using a Phone
- Using Computer Hardware
- Using Computer Applications

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Accommodation Wizard

Limitation: Using hand and fingers

Task: Using a phone

↓

Problem? Dialing Phone (keypad buttons difficult to operate)

↓

Possible Approaches:

One-touch dialing   Larger buttons

Environ. Control   Voice dialing

↓

assistivetech.net

Supporting Workplace Participation: Effects of Job Accommodations

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Activity vs. Participation (Community)

	Activity	Participation
ICF definition	• Execution of a task or action by an individual	• Involvement in a life situation
Common constructs	• Individual tasks • Independence • performance	• Valued occupations • Independence/Interdependence • Social roles • Social relationships
Measure	• Quality, Efficiency	• Sense of Belonging or Inclusion
Distinction	• Individual	• Social

(Dijkers, 1998; Fougeyrollas et al., 1998; ICF, 2001; Rochette et al., 2006; Winkler et al., 2006)

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ADA Title I (Employment)

- **Ensures that qualified individuals:**
  - Have equal opportunity to apply for jobs;
  - Have equal opportunity to work in jobs for which they are qualified and be promoted once working;
  - Have equal access to benefits and privileges of employment that are offered to other employees;
  - Are not harassed because of disability.

- Requires an employer to provide reasonable accommodation.
  - "Essential functions"

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ICF (WHO, 2001)

