Reliability and validity evidence for the revised Caregiver Self-Efficacy Scale

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FINAL APPROVAL OF SCHOLARLY PROJECT
For the Degree of
Master of Occupational Therapy

Title of Scholarly Project
"Reliability and Validity Evidence for the Revised Caregiver Self-Efficacy Scale"

Submitted by
Jessica Craig Duke

In partial fulfillment of the requirements for the degree Master of Occupational Therapy

APPROVED

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Attachment: Abstract

Final Approval of SP MOT
Reliability and Validity Evidence for the Revised Caregiver Self-Efficacy Scale

Jessica F. Duke

Department of Occupational Therapy

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Abstract

The purpose of this study was to assess the psychometric properties of the revised Caregiver Self-Efficacy Scale (CSES) for caregivers of non-ambulatory children. Seventy-one caregivers completed the 14-item revised CSES and a demographic form. Psychometric properties were gathered via the Rasch Measurement Model (RMM). The RMM Reliability Index indicated a caregiver reliability of 0.96, which contributed to the scale’s stability and accuracy. The RMM Reliability Index also indicated an item reliability of 0.94, which strengthened the scale’s test stability reliability. The point bi-serial correlations for the infit statistics were all greater than 0.77, which contributed to the scale’s construct validity. The items separated in order of perceived difficulty demonstrating a hierarchical validity of the items. The bathtub transfer under adverse conditions was perceived to be the most difficult, while the wheelchair transfer into the car/van under optimal conditions was perceived to be the easiest. Caregivers indicated a lower self-efficacy score for transfers performed under adverse conditions, which indicated that these items were perceived to be more difficult. Caregivers indicated a higher self-efficacy score for outdoor transfers versus indoor transfers, which indicated that these transfers were perceived to be less difficult. Separation indices were computed for the revised CSES. The caregivers separated into more than five distinctly different levels of self-efficacy, and the items separated in at least 4 distinctly different levels of item difficulty, which demonstrated that the scale is a sensitive measure. The results of the factor analysis demonstrated that the scale contained two factors, indoor and outdoor transfers. The results demonstrated that the revised CSES is a reliable, valid, and sensitive instrument to assess the self-efficacy of caregivers of non-ambulatory children to safely transfer their children without fears of straining their backs.
Reliability and Validity Evidence for the Revised Caregiver Self-Efficacy Scale

Occupational therapists work with caregivers of all types of persons. According to Culler (1998), if a person cares for another person at least once a week he or she is considered to be a caregiver. Law (2002) states, “the goal of occupational therapy is to enable individuals to achieve competency and satisfaction in life’s chosen roles and in the activities that support function of these roles” (p. 32). One way for occupational therapists to determine caregivers’ satisfaction and competency as caregivers would be to assess their confidence level in their caregiving skills through a self-efficacy assessment. This type of assessment can be used to clarify limiting factors that are inhibiting the caregivers’ performance in their role of caregiver (Law, 2002). After a person’s level of self-efficacy is determined, occupational therapists can then:

1. Resolve deficits in performance areas, skills, and patterns
2. Teach new methods of occupational performance to compensate for deficits
3. Suggest modifications of the occupational form
4. Educate the caregiver about remediating deficits, compensating, and modifications to prevent future difficulties. (Culler, 1998).

The purpose of this study was to assess the psychometric properties of the revised Caregiver Self-Efficacy Scale (CSES) for caregivers of nonambulatory children (Shuford, 2000). This scale focuses on the perceived self-efficacy of caregivers to perform specific physical transfers with their children that they encounter in their normal occupations of daily living.

Prior to describing this study, pertinent literature will be summarized. First, self-efficacy will be defined and then described in relation to caregivers. Secondly, the prevalence of physical
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strain on caregivers will be examined. Finally, the characteristics of a self-efficacy assessment will be examined and the psychometric properties will be explored.

Self-efficacy

Self-efficacy is a product of Bandura’s social cognitive theory. Maddux (1995) states, “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). Perceived self-efficacy is independent of the number of skills a person possesses, the tools accessible to him or her, and the degree of the challenge that the occupational form presents (Bandura, 1997). In other words, self-efficacy is a person’s beliefs in his or her ability to accomplish certain occupational performances in the context of specific occupational forms.

Self-efficacy has been studied in a wide array of subject areas and with several different populations, from the self-efficacy to quit smoking, the self-efficacy of teaching, political self-efficacy, parental self-efficacy, to caregiver self-efficacy (Bandura, 1997). When a person has low self-efficacy he or she doubts his or her ability to perform the required occupation and tend to give up. A person with high self-efficacy believes that he or she can successfully complete the occupation even if new challenges are encountered (Maddux, 1995). According to Bandura (1997),

“a strong sense of efficacy has been shown to predict coping behavior five years later, health functioning four years later, and maintenance of habit changes over long time intervals (Coletti, Supnick, & Payne, 1985; Devins & Edwards, 1988; Homan & Lorig, 1992). In contrast, weakly held efficacy beliefs are highly vulnerable to change. Self-
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doubts rise as performance of taxing activities draws near (Kent, 1987; Kent & Gibbons, 1987). Negative experiences readily reinstate disbelief in one’s capabilities” (p. 68).

