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# Caregiver Self-Efficacy Scale for Transfers

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**ABSTRACT.** Parents and caregivers faced with the challenges of transferring children with disability are at risk of musculoskeletal injuries and/or emotional stress. The Self-Efficacy Scale for Transfers (CSEST) is a 14-item questionnaire that measures self-efficacy for transferring under common conditions. The CSEST yields reliable data and valid inferences; however, its rating scale structure has not been evaluated for utility. The aims of this study were to evaluate the category response structure of the CSEST, test the utility of a revised rating scale structure, and confirm its psychometric properties. The Rasch Measurement Model was used for all analyses. Subjects included 175 adult caregivers recruited from multiple communities. Results confirm that a revised five-category rating scale structure yields reliable data and valid inferences. Given the relationship between self-efficacy and risk of physical and/or emotional stress, measuring parental self-efficacy for transfers is a proactive process in rehabilitation.

**KEYWORDS**. Self-Efficacy, Rasch Model, Rating Scale, Children, Transfers

Injuries to employees in the health care and social assistance sector account for the second highest rate (16%) of occupational injuries reported in the United States (U.S. Bureau of Labor Statistics 2006). Health care workers involved in the lifting and/or transferring of patients are at particular risk because of the physical demands associated with patient transferring (Waters, Collins, Galinsky, & Caruso, 2006). Given these physical demands imposed on trained health care workers, we can assume that parents and/or significant others of children with physical disabilities, also face similar physical stress. Daily, caregivers of children with physical disabilities are faced with the frequent task of transferring the child, the child's wheelchair device, and other such assistive devices. This places caregivers at risk for musculoskeletal injury (Sanders and Morse, 2005). Parents and caregivers of children who do not walk have a unique challenge in that the child will continue to grow throughout the years and the caregiver will need to adapt to the child's changing weight and height. As children grow, and as caregivers age, caregivers' confidence in their abilities to transfer their children safely without injury to the children or to themselves may diminish.

The daily stress of caring for a child with disability creates an environment for emotional distress on the part of the caregiver. Studies show that the parents and caregivers of children with traumatic brain injury are at greater risk of depression and anxiety (Chronister, Chan, Sasson-Gelman, & Chui, 2010; Degeneffe, 2001). Associated with this risk of emotional distress, as well as the risk of injury, on the part of the parent/caregiver, is the individual's level of self-efficacy to care for a child (Chronister, Chan, Sasson-Gelman, & Chiu, 2010; Degeneffe, 2001). Zeiss et al (1999) and Steffen et al (2002) found positive correlations between the level of self-efficacy on the part of parent or caregiver, and the level of depression, anger, and axiety (Zeiss, Gallagher-Thompson, Lovett, Rose, & McKibbin, 1999; Steffen, McKibbin, Zeiss,

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Gallagher-Thompson, & Bandura, 2002). It can be assumed that each caregiver has a different level of confidence when transferring his or her child. As noted by Maddux (1995), "the crux of self-efficacy theory is that the initiation of and persistence at behaviors and courses of action are determined primarily by judgments and expectations concerning behavioral skills and capabilities and the likelihood of being able to successfully cope with environmental demands and challenges" (p. 4).

To study the self-efficacy of the parents/caregivers of children who do not walk, Thomas et al. (2007) developed the Caregiver Self-Efficacy Scale for Transfers. The CSEST identifies the perceived self-efficacy of caregivers to perform specific physical transfers with their children that they encounter in their normal occupations of daily living. The CSEST targets parents/caregivers of children with movement dysfunction, addressing their self-efficacy for transfer activities. The CSEST consists of 14 items focusing on transfer tasks performed under varying conditions (optimal and adverse). The tasks include such activities as transferring the child from a chair to the toilet, or transferring the chair into a car or van. The CSEST data demonstrated reliability indices (Cronbach's alpha) of 0.96 and 0.94 for respondents and items, respectively. There was a sufficient separation of levels of self-efficacy with an item separation index of 4.13 and person separation index of 5.23. The hierarchical structure of the CSEST was stable with adequate content validity (standardized chi-square fit statistics were less than 2.0) and point biserial correlations were greater than 0.67.

The CSEST uses an 11-category response structure ranging from 0 ("not at all confident") to 10 ("extremely confident"). However, research suggests that a smaller range for category responses might be more suitable for the respondent (Streiner & Norman, 1995). Based on the memory work by Miller (1956) and the empirical testing by Streiner and Norman (1995), a

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category structure between five and seven response choices seems to be most adequate. Given that the goal of the rating scale structure is to allow the respondent to most accurately reflect a level of self-efficacy in response to a given situation, it is important to provide the respondent with a sufficient range of categories to achieve this goal. With too many categories, the respondent might have difficulty differentiating levels; with too few categories, the respondent is provided with insufficient response choices (Smith, Wakely, De Kruf, & Swartz, 2003). In their investigation of the psychometric properties of the CSEST, Thomas et al. (2007) did not investigate the utility of this 11-category rating scale structure. Hence, it is not known if the 11-category response structure of the CSEST is the optimal response structure.

The aims of this study were: 1) to identify the optimal rating scale structure of the CSEST, and 2) to confirm the essential psychometric properties of the CSEST with a new sample of caregivers. We hypothesized that the 11-category rating scale structure of the CSEST provides too many categories for the respondents. We anticipated that a smaller range of categories would be more useful to respondents.

**METHOD**

This study included two phases of analysis. In the first phase, simulation studies were conducted using the Rasch Model to establish the ideal rating scale structure of the CSEST. Using responses from the caregiver sample for the study by Thomas et al. (2007), the rating scale structure was evaluated based on Linacre's criteria, and categories were collapsed until a satisfactory structure was established (Linacre, 2002). Linacre proposed eight criteria to optimize rating scale structure and to assure empirically that the rating scale is being used as the researchers and respondents intended. These criteria take advantage of the Rasch Measurement Model, by evaluating the sufficient use of each rating scale response category within a self-

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efficacy instrument, and providing a method to evaluate the utility of the category structure of any rating scale. Briefly, the criteria assure that all category choices are used by the individuals, that the categories provide sufficient discrimination between levels of self-efficacy, and that the respondents use the categories as they were intended. The Rasch Model, and specifically Linacre's criteria are frequently used to evaluate the psychometric property of self-efficacy instruments and other rating scales (Bogner, Corrigan, Bode, & Heinemann, 2000; Lee, Peterson, & Dixon, 2010; Lee & Fisher, 2002; Smith, Wakely, DeKruf, & Swartz, 2003).

In the second phase, the revised CSEST (i.e., the CSEST with a new response category structure), was administered to a new sample of caregivers. The psychometric properties were evaluated along with an evaluation of the rating scale structure.

**Phase I: Simulation Study**

The first step of this study used the data from the CSEST (Thomas et al., 2007). The respondents in the 2007 data included 71 adult caregivers (female = 57, male = 14) with mothers accounting for 73% of the respondents, fathers accounting for 14% of the respondents and grandparents or others accounting for the remaining 13% of the respondents. The average age of this sample was 41.1 years (sd = 8.5 years). This first step evaluated the utility of the 11-category rating scale structure, using the Rasch Model and seven of Linacre's criteria (see Figure 1). Six of Linacre's criteria can be determined objectively, while two of the criteria are subjective in nature. We chose to evaluate the six objective criteria (criteria 1, 3, 4, 5, 7, and 8) as well as one of the subjective criteria (criterion 2) as they are most relevant to the evaluation of the CSEST.

INSERT FIGURE 1 ABOUT HERE

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The Rasch Measurement Model was used to analyze the category structure using the WINSTEPS computer program (Linacre, 2002). If the data did not meet each criterion, categories were collapsed and the data were reanalyzed. When testing the 11-category structure, few of the 14 items of the CSEST met the criteria proposed by Linacre. In particular, criteria one, two, three, and five were not met by most of the 14 items, suggesting too many categories for the respondents to clearly distinguish. An 11-category response structure provided too many choices for the respondents and warranted collapsing adjacent categories. Decisions about which response categories to collapse were based on where the disordering occurred in the observed averages and structure calibrations. Response categories were then collapsed through numerous iterations to determine the best category structure with the existing data. For each iteration, the data were re-analyzed using WINSTEPS and Linacre's criteria.

After examining nine variants of the rating scale structure, we determined that a five-category structure best met the criteria established by Linacre. The five-category structure was achieved by collapsing categories 0 and 1 to become the new category 0 ("not at all confident"); 2 and 3 were collapsed to become category 1; 4 and 5 were collapsed to become category 2 ("moderately confident"); categories 6, 7, and 8 were collapsed to become category 3, and categories 9 and 10 were collapsed to become category 4 ("totally confident"). This new five-category scale sufficiently met all seven of Linacre's testable criteria, with the exception of a few response categories not meeting the outfit statistic criteria.

**Phase II: Validation Study with New Sample**

The second step of this study was to administer the CSEST, using this five-category rating scale structure, to a new sample of caregivers. The CSEST is included in the Appendix and consists of 14 items addressing seven different daily occupations dealing with different types of

transfers, each of them under optimal or adverse conditions. The rating scale consists of five response categories with descriptive anchors for categories zero (not confident at all), two (moderately confident), and four (extremely confident).

**Participants**

The inclusion criteria were caregivers of children and young adults, under the age of 22, who do not walk and require assistance with transfers on a daily basis. The caregivers were the primary or secondary caregiver of the child or young adult, English speaking/reading, and at least 18 years of age. The study was classified as exempt by the Institutional Review Boards at The University of Toledo and at San Diego State University. Return of the survey implied consent to participate.

We distributed 714 packets in hopes of obtaining 125 usable surveys. The caregivers were solicited at school districts, outpatient pediatric facilities, support groups, and therapeutic riding facilities in Ohio, Texas, Michigan, and Southern California. The investigators or other health care professionals and/or facility staff provided the research packet to caregivers. There were 213 surveys received (30% response rate), 38 of which were excluded due to the child's age being too old or for missing data. This netted 175 useful surveys. However, data from 23 of the respondents were not included because of poor person fit statistics (person fit statistics are an indication how well individuals fit the expected model), when examined with the Rasch Analysis; 152 respondents were included in the final analyses.

Caregivers' ages ranged from 20 - 79 years (mean 43, s.d. 11.6). Caregiver respondents were mothers (68%), fathers (18.3%), grandmothers (6.9%), grandfathers (2.9%), or other (2.9%).

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The primary sex of the respondents was female (76%). Caregiver respondents were asked to rate their level of health, with 34.9% reported their health as excellent, 49.7% as good, 12.0% as average, and 1.7% as poor (1.7% of respondents did not answer). Each caregiver respondent was also asked to report if he or she had any ailment due to the role of caregiver; 57.7% marked yes, and 41.1% marked no (1.2% of respondents did not answer). The most frequently reported ailment was back pain, followed by herniated disks, and arthritis. Other reported ailments included such items as knee problems, asthma, and heart problems.

The children and young adults varied from 7 months to 21 years (mean age = 9 years, s.d. 5 years). Their weights varied from 8.2 kg to 92.2 kg (mean 28.1 kg, s.d. 19.8 kg) and height ranged from 63.5 cm to 187.9 cm (mean 121.6 cm, s.d. 28.5cm). The most frequent diagnoses were cerebral palsy and developmental delay. The majority (66.9%) of children and young adults required maximum assistance to transfer with 19.4% requiring moderate assistance. The majority of children and young adults (44%) used manual wheelchairs, 14.9% used a power chair, and 17.1% used a stroller, the rest used more than one type of chair.

**Procedure**

The data collection packet consisted of a cover letter indicating the purpose of the study and, a demographic sheet, the CSEST, and a return self-addressed stamped envelope. Upon agreement to complete the survey, the caregivers had the option to either hand the sealed envelope back to the person who provided it or mail the survey to the investigators. The demographic sheet requested information about caregiver health status, caregiver physical ailments, caregiver's age, gender, child's weight, child's diagnosis, and the child's age.

**Data Analysis**

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Descriptive statistics and proportions to describe the sample of caregivers were generated using Excel. The Rasch Model (WINSTEPS version 3.51) was used to assure sufficient fit of respondents and items, prior to testing the psychometric properties of the CSEST and the rating scale utility of the CSEST. The Rasch analysis produced estimates of response category function, which included calibration structure, fit statistics, and probability curves that graphically displayed how respondents used each response category for each item. These data allowed for the rating scale analyses based on Linacre's criteria.

The data from 23 respondents were removed prior to testing the psychometric properties, due to poor person fit statistics (outfit statistic that fell outside of 1.4 and 0.60); a total of 152 responses were analyzed. We removed those respondents with excessive outfit statistics prior to further analysis.

## RESULTS

All 14 items demonstrated fit statistics within the acceptable range of 1.40 and 0.60 (Wright and Linacre, 1994). Reliability indices were 0.94 and 0.98 for person and items respectively. This yielded separation indices of 3.6 and 8.0 for persons and items respectively. All point bi-serial correlations for the items exceeded 0.70. Table 1 provides the measurement properties of the CSEST.

INSERT TABLE 1 ABOUT HERE

In terms of sufficient observations for each of the five categories (criterion 1), items 1, 2, 3, 8, 11, and 12 did not meet this criterion, mainly for category 0 ("not confident at all"). Each of these six items represented questions related to "optimal" transfer situations.

Criterion 2 was analyzed via the probability curves for each item. Each item was visually inspected to determine if each response category had its own peak, that is, that each category had

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an independent probability of being selected. Each response category for each item had its own unique peak (Figure 2).

INSERT FIGURE 2 ABOUT HERE

Criterion 3 was analyzed to determine if the average measure advanced monotonically with each category. There was adequate ordering of the average measure for each of the 14 items (Table 2).

INSERT TABLE 2 ABOUT HERE

Criterion 4 specifies that the outfit mean-squares fit statistics should be less than 2.0 for each response category, to assure sufficient randomness of the responses to each category (Linacre, 2002; Wright and Linacre, 1994). All but three response categories had results less than 2.0: items one, five, and thirteen each had one response category with an outfit statistic that exceeded 2.0 (Table 3). Aside from these three items, all remaining items had fit statistics for all five response categories that fell below 2.0.

INSERT TABLE 3 ABOUT HERE

Criterion 5 specifies that step calibrations advance monotonically, to assure that greater levels of self-efficacy must be present in order to endorse a higher category in the category structure. The step calibrations for each of the steps to advance from 0 to 1, and 1 to 2, etc., for all 14 items, advanced monotonically (Table 4).

INSERT TABLE 4 ABOUT HERE

Criteria 7 and 8 specify that step difficulties advance by at least 1.4 logits but no more than 5.0 logits. Items two and thirteen had step difficulties between response categories one and two that did not advance by at least 1.4 logits. These two items represented "optimal" transfer conditions. The category structure of the remaining 12 items advanced by at least 1.4 logits. All

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items had step difficulties that advanced by less than 5.0 logits which fully met criterion 8 (Table 2).

## DISCUSSION

The first phase of this study, that of examining the utility of the original 11-category response structure of the CSEST, yielded a revised CSEST with a 5-category response structure. By collapsing the 11 response categories into 5 categories, the CSEST satisfactorily met the 7 criteria of Linacre. The second phase of this study, that of evaluating the utility of this revised version of the CSEST (5-category response structure) with a new sample of caregivers, demonstrated that Linacre's 7 criteria were satisfactorily met. Three criteria were only problematic with a few of the 14 items of the CSEST. Further, this revised CSEST demonstrated comparable psychometric properties for reliability of the data and validity of the inferences, when compared with the psychometric data from Thomas et al (2007).The revised CSEST with a five-category response structure provided an effective and presumably more efficient rating scale for caregivers.

In support of validity, item response analysis uses the measure of item separation (the index that determines how well persons and items can be separated into distinct levels of the construct). The item separation index improved with the five-category CSEST, when compared with the original version studied by Thomas et al (2007). This revised version may allow respondents to better distinguish self-efficacy differences among the 14 different items. In addition, content validity evidence was supported by sufficient point-biserial correlation values, all of which exceeded 0.70, similar to the 0.67 reported by Thomas et al. (2007). Hence, the

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psychometric properties remain sufficient with this revised version of the CSEST, when compared with the version examined by Thomas et al. in 2007.

Stability of the items was demonstrated by similar ordering of difficulty of the items, when compared with the original version of the CSEST (Thomas et al, 2007). When looking at each of the 14 items of the CSEST, the caregivers perceived the items with transfers under adverse conditions to be the most difficult to endorse in terms of self-confidence. This compares with the study by Thomas et al. in which their sample of caregivers also perceived the adverse conditions to be the most difficult to endorse, compared with transfers under optimal conditions. Similarly, respondents for both studies perceived the activity of transferring a child in/out of the bathtub under adverse conditions to be the most difficult item to endorse. In both studies, respondents found that transferring a wheelchair in/out of a car under optimal conditions to be the easiest items to endorse (i.e., the caregivers perceived the greatest level of confidence with transferring the wheelchair in/out of a car/van). And in terms of all of the transfers under optimal conditions, both samples of caregivers reported the least amount of confidence with bathtub transfers under optimal conditions. This consistency between the two samples of caregivers lends support to the stability of the CSEST.

There were a few limitations identified with this five-category response structure of the CSEST. We found concerns with three of Linacre's criteria, namely 1, 4 and 7. Insufficient numbers of observations for some of the lower categories (criterion one) suggests that our sample may have consisted of individuals with high levels of self-efficacy; few respondents felt a total lack of self-efficacy, particularly for some of the "optimal" transfer situations. Along this same line of reasoning, a few response categories demonstrated excess fit, based on criterion four; this suggests issues with the expected randomness of responses, and maybe related to a

sample that was too homogenous in terms of their self-efficacy. We recommend that another sample of caregivers be targeted, a sample that contains a proportion of caregivers who are either inexperienced with transferring or new to transferring.

Finally, criterion 7, which specifies that each category should be separated by at least 1.4 logits, was not sufficiently met by all categories for all items indicating that respondents had difficulty detecting sufficient difference between response categories one and two on those items. This suggests that respondents found it difficult to distinguish between minimal and moderate levels of self-efficacy for a few items. However, the probability curves for these same items demonstrated that each of the rating categories had a unique probability of being selected, suggesting that the category structure is effective, however it could likely be improved for sensitivity. Perhaps adding a verbal description for categories one and three, similar to zero, two, and four, would improve this issue.

**Implication for Practice**

Self-efficacy plays an important role in the health and psychological well-being of the caregiver (Degeneffe, Chan, Dunlap, & Man, 2011). Given the physical and emotional demands of caring for a child or loved one with a physical disability, it is not surprising that self-efficacy is associated with caregiver risk for physical injury, depression, and/or anxiety (Chronister, Chan, Sasson-Gelman, & Chiu, 2010; Degeneffe, 2001). Studies by Zeiss et al. (1999) and Steffen et al. (2002) identified positive correlations between high levels self-efficacy and less depression, lower subjective burden, less anger, and less anxiety (Zeiss, Gallagher-Thompson, Lovett, Rose, & McKibbin, 1999; Steffen, McKibbin, Zeiss, Gallagher-Thompson, & Bandura, 2002). Physical and occupational therapists are ideally positioned to identify caregivers who may be at risk of physical and/or emotional harm, as a result of poor self-efficacy. The CSEST may

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be a useful tool to provide a measure of self-efficacy of caregivers whose children are under their clinical care. With the CSEST, physical and occupational therapists will be able to identify parents who report low self-efficacy for transfers and may therefore be at increased risk of musculoskeletal injury, depression, anger, or anxiety that often accompany poor self-efficacy. The CSEST will alert the clinician to those family members who might best benefit from targeted training and education regarding transferring of a child.

The CSEST can identify the specific areas of transfer concerns of a caregiver; therefore the occupational and physical therapist can focus caregiver education and training to address these areas of concern. For instance, transferring a child under adverse conditions has been demonstrated to be an area of least self-efficacy, when compared with optimal conditions, and bathtub transfers appears to be one of the most difficult transfers for caregivers, compared to all other transfer situations. The clinician might consider incorporating caregiver education and training to specifically address bathtub transfers and also to find ways to minimize external stressors during transfers (i.e., stressors such as feeling rushed, urgent, or too much commotion during transfers). A recent intervention study provides evidence that training and education can improve self-efficacy and hence performance (Nishisaki, Keren, & Nadkarni, 2007). Therefore, it is important for the occupational or physical therapist to identify parents and/or caregivers who may be at risk of injury, depression, and/or anxiety, as it relates to self-efficacy in the care of their loved ones. Using a self-efficacy measure, such as the CSEST, may assist the health care professional identify these individuals and may provide an avenue for education and training, and thus minimize risk of these common factors associated with caring for loved ones with disabilities.

Finally, further research is needed to determine the usefulness of education and training for parents and caregivers of children with physical challenges, as a means to reduce risk of injury while also improving self-efficacy.   Education and training related to proper lifting and transferring technique might improve the effectiveness of parent care for their child as well as improve overall levels of self-efficacy.  The CSEST could serve as a reliable and valid measure to determine the effectiveness of such an intervention program.

## CONCLUSION

The CSEST is a psychometrically sound measure and we recommend it as a tool to assess the level of self-efficacy for parents and caregivers as it relates to transferring a child under various conditions.  The analyses of the five-category structure demonstrated substantial improvements over the original 11-category rating scale structure. The CSEST provides a brief and time efficient instrument that can be self-administered by parents or caregivers prior to a therapy session. The CSEST may be useful to identify areas of transfer concerns that can be identified for parent and/or caregiver education.  The CSEST is recommended for use by occupational and physical therapists as an efficient means of identifying parents and caregivers who may be at risk of injury or emotional stress due to a lack of confidence in their skills to transfer their child and the child's equipment.

**Declaration of interest**

The authors report no conflicts of interest.

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**FIGURE 1.** Linacre's Criteria for Optimizing Rating Scale Category Effectiveness

| Criteria #1 | At least 10 observations of each category. |
|---|---|
| Criteria #2 | Regular observation distribution (uniform distribution of observations such that each category has a unique probability of endorsement). See Figure 2 for an illustration. |
| Criteria #3 | Average measures advance monotonically with category (the intended level of self-efficacy should be reflected in the average measure for each advancing category). |
| Criteria #4 | Outfit mean squares less than 2.0 (excess fit statistics are an indication of too random of a response pattern). |
| Criteria #5 | Step calibrations advance (the level of difficulty to endorse each advancing rating category should advance as intended). |
| Criteria #6* | Ratings imply measures, and measures imply ratings. |
| Criteria #7 | Step difficulties advance by at least 1.4 logits (in order for two adjacent categories to be sufficiently unique from each other, their measures should differ by at least 1.4 logits). |
| Criteria #8 | Step difficulties advance by less than 5.0 logits (in order to assure that there are sufficient choices of rating categories, there should be no greater than 5.0 logits between categories). |

*Not tested

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P     ++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----++
R   1.0 +                                                            +
O       |                                                            |
B       |00                                                        4 |
A       |  00                                                    44  |
B    .8 +    00                                                44    +
I       |      00                                            44      |
L       |       0                                           4        |
I       |        0                                         4         |
T    .6 +         0                         333333        4          +
Y       |          0     1111111         33        33  44           |
     .5 +           0 11        1     2222    33          34         +
O       |            1*0          1122    223          433          |
F    .4 +             1    0       221      322        4   3         +
        |            11      0     2    1     3   2      4      33    |
R       |          1          0    2      1  3      22     4      3   |
E       |        11          0 22       13        2  44        33    |
S    .2 +     11            *0        3311       2*          33      +
P       |  11             22  0      3      1    44 22         33    |
O       |11            222     00*33      111 44      22          3  |
N       |        2222        333 0000     444*11       22222        |
S    .0 +*******************44444444****000000********************** +
E       ++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----++
        -5    -4    -3    -2    -1     0     1     2     3     4     5
                                  LOGITS
```
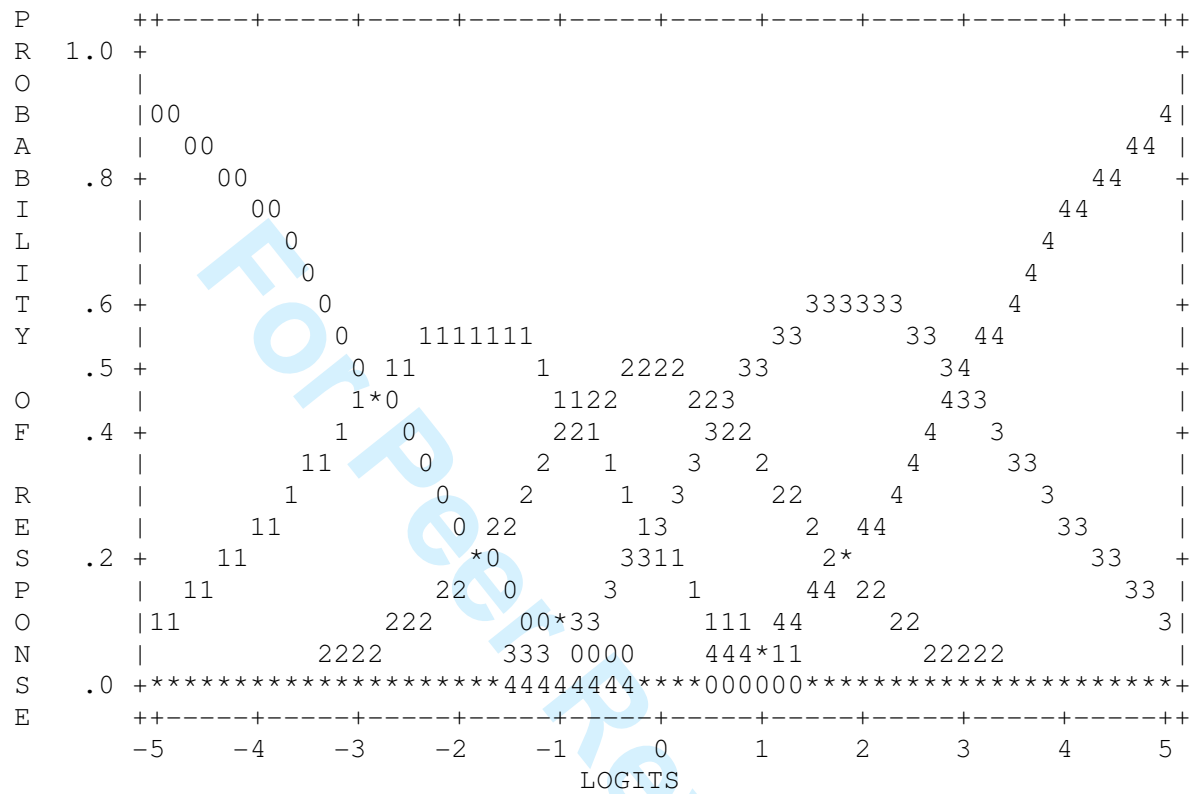
Figure 2: Sample probability curves of the five response categories for an item. For example, the greatest probability for endorsing category one (60% probability) occurs at a level of self-efficacy equivalent to -2.0 logits.

**TABLE 1.** Measurement Characteristics of the CSEST with the 5-category Rating Scale

| Item (item number on CSEST) | Measure in Logits (se) | Infit (z) | Outfit (z) | Point Bi-Serial |
|---|---|---|---|---|
| Bathtub Transfer: Adverse (9) | 1.48 (0.12) | 0.85 (-1.3) | 0.84 (-1.2) | 0.87 |
| Child out Car/Van: Adverse (7) | 1.14 (0.12) | 0.87 (-1.1) | 0.82 (-1.3) | 0.85 |
| Child in Car/Van: Adverse (6) | 1.02 (0.12) | 0.99 (0.0) | 0.96 (-0.2) | 0.84 |
| Floor Transfer: Adverse (4) | 0.87 (0.12) | 0.87 (-1.1) | 0.85 (-1.2) | 0.86 |
| Toilet Transfer: Adverse (5) | 0.87 (0.13) | 0.78 (-1.9) | 1.32 (2.1) | 0.87 |
| WC in Car/Van: Adverse (14) | 0.62 (0.12) | 1.40 (2.2) | 1.31 (2.0) | 0.78 |
| Bed Transfer: Adverse (10) | 0.48 (0.12) | 0.97 (-0.2) | 0.96 (-0.3) | 0.84 |
| Bath Transfer: Optimal (13) | 0.27 (0.12) | 1.31 (1.9) | 1.36 (2.3) | 0.77 |
| Child out Car/Van: Optimal (3) | -0.76 (0.13) | 0.86 (-1.1) | 0.92 (-0.4) | 0.77 |
| Toilet Transfer: Optimal (11) | -0.91 (0.13) | 0.89 (-0.9) | 0.85 (-1.1) | 0.80 |
| Child in Car/Van: Optimal (2) | -0.99 (0.13) | 0.83 (-1.4) | 0.92 (-0.4) | 0.76 |
| Bed Transfer: Optimal (12) | -1.13 (0.13) | 0.84 (-1.3) | 0.76 (-1.6) | 0.80 |
| WC out Car/Van: Optimal (8) | -1.33 (0.14) | 1.20 (1.6) | 1.26 (1.5) | 0.74 |
| WC in Car/Van: Optimal (1) | -1.61 (0.14) | 1.01 (0.1) | 1.39 (2.4) | 0.73 |

Measure: positive values most difficult to endorse; negative values easiest to endorse

Fit statistics: 0.70 – 1.40 is the fit criteria

Point Bi-Serial Correlations should exceed 0.70

CSEST: Caregiver Self-efficacy Scale for Transfers

WC: wheelchair

TABLE 2. Evidence for Criteria 3, 7, and 8: Average Measure Advances Monotonically and by at Least 1.4 Logits but not Greater than 5.0 Logits (Values are Logits)

| Item | Category 0 | Category 1 | Category 2 | Category 3 | Category 4 |
|------|-----------|-----------|-----------|-----------|-----------|
| 1 | -4.51 | -2.08 | -0.87 | 0.89 | 2.38 |
| 2 | -3.01 | -2.20* | -0.74 | 1.22 | 2.65 |
| 3 | -3.34 | -1.88 | -0.45 | 1.39 | 2.85 |
| 4 | -1.91 | -0.50 | 0.93 | 2.50 | 3.93 |
| 5 | -1.89 | -0.45 | 0.97 | 2.55 | 4.49 |
| 6 | -1.88 | -0.48 | 0.93 | 2.38 | 3.81 |
| 7 | -1.94 | -0.51 | 0.90 | 2.46 | 4.02 |
| 8 | -3.77 | -2.21 | -0.32 | 1.14 | 2.57 |
| 9 | -1.68 | -0.26 | 1.16 | 3.02 | 4.57 |
| 10 | -2.34 | -0.59 | 0.87 | 2.33 | 3.78 |
| 11 | -4.26 | -1.77 | -0.04 | 1.38 | 3.05 |
| 12 | -4.51 | -1.96 | -0.38 | 0.94 | 3.06 |
| 13 | -1.70 | -0.99* | 0.42 | 1.83 | 3.26 |
| 14 | -1.96 | -0.55 | 0.85 | 2.37 | 3.84 |

*Category did not advance by at least 1.4 logits

**TABLE 3**. Fit Statistics for Each Response Category, Mean-squared Outfit Statistic

| Item | Category 0 | Category 1 | Category 2 | Category 3 | Category 4 |
|------|-----------|-----------|-----------|-----------|-----------|
| 1 | 0.40 | 0.90 | 084 | 3.37* | 1.27 |
| 2 | 1.36 | 0.45 | 0.36 | 1.23 | 1.13 |
| 3 | 0.95 | 0.34 | 0.44 | 1.19 | 1.28 |
| 4 | 1.53 | 0.57 | 0.58 | 0.60 | 1.26 |
| 5 | 1.12 | 0.56 | 3.37* | 0.58 | 0.61 |
| 6 | 1.24 | 0.48 | 0.91 | 0.63 | 1.67 |
| 7 | 1.16 | 0.48 | 0.71 | 0.76 | 1.08 |
| 8 | 0.69 | 0.93 | 1.06 | 1.42 | 1.48 |
| 9 | 1.56 | 0.74 | 0.53 | 0.57 | 0.79 |
| 10 | 0.99 | 1.30 | 0.72 | 0.65 | 1.24 |
| 11 | 0.37 | 0.69 | 0.93 | 0.84 | 0.95 |
| 12 | 0.41 | 0.71 | 0.85 | 0.67 | 0.89 |
| 13 | 2.79* | 1.00 | 0.75 | 1.58 | 1.04 |
| 14 | 1.69 | 1.10 | 1.30 | 0.95 | 1.95 |

*Category fit statistic > 2.0

TABLE 4. Measure of Advance Between each Category (Values are Logits)

| Item | Categories 0 – 1 | Categories 1 – 2 | Categories 2 – 3 | Categories 3 – 4 |
|------|------------------|------------------|------------------|------------------|
| 1 | -2.81 | -0.79 | 0.62 | 2.98 |
| 2 | -1.92 | -1.27 | 0.55 | 2.63 |
| 3 | -1.96 | -1.17 | 0.55 | 2.58 |
| 4 | -2.61 | -1.41 | 1.13 | 2.89 |
| 5 | -2.80 | -1.78 | 1.01 | 3.56 |
| 6 | -2.14 | -1.76 | 0.96 | 2.95 |
| 7 | -2.15 | -1.82 | 0.23 | 3.74 |
| 8 | -3.03 | -1.37 | 1.29 | 3.11 |
| 9 | -2.86 | -1.49 | 0.69 | 3.66 |
| 10 | -2.88 | -1.29 | 1.50 | 2.67 |
| 11 | -3.11 | -0.94 | 0.90 | 3.14 |
| 12 | -3.51 | -0.73 | 1.14 | 3.09 |
| 13 | -1.72 | -1.29 | 0.54 | 2.48 |
| 14 | -2.69 | -1.20 | 0.56 | 3.33 |

**APPENDIX**

**Caregiver Self-Efficacy Scale for Transfers**

After each item, please rate how confident you are that you could do the task without straining your back if you were to find yourself in that situation today.  "Straining your back" means having soreness or pain in your back after lifting your child or lifting the child's equipment.  Rate the degree of confidence that you are feeling right now by circling a number from 0 to 4 on the scale after each item.

1.  You are home and **feeling calm**.  You are going on an outing that you and your child have enjoyed before.  **You have plenty of time**, and the **weather is pleasant.** How confident are you that you can store the wheelchair or stroller in the car or van without straining your back?

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Not at all Confident | | Moderately Confident | | Completely Confident |

2.  You are home and **feeling calm**.  You are going on an outing that you and your child have enjoyed before.  You **have plenty of time**, and the **weather is pleasant.** How confident are you that you can move your child from the wheelchair or stroller into the car or van without straining your back?

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Not at all Confident | | Moderately Confident | | Completely Confident |

3.  You are **feeling calm**.  You have arrived for an outing that you and your child have enjoyed before.  **You have plenty of time**, and the **weather is pleasant.** How confident are you that you can get your child from the car or van into the wheelchair or stroller without straining your back?

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Not at all Confident | | Moderately Confident | | Completely Confident |

4.  You are home.  You are **feeling hurried, and you are running late.** How confident are you that you can move your child from the wheelchair or stroller to the floor and back to the wheelchair without straining your back?

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Not at all Confident | | Moderately Confident | | Completely Confident |

5.  You are home.  You are **feeling hurried, and you are running late.** How confident are you that you can move your child from the wheelchair or stroller to the toilet, to a toileting device, or to where you diaper the child, and back to the wheelchair without straining your back?

1

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Not at all | | Moderately | | Completely |
| Confident | | Confident | | Confident |

6.  You are home and **feeling hurried**.  You are going on an outing that you and your child have enjoyed before.  **You are running late.  It is raining, cold, and windy.** How confident are you that you can move your child from the wheelchair or stroller into the car or van without straining your back?

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Not at all | | Moderately | | Completely |
| Confident | | Confident | | Confident |

7.  You are **feeling hurried.**  You have arrived for an outing that you and your child have enjoyed before.  You are **running late**.  **It is raining, cold and windy.** How confident are you that you can get your child from the car or van into the wheelchair or stroller without straining your back?

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Not at all | | Moderately | | Completely |
| Confident | | Confident | | Confident |

8.  You are **feeling calm**.  You have arrived for an outing that you and your child have enjoyed before.  **You have plenty of time**, and the **weather is pleasant.**  How confident are you that you can get the wheelchair or stroller out of the car or van without straining your back?

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Not at all | | Moderately | | Completely |
| Confident | | Confident | | Confident |

9.  You are home.  You are **feeling hurried, and you are running late.** How confident are you that you can move your child from the wheelchair or stroller into the bathtub and from the bathtub back to the wheelchair without straining your back?

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Not at all | | Moderately | | Completely |
| Confident | | Confident | | Confident |

10. You are home.  You are **feeling hurried, and you are running late.** How confident are you that you can move your child from the wheelchair or stroller into bed and from bed back to the wheelchair without straining your back?

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Not at all | | Moderately | | Completely |
| Confident | | Confident | | Confident |

11. You are home and **feeling calm**.  You **have plenty of time**.  How confident are you that you can move your child from the wheelchair or stroller to the toilet, to a toileting device, or to where you diaper the child, and back to the wheelchair or stroller without straining your back?

2

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Not at all Confident | | Moderately Confident | | Completely Confident |

**12.** You are home and **feeling calm**. You **have plenty of time.** How confident are you that you can move your child from the wheelchair or stroller into bed and from bed back to the wheelchair without straining your back?

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Not at all Confident | | Moderately Confident | | Completely Confident |

**13**. You are home and **feeling calm**. You **have plenty of time.** How confident are you that you can move your child from the wheelchair or stroller into the bathtub and from the bathtub back to the wheelchair or stroller without straining your back?

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Not at all Confident | | Moderately Confident | | Completely Confident |

**14.** You are home and feeling **hurried**. You are going on an outing that you and your child have enjoyed before. **You are running late**. It **is raining, cold, and windy.** How confident are you that you can store the wheelchair or stroller in the car or van without straining your back?

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Not at all Confident | | Moderately Confident | | Completely Confident |

3