ADA vs. ICF

ADA

Accommodations for work tasks → Activity Performance → Participation

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ICF

Accommodations for work tasks → Activity Performance

Accommodations for inclusive interactions → Participation
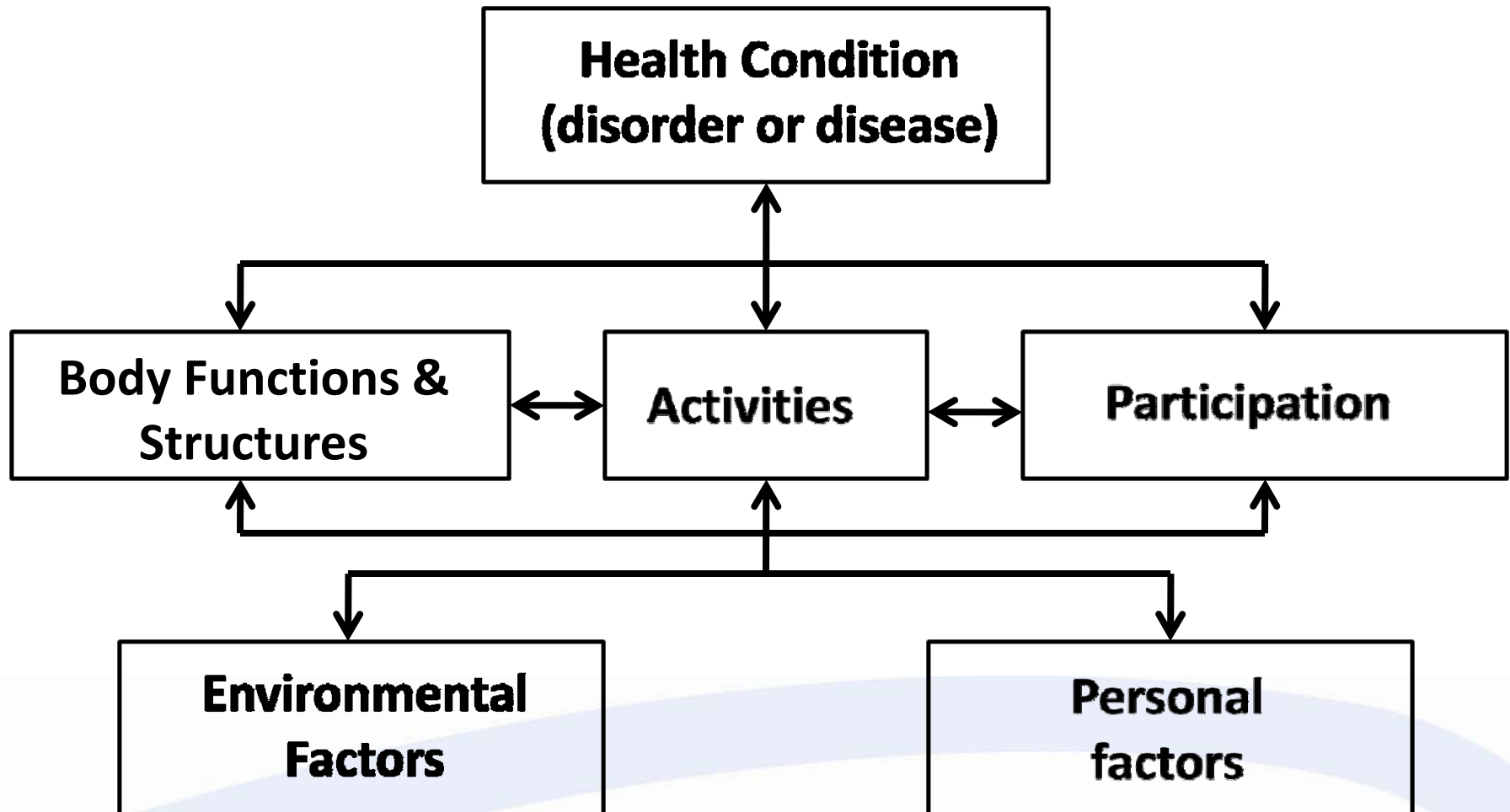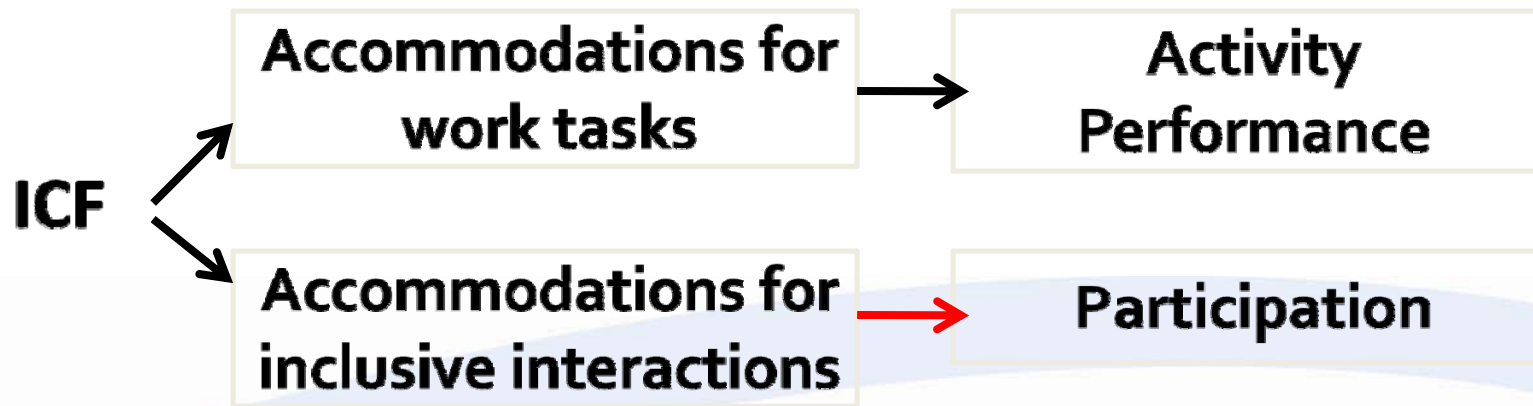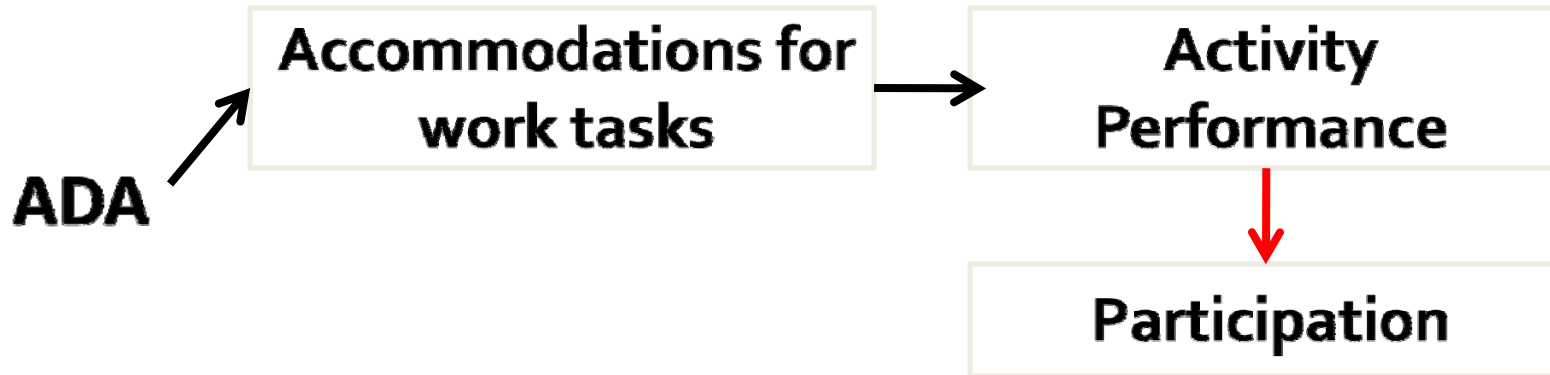
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Importance of Workplace Participation