If a child has health problems, especially where the occupations of daily living are impaired, parental self-efficacy is more vulnerable. It is the parent’s level of self-efficacy not the severity of the child’s condition that explains the level of parental functioning (Bandura, 1997).

Recently there has been significant research in the self-efficacy of caregivers. However, most of the self-efficacy studies and assessments examine caregivers of people with dementia, and rarely address the physical strain a caregiver may experience (Dibartolo, 2002; Fortinsky, Kercher, & Burant, 2002). Caregivers of persons with dementia suffer from enormous burdens physically, socially, emotionally, and financially (Dibartolo, 2002; England, 2000; Fortinsky, Kercher, & Burant, 2002; Son, Wykle, & Zauszniewski, 2003). They assist the persons with dementia with several of the same occupations of daily living that caregivers of non-ambulatory children help with such as feeding, dressing, toileting, getting up and going to bed, and bathing (Son, Wykle, & Zauszniewski, 2003). Physical strain on all caregivers is a well-recognized problem by researchers, however it is rarely examined in any great detail (Acton, 2002; Dibartolo, 2002; England, 2000; Esdaile, 1994; Fortinsky, Kercher, & Burant, 2002; Griffin & Price, 2000; Son, Wykle, & Zauszniewski, 2003).

Lin and Ward’s (1996) study examined self-efficacy’s role in coping with low back pain. They developed a self-efficacy scale, the Coping Behaviors Instrument, since no self-efficacy assessment existed. They found that self-efficacy to cope with chronic back pain was negatively correlated to pain intensity and pain interference in their occupations of daily living. Also, perceived self-efficacy to use a particular coping strategy was positively correlated to caregivers’ consistency in employing that specific behavior (Lin and Ward, 1996).
Physical Strain on Caregivers

Caregivers, in general, are prone to back strain. According to Nicholson (1999), British researchers performed a study on caregivers of children with disabilities and the “general and back pain (Lamb and Layzells, 1995) [which] indicated an incidence of 65%” of caregivers experiencing some type of back (p. 208). Physical stress on the caregivers and on nurses who care for disabled children is a well-recognized problem (Griffin and Price, 2000; Sales and Utting, 2002; Casey, 2002; Hewett and Newson, 1970). The Bureau of Labor Statistics has documented that the home health care aide injury rate due to overexertion from all types including lifting is 183 per 10,000 workers (1997). This is more than double the national rate and it one of the ten highest rates documented by the Bureau of Labor statistics when examining hundreds of industries (1997).

Caregivers of nonambulatory children are a specific population prone to musculoskeletal injury. In the United States, 0.2% of children between the ages of 6 and 14 use a wheelchair. In other words, 1 in 500 children in that age range are nonambulatory (U.S. Census Bureau, 1997). There is at least 1 caregiver, usually 2-3, for each child using a wheelchair. Nicholson (1999) examined the musculoskeletal stress on parents of children with restricted mobility and found that 91% of the caregivers had a musculoskeletal problem(s); 88% experienced back pain, 50% neck pain, 46.3% joint pain, and 45.4% muscle pain. These injuries resulted from physical transfers involved in the child’s occupations of daily living such as getting up from a seat, getting up from the seat/floor, getting in/out of the bath, getting in/out of the bed, and getting on/off the toilet. Parents tend to put the child’s safety and comfort above their own health thus increasing their chance for injury (Griffin and Price, 2000; Nicholson, 1999).
Need for self-efficacy assessment

The Federal Government recognized the need for education, assessments, and training specific for the caregivers of children with disabilities in the Education of the Handicapped Amendment Act of 1986 (PL 99-457). Few researchers have investigated the presence of back strain in caregivers of children with physical disabilities (Nicholson, 1999). Healthcare professionals have recognized musculoskeletal stress in caregivers of disabled children and have called for the development of risk assessments (Sales and Utting, 2002; Casey, 2002). Sales and Utting (2002) state, “child-specific patient risk assessment forms would be a useful addition to the assessment protocols used for children both in hospital and at home, where many children with long-term care needs are moved and lifted by parents and other carers” (p. 39).

Knowledge of self-efficacy is recognized as a positive influence on caregivers of stroke and dementia patients (Van den Heuvel et al., 2001; Dibartolo, 2002) and can be used as an intervention method with caregivers of non-ambulatory children. Dibartolo (2002) states that very few studies involving caregivers look at self-efficacy and calls for more research examining self-efficacy in caregivers.

According to Bandura (1997), “efficacy beliefs should be measured in terms of particularized judgments of capability that may vary across realms of activity, under different levels of task demands within a given activity domain, and under different situational circumstances” (p. 42). By examining different occupations, each graded with task demands, one increases the predictive and explanatory power of that measure in terms of its ability to be applied to other daily occupations. This type of assessment helps to determine the capacities and incapacities a person may experience when performing an occupation (Bandura, 1997).
After drawing on one’s expertise about a population, disorder, and other relevant factors a person can gather self-efficacy information from a variety of methods including interviews, open-ended surveys, and structured questionnaires to determine the challenges to success. It is important to realize that it is the self-efficacy to do an occupation on a daily basis that is important, not the specific occasion (Bandura, 1997). The person must be able to perform these occupations “under various impediments such as when they are under pressure from work, are tired, or are depressed; in foul weather; or when they have other commitments or more interesting things to do” (Bandura, 1997, p. 43).

The original CSES was developed with all the above considerations in mind. Shuford (2000) hypothesized that caregiver perceived self-efficacy would be different performing the same occupation but under different conditions/occupational forms. The conditions examined were adverse conditions, (i.e. being in a hurry, running late, and cold, rainy, windy weather conditions and optimal conditions (i.e. not being rushed, running on time, and pleasant weather) (2000). Daily occupations used in the scale were determined by conducting interviews with occupational therapists and caregivers of nonambulatory children. The occupations examined were:

1) storing the wheelchair in the car or van; 2) getting the wheelchair out of the car or van; 3) moving the child from the wheelchair into the car or van; 4) moving the child from the car or van into the wheelchair; 5) moving the child from the wheelchair to the toilet, a toileting device, or to where the child is diapered, and back to the wheelchair; 6) transferring the child from the wheelchair to the floor and back to the wheelchair; 7) transferring the child from the wheelchair into bed and from bed back to the wheelchair;
and 8) moving the child from the wheelchair into the bathtub and from the bathtub back to the wheelchair (Shuford, 2000, p. 8).

From the 82 surveys collected and analyzed, Shuford (2000) concluded that there was a significant difference between the caregivers’ self-efficacy under the adverse and optimal conditions ($p=.000$). There was a “weak negative correlation between the caregivers’ score and the age of the child (-.25, $p=0.2$) and the score and weight of the child (-.23, $p=.04$)” (Shuford, 2000, p. 12). A significant difference was found between the caregivers’ rating their health as poor, average, good, or excellent and their total score on the CSES ($p=.009$). Shuford (2000) also found a statistically significant difference between the total scores of males and females. The CSES investigated several factors that could affect the caregivers self-efficacy score such as health status of the caregiver, age of the caregiver, weight of the child, and age of the child. If therapists only examine a few of these factors they may not obtain an accurate picture of which caregivers need their assistance. Therefore, the CSES is an essential tool for therapists to accurately identifying those caregivers who require their assistance.

The original scale initially consisted of seventeen items. Upon analysis of the psychometric properties of this scale Shuford (2000) determined that there was a high degree of internal consistency reliability, therefore, the scale could be shortened by removing three items, which had the lowest values for the corrected item-total correlations. The revised CSES consists of 14 items. Shuford (2000) calls for future research on the psychometric properties of the revised CSES with a larger population, more males, and more secondary caregivers.

Rasch Analysis was used for a significant portion of the data analysis for the revised CSES. According to Fisher (1993a), “the Rasch measurement models offer an alternative approach to instrument development that results in unidimensional linear measures based on
additive numbers” (p. 320). In other words, Rasch Analysis takes ordinal data and converts this data into a unidimensional construct via a logarithmic formula based on probabilities of a person rating a particular item a specific score, which yields empirical data (Fisher, 1993a; Fisher, 1993b).

The current study was part of a larger study that examined the revised CSES for its psychometric properties. The larger study addresses the ability of the CSES to differentiate subgroups and discriminate among characteristics of those who participated in the study, and these results are described elsewhere (Pymer, 2004). The purpose of this study was to assess the psychometric properties of the revised CSES for caregivers of non-ambulatory children. This study examines the following research questions:

1. Does the scale reliably measure the sample of people and do the items on the scale demonstrate reliability?
2. Do the items sufficiently fit the revised CSES?
3. Do the items of the revised CSES follow a hierarchical order?
4. Does the scale separate people into different levels of self-efficacy and items into different levels of difficulty?
5. Does the CSES contain more than one subscale?

Methods

Participants

The participants were parents/caregivers of nonambulatory children. The caregivers were English speaking/reading adults at least 18 years of age. The caregivers had to be a primary or secondary caregiver of the child. The participants were gathered from Toledo, Ohio area school systems, outpatient pediatric rehabilitation clinics, a therapeutic riding facility, and local
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caregiver support groups. The child could have been of any age as long as they were dependent for transfers. The child must have had an orthopedic deficit or deficits from multiple conditions, and require assistance with transfers on a daily basis for the caregiver/parent to qualify for this study.

Materials

The revised CSES (Shuford, 2000) was used to assess the caregivers’ self-efficacy in certain daily occupations the person may encounter while in the role of caregiver. It consists of fourteen items rated from 0 to 10 with 0 being “not confident at all” and 10 being “extremely confident.” The lowest possible score is 0 and the highest possible score is 140 (10 points x 14 items) with the higher score indicating a higher level of self-efficacy. The revised CSES addresses the same eight daily occupations as the original CSES, and examines them under adverse and/or optimal conditions (see Appendix A).

Procedure

Permission was granted to contact parents/caregivers of children who have an orthopedic deficit or deficits from multiple conditions, and those that require assistance with transfers on a daily basis from local school districts, outpatient pediatric clinics, a therapeutic riding facility, and community-based local support groups for caregivers of children with special needs. Occupational therapists and physical therapists in the two school districts and outpatient rehabilitation clinics identified the children who fit in the above two categories that were in need of transfers. Occupational and physical therapists then distributed a packet of information to parents by placing the packet in the child’s book-bag or directly handing it to the parents. The director at the therapeutic riding facility and the community-based local support groups identified the eligible caregivers and distributed the packets to the caregivers.
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The packet included a letter indicating the purpose of the study, stating the fact that it is confidential, and giving an estimate of the amount of time it will take to complete the survey (see Appendix B). At the bottom of the letter parents/caregivers will indicate whether or not they wish to participate in this study. The packet also included the revised CSES and a demographic sheet (health status, gender, child’s weight, caregiver’s age, child’s diagnosis, physical ailments, child’s age). Please see Appendix C for the demographic data sheet. The parents/caregivers were given an option to be contacted at home to complete the survey and demographic information via a telephone interview, fill out the survey and demographic sheet and return to their corresponding facility, or to complete the survey and demographic information and return them via the United States Postal Service. Please see Appendix D for the script used for the telephone interview. The bottom of the initial letter and completed surveys were returned to the researchers by the occupational therapists, physical therapists, or directors at the participating facilities. After any telephone interviews were completed with the parent/caregiver, identifiable information such as their name, phone number, and date(s) called was destroyed. The remainder of the surveys were collected from a pilot study conducted by Diane Shuford (2000) with the revised CSES and the same demographic questions.

Data Analysis

The following statistics were calculated for the revised CSES to answer these research questions:

1. Does the scale reliably measure the sample of people and do the items on the scale demonstrate reliability?

   • Internal consistency reliability (item reliability analysis) was computed using the reliability index generated from the Rasch Measurement Model (RMM).
• The RMM Person Reliability Index was used to indicate the probability that people would maintain their scores and remain consistent given repeated administrations of the revised CSES.

• The RMM Item Reliability Index was used to indicate the probability that items on the scale would retain their positions on the scale given repeated administrations of the revised CSES.

• These reliability indices contribute to the scale’s level of stability.

2. Do the items sufficiently fit the revised CSES?

• A goodness of fit test was performed to determine if each item fit the construct of interest, which in this research study is self-efficacy, by comparing observed response patterns with expected response patterns.

3. Do the items of the revised CSES follow a hierarchical order?

• A hierarchical order was expected indicating that perceived item difficulty would progress from least to most difficult, and to ensure that the revised CSES was able to measure a range of confidence levels for the caregivers.

4. Does the scale separate caregivers into different levels of self-efficacy and items into different levels of difficulty?

• RMM was used to estimate Separation Indices to indicate whether the revised CSES separates caregivers into different levels of self-efficacy and items into different levels of difficulty, which contributed to the scale’s construct validity.

5. Does the revised CSES contain more than one subscale?

• A factor analysis determined whether the revised CSES contained more than one subscale.
Descriptive statistics were also examined for the items looking at mean and standard deviation. Basic demographic information gathered during the research study allows descriptive statistics of the caregivers to be examined such as age, health, age of child, weight of child, physical ailments, diagnosis of the child, and the amount of assistance required for a transfer.

Results

Descriptive Statistics of Participants

All persons in this research study were treated in accordance with the ethical standards of the American Psychological Association. The Institutional Review Board of the Medical College of Ohio also approved this research study. Seventy-four surveys were collected from caregivers/parents of nonambulatory children for this research study. Three surveys were unable to be used for the study because the children were noted to be ambulatory. Seventy-one scales were included in the data analyses. Incomplete data were documented as missing data.

Ages of the caregivers ranged from 24 to 69 years (M = 41.08, SD = 8.550). Thirteen males (18.3%) and 57 females (80.3%) completed the revised CSES. One survey did not indicate gender. Sixty-five (91.5%) of the caregivers were the children’s primary caregivers. The remaining 6 (8.5%) were secondary caregivers. Thirty-six of the caregivers (50.7%) reported that they were in good health. The remaining caregivers were almost equally divided between average health (17 caregivers, 23.9%) and excellent health (18 caregivers, 25.4%). Not one caregiver indicated his or her health as poor. Fifty-two of the caregivers identified themselves as the children’s mothers, 10 were fathers, 1 was a grandfather, and 8 identified themselves as “other”. The majority of caregivers (69.0%) reported a physical ailment that limited them in their ability to care for their children.
Ages of the children ranged from 3 to 22 years (M = 10.67, SD = 5.081). The weight of the children ranged from 21 to 165 pounds (M = 64, SD = 34). Thirty-eight of the children (53.5%) had a diagnosis of cerebral palsy. The majority of the children (80.3%) required maximum assistance with their physical transfers. Also, the majority of the nonambulatory children (83.1%) used a manual wheelchair as opposed to a power wheelchair or stroller.

Descriptive statistics for items

Each variable/scene was examined separately to determine how confident or not confident the individuals were on each item. Please see Figures 1-14. Figures 1-14 include the mean and standard deviation for each item of the revised CSES.

Psychometric properties

Caregiver reliability.

The RMM Reliability Index was used to indicate the probability that each caregiver would maintain his or her score after repeated administrations. The RMM Reliability Index for the caregivers was 0.96.

Item reliability.

The RMM Reliability Index was used to indicate the probability that each item would maintain its position on the scale and remain constant given repeated administrations of the revised CSES. The RMM reliability for the items was 0.94.

Infit statistic.

The infit statistic, which measures how well items were perceived as expected by the caregivers was calculated. The standardized fit statistic showed the majority of the items were less than two standardized units from the expected values. The point biserial correlations were all greater than 0.77.
Order validity.

Table 1 shows the items in order of perceived item difficulty demonstrating the hierarchical validity of the items. The harder items (lower self-efficacy) are at the top of the Table and the easier items (higher self-efficacy) are at the bottom.

The Construct Validity Key Map (Figure 16) addresses caregivers and the items. Figure 16 illustrates the range of difficulty of the items ranging from hard to easy, and where the caregivers are positioned on this map in reference to their scores. The lightly shaded items indicate hurried scenarios and the darker shaded items indicate the calm scenarios. Six of the 7 hurried scenarios were found in the upper half of the scale reflecting the more difficult items. Figure 17 illustrates how the 2 factors, indoor transfers and outdoor transfers, distributed among the perceived item difficulty. The lightly shaded items indicate the outdoor transfers and the darker shaded items indicate the indoor transfers. Five of the seven transfers done outdoors involving the car or van were found in the second half of the scale reflecting the less difficult items.

Scale separation

The sample had a separation index of 5.23 indicating the caregivers separated into more than five distinctly different levels of self-efficacy. The items had a separation of 4.13 indicating at least four distinctly different levels of item difficulty.

Scale subscales

The results of the factor analysis demonstrated that the revised CSES contains two factors or subscales as indicated by the Scree Plot (Figure 18). The first factor explains nearly 77.5% of the variance in the variables; the second factor accounts for an additional 7.4%, while the third and additional factors contributed much less. Using a varimax rotated solution retaining only
those values with a variance greater than 0.40 the items from the revised CSES divided into two factors. Please see Table 2 for the scale items for each of the two factors.

Discussion

The purpose of this study was to assess the psychometric properties of the revised CSES for caregivers of non-ambulatory children. This study examined the following research questions:

1. Does the scale reliably measure the sample of people and do the items on the scale demonstrate reliability?
2. Do the items sufficiently fit the revised CSES?
3. Do the items of the revised CSES follow a hierarchical order?
4. Does the scale separate people into different levels of self-efficacy and items into different levels of difficulty?
5. Does the CSES contain more than one subscale?

The findings of the study strengthen the reliability and validity, and contribute to the use of the revised CSES in clinical practice.

Psychometric properties

Before the components and trends of the revised CSES are investigated, the reliability and validity of the scale needs to be examined. The RMM Reliability Index indicated an extremely high person reliability of 0.96. The reliability of an apparatus “is not the property of the instrument, but rather of the instrument when administered to a certain sample under certain conditions,” (Polit & Hungler, 1983, p. 386). In other words, a high person reliability means that present sample of caregivers was an accurate and consistent sample to use to analyze the psychometric properties of the revised CSES yielding a high degree of stability and accuracy to
the measure. The RMM Reliability Index was also used to indicate the probability that people will maintain their scores and remain consistent given repeated administrations of the revised CSES, which will contribute to test stability reliability which is equivalent to test-retest reliability.

The RMM Reliability Index indicated an extremely high item reliability of 0.94. According to Polit and Hungler (1983), a reliability of 0.70 is considered to be acceptable for the majority of instruments. The extremely high item test stability reliability strengthens confidence in the stability of the revised CSES for repeated administrations, indicating that there is a very high likelihood that the items will retain its positions on the unidimensional ruler (perceived item difficulty) given repeated administrations of the revised CSES.

The RMM “generates goodness-of-fit statistics that can be used to perform confirmatory construct validity analyses of the constructed scales based on (a) formulating expectations about what should happen when a group of persons take a test, and then (b) confirming that the test items fit that model” (Fisher, 1993a, p. 320). Infit statistics is an empirical method to discern the construct validity of an instrument (Fisher, 1993a). The standardized fit statistics indicated that the majority of the items were less than two standardized deviations from the expected values. Fisher (1993a) states that point-biserial correlations should be close to 1.0 for a good item fit. The point-biserial correlations were all greater than 0.77, which contributes to the scales construct validity.

Figures 1-14 illustrate how the caregivers scored their self-efficacy for each variable/scene. This allows one to determine which items are easier and harder for caregivers to express their self-efficacy for transfers in terms of straining their back. The responses the individuals gave for each variable/scene were examined and it was found that the subjects used
all of the responses across all of the possible choices from 0 to 10. Since there is a valid response for the 0 to 10 scale there is no need for a shorter scale.

Table 1 helps to confirm that the items in the revised CSES are testing a unidimensional construct. The unidimensional ruler is a log-linear transformation of the p-value, which creates and additive scale (Fisher, 1993a). The person and item parameter estimation procedure using the RMM results in a sample-free measure and an item-free person measure. According to Fisher (1993a), a “sample free measurement means that it is possible to develop a common scale that functions independently of the individuals or populations tested” because “Rasch item difficulty and task challenge calibration do not vary significantly from sample to sample” (p. 235). In traditional psychometrics item difficulty would have been determined by computing the p-value for the proportion of the sample that passed the particular item on the scale, and the p-value is sample dependent not sample-free (Fisher, 1993a).

Figure 15 depicted item difficulty when compared to caregivers self-efficacy score. The items are more condensed in the middle of the scale. Therefore, the caregivers within ± 1 SD from the mean are measured the most accurately. The caregivers who are more than ± 2 SD from the mean are not measured as well because the items do not span the entire ruler. In other words, the caregivers were represented by varying levels of self-efficacy. Figure 15 illustrated a wide variety of self-efficacy levels among the caregivers, which means that there are a variety of items that tap into a variety of levels of self-efficacy. This variety further supports the reliability of the revised CSES. Polit and Hangler (1983) state,

the reliability of an instrument is related in part to the heterogeneity of the group to which it is administered. The more homogeneous the sample (the more similar their scores), the lower the reliability coefficient will be….If the sample is homogeneous, it is more
difficult for the instrument to reliably discriminate among those who possess varying degrees of the attribute being measured (p. 394).

A scale with good reliability can have poor validity. It is important to look at reliability and validity when examining the psychometric properties of an instrument. Construct validity ensures that the revised CSES is measuring the construct or attribute of self-efficacy. The Construct Validity Key Map (Figure 16) is a hierarchical order of item difficulty with the easier to endorse item (higher self-efficacy) at the bottom and the harder to endorse item (lower self-efficacy) items at the top of the figure. The caregivers are displayed along the bottom of the graph, according to each of their perceived self-efficacy. This demonstrated that all caregivers’ “confidence” levels are represented throughout the rating scale and items. For example, Figure 16 illustrates that the easiest scenario involving transferring the wheelchair into the car or van under calm conditions with a self-efficacy rating of a 10 would be equivalent to a self-efficacy rating of an 8 for the hardest scenario of the bathtub transfer under hurried conditions. In other words, it was more difficult for the caregivers to report a higher score of self-efficacy in hurried situations when compared to calm situations. The highest self-efficacy reported for the hardest transfer was a score of 8 on a scale of 0 to 10.

Scale Separation

The Separation Index indicated how well the revised CSES separated caregivers into different levels of self-efficacy. A scale needs to produce at least 2 distinct levels of a construct to be considered sensitive. The Separation Index indicated that caregiver separated into 5.23 distinctly different levels of self-efficacy. This means that the revised CSES is sensitive to the construct being tested. Since the scale separated into at least 5 distinct levels of self-efficacy, it is said to have a good separation of caregivers. The more heterogeneous the sample is, the more
sensitive the scale. Since the items separated into at least 4 levels of item difficulty, it is said that there is a sufficient level of separation of item difficulty for the revised CSES. The sensitivity of the scale further contributes to the scale’s construct validity.

The Separation Index confirmed the sensitivity of the revised CSES. It appears that the scale can be useful in the clinical setting because of its sensitivity. The data indicated that the scale is able to separate caregivers into different levels of self-efficacy and items into different levels of difficulty.

*Trends and Subscales*

The results indicated that there are several trends concerning perceived self-efficacy of caregivers of nonambulatory children. The items were examined individually and together along with the caregivers perceived self-efficacy. It was found that overall, caregivers perceived the adverse conditions to be more difficult than the optimal conditions. If there is a time constraint, caregivers may not lift the child in the safest manner. Griffin and Price (2000) stated that the lifting “methods chosen were not, however, always those that were ‘best’ for the mother’s back, just those that were time saving” (p. 9). In other words, caregivers may report decreased self-efficacy for transferring their children without straining their back for adverse conditions because they may resort to unsafe lifting techniques in time-constrained situations.

The factor analysis revealed that the revised CSES consisted of a two-factor solution. According to Polit and Hungler (1983), factor analysis is a method to examine a scale’s construct validity where groups of related variables are categorized together into factors, each of which represents the overall construct or attribute of the study. The factor analysis looked at how each caregiver scored his or her self-efficacy on each specific scene. From these data points the analysis discovered patterns of relationships among the variables. In the original study by
Shuford (2000), it was hypothesized that the two factors of the scale would be item reflecting optimal or calm situations and items reflecting adverse or hurried conditions. The two factors did not separate into optimal and adverse conditions previously thought. The two factors were transfers inside the home and transfers outside the home with the van or car. This means that caregivers’ perceived self-efficacy was different when transfers occurred inside the home versus outside the home. Figure 17 illustrates that the caregivers had a higher perceived self-efficacy with the majority of the outdoor transfers compared to the indoor transfers.

There are several reasons why indoor transfers may be perceived by caregiver as more difficult than outdoor transfers. First of all, there are several different daily occupations that the caregiver may have to assist with inside the home each requiring different physical demands on the caregiver. Nicholson (1999) examined the following transfers with caregivers of children with physical disabilities: getting up from a seat, getting up from seat/floor, standing, walking, dressing, getting in/out of bath, get in/out of bed, and getting on/off of the toilet. The revised CSES examines, bathtub, floor, toilet, and bed transfers. Secondly, transfers performed inside the home such as toilet transfers occur in a greater frequency during the day than transfers performed outside the home (Griffin and Price, 2000). Griffin and Price (2000) state that car transfers were not often commented on because it was a “task that was not performed as frequently as other tasks” (p. 10). This could be one reason why outdoor transfers are perceived as less difficult.

The bathtub transfer and floor transfer under adverse or hurried conditions were perceived by caregivers to be the most difficult transfers to perform. The hierarchical ranking of items according to perceived item difficulty are split with the hurried or adverse situations being perceived as more difficult in which to express one’s confidence in one’s skills, and the calm situations being the less difficult except for one item, bathtub transfer under optimal conditions.
In a study performed by Nicholson (1999), 96% of parent caregivers assist their child with transferring in and out of the bathtub, which is the highest percentage of required parent assistance when compared to all the other transfers examined (get up from seat; get up from seat/floor; standing; walking; dressing; get in/out of bed; get on/off toilet). The bathtub transfer under both optimal and adverse conditions fell in the upper half of perceived item difficulty indicating that the bathtub transfer is perceived to be particularly more difficult than other transfers. According to Griffin and Price (2000), “for many of the mothers, bathing did not become a problem until they [the child] moved from a baby bath to a proper bath” (p. 12). The revised CSES would seem to identify and measure accurately this perception of caregivers.

In Nicholson’s (1999) sample of caregivers, mechanical assistive equipment was used most often with transfers involving the bathtub with 70% of caregivers using equipment to assist in the safe transfer of their children to and from the bathtub. Nine percent of caregivers in Nicholson’s (1999) study used equipment when transferring the children to and from the floor. It is unknown whether or not the current sample of caregivers used mechanical equipment to assist in transfers. However, it is known from past research that mechanical equipment was viewed by a majority of caregivers as burdensome and inconvenient in the home (Nicholson, 1999).

There are commonalities between the bathtub and floor transfers, which were perceived as two of the hardest transfers by caregivers. First of all, the bathtub transfer and floor transfer were performed under adverse conditions. Also, they both require significant lifting demands required from the caregiver since the child is at ground level for both transfers. The bathtub transfer may be perceived as more difficult, especially under hurried conditions, because of safety concerns such as slippery surfaces and that it must be performed in a confined space. Griffin and Price (2000) found in their sample of mother caregivers that the “mothers also felt
that it was not always possible to use correct techniques when lifting a child…. when it is not possible to squat lift” (p. 14). No other transfer requires the same lifting demands as these two transfers. The toilet, bed, and car transfers are all performed from an elevated surface. Also, research has indicated that it is hard to ergonomically lift a child because their center of gravity constantly changes as they are moved in space (Sales & Utting, 2002). This may also explain why the wheelchair was perceived as easier to lift into and out of the car than most of the other transfers involving the child.

The bathtub transfer and floor transfer both involve more bending and lifting than other transfers, which may cause the caregivers to resort to time saving lifting methods rather than safer methods in hurried conditions. The above factors influencing the bathtub transfer and floor transfer under adverse or hurried conditions may be reasons why these two scenarios were perceived to be the most difficult transfers to perform without straining the caregiver’s back.

These trends can be used in a clinical setting to determine in what environment and under what conditions (optimal or adverse) does the caregiver have a lower perceived self-efficacy when performing transfers with his or her child. Maddux (1995) reported “people choose environments where they know they can succeed thus increasing their self-efficacy. People avoid environments where they think they will not succeed even though they might have the ability to succeed, thus decreasing their self-efficacy” (p. 14). Clinicians are in a unique position to increase a caregiver’s self-efficacy by educating them on how to perform specific transfer under particular conditions safely and efficiently.

This study indicated that hurried transfers are perceived as more difficult than transfers under calm situations, and transfers inside the home are perceived as more difficult than transfers outside the home. Particularly, the two hardest transfers for caregivers indicated by this study are
the bathtub transfer and floor transfer performed under adverse conditions while the easiest transfers were transferring the wheelchair into and out of the car or van under optimal conditions. In other words, clinicians can assume that caregivers may have more difficulty with transfers inside the home particularly the bathtub and floor transfer under adverse conditions.

Bandura (1997) stated “efficacy beliefs affect performance both directly and by influencing intentions” (p. 43). Thus, clinicians can assume that a decreased level of self-efficacy indicates a decreased ability to perform a specific transfer. By using the revised CSES in the clinical setting, information gathered from the revised CSES during administration can help clinicians target their family education addressing those areas of particular concern as indicated by a low self-efficacy score for particular scenarios. Clinicians can then provide specific literature to families and target their intervention specifically to those transfers perceived as more difficult by the caregivers. The clinicians can also use repeated administrations of the revised CSES to determine if their interventions are working and if the caregivers have an increased self-efficacy level, indicating an increased ability to perform the transfer with confidence. By increasing a caregiver’s self-efficacy, clinicians are changing the caregiver’s behavior. Bandura (1997) stated that, “physical health is largely determined by lifestyle habits and environmental conditions. People suffer physical impairments and die prematurely mostly because of preventable detrimental habits” (p. 258). Clinicians are able to help caregivers change their behavior and increase their self-efficacy, which can in turn have lasting impacts on a caregiver’s overall health and well-being.

Limitations

There are several limitations to this study. First of all, the sample consisted largely of females and primary caregivers. Also, data were gathered from older surveys gathered by
Shuford (2000). Another limitation to this study is that it is unknown whether or not the caregiver used any assistive devices or equipment to help them perform the transfers such as a wheelchair lift or bath hoist. Finally, the revised CSES was administered via three different methods, which could have had an effect on how the individual answered. Since some surveys were administered via telephone, this could have led to a social bias.

Future Research

Future research needs to further explore the limitations of this study. In order to be confident in the reliability and validity of the revised CSES, the scale needs to be administered to more males and secondary caregivers to determine if their self-efficacy trends differ from those gathered in this research study. Further research in this area would help to determine if self-efficacy differs in regards to gender or caregiver role. Secondly, collection of information pertaining to the use of assistive devices and lifts to aid the caregiver in performing transfers will document the prevalence of equipment use and its effects on caregiver self-efficacy for performing transfers. Finally, future research should explore how useful occupational and physical therapists view this scale in the clinical setting. Finally, future research can examine the use of the revised CSES to aid clinicians to determine the effects of targeted interventions with their caregivers.

Conclusion

The purpose of this study was to future examine the psychometric properties of the revised CSES and to determine if the scale contained subscales. More specifically, the revised CSES was analyzed using the Rasch Analysis and factor analysis methods. This study found that the revised CSES has a high person reliability and a high item reliability. Also, the specific items of the scale fit the unidimensional ruler created by the RMM which contributes to the scale’s
construct validity. The items of the revised CSES were also found to follow a hierarchical order in which the bathtub transfer under adverse conditions was found to be the hardest transfer and transferring the wheelchair into the car or van was perceived to be the easiest transfer by the caregivers. Also, the scale is able to separate caregivers into different levels of self-efficacy and items into different levels of difficulty, which indicates that the revised CSES is a sensitive measure. Finally, the revised CSES was found to contain two subscales, transfers occurring inside the home and transfers occurring outside the home. Clinicians can use this scale in practice in several manners including assessing caregiver’s level of self-efficacy to perform transfers without straining his or her back, to target specