

VERSION 3.0

Craig
Hospital
Inventory of
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Factors

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The Creation of the Craig Hospital Inventory of Environmental Factors (CHIEF)

Background

The World Health Organization (WHO) has been both praised and criticized for the model of disablement conceptualized in the landmark publication, *An International Classification of Impairments, Disabilities, and Handicaps* (ICIDH) (WHO, 1980, 1993). The WHO model of disablement has been praised for its important conceptual distinctions among three types of outcomes – *impairments* (defined as limitations in the presence or performance of organs or organ systems), *disabilities* (defined as limitations in the performance of activities of daily living at the person level), and *handicaps* (defined as limitations in the performance of social roles as members of society). On the other hand, the WHO model of disablement has been criticized for its excessive reliance on the medical model, its failure to adequately recognize the importance of the environment in determining disablement outcomes, and its use of the term “handicap” (often used pejoratively in America) to describe limitations in the performance of social roles. The WHO recognized these shortcomings in its forward to the 1993 reprint of the ICIDH (WHO, 1980, 1993) by inaugurating a worldwide revision process that is under way. Current drafts of the revised model of disablement (WHO, 1999, 2000) address the areas that have been criticized while retaining the former areas of strength by adding a fourth domain of *Environmental Factors* and renaming the third domain of social role fulfillment (formerly handicap) as “*Participation*”.

In the area of societal participation, considerable, conceptual and empirical research has been conducted to develop measurement instruments. Within the domain of Environmental Factors, however, almost no research has been conducted towards instrument development. What little work has been done, has focused exclusively on architectural barriers in the physical environment (Steinfeld, 1997). What is needed is a broad-based measure of the environment which quantifies the degree to which elements of the physical, social, and political environments act as barriers or facilitators to full participation for people with disabilities. This has therefore been the objective at the heart of the research described herein; its goal, to provide a new type of instrument that will allow the quantification of Environmental Factors and lead to a better understanding of the degree to which elements of the environment impede or facilitate the lives of people with disabilities.

Several methods of conceptualizing Environmental Factors and their relationship to disability have been suggested. (Fougeyrollas, 1995) was the first within the field of disability studies to offer a taxonomy of Environmental Factors. He and the Canadian Society for the International Classification of Impairments, Disabilities and Handicaps cataloged over a hundred elements of the environment which they viewed as important determinants of handicap or participation. This strategy has been incorporated into

the current classification scheme of the environment included in the beta draft of the ICIDH-2 (WHO, 1999, 2000). While this strategy does provide an exhaustive list of environmental elements which may influence the disablement process, it does not provide a very useful conceptual framework for quantifying environment in survey tools.

In contrast to the approach of categorizing elements of the environment, Whiteneck, et al (1997) have attempted to identify a few salient characteristics of the environment which correspond to major dimensions of the environment that act to either impede or facilitate participation by people with disability. This conceptualization proposes five characteristics of the environment:

1. Accessibility
2. Accommodation
3. Resource availability
4. Social support
5. Equality

Accessibility answers the question, "Can you get where you want to go?" It is defined in terms of physical access and includes architectural barriers such as steps and inaccessible bathrooms as well as the accessibility of transportation. These aspects of the environment either restrict or facilitate an individual's ability to move about freely in his or her community.

Accommodation addresses the question, "Can you do what you want to do?" It is defined in terms of the equipment, services, or modifications to tasks which facilitate full participation and independent living. Areas of accommodation include home, workplace, school, other business and organizations, and other community settings. This aspect of the environment either restricts or facilitates an individual's ability to participate in an activity once he or she is at the location of that activity.

Resource availability addresses the question of, "Are your special needs met?" It is defined in terms of the availability and provision of services and resources made necessary by the particular disability. These may include medical care, personal assistant services, and income security. This category assesses the degree to which the extra resources needed by a person with a disability are available.

Social support addresses the question, "Are you accepted and supported by those around you?" It is defined in terms of the attitudes and prejudices of others which either discourage community integration or provide a supportive environment that allows community integration to flourish. Social support may be provided by family and friends, employers and teachers, neighbors and peers, and other community members. This category focuses on the social barriers which can only be remedied by attitude change in others. Extra funding is not likely to solve these particular problems.

Finally, *equality* addresses the question, "Are you treated equally with others?" It is defined in terms of the degree to which the policies and regulation of governments and institutions insure equality of opportunity for people with disabilities. Included in this category are discrimination, financial disincentives, health care management and rationing, and legislative mandates to name a few.

These five environmental characteristics form useful criteria for evaluating environments. However, they must be applied to each individual's own situation, since the same environment that may restrict one person may assist or not affect another. In each case, these five environmental characteristics can be assessed on a continuum ranging from restrictive barriers to inclusive facilitators.

In addition to these two methods of conceptualizing the environment (by listing its elements and by defining influential characteristics) a more recent method of characterizing disability has also been suggested which plays a substantial role in the design of this project. For several years, the study of disability has progressed through research isolated on the study of diagnostic categories. For example, considerable research relating to disability issues has focused on either spinal cord injury, traumatic brain injury, stroke, visual impairments, hearing impairments, etc. Most research did not cross diagnostic groups and was categorically funded due to interest in a particular diagnosis. In 1997 the CDC announced two programs related to disability (730 and 731, which funded the research described herein) which defined four primary disability domains without reference to impairment diagnoses. These included *mobility limitations*, *personal care/home management limitations*, *communication limitations*, and *learning limitations*. This newer approach focuses disability research on common themes of limitation which cross multiple diagnoses. Furthermore, this approach is grounded in a growing body of literature which demonstrates that considerable commonality of secondary conditions result from a wide variety of primary diagnoses (White, et al, 1996).

Creation of the Environmental Instrument

Using multiple methodologies, pools of qualified persons were identified to participate in four separate advisory panels. Methods for identifying and selecting participants assured that a wide and varied range of abilities, disabilities, attitudes, philosophies, knowledge and skills were reflected in the panel meetings. This group included a diverse array of 32 participants with expertise in the four areas of disability: mobility, self-care, learning, and communication limitations. Each individual brought his or her personal and professional perspectives and experiences on disability, participation, and the impact of the environment. The group consisted of professors, researchers and academicians representing the fields of sociology, occupational therapy, economics, public health and philosophy. Universities represented included Boston University, Rutgers University, the University of Denver, Queens University in Ontario, the State University of New York (Buffalo, Plattsburgh), University of Illinois at Chicago, University of California-Berkeley, Ohio State University, and the University of North Carolina.

There were representatives from such advocacy and policy implementation groups as the Institute on Disability and Human Development, the American Foundation for the Blind, the Paralyzed Veterans of America, and the Access Board, while the U.S. government had representatives from the Centers for Disease Control and Prevention and the National Center for Health Statistics. Consumer representatives included Native Americans and individuals with hearing and visual impairments, spinal cord injuries, speech impairments, and cerebral palsy, as well as family members of people with mental retardation and traumatic brain injury. Finally, service providers' input was provided by physicians, occupational and physical therapists, a former independent living center director, a director of a university's disabled student services program, and a vocational rehabilitation counselor. These meetings were very productive resulting in 4 draft instruments, one from each group. Each draft instrument was designed to be used in a telephone or 'paper pencil' survey that would be appropriate for general population use, as well as applying to the full range of disability categories.

After reviewing and critically assessing the four instruments, project staff decided the best instrument would come from synthesizing the vital elements, conceptualizations, and spirit of each draft into a fifth or "next generation" survey. Advisory panel members continued to be involved, and to participate via mail. Project staff applied advisory group comments and advice to the development of the draft instrument which identified 25 key elements of the environment. Two forms of the draft instrument were proposed. Both had the same item content, but two different metrics were used to assess environmental impact. In one form, individuals were asked to indicate "how often" a barrier is encountered using response categories of "daily, weekly, monthly, less than monthly, and never". In the other form, individuals were asked to assess the degree to which the environmental element "facilitates or hinders" participation using response categories of "big barrier, little barrier, no impact, little help, and big help." The first form had the advantage of easier response categories, while the second form had the advantage of identifying facilitators as well as barriers.

Initial Pilot Testing

Both forms were tested on a group of 97 people, 50 with disabilities and 47 who indicated they did not have a disability. Results of that pilot testing indicated:

1. The "frequency" response categories were strongly preferred by participants over the "extent of barrier/facilitator" response categories.
2. The "frequency of barrier" response categories better differentiated people with and without disabilities than the "extent of barrier/facilitator" response categories.
3. Correlations between the two response categories, while significant, were relatively low.

Discussions of the results from the comparison of response categories with project staff and representatives who attended advisory panel meetings, yielded a consensus that all 25 items should be retained in the draft instrument, but that a follow-up impact question needed to be added since the correlation between frequency and impact was not particularly high. These discussions led to adding a follow-up question, "When this problem occurs, is it usually a big problem or a little problem?" This question was added after each item where the respondent indicated the frequency of the problem to be anything other than never. The final draft instrument, the Craig Hospital Inventory of Environmental Factors (CHIEF) was distributed to all advisory panel members for review.

Testing of the Environmental Instrument

Instrument Validation - "CHIEF 400 Dataset"

A convenience sample of 409 individuals with disability was recruited for a validation study to test the psychometric properties of the CHIEF. The sample included available people with spinal cord injury and traumatic brain injury who had been treated at Craig Hospital (but not included in prior pilot tests of the instrument). The sample also included individuals recommended for recruitment by advisory panel members, professional colleagues, and acquaintances of other project staff and research participants. In total, the sample included 124 participants with spinal cord injury, 120 participants with traumatic brain injury and 165 participants with a wide variety of other disabilities. This included 55 persons with Multiple Sclerosis, 35 persons with amputations, and others with auditory and visual impairments, developmental disabilities, Cerebral Palsy and some with multiple impairments resulting in disability. While the spinal cord injury group was 80% male with an average age of 41 and the traumatic brain injury group was 61% male with an average age of 41, the variety of other impairments were 62% female with an average age of 48.

All 409 study participants were administered the CHIEF. In addition, 103 of the total 409 participants (46 with SCI, 44 with TBI, and 13 with other impairments) were interviewed using CHIEF a second time, approximately two weeks after the first administration in order to assess test-retest reliability. Finally, family members or friends of 125 subjects (46 with SCI, 54 with TBI, and 25 with other impairments), not included in the test-reliability sub-study, were successfully recruited and asked to complete the CHIEF as a proxy for the subject in order to assess subject-proxy agreement.

This completed dataset will be later referred to as the "*CHIEF 400 Dataset*". Analysis of this data began by defining three methods of scoring each item:

1. A frequency score on a scale of 0-4 indicating the frequency with which barriers were encountered (0=never, 1=less than monthly, 2=monthly, 3=weekly, and 4=daily).
2. A magnitude score on a scale of 0-2 indicating the size of the problem which a barrier typically presented (0=no problem since the barrier was never encountered, 1=a little problem, and 2=a big problem).
3. A frequency-magnitude product score on a scale of 0-8 calculated as the product of the frequency score and the magnitude score, indicating the overall impact of the barrier.

Total scores across the 25 items were calculated as the average frequency score, the average magnitude score, and the average frequency-magnitude product score across all of the non-missing scale items.

Test-Retest Reliability

Test-retest reliability of individual items and the total scale were calculated using both the intra-class correlation coefficient and the percent of cases with exact agreement between both tests. Mean difference scores between the test and retest were also calculated and significance assessed. This process was repeated for frequency scores, magnitude scores, and frequency-magnitude product scores. In general, the product scores showed slightly higher reliability co-efficient and they became the focus of additional psychometric analysis.