- ## Support job functions
  - execution of work-related tasks
  - coordination of group activities
  - transmission of office culture
  - team building

  (Kraut et al, 1993; Whittaker et al, 1994)

- ## Enhance work outcomes
  - higher individual and firm productivity
  - Increased satisfaction with colleagues and their work
  - Less turnover intention

  (Klein, D'Aunno, 1986; Pearce, Randel, 2004; Young, 1986; Whittaker, Guthrie, 2001)

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Impact of Activity-Focused Accommodations

- Telework
  - Difficulty in coordination of group activities
  - Ineffective exchange of simple information
  - Stigmatization
  - Reduced participation in the work group
  - Social and professional isolation
  - Low job satisfaction
  - Poor job performance and reduced productivity

(Anderson, Bricout, & West, 2001; Bailey & Kurland, 2002; Baker, Moon & Ward, 2006; Bricout, 2004; Guthrie, 1997; Hesse, 1991; Kerrin & Hone, 2001; Kurland & Cooper, 2002; Nie, 2001; Venkatesh & Speier, 2000)

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The Study

- Goal:
  - To better understand the influence of accommodations on participation as a sense of belonging and inclusion.

- Participants:
  - 50 employees with and 50 without **mobility disabilities**
  - Work > 50% FTE
  - In an **office** setting

- Measures:
  - Satisfaction with Activity and Inclusion
  - Accommodation Use / Unmet Needs

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Measures

Respondents reported on their ability to perform activities and participate in specific environments.

Accommodation Use was itemized for Individual Workspaces and Shared workspaces.

Unmet needs were identified when
1. individual reported difficulty with an activity or environment AND
2. had not received an accommodation for that barrier.

Measures

- Job tasks
  - Quality
  - Efficiency

- Satisfaction with Workplace participation

	Formal	**Informal**
Inside	•Meetings	• Social interactions with coworkers and supervisor(s)
Outside	•Conferences •Prof. development activities	• Lunch outings, birthday parties, etc.

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Participants with mobility disabilities

- **Types of mobility device**
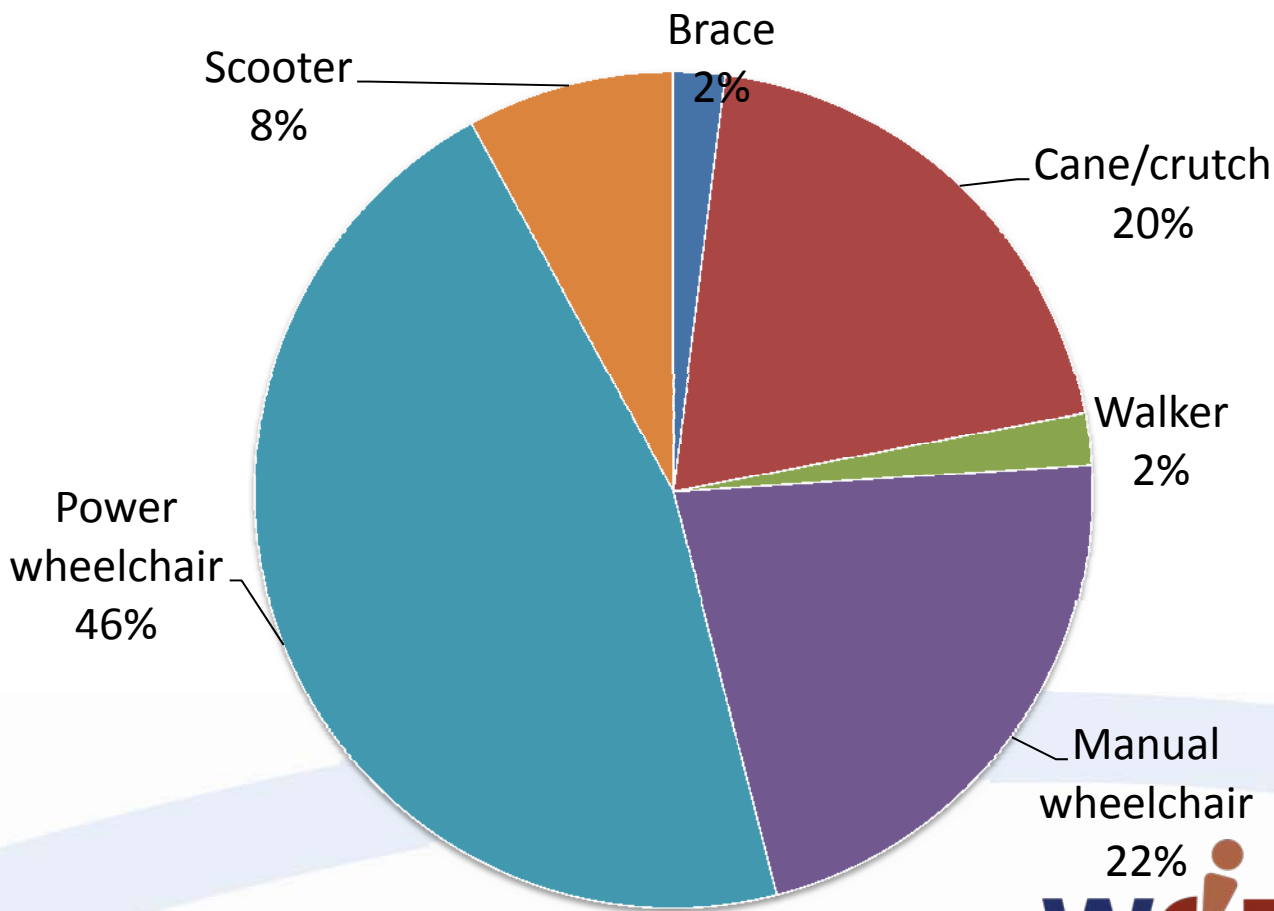
Unmet Accommodation Needs

- **3/50** with unmet needs in the <u>individual workspace</u>

- **25/50** with unmet needs in the <u>shared workspace</u>

- Significant difference between individual and shared workspace unmet needs (p=.000)

Unmet Accommodation Needs

- **% of employees with disabilities**

Communication	Workstation	Office entrance	Computer	Building entrance	Moving around	Furniture
0%	0%	2%	4%	8%	12%	34%

Workplace Participation

Legend: ■ Disability (ALL)

Bar chart values:
- Activity: 4%
- Informal P. (in): 4%
- Formal P. (in): 10%
- Formal P. (out): 18%
- Informal P. (out): 32%

Dissatisfaction **with Activity and Participation**

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Impact of shared-space unmet needs

Legend: ■ w/ unmet need ■ w/o unmet need

Activity: 8% / 0%
Informal P. (in): 5% / 3%
Formal P. (in): 20% / 0%
Formal P. (out): 28% / 8%
Informal P. (out): 48% / 16%

Dissatisfaction with Activity and Participation

Impact of shared-space unmet needs

	w/ vs. **w/o** unmet needs
Job tasks Performance & efficiency	N.S.
Workplace participation Formal e.g. meetings, conferences	**.014**
Informal e.g. chatting, social events	**.016**

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Comparison of those with disabilities to those without

	w/ unmet needs	w/o unmet needs
Job tasks Performance & efficiency	N.S.	N.S.
Workplace participation Formal (e.g. meetings, conferences) Informal (e.g. chatting, social events)	.003 .004	N.S. N.S.

Discussion

- Belonging and inclusion are more than (different than) just being able to complete job tasks.

- Evidence suggests that ADA assumptions about activity leading to participation have not be supported. The research indicates that activity and participation as suggested by the ICF, are independent constructs and that each requires accommodation.

ADA vs. ICF
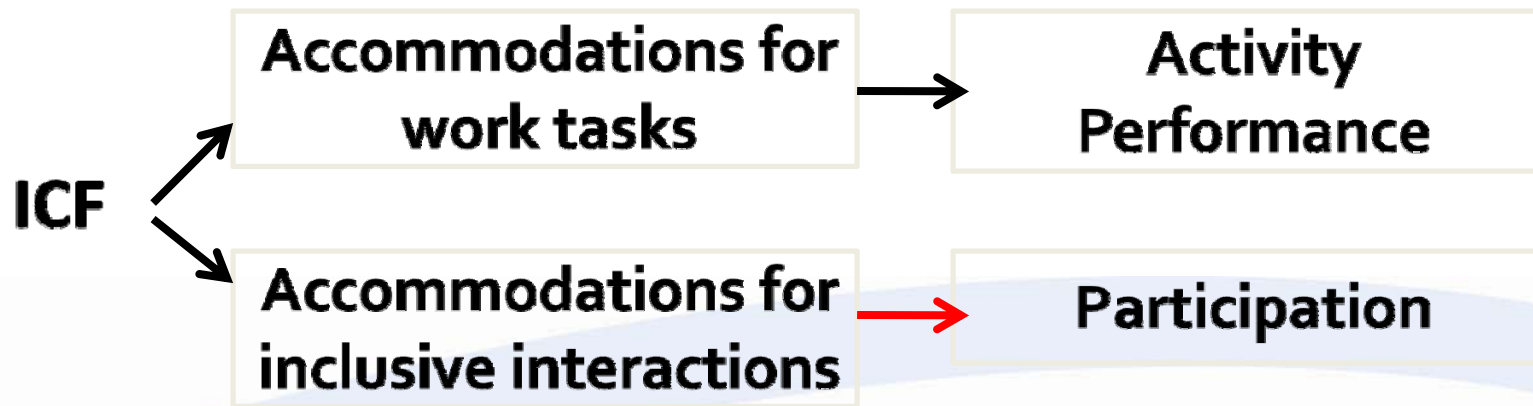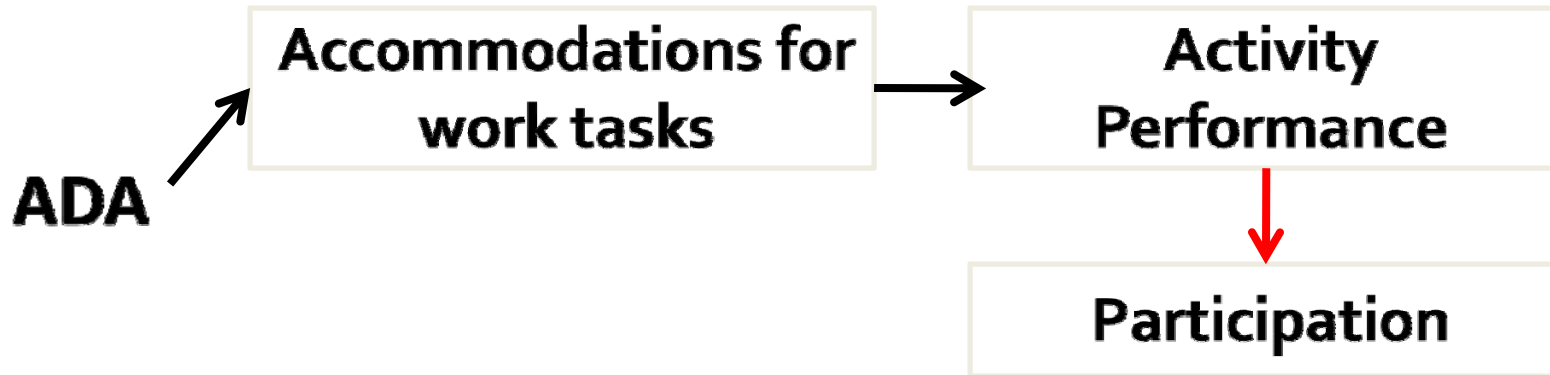
Implications

In order to support workplace participation,

- ■ Consider whether additional accommodations are needed for workplace social interactions, in addition to those for task performance.

- • Consider social impact of recommended task accommodations. For example, accommodations should address "proximity" and "similarity"

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Context-Aware Development Projects

What is "context aware"?

- Technologies that use various sensors to determine the "context" of their use (e.g., location, person, time) and react accordingly

- Two development projects:
  – Context Aware Prompting System (CAPS)
  – AwareComm

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Context-Aware Prompting System (CAPS)

- Context aware prompting system that acts as a job coach for adults with cognitive disabilities working in assembly line jobs

- Testing it with "First Aid" chocolate boxes

- Project with RERC on the Advancement of Cognitive Technologies (U. of Colorado)

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Context-Aware Prompting System
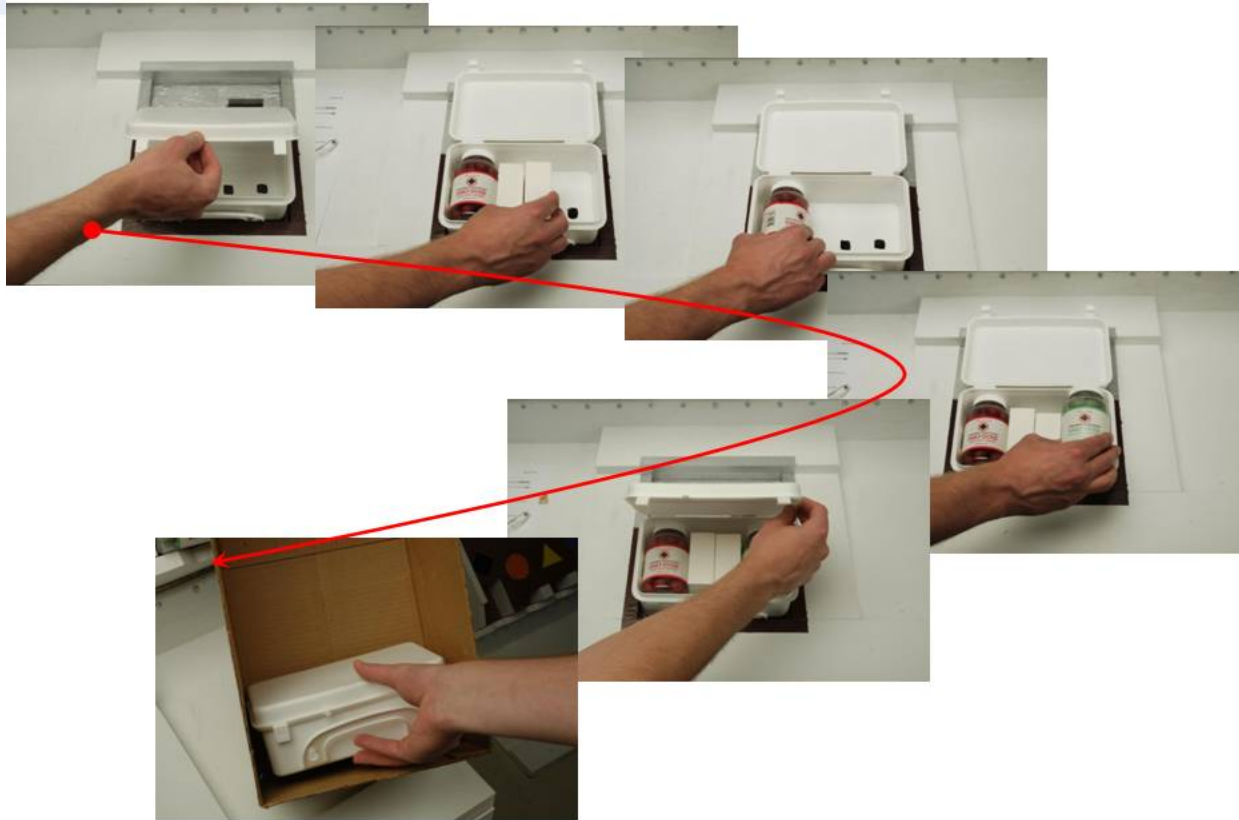
- Sensors detect when an item is removed from an inventory bin / when it is properly placed

Context-Aware Prompting System: Trials

- Linear Prompting System
  - Subjects forget to hit button to advance to next prompt
  - System is unable to recognize product orientation differences (which leads to further errors)
  - Subjects unable to fix errors using manual prompting

- Non-linear Prompting System
  - Subjects have been able to fix some errors using automated prompting

- Both Linear and Non-linear Prompting Systems
  - Subjects often wait for voice prompt to finish before performing task, effectively slowing down productivity

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AwareComm

- Communication system that uses context-aware technology to help users access appropriate phrases faster
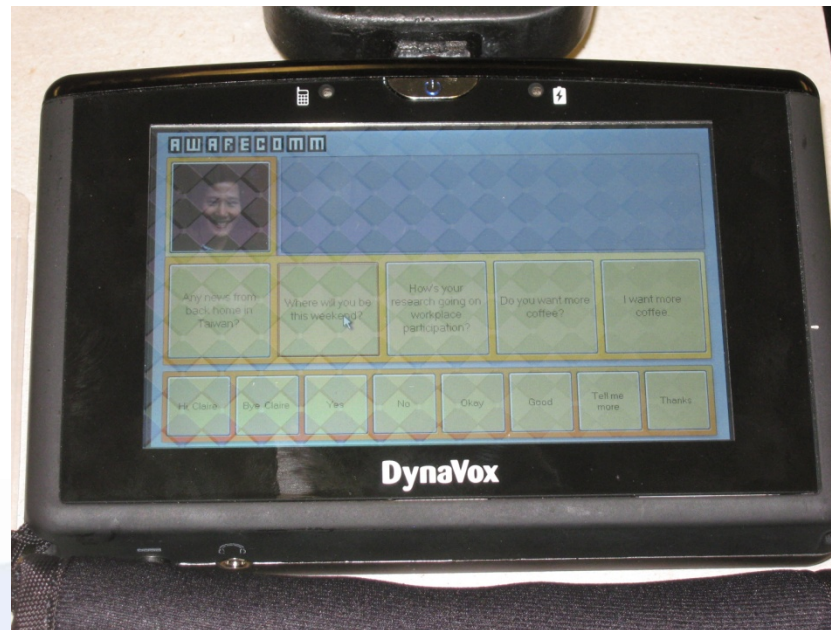
AwareComm Sub-Projects

- Workplace Conversation Study

  – Analyzing vocab. & conversational structure of people with / without AAC

- Tag Talker

  – User can "tag" utterances in a specific context

  – Speeds real-time access for specific situations

- AwareComm (full system)

  – Tagged vocabulary is pulled up depending on the context of the communication (e.g., time, location, conversational partner)

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Where to Store Phrases about TagTalker?

- Work RERC
  - TagTalker

- RESNA Conference
  - Developer's Forum

- Work RERC
  - Presentations
    - TagTalker

- RESNA Conference
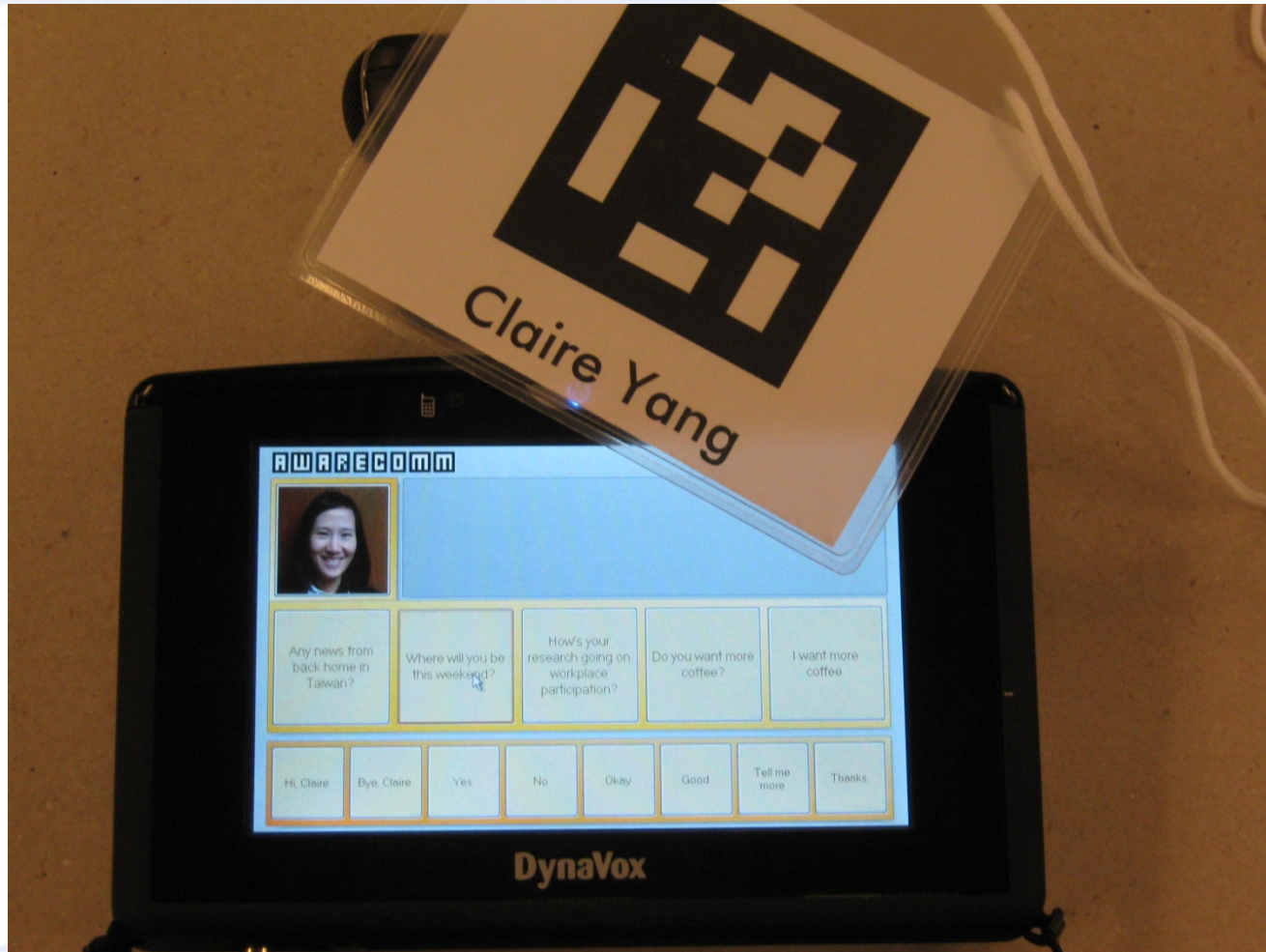 - Work RERC Session
    - Context Aware Projects

Tag Talker

TagTalker

- Intended to be used along with other methods for storing phrases

- Storing phrases
  1. Thinking of / writing down possible associations
  2. Choosing the best (this step not needed with TagTalker)

- Currently testing users' success and efficiency at retrieving phrases

AwareComm

AwareComm

Thank you