Table 1 presents all test-retest comparison data (separately for frequency and magnitude), while Table 2 presents the test-retest reliabilities for the frequency magnitude product scores. These tables report item and total scale reliability scores. Data are presented separately for spinal cord injury, traumatic brain injury, and "other" impairment groups, as well as total sample reliability statistics. These data indicate a total scale score ICC reliability of .926, indicating acceptable reliability for the instrument.

Subject-Proxy Agreement

After establishing test-retest reliability for CHIEF, the extent of subject-proxy agreement was analyzed. Tables 3 and 4 present the results of frequency and magnitude comparisons and frequency magnitude product data respectively in a format identical to Tables 1 and 2. Across all disability sub-groups subject proxy interclass correlations ranged from .406-.699 with a total scale ICC of .618. These data indicate that subject proxy agreement is marginal and result in the recommendation that proxies not be asked to complete CHIEF when subjects are unavailable to do so.

As one method of validating the data collected in CHIEF, differences in response patterns were compared across impairment groupings in an effort to determine if the

instrument differentiated among impairment groups in expected ways. Tables 5, 6 and 7, report percent frequency distributions of the raw data across the 25 items for spinal cord injury, traumatic brain injury, and other impairment groups respectively. Table 8 presents the mean frequency-magnitude product scores for persons with spinal cord injury, traumatic brain injury, MS, amputees, and other impairments as well as the total sample mean. Tests of differences among the five groupings were compared using one-way analysis of variance with Bonferroni post hoc comparisons. Significant main effects and significant differences between groups are indicated in the table. It can be seen that the majority of items and sub-scales produce statistically significant differences among the impairment groups. Cases with TBI scored dramatically lower on physical barriers than the other groups. These data lend support to the validity of CHIEF by indicating that the tool differentiates scores among different disability groups in ways that are consistent with the unique barriers faced by those groups.

Further Evaluation of the Environmental Instrument

Additional evaluation of the CHIEF was performed to: 1) examine the underlying dimensions that might exist within the context of the 25 items; 2) demonstrates its applicability to large-scale disability surveillance; 3) establish scoring norms; and 4) develop a CHIEF Short Form. This was accomplished by adding the CHIEF to the Behavioral Risk Factor Surveillance System (BRFSS) survey in Colorado. In 1999, a second population-based sample was drawn and this sample was administered the: 1) BRFSS core survey; 2) BRFSS Quality of Life Module; 3) BRFSS State-added Disability Questions; 4) Craig Handicap Assessment and Reporting Technique Short Form (CHART-SF); and 5) CHIEF. The survey was administered via telephone to 2,259 individuals. This completed dataset will be henceforth referred to as the "*BRFSS Dataset*".

The BRFSS data was weighted using the standard BRFSS weighting formula. In addition, post-stratification weighting has been applied to account for differences in age and gender between the sample and the population of Colorado. All analyses have been performed using the weighted data; therefore, the results can be generalized to the entire population of Colorado, 18 years or older.

Identification of CHIEF Subscales

Factor analysis was used to identify underlying dimensions, or subscales, within CHIEF. This analysis was performed on the 25 CHIEF items with five factors accounting for 48% of the cumulative variance across the 25 items. After varimax rotation, each item was assigned to the factor with the highest positive loading. This resulted in five factors with 3-7 items included in each factor. Descriptive labels for the factors were assigned including "attitude and support barriers", "services and assistance barriers", "physical and structural barriers", "policy barriers" and "work and school barriers".

Scoring Differentiation Between Groups

Across items, subscales and total scores, the CHIEF was able to show differences in reported frequency and magnitude of environmental barriers between groups with a variety of impairments and activity limitations. Table 9 summarizes the mean and standard deviation for each CHIEF item, subscale and total score using the two datasets (CHIEF 400 and BRFSS) grouped by disability status.

Subjects within the BRFSS Dataset were differentiated by whether or not they had a "disability". This was determined by using a definition where a subject was considered "disabled" if they responded "yes" to any of the following questions: 1) Are you limited in the kind or amount of work you can do because of any impairment or health problem; 2) Because of any impairment or health problem, do you have any trouble learning, remembering or concentrating; 3) Do you use special equipment or help from others to get around; 4) Are you limited in any way in any activities because of any impairment or health problem. Within the "CHIEF 400 Dataset", subjects were differentiated by the same impairment categories as previously described.

Figures A through F provide a graphic summary of the information in Table 9. Figure A shows the CHIEF subscales and total scale mean scores by disability status. This figure indicates that both people with and without disabilities experience environmental barriers. However, those with disabilities reported an overall higher frequency and magnitude of environmental barriers. Further, individuals with TBI reported greater barriers than those identified as having a disability from the BRFSS data (see definition above), but fewer than individuals with SCI. Individuals with other types of impairments (i.e., MS, Amputees, other auditory, visual and multiple impairments, DD, CP) reported the greatest barriers.

Figures B through F show the mean scores for each CHIEF subscale and the items on that subscale by disability status. Overall, the same general trend is seen, however some items and subscales do vary by disability status. This analysis confirms that the CHIEF has the ability to differentiate between those with and without disability and between different impairment groups.

Development of the CHIEF Short Form

Several criteria were used to determine which items should be retained for a "short form" version of the CHIEF. In general, these criteria included items which: 1) had the highest frequency of barrier mean scores; 2) had the highest magnitude of barrier mean scores; 3) had the highest item score-subscale score correlations (using the mean frequency-magnitude product score); 4) had the highest item score-total score correlations (using the mean frequency-magnitude product score); 5) were the most frequently reported barriers; and 6) best differentiated between people with and without disability. In addition, taking all of the criteria into consideration, if an item was to be excluded, but it was felt, conceptually should be in the scale, it was retained.

Results of this analysis identified 12 items within the original five subscales to be retained. Table 10 shows the mean and standard deviation for each CHIEF-SF item, subscale and total score using the two datasets (CHIEF 400 and BRFSS) grouped by disability status. Figures G and H provide a graphic summary of the information in Table 10. Figure G shows the CHIEF-SF subscales and total scale mean scores by disability status, and Figure H shows the total scale and item mean scores by disability status. These figures further substantiate the findings from the CHIEF Long Form.

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Table 1: Test-Retest comparisons (ICC, percent agreement, and mean differences) across impairment group and total

Test-Retest Question	Measurement	SCI n=46			TBI n=44			Other n=13			Total n=103		
		ICC	% Correct	Mean Difference	ICC	% Correct	Mean Difference	ICC	% Correct	Mean Difference	ICC	% Correct	Mean Difference
Transportation	Frequency	.713	73.9	.020	.703	79.5	.341*	.951	76.4	-.077	.749	76.7	-.146
	Magnitude	.772	76.9	.065	.603	63.6	.159	.905	80.0	.000	.743	80.6	.097
Design home	Frequency	.563	63.0	-.217	.239	81.8	-.609	.859	84.6	.307	.556	73.8	-.165
	Magnitude	.564	71.4	.091	.306	66.7	-.023	.851	75.0	-.154	.573	78.2	-.049
Design work/school	Frequency	.635	50.0	.300	.252	75.9	.276	.698	63.6	.454	.598	65.0	.316*
	Magnitude	.412	81.8	.100	.568	100.0	.000	.798	100.0	.000	.629	75.0	.033
Design community	Frequency	.476	58.7	.369*	.528	79.5	-.027	.808	69.2	.307	.629	68.9	-.194
	Magnitude	.666	75.8	.087	.568	60.0	.021	.688	100.0	-.154	.733	74.8	-.068
Natural Environment	Frequency	.510	58.7	.044	.561	67.4	.116	.740	46.2	.154	.625	60.8	-.088
	Magnitude	.478	78.9	.087	.629	58.8	-.139	.889	88.9	.000	.642	68.6	-.098
Surroundings	Frequency	.573	54.3	.021	.678	65.9	.023	.762	61.5	.154	.648	60.2	.038
	Magnitude	.378	93.3	.089	.670	88.9	.023	.861	87.5	.000	.575	72.5	.049
Information	Frequency	.619	63.0	.304*	.639	67.4	.047	.375	53.8	-.154	.597	63.7	-.176
	Magnitude	.343	81.8	-.217	.583	87.5	-.024	.363	66.7	.154	.461	69.3	-.109
Education/training	Frequency	.511	73.9	-.109	.327	68.2	.000	.075	33.5	-.231	.369	67.0	-.077
	Magnitude	.618	70.0	.065	.559	57.1	-.023	-.030	38.3	-.077	.496	68.6	.009
Medical Care	Frequency	.659	63.0	-.109	.318	77.3	-.182	.434	61.5	.615	.511	68.9	-.048
	Magnitude	.681	83.3	-.174	.446	50.0	-.139	.480	33.3	.231	.626	71.6	-.107
Equipment	Frequency	.665	60.9	.130	.535	84.1	.045	.483	38.5	-.077	.635	68.0	-.087
	Magnitude	.752	61.1	.000	.752	100.0	.093	.434	75.0	.000	.677	78.4	.039
Technology	Frequency	.627	63.0	.413*	.479	76.7	.116	.149	61.5	-.462	.537	68.6	-.177
	Magnitude	.565	64.3	.109	.453	66.7	.186	.536	100.0	-.307	.524	74.5	-.088
Help home	Frequency	.752	50.0	-.217	.652	84.1	-.068	.616	53.8	-.077	.730	65.0	-.077
	Magnitude	.624	72.7	.111	.706	60.0	.023	.515	60.0	.154	.684	72.5	-.078
Help work	Frequency	.513	68.4	-.211	.537	65.5	-.035	.816	63.6	.091	.601	66.1	-.067
	Magnitude	.823	100.0	-.105	.554	66.7	-.071	.878	75.0	.000	.755	75.9	-.069
Help community	Frequency	.563	63.0	.044	.796	86.4	-.069	.385	46.2	.307	.627	71.6	-.088
	Magnitude	.751	82.4	.022	.797	85.7	.023	.854	80.0	-.077	.794	80.4	.009
Attitudes home	Frequency	.718	73.9	.022	.719	68.2	-.046	.390	76.9	.153	.674	72.5	.009
	Magnitude	.644	83.3	-.022	.697	63.6	-.048	.536	33.3	.000	.649	75.2	-.029
Attitudes work/school	Frequency	.382	60.0	-.400	.870	86.2	-.035	.762	81.8	-.272	.687	76.7	-.200*
	Magnitude	.282	80.0	-.250	.906	100.0	.000	.710	50.0	-.182	.676	77.6	-.120
Attitudes community	Frequency	.853	78.3	-.044	.907	79.5	.136	.753	53.8	.000	.864	75.7	-.038
	Magnitude	.599	58.3	.087	.789	92.3	.114	.536	40.0	-.154	.445	74.8	.029
Support in home	Frequency	.560	89.1	.022	.845	86.4	-.045	.793	84.6	.077	.772	87.4	.000
	Magnitude	.460	50.0	.044	.864	80.0	-.068	.692	100.0	.307	.712	85.4	.029
Support work/school	Frequency	.404	60.0	.300	.801	79.3	-.034	.268	63.6	.000	.557	70.0	-.116
	Magnitude	.326	50.0	-.050	.679	60.0	.034	.250	100.0	-.300	.469	72.9	-.051
Support community	Frequency	.743	67.4	.044	.659	75.0	-.136	.676	53.8	-.307	.696	68.9	-.038
	Magnitude	.473	60.0	.044	.584	85.7	.000	.700	75.0	-.154	.540	73.8	.000
Discrimination	Frequency	.768	67.4	.043	.788	70.5	.045	.787	69.2	-.307	.779	98.9	.000
	Magnitude	.867	80.8	.067	.719	91.7	.045	.799	66.7	-.230	.806	81.4	-.019
Services community	Frequency	.695	57.8	-.244	.589	79.5	.000	.786	61.5	-.077	.693	67.6	-.098
	Magnitude	.688	75.0	.114	.689	80.0	-.024	.680	50.0	.154	.703	74.7	.060
Policies of business	Frequency	.753	60.9	-.011	.521	68.2	.091	.728	61.5	.385	.645	64.1	.068
	Magnitude	.506	64.3	-.065	.501	100.0	.046	.741	50.0	-.231	.543	69.6	-.019
Educat/Employ policies	Frequency	.278	67.7	-.097	.419	69.2	.205	.560	33.3	-.167	.407	63.4	-.036
	Magnitude	.442	50.0	-.129	.129	60.0	-.103	.173	66.7	.083	.258	61.0	.012
Government policies	Frequency	.630	52.2	.000	.749	76.7	.000	.720	61.5	.000	.698	63.7	.000
	Magnitude	.590	77.3	.000	.721	87.5	.000	.649	60.0	.000	.679	71.6	.000
Total Frequency		.904		.067	.911		.050	.915		.061	.912		-.059*
Total Magnitude		.849		.034	.890		.029	.886		.025	.881		-.031

Table 2: Test-Retest comparisons (ICC, percent agreement, and mean differences) across impairment group and total using the product for each item

Test-Retest score Question	SCI n=46			TBI n=44			Other n=13			Total n=103		
	ICC	% Correct	Mean Difference	ICC	% Correct	Mean Difference	ICC	% Correct	Mean Difference	ICC	% Correct	Mean Difference
Transportation	.769	71.7	.000	.634	77.3	.386	.924	76.9	.153	.753	74.8	.184
Design home	.584	59.1	.318	.107	81.8	.136	.865	76.9	.615	.535	71.3	.277
Design work/school	.543	50.0	.150	.543	75.9	.344	.885	63.6	.454	.680	65.0	.300
Design community	.485	50.0	.652	.735	75.0	.068	.883	67.2	.538	.689	63.1	.388*
Natural Environment	.628	47.8	.087	.610	62.8	.139	.782	46.2	.077	.694	53.9	.107
Surroundings	.662	53.3	-.044	.698	63.6	.045	.764	61.5	.462	.703	58.8	.058
Information	.621	60.9	.413	.656	69.0	.071	.307	53.8	.615	.588	63.4	.297
Education/training	.557	69.6	-.022	.401	67.4	-.139	-.016	38.5	-.307	.409	64.7	-.108
Medical Care	.700	60.6	-.195	.249	76.7	-.348	.337	61.5	1.00	.504	67.6	-.107
Equipment	.659	54.3	.283	.548	86.0	.069	.336	38.5	-.076	.610	65.7	.147
Technology	.530	60.9	.652	.547	72.1	.465	.317	61.5	-.615	.533	65.7	.412
Help home	.742	44.4	.467	.756	84.1	.000	.653	46.2	-.769	.752	61.8	.303
Help work/school	.728	68.4	-.105	.697	67.9	-.214	.718	54.5	.454	.725	65.5	-.051
Help community	.685	60.9	.152	.755	88.4	.116	.434	46.2	.846	.678	70.6	.225
Attitudes home	.790	73.9	.174	.788	66.7	.047	.169	69.2	.384	.705	70.3	.148
Attitudes work/school	.383	55.0	-.450	.961	88.9	-.074	.454	81.8	-.636	.741	75.9	-.310*
Attitudes community	.878	69.6	-.195	.949	77.3	.204	.553	53.8	.538	.882	70.9	.068
Support home	.612	87.0	.065	.853	84.1	-.136	.736	76.9	.461	.727	84.5	.029
Support work	.336	60.0	-.250	.821	75.9	.034	.678	70.0	-.300	.564	69.5	-.118
Support community	.745	63.0	.217	.698	75.0	.159	.886	53.8	-.307	.743	67.0	.126
Discrimination	.829	64.4	.111	.804	70.5	.181	.746	61.5	-.615	.807	66.7	.049
Services community	.823	56.8	.409*	.643	83.3	.071	.824	53.8	.307	.771	67.7	.252
Policies business	.838	54.3	-.043	.567	69.8	.069	.677	46.2	1.00	.689	59.8	.137
Educat/Employ policies	.339	54.8	-.290	.236	66.7	.462	.570	33.3	.333	.332	57.3	.158
Government policies	.703	47.8	.130	.745	76.7	.093	.710	53.8	.153	.728	60.8	.117
Total	.915		3.26*	.933		1.97	.923		6.31*	.926		3.09*

Table 3: Test-Proxy comparisons (ICC, percent agreement, and mean differences) across impairment group and total

Test-Proxy Question	Measurement	SCI n=46			TBI n=54			Other n=25			Total n=125		
		ICC	Correct %	Mean Difference	ICC	Correct %	Mean Difference	ICC	Correct %	Mean Difference	ICC	Correct %	Mean Difference
Transportation	Frequency Magnitude	.571 .451	67.4 69.6	.044 -.239	.488 .543	64.2 69.8	.000 -.094	.616 .537	44.0 64.0	-.320 -.400*	.572 .542	61.3 68.5	-.048 -.209*
Design home	Frequency Magnitude	.442 .491	58.7 58.7	-.044 -.044	.512 .512	81.5 85.2	-.148 -.074	.391 .263	52.0 48.0	-.520 -.480*	.513 .477	67.2 70.4	-.024 -.072
Design work/school	Frequency Magnitude	.242 .013	35.0 50.0	-.200 -.150	.281 .281	79.4 76.5	-.235 .000	.147 .172	14.3 28.3	-.157* -.857*	.403 .351	57.4 62.3	-.377* -.147
Design community	Frequency Magnitude	.488 .172	30.4 45.7	-.30 -.231	.653 .543	77.8 81.5	.000 .037	.576 .622	40.0 64.0	-.400 -.160	.662 .572	52.8 64.8	-.128 -.104
Natural Environment	Frequency Magnitude	.194 .055	41.3 30.4	.065 -.087	.317 .410	49.1 52.8	-.132 .037	.473 .274	28.0 48.0	-.160 .080	.369 .393	41.9 43.5	-.040 .000
Surroundings	Frequency Magnitude	.351 .408	41.3 47.8	.022 -.044	.514 .632	40.0 61.5	-.326 -.134	.399 .588	25.0 45.8	-.083 -.125	.478 .573	37.7 53.3	-.147 -.098
Information	Frequency Magnitude	.009 .365	54.3 56.5	.109 .022	-.001 -.027	50.9 53.8	-.207 -.076	.375 .124	36.0 36.0	-.280 -.160	.182 .187	49.2 51.2	-.105 -.057
Education/training	Frequency Magnitude	.283 .309	63.0 65.2	-.456* -.261*	.218 .454	63.0 70.4	-.296 -.074	.206 .225	28.0 32.0	-.600 -.520*	.281 .389	56.0 60.8	-.416* -.232*
Medical Care	Frequency Magnitude	.357 .599	54.3 56.5	.108 .000	.456 .309	69.8 67.9	-.226 -.163	.436 .369	41.7 50.0	-.485* -.333	.428 .478	58.5 60.2	-.146 -.113
Equipment	Frequency Magnitude	.026 .091	37.0 45.7	.196 .196	.125 .216	89.0 89.0	-.185 -.074	.525 .524	48.0 56.0	-.600* -.400*	.324 .398	60.8 65.6	-.128 -.040
Technology	Frequency Magnitude	-.140 -.058	57.8 55.6	.089 .022	.381 .295	76.5 78.0	.039 -.040	.195 .416	40.0 48.0	-.600* -.120	.206 .261	62.0 63.3	-.181 -.050
Help home	Frequency Magnitude	.603 .262	45.7 36.4	-.087 -.409*	.282 .356	67.3 69.2	-.500* -.231	.398 .182	44.0 48.0	-.160 -.440	.486 .342	54.5 52.9	-.276* -.338*
Help work/school	Frequency Magnitude	.026 .452	65.0 65.0	.100 -.100	.076 -.024	69.7 72.3	-.090 -.030	.451 .600	42.9 42.9	-.428 .000	.309 .475	65.0 66.7	-.067 -.050
Help community	Frequency Magnitude	.234 .519	47.8 52.2	-.282 -.130	.152 .555	75.5 80.8	-.264 -.096	.127 .229	48.0 40.0	.080 -.080	.201 .516	56.5 61.8	-.193 -.073
Attitudes home	Frequency Magnitude	.341 .223	60.9 64.4	-.311 -.222	.436 .393	60.4 67.9	-.056 .037	.633 .528	44.0 48.0	-.040 -.160	.457 .378	57.7 62.6	-.130 -.097
Attitudes work/school	Frequency Magnitude	.010 -.034	60.0 47.8	-.300 -.300	.332 .383	60.6 66.7	-.181 -.090	.455 -.102	33.3 33.3	-.667 -.883	.334 .226	57.6 62.7	-.271 -.237*
Attitudes community	Frequency Magnitude	.333 .454	47.8 47.8	.087 .108	.535 .345	69.2 67.3	-.077 -.135	.350 .554	54.2 37.5	-.333 -.208	.434 .461	58.2 54.1	-.065 -.057
Support home	Frequency Magnitude	.222 .020	62.2 65.9	-.159 -.272*	.116 .229	67.3 69.2	.039 .057	.127 .034	48.0 52.0	.080 .000	.161 .105	62.0 64.5	-.024 -.074
Support work/school	Frequency Magnitude	-.026 .159	75.0 75.0	-.050 -.050	.316 .683	69.7 78.8	.212 .151	.546 .300	33.3 33.3	-.500 -.167	.397 .575	67.8 72.9	-.051 .051
Support community	Frequency Magnitude	.087 .185	65.2 63.0	-.196 -.174	.043 .062	75.5 73.6	-.283* -.188*	.211 .233	40.0 48.0	-.200 -.280	.145 .206	64.5 64.5	-.233* -.202*
Discrimination	Frequency Magnitude	.572 .318	52.2 57.8	.023 -.089	.401 .319	66.0 67.9	-.113 -.189	.549 .449	37.5 50.0	.000 .083	.543 .395	55.3 60.7	-.041 -.098
Services community	Frequency Magnitude	.282 .413	60.9 63.0	-.239 -.108	.492 .684	73.6 76.9	-.094 .039	.135 .182	25.0 45.8	-.083 -.208	.358 .479	59.3 65.6	-.146 -.065
Policies business	Frequency Magnitude	.146 .307	58.7 58.7	-.369* -.174	.069 .125	62.3 66.7	.056 .098	.204 .281	32.0 45.8	-.160 .000	.205 .309	54.8 59.5	-.145 -.024
Educational/employment policies	Frequency Magnitude	.449 .418	66.7 65.7	-.138 -.171	.269 .287	68.6 73.5	-.235 -.102	.658 .416	61.5 50.0	-.384 -.333	.455 .398	67.0 67.7	-.220 -.156*
Government policies	Frequency Magnitude	.146 .204	28.3 50.0	.239 .087	.336 .389	68.5 69.8	.000 -.075	.414 .521	32.0 64.0	.040 -.120	.323 .408	46.4 61.3	.096 -.024
Total Frequency		.572	50.0	-.075	.587	69.8	-.134	.506	64.0	-.179	.625	61.3	-.121*
Total Magnitude		.522	50.0	-.112*	.718	69.8	-.047	.462	64.0	-.191	.658	61.3	-.100*

Table 4: Test-Proxy comparisons (ICC, percent agreement, and mean differences) across impairment group and total using the product for each item

Test-Proxy score Question	SCI n=46		TBI n=54		Other n=25		Total n=125	
	ICC	% Correct	ICC	% Correct	ICC	% Correct	ICC	% Correct
Transportation	.567	63.0	.522	64.2	.612	44.0	.592	59.7
Design home	.604	56.5	.567	81.5	.457	40.0	.580	64.0
Design work	.005	35.0	.363	76.5	.194	14.3	.352	55.7
Design community	.551	26.1	.668	77.8	.697	32.0	.699	49.6
Natural Environment	.204	26.1	.328	47.2	.419	28.0	.363	35.5
Surroundings	.469	41.3	.502	42.3	.444	16.7	.511	36.9
Information	.162	54.3	-.109	50.0	.256	32.0	.154	48.0
Education/training	.207	152	.291	63.0	.269	20.0	.290	53.6
Medical Care	.358	43.5	.443	67.9	.491	37.5	.431	52.8
Equipment	.043	39.1	.066	87.0	.596	48.0	.345	61.6
Technology	-.116	55.6	.377	78.0	.558	36.0	.312	60.8
Help home	.493	36.4	.262	67.3	.381	32.0	.433	48.8
Help work	.110	60.0	.013	69.7	.572	28.6	.408	61.7
Help community	.238	47.8	.225	76.9	.023	32.0	.242	56.9
Attitudes home	.446	62.2	.268	60.4	.640	40.0	.456	56.9
Attitudes work	-.057	60.0	.310	60.6	.398	33.3	.333	57.6
Attitudes community	.265	43.5	.355	61.5	.468	33.3	.365	49.2
Support home	.293	63.6	.157	67.3	.253	48.0	.239	62.0
Support work	-.025	75.0	.614	69.7	.619	50.0	.632	69.5
Support community	.029	60.9	.004	73.6	.339	40.0	.148	62.1
Discrimination	.652	51.1	.339	66.0	.533	33.3	.534	54.1
Services community	.197	58.7	.467	75.0	.138	25.0	.316	59.0
Policies business	.123	56.5	.175	64.7	.218	33.3	.230	55.4
Educat/Employ policies	.545	65.7	.338	73.5	.557	50.0	.479	67.7
Government policies	.177	28.3	.364	67.9	.444	32.0	.348	46.0
Total	.494	-5.28	.618	-.507	.570	-7.20	.618	-5.57*

Table 5: Frequency Distribution for SCI

Question	Never	Less than monthly	Percent				Daily	Little problem	Big problem
			Percent	Percent	Percent	Percent			
Transportation	64.2	15.4	8.1	5.7	6.5	15.4	20.3		
Design of home	52.1	17.4	5.8	5.8	19.0	36.4	11.6		
Design of work	37.9	31.0	6.9	13.8	10.3	51.7	10.3		
Design of community	22.0	26.8	20.3	22.8	8.1	46.3	31.7		
Natural Environment	15.4	35.0	25.2	14.6	9.8	43.1	41.5		
Surroundings	49.6	30.1	13.0	5.7	1.6	38.2	12.2		
Information	59.3	22.0	8.1	8.1	2.4	29.3	11.4		
Education	71.3	18.0	5.7	2.5	2.5	15.6	13.1		
Medical Care	52.8	25.2	15.4	4.1	2.4	25.2	22.0		
Equipment	48.0	27.6	11.4	4.9	8.1	30.1	22.0		
Technology	68.3	9.8	4.1	9.8	8.1	17.9	13.8		
Help in home	43.8	21.5	14.0	8.3	12.4	33.1	23.1		
Help at work	64.9	10.5	7.0	14.0	3.5	21.1	14.0		
Help in community	61.0	19.5	12.2	4.1	3.3	27.6	11.4		
Attitudes at home	79.7	8.9	2.4	4.1	4.9	13.0	7.3		
Attitudes at work	75.9	15.5	5.2	3.4	0.0	22.4	1.7		
Attitudes in community	58.5	20.3	15.4	4.1	1.6	32.5	8.9		
Support in home	88.6	4.9	0.8	0.8	4.9	5.7	5.7		
Support in work	79.3	13.8	3.4	3.4	0.0	17.2	3.4		
Support in community	75.6	12.2	6.5	3.3	2.4	17.1	7.3		
Discrimination	48.8	29.8	12.4	5.8	3.3	34.7	16.5		
Services in community	60.3	19.0	10.7	4.1	5.8	20.7	19.0		
Policies of business	64.2	17.9	13.0	1.6	3.3	17.1	18.7		
Educational policies	68.3	17.8	7.9	4.0	2.0	19.8	11.9		
Government policies	42.3	21.1	17.9	7.3	11.4	19.5	38.2		

Table 6: Frequency Distribution for TBI

Question	Percent					Big problem	Little problem	Percent
	Never	Less than monthly	Monthly	Weekly	Daily			
Transportation	65.0	10.8	5.0	8.3	10.8	20.0	15.0	
Design of home	83.3	2.5	3.3	5.0	5.8	10.0	6.7	
Design of work	79.0	11.1	2.5	3.7	3.7	14.8	6.2	
Design of community	73.3	13.3	5.8	6.7	0.8	18.3	8.3	
Natural Environment	47.1	31.9	11.8	6.7	2.5	30.3	22.7	
Surroundings	44.2	23.3	13.3	10.0	9.2	38.3	17.5	
Information	68.1	10.3	6.0	7.8	7.8	15.5	16.4	
Education	76.5	16.0	1.7	2.5	3.4	15.1	8.4	
Medical Care	79.8	10.1	5.9	3.4	0.8	9.2	10.9	
Equipment	88.2	6.7	5.0	0.0	0.0	7.6	4.2	
Technology	77.3	5.0	1.7	7.6	8.4	6.7	16.0	
Help in home	80.0	6.7	5.8	4.2	3.3	10.0	10.0	
Help at work	81.5	9.9	3.7	4.9	0.0	12.3	6.2	
Help in community	83.9	6.8	5.9	2.5	0.8	8.5	7.6	
Attitudes at home	62.7	15.3	6.8	7.6	7.6	21.2	16.1	
Attitudes at work	73.4	12.7	6.3	5.1	2.5	15.2	11.4	
Attitudes in community	69.2	15.8	7.5	3.3	4.2	19.2	11.7	
Support in home	72.5	15.8	5.8	2.5	3.3	18.3	9.2	
Support in work	71.6	17.3	4.9	4.9	1.2	22.2	6.2	
Support in community	80.8	9.2	3.3	4.2	2.5	13.3	5.8	
Discrimination	66.7	17.5	6.7	4.2	5.0	20.8	12.5	
Services in community	78.0	9.3	4.2	3.4	5.1	11.9	10.2	
Policies of business	70.9	12.0	10.3	3.4	3.4	12.8	16.2	
Educational policies	79.5	8.0	4.5	4.5	3.6	8.9	11.6	
Government policies	75.2	6.0	6.8	2.6	9.4	9.4	15.4	

Table 7: Frequency Distribution for Other Impairments

Question	Percent					Big problem	Little problem	Percent
	Never	Less than monthly	Monthly	Weekly	Daily			
Transportation	49.1	14.9	9.9	16.1	9.9	18.6	32.3	
Design of home	57.4	9.3	5.6	7.4	20.4	18.5	24.1	
Design of work	57.5	13.8	11.5	6.9	10.3	26.4	16.1	
Design of community	29.4	26.4	20.9	15.3	8.0	38.7	31.9	
Natural Environment	16.9	37.5	19.4	15.6	10.6	37.5	45.6	
Surroundings	45.4	19.0	12.9	12.9	9.8	27.0	27.6	
Information	51.5	14.7	12.3	11.7	9.8	20.9	27.6	
Education	68.7	11.7	6.1	6.1	7.4	11.7	19.6	
Medical Care	61.3	19.0	9.8	5.5	4.3	12.3	26.4	
Equipment	54.7	17.4	10.6	4.3	13.0	15.5	29.8	
Technology	55.7	13.9	7.0	10.1	13.3	19.6	24.1	
Help in home	51.9	11.9	11.3	13.1	11.9	18.8	29.4	
Help at work	63.3	13.9	6.3	11.4	5.1	16.5	20.3	
Help in community	59.0	116.8	11.8	6.2	6.2	19.9	21.1	
Attitudes at home	68.1	11.9	5.6	6.9	7.5	15.0	16.9	
Attitudes at work	73.4	7.6	8.9	6.3	3.8	15.2	11.4	
Attitudes in community	58.6	17.9	12.3	4.9	6.2	23.5	17.9	
Support in home	75.0	11.3	3.8	5.0	5.0	7.4	15.6	
Support in work	71.8	11.5	6.4	2.6	7.7	12.8	15.4	
Support in community	66.3	15.3	8.6	5.5	4.3	19.0	14.7	
Discrimination	50.3	27.7	9.4	6.3	6.3	23.9	25.8	
Services in community	56.2	15.4	13.0	7.4	8.0	16.0	27.8	
Policies of business	51.3	25.0	9.4	5.6	8.8	16.9	31.9	
Educational policies	72.2	10.4	3.5	6.9	6.9	6.9	20.8	
Government policies	51.9	16.7	13.6	6.2	11.7	9.3	38.9	

Table 8: Mean Differences Across Groups

	[S]CI	[T]BI	[M]S	[A]mputee	[O]ther	Total
Transportation	1.19 ^o	1.31 ^o	2.18 ^o	1.11 ^o	2.52 ^{sta}	1.59**
Design home	1.60	0.72 ^{mao}	2.21 ^t	2.31 ^t	1.79 ^t	1.51**
Design work	1.62 ^t	0.51 ^{so}	0.75	1.57	1.57 ^t	1.16**
Design community	2.51 ^t	0.64 ^{smao}	2.51 ^t	1.88 ^t	2.30 ^t	1.87**
Natural Environment	2.60 ^t	1.29 ^{smao}	3.22 ^t	2.51 ^t	2.49 ^t	2.27**
Surroundings	1.05 ^o	1.66	1.94	1.08 ^o	2.41 ^{sa}	1.60**
Information	0.95 ^o	1.24 ^o	1.29 ^o	1.14 ^o	2.72 ^{stma}	1.42**
Education/training	0.74	0.62	1.02	1.14	1.32	0.88
Medical Care	1.20	0.58 ^a	1.20	1.68 ^t	1.05	1.03*
Equipment	1.45 ^t	0.24 ^{smao}	1.54 ^t	1.62 ^t	2.14 ^t	1.24**
Technology	1.22	1.16	2.20	0.80	2.07	1.44**
Help home	1.90 ^t	0.71 ^{so}	1.76	1.00 ^o	2.71 ^{ta}	1.59**
Help work	1.17	0.45 ^o	0.30	1.00	1.70 ^t	0.95**
Help community	0.97	0.47 ^o	1.24	0.82	1.70 ^t	0.98**
Attitudes home	0.69	1.27	1.38	0.68	1.35	1.07
Attitudes work	0.37	0.82	0.22	1.00	1.06	0.75
Attitudes community	0.89	0.87	1.09	0.91	1.60	1.04
Support home	0.48	0.71	1.29	0.62	0.77	0.72
Support work	0.37	0.62	0.33	0.96	1.31	0.72
Support community	0.64	0.55	0.91	0.68	1.24	0.76
Discrimination	1.17	0.97 ^o	1.38	0.82	1.87 ^t	1.23**
Services community	1.23	0.81 ^o	1.52	1.00	2.09 ^t	1.28**
Policies business	1.00 ^o	0.93 ^o	1.72	0.97	2.04 st	1.26**
Educat/Employ policies	0.76 ^o	0.75 ^o	0.53 ^o	0.97	1.75 ^{stm}	0.94**
Government policies	2.25 ^t	1.14 ^{so}	1.69	1.94	2.35 ^t	1.84**
Total Average	1.26^o	0.88^{mo}	1.60^t	1.19	1.90st	1.31**

Superscript letter indicates significant difference from the group with initial in bracket.

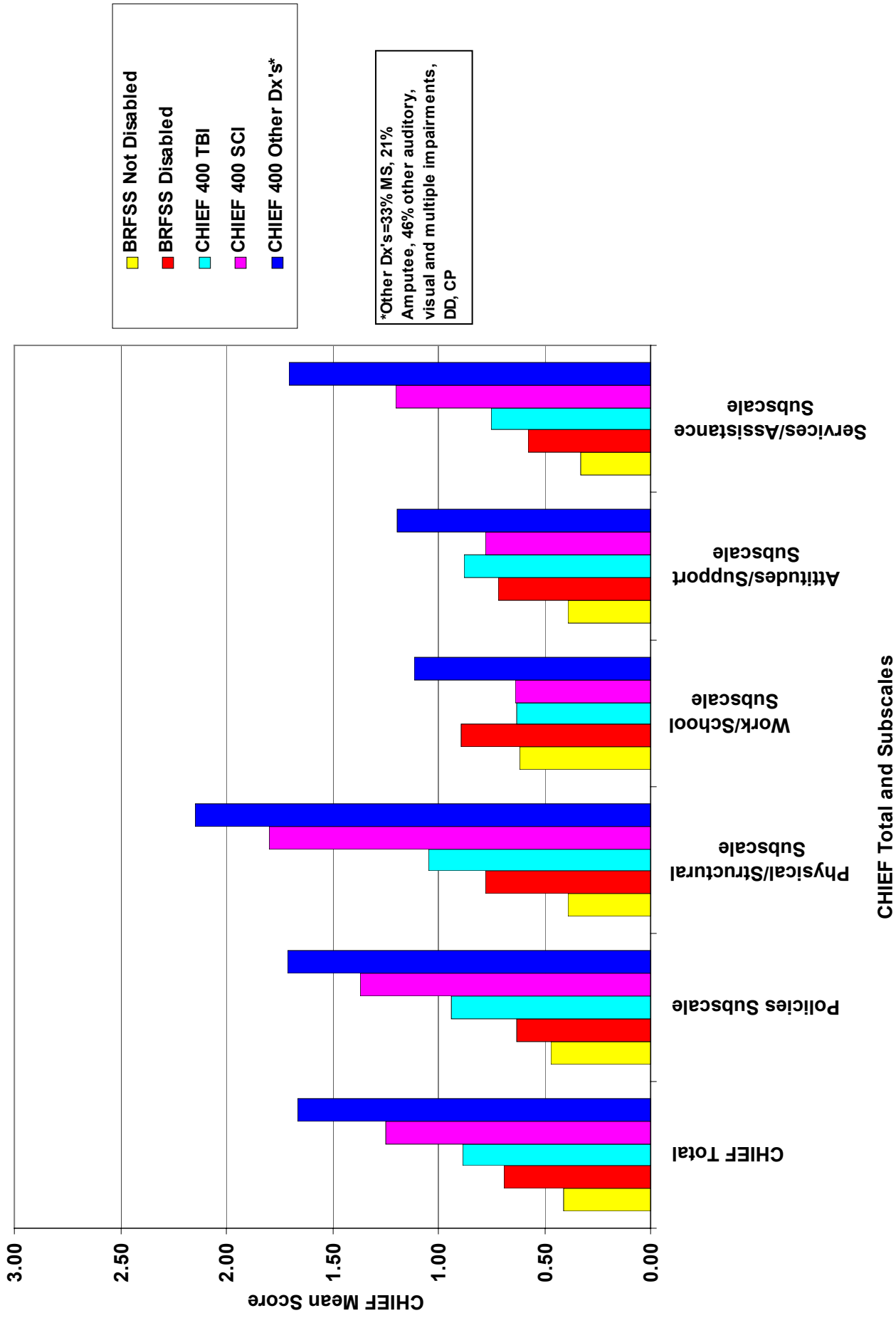
* p<.05

* p<.01

Table 9: Mean product scores for CHIEF items, subscales and total by Disability Status

CHIEF	BRFSS Data						CHIEF 400 Data							
	All Cases		Disabled		Not Disabled		All Cases		SCI		TBI		Other Dx's	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Policies Subscale	0.51	0.96	0.63	1.09	0.47	0.92	1.38	1.81	1.37	1.65	0.94	1.65	1.71	1.99
Policies businesses	0.71	1.61	0.96	1.99	0.64	1.48	1.26	2.17	1.01	1.84	0.93	1.88	1.70	2.51
Policies employment/education	0.46	1.31	0.49	1.39	0.45	1.29	0.94	2.03	0.76	1.54	0.75	1.85	1.20	2.41
Services community	0.22	0.86	0.27	0.85	0.21	0.87	1.28	2.29	1.23	2.14	0.81	2.05	1.67	2.51
Policies government	0.64	1.64	0.82	1.92	0.60	1.55	1.84	2.72	2.22	2.73	1.15	2.48	2.06	2.79
Physical/Structural Subscale	0.47	0.79	0.78	1.22	0.39	0.60	1.72	1.58	1.80	1.34	1.05	1.30	2.15	1.77
Design home	0.33	1.15	0.65	1.78	0.24	0.88	1.52	2.59	1.60	2.37	0.72	1.93	2.05	3.00
Surroundings	0.54	1.42	0.91	1.99	0.44	1.20	1.60	2.25	1.05	1.56	1.67	2.30	1.97	2.55
Design community	0.21	0.92	0.42	1.26	0.16	0.79	1.87	2.31	2.51	2.39	0.64	1.37	2.28	2.45
Design work/school	0.31	1.19	0.50	1.60	0.27	1.08	1.16	2.00	1.62	2.13	0.52	1.28	1.45	2.31
Natural environment	0.76	1.44	1.25	2.19	0.63	1.11	2.27	2.34	2.61	2.26	1.29	1.84	2.74	2.51
Technology	0.64	1.61	0.88	1.99	0.57	1.48	1.45	2.57	1.23	2.34	1.16	2.48	1.84	2.77
Work/School Subscale	0.66	1.13	0.89	1.34	0.62	1.08	0.81	1.52	0.64	0.91	0.63	1.36	1.12	1.93
Support work/school	0.48	1.29	0.71	1.58	0.44	1.22	0.73	1.75	0.38	0.99	0.63	1.44	1.09	2.34
Attitudes work/school	0.99	1.72	1.31	2.17	0.93	1.61	0.75	1.73	0.38	0.77	0.82	1.86	0.95	2.06
Help work/school	0.54	1.43	0.76	1.82	0.50	1.34	0.95	1.90	1.18	2.08	0.46	1.23	1.30	2.23
Attitudes/Support Subscale	0.46	0.88	0.72	1.39	0.39	0.66	0.97	1.44	0.78	1.25	0.88	1.44	1.19	1.55
Support community	0.19	0.91	0.39	1.52	0.14	0.64	0.77	1.72	0.64	1.59	0.56	1.58	1.01	1.90
Attitudes community	0.37	1.04	0.52	1.38	0.32	0.92	1.04	1.91	0.89	1.51	0.88	1.88	1.28	2.16
Support home	0.41	1.21	0.74	1.79	0.32	0.98	0.73	1.85	0.49	1.76	0.72	1.66	0.92	2.04
Attitudes home	0.82	1.65	1.29	2.37	0.69	1.38	1.07	2.21	0.69	1.87	1.28	2.29	1.22	2.35
Discrimination	0.53	1.37	0.79	1.78	0.47	1.23	1.24	2.02	1.17	1.69	0.98	2.02	1.48	2.22
Services/Assistance Subscale	0.39	0.72	0.58	0.93	0.33	0.64	1.27	1.42	1.20	1.16	0.75	1.18	1.70	1.62
Transportation	0.48	1.38	0.50	1.44	0.48	1.36	1.59	2.44	1.19	2.08	1.32	2.31	2.10	2.70
Medical care	0.48	1.39	0.96	1.96	0.34	1.16	1.04	1.85	1.20	1.81	0.59	1.50	1.24	2.05
Help home	0.40	1.15	0.57	1.40	0.35	1.07	1.59	2.48	1.90	2.58	0.72	1.83	2.01	2.67
Education/training	0.34	1.18	0.43	1.33	0.32	1.13	0.89	1.92	0.75	1.66	0.62	1.67	1.18	2.21
Help community	0.20	0.70	0.30	0.88	0.17	0.64	0.98	1.89	0.98	1.76	0.47	1.38	1.36	2.21
Information	0.61	1.37	0.81	1.75	0.56	1.24	1.42	2.31	0.96	1.60	1.24	2.35	1.90	2.64
Personal equipment	0.19	0.99	0.46	1.55	0.11	0.76	1.25	2.23	1.46	2.12	0.24	0.80	1.83	2.72
CHIEF Total	0.47	0.63	0.69	0.87	0.41	0.53	1.31	1.30	1.25	1.08	0.89	1.19	1.66	1.42

Figure A: CHIEF Subscales and Total by Disability Status



*Other Dx's=33% MS, 21% Amputee, 46% other auditory, visual and multiple impairments, DD, CP

Figure B: CHIEF Policies Subscale by Disability Status

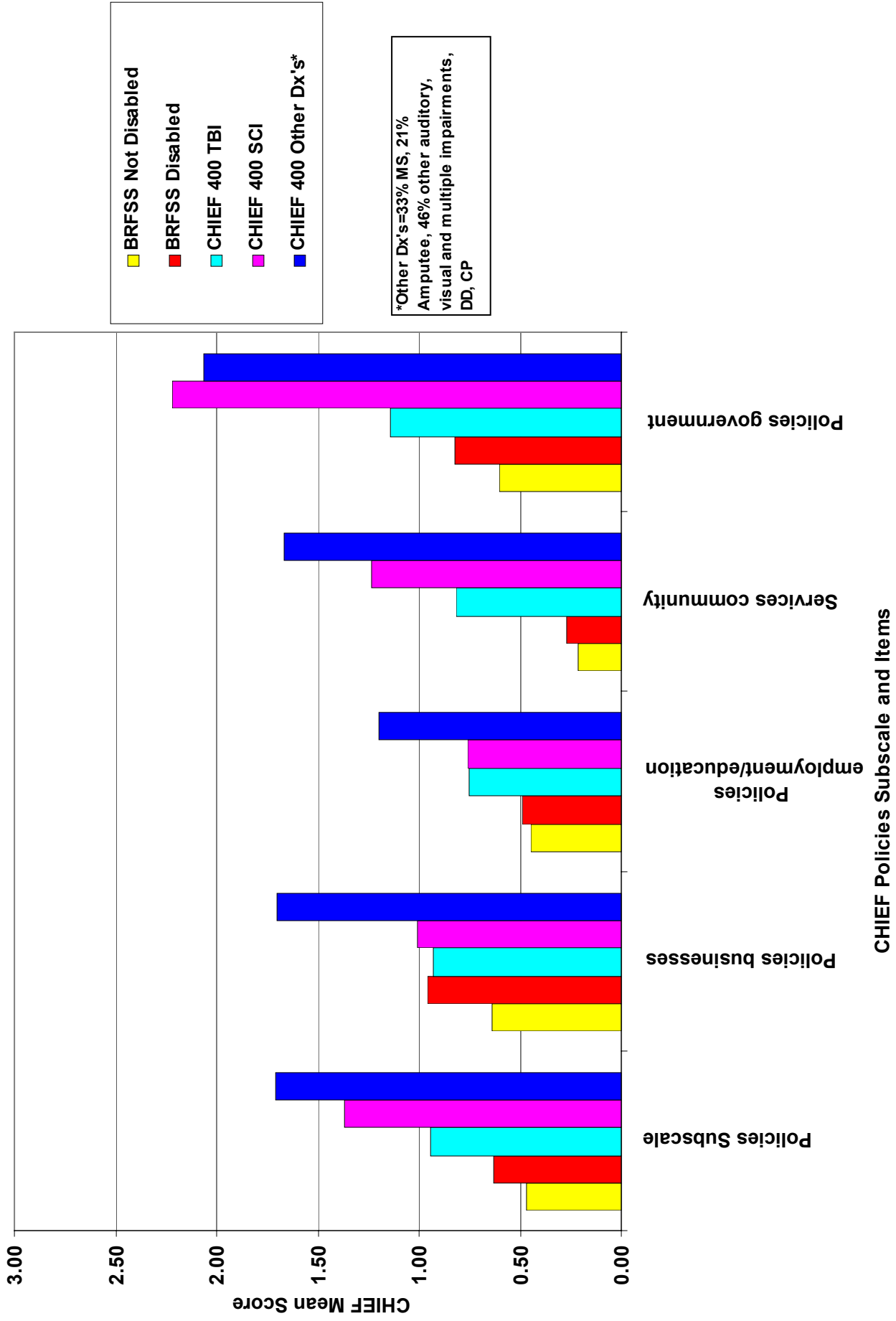


Figure C: CHIEF Physical/Structural Subscale by Disability Status

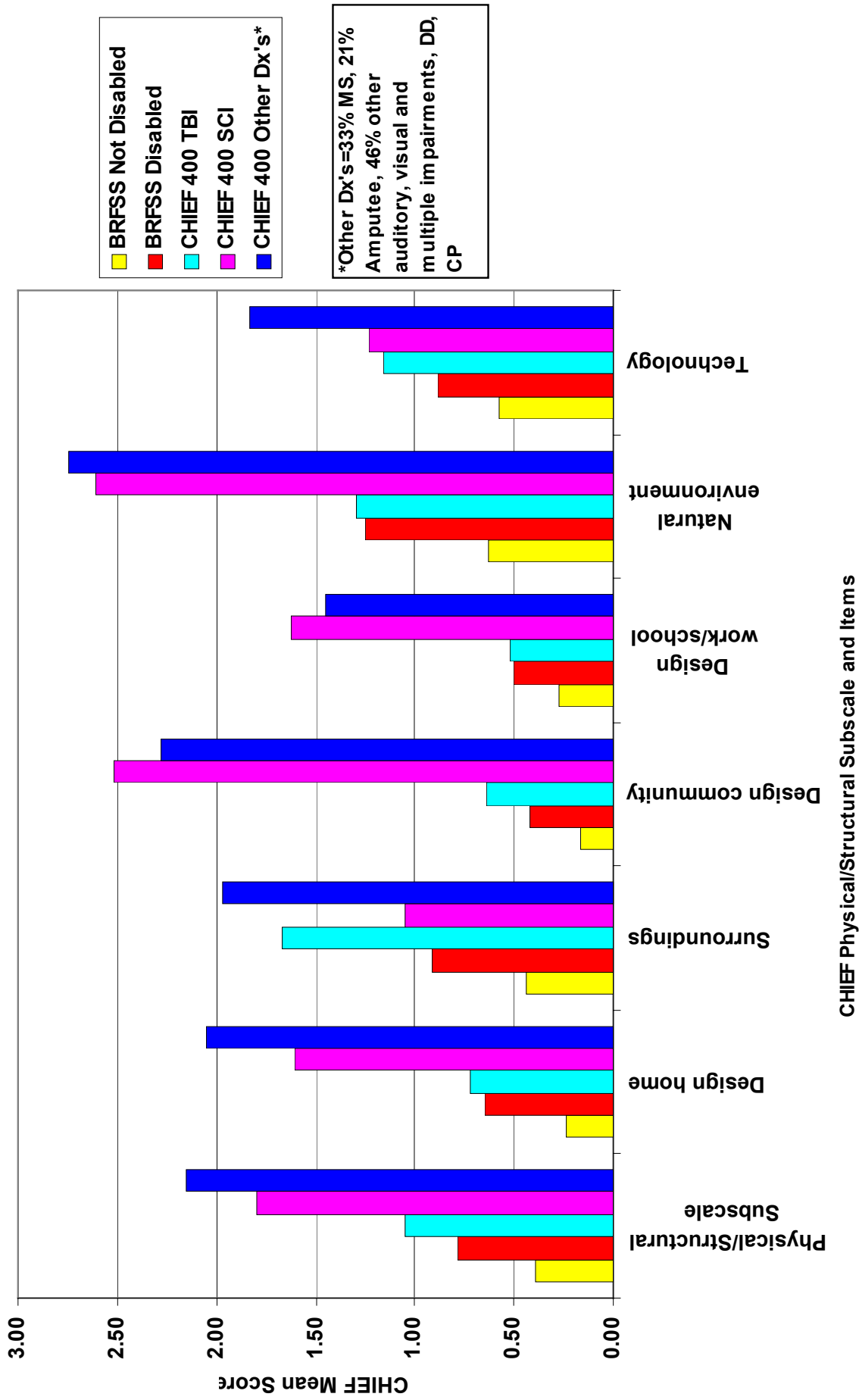


Figure D: CHIEF Work/School Subscale by Disability Status

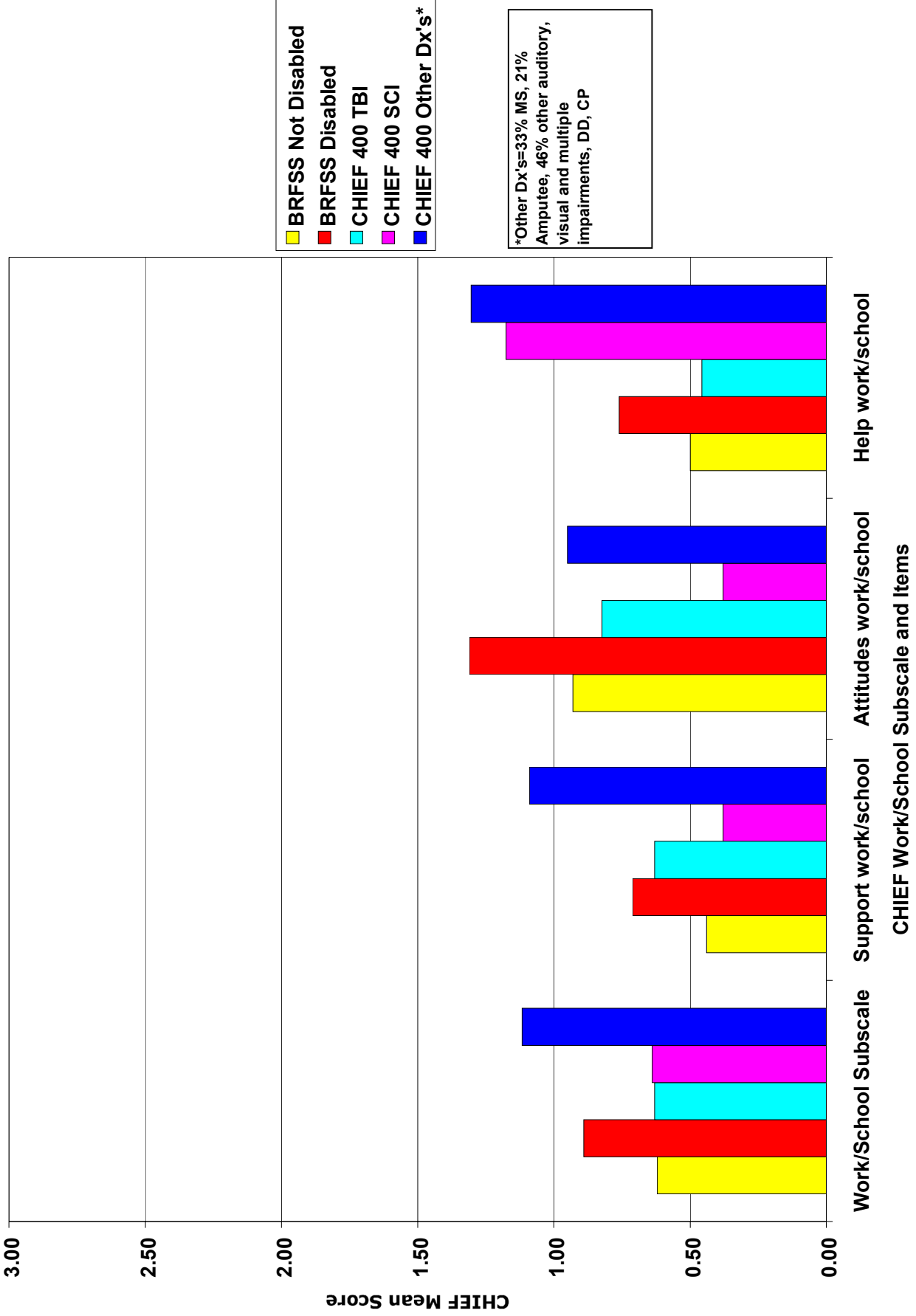


Figure E: CHIEF Attitudes/Support Subscale by Disability Status

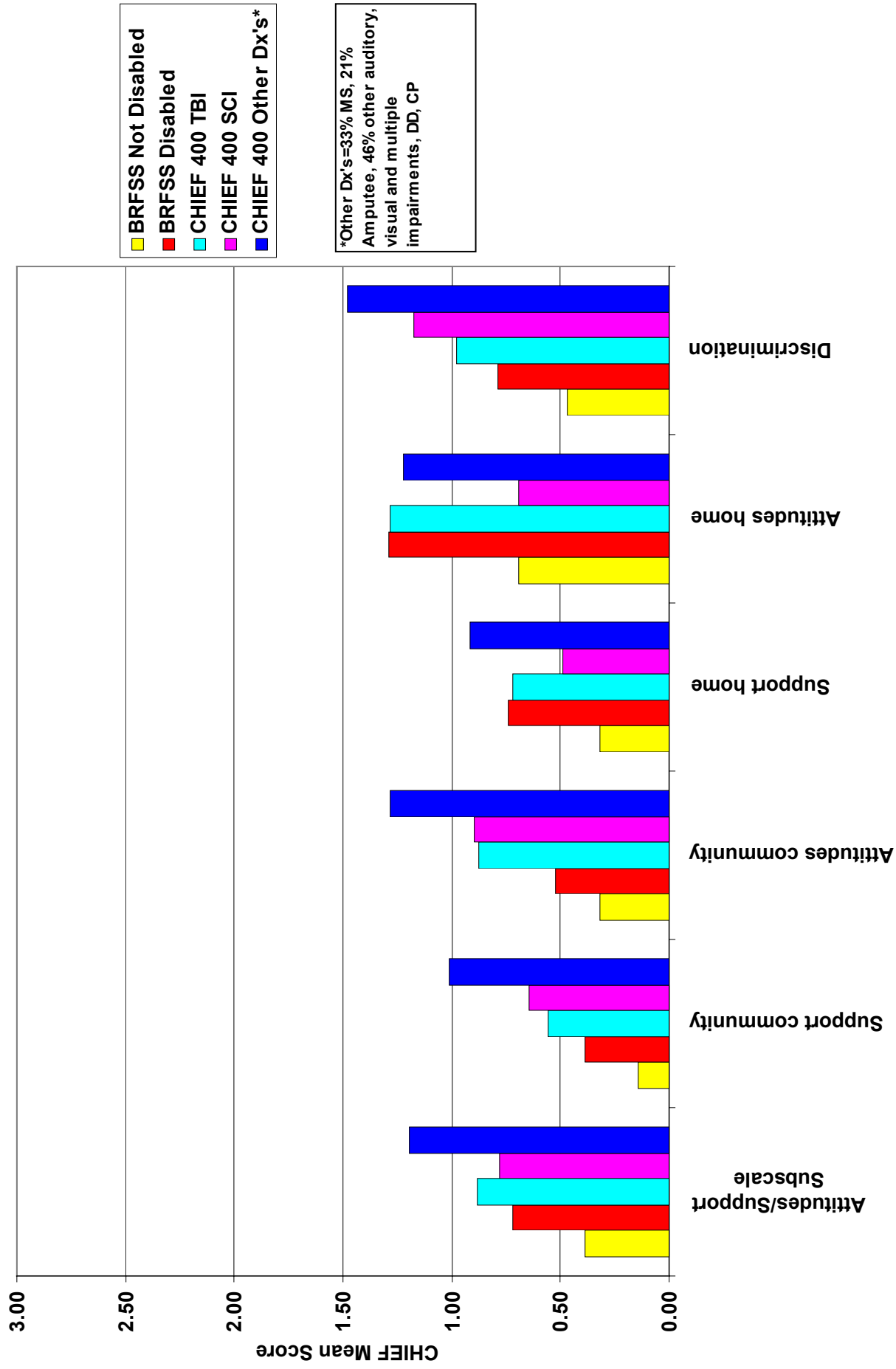


Figure F: CHIEF Services/Assistance Subscale by Disability Status

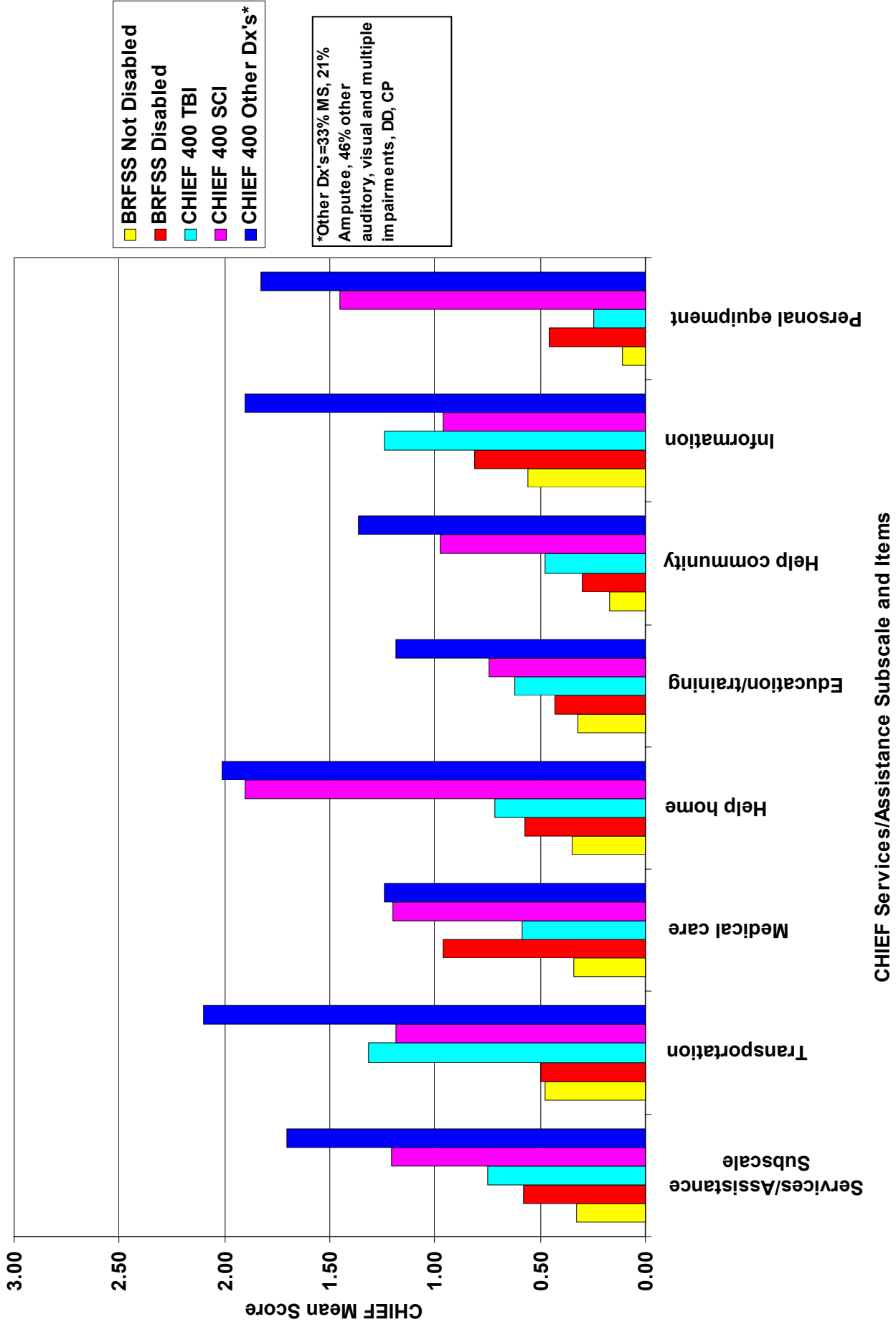


Table 10: Mean product scores for the CHIEF Short Form items, subscales and total by Disability Status

CHIEF-SF	1999 BRFSS Data						CHIEF 400 Data							
	All Cases		Disabled		Not Disabled		All Cases		SCI		TBI		Other Dx's	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Policies Subscale	0.68	1.34	0.89	1.66	0.64	1.34	1.55	2.05	1.61	1.86	1.04	1.84	1.88	2.25
Policies businesses	0.71	1.61	0.96	1.99	0.63	1.48	1.26	2.17	1.01	1.84	0.93	1.88	1.70	2.51
Policies government	0.64	1.64	0.82	1.92	0.60	1.55	1.84	2.72	2.22	2.73	1.15	2.48	2.06	2.79
Physical/Structural Subscale	0.65	1.18	1.08	1.79	0.53	0.92	1.95	1.83	1.83	1.52	1.48	1.69	2.38	2.04
Surroundings	0.54	1.42	0.91	1.99	0.44	1.21	1.60	2.25	1.05	1.56	1.67	2.30	1.97	2.55
Natural environment	0.76	1.44	1.25	2.19	0.63	1.11	2.27	2.34	2.61	2.26	1.29	1.84	2.74	2.51
Work/School Subscale	0.76	1.24	1.00	1.50	0.71	1.18	0.85	1.57	0.77	1.12	0.63	1.43	1.13	1.90
Attitudes work/school	0.99	1.72	1.31	2.17	0.93	1.61	0.75	1.73	0.38	0.77	0.82	1.86	0.95	2.06
Help work/school	0.54	1.43	0.76	1.82	0.50	1.34	0.95	1.90	1.18	2.08	0.46	1.23	1.30	2.23
Attitudes/Support Subscale	0.67	1.21	1.00	1.77	0.57	0.99	1.17	1.77	0.96	1.50	1.13	1.74	1.36	1.97
Attitudes home	0.82	1.65	1.29	2.37	0.69	1.38	1.07	2.21	0.69	1.87	1.28	2.29	1.22	2.35
Discrimination	0.54	1.37	0.79	1.79	0.47	1.23	1.24	2.02	1.17	1.69	0.98	2.02	1.48	2.22
Services/Assistance Subscale	0.49	0.91	0.71	1.13	0.43	0.83	1.43	1.61	1.31	1.32	0.98	1.50	1.85	1.78
Transportation	0.48	1.38	0.50	1.44	0.48	1.36	1.59	2.44	1.19	2.08	1.32	2.31	2.10	2.70
Medical care	0.48	1.39	0.96	1.96	0.34	1.16	1.04	1.85	1.20	1.81	0.59	1.50	1.24	2.05
Help home	0.40	1.15	0.57	1.40	0.35	1.07	1.59	2.48	1.90	2.58	0.72	1.83	2.01	2.67
Information	0.61	1.37	0.81	1.75	0.56	1.24	1.42	2.31	0.96	1.60	1.24	2.35	1.90	2.64
CHIEF-SF Total	0.62	0.80	0.88	1.10	0.54	0.68	1.47	1.43	1.35	1.12	1.09	1.38	1.83	1.58

Figure G: CHIEF-SF Subscales and Total by Disability Status

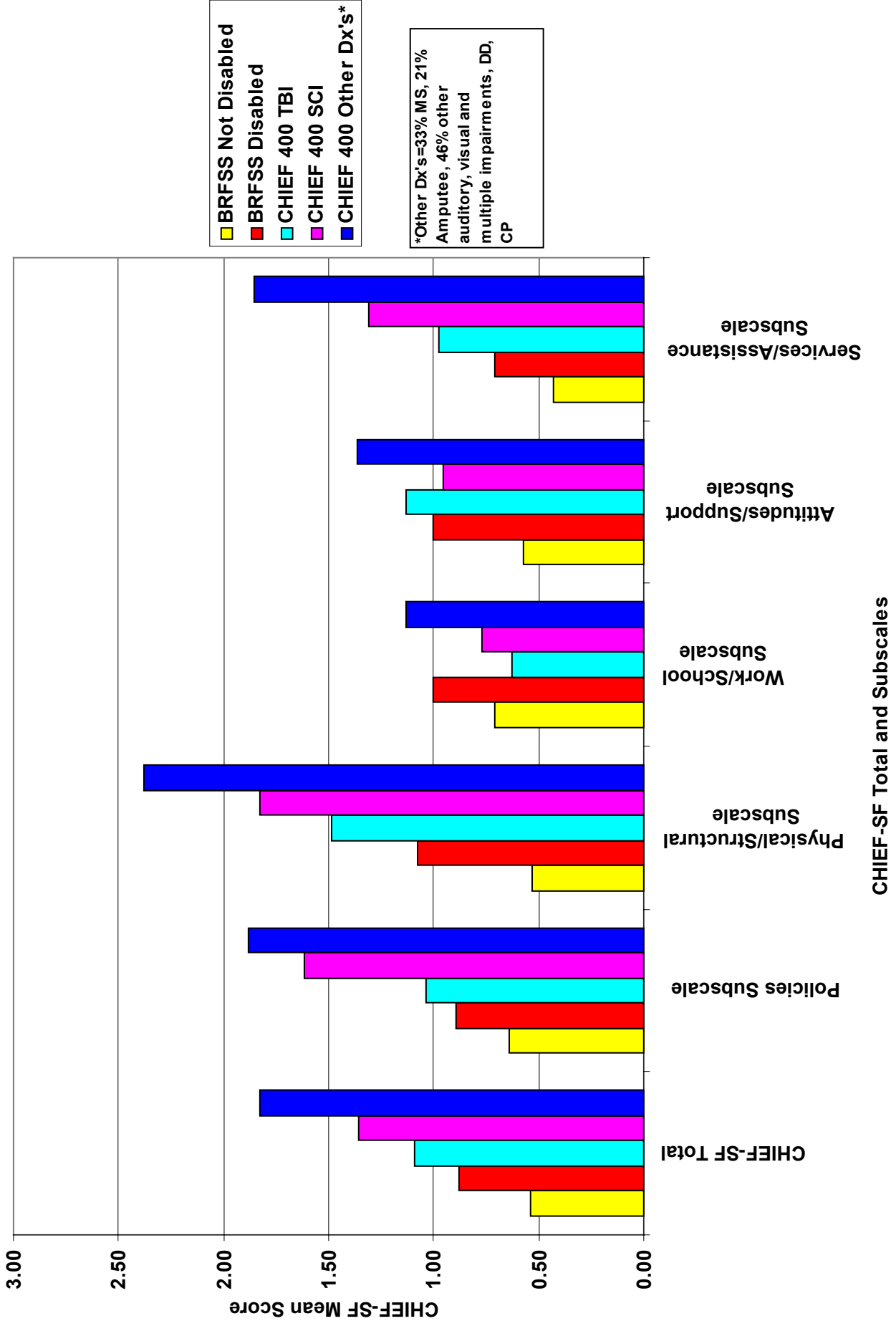
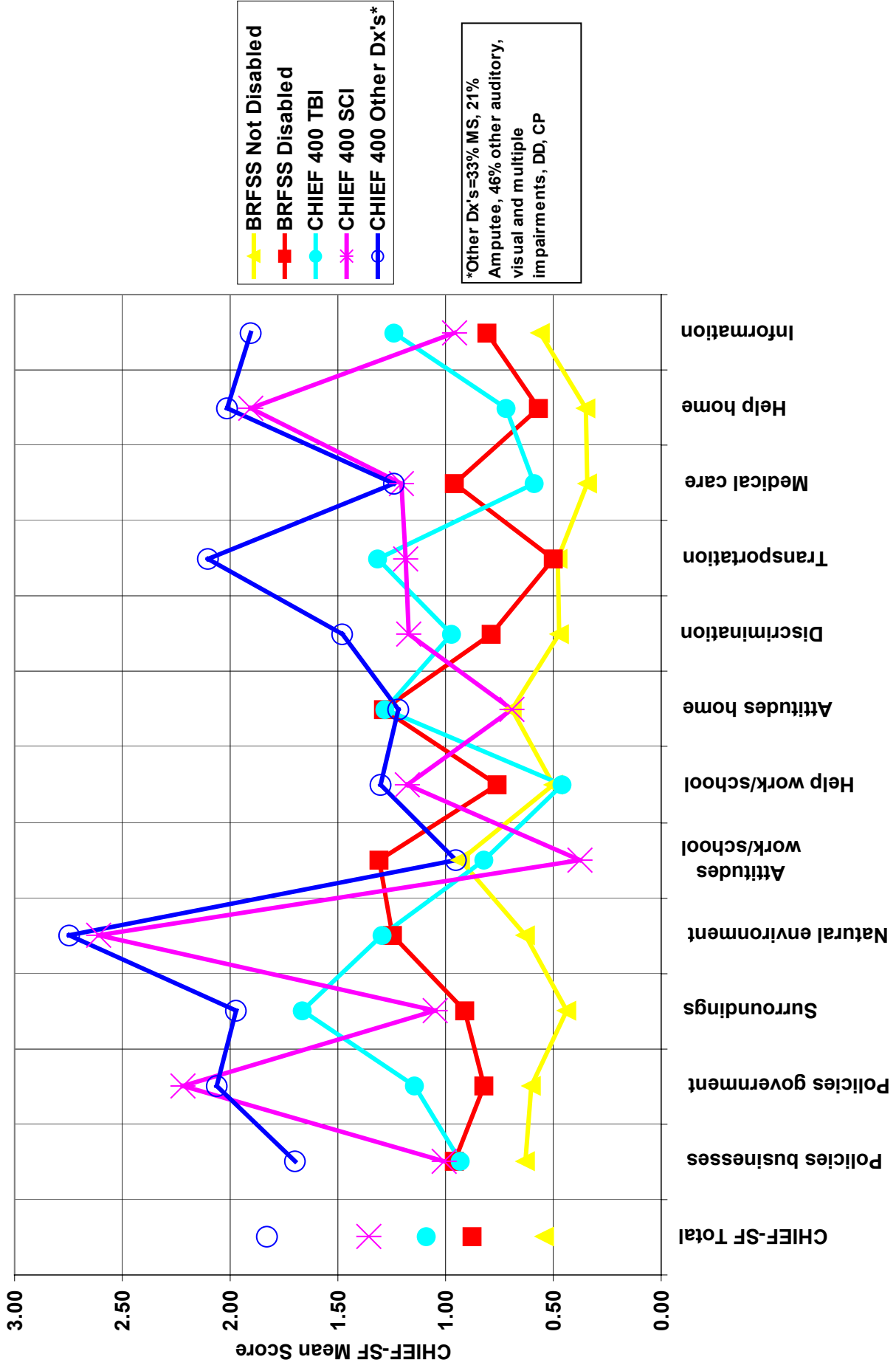


Figure H: CHIEF-SF by Disability Status



CHIEF-SF Total and Items

Craig Hospital Inventory of Environmental Factors

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Being an active, productive member of society includes participating in such things as working, going to school, taking care of your home, and being involved with family and friends in social, recreational and civic activities in the community. Many factors can help or improve a person's participation in these activities while other factors can act as barriers and limit participation. First of all, do you think **you** have had the same opportunities as other people to participate in and take advantage of:

education	___yes	___no
employment	___yes	___no
recreation/leisure	___yes	___no

First, please tell me how often each of the following has been a barrier to your own participation in the activities that matter to you. Think about the past year, and tell me whether each item on the list below has been a problem **daily, weekly, monthly, less than monthly, or never**. If the item occurs, then answer the question as to how big a problem the item is with regard to your participation in the activities that matter to you.

(Note: if a question asks specifically about **school or work** and you neither work nor attend school, check not applicable)

	Daily	Weekly	Monthly	Less than monthly	Never	Not applicable	Big problem	Little problem
1. In the past 12 months, how often has the availability of transportation been a problem for you? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
2. In the past 12 months, how often has the design and layout of your home made it difficult to do what you want or need to do? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
3. In the past 12 months, how often has the design and layout of buildings and places you use at school or work made it difficult to do what you want or need to do? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. In the past 12 months, how often has the design and layout of buildings and places you use in your community made it difficult to do what you want or need to do? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
5. In the past 12 months, how often has the natural environment - temperature, terrain, climate - made it difficult to do what you want or need to do? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
6. In the past 12 months, how often have other aspects of your surroundings - lighting, noise, crowds, etc - made it difficult to do what you want or need to do? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>

	Daily	Weekly	Monthly	Less than monthly	Never	Not applicable	Big problem	Little problem
7. In the past 12 months, how often has the information you wanted or needed not been available in a format you can use or understand? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
8. In the past 12 months, how often has the availability of the education and training you needed been a problem for you? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
9. In the past 12 months, how often has the availability of health care services and medical care been a problem for you? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
10. In the past 12 months, how often has the lack of personal equipment or special adapted devices been a problem for you. Examples might include hearing aids, eyeglasses or wheelchairs. When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
11. In the past 12 months, how often has the lack of computer technology been a problem for you? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
12. In the past 12 months, how often did you need someone else's help in your home and could not get it easily? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
13. In the past 12 months, how often did you need someone else's help at school or work and could not get it easily? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. In the past 12 months, how often did you need someone else's help in your community and could not get it easily? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
15. In the past 12 months, how often have other people's attitudes toward you been a problem at home? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
16. In the past 12 months, how often have other people's attitudes toward you been a problem at school or work? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. In the past 12 months, how often have other people's attitudes toward you been a problem in the community? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>

	Daily	Weekly	Monthly	Less than monthly	Never	Not applicable	Big problem	Little problem
18. In the past 12 months, how often has a lack of support and encouragement from others in your home been a problem? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
19. In the past 12 months, how often has a lack of support and encouragement from others at school or work been a problem? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. In the past 12 months, how often has a lack of support and encouragement from others in your community been a problem? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
21. In the past 12 months, how often did you experience prejudice or discrimination? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
22. In the past 12 months, how often has the lack of programs and services in the community been a problem? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
23. In the past 12 months, how often did the policies and rules of businesses and organizations make problems for you? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
24. In the past 12 months, how often did education and employment programs and policies make it difficult to do what you want or need to do? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. In the past 12 months, how often did government programs and policies make it difficult to do what you want or need to do? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>

Craig Hospital Inventory of Environmental Factors Short Form

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Being an active, productive member of society includes participating in such things as working, going to school, taking care of your home, and being involved with family and friends in social, recreational and civic activities in the community. Many factors can help or improve a person's participation in these activities while other factors can act as barriers and limit participation.

First, please tell me how often each of the following has been a barrier to your own participation in the activities that matter to you. Think about the past year, and tell me whether each item on the list below has been a problem **daily, weekly, monthly, less than monthly, or never**. If the item occurs, then answer the question as to how big a problem the item is with regard to your participation in the activities that matter to you.

(Note: if a question asks specifically about **school or work** and you neither work nor attend school, check not applicable)

	Daily	Weekly	Monthly	Less than monthly	Never	Not applicable	Big problem	Little problem
1. In the past 12 months, how often has the availability of transportation been a problem for you? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
2. In the past 12 months, how often has the natural environment - temperature, terrain, climate - made it difficult to do what you want or need to do? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
3. In the past 12 months, how often have other aspects of your surroundings - lighting, noise, crowds, etc - made it difficult to do what you want or need to do? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
4. In the past 12 months, how often has the information you wanted or needed not been available in a format you can use or understand? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
5. In the past 12 months, how often has the availability of health care services and medical care been a problem for you? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
6. In the past 12 months, how often did you need someone else's help in your home and could not get it easily? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
7. In the past 12 months, how often did you need someone else's help at school or work and could not get it easily? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Daily	Weekly	Monthly	Less than monthly	Never	Not applicable	Big problem	Little problem
8. In the past 12 months, how often have other people's attitudes toward you been a problem at home? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
9. In the past 12 months, how often have other people's attitudes toward you been a problem at school or work? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. In the past 12 months, how often did you experience prejudice or discrimination? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
11. In the past 12 months, how often did the policies and rules of businesses and organizations make problems for you? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
12. In the past 12 months, how often did government programs and policies make it difficult to do what you want or need to do? When this problem occurs has it been a big problem or a little problem?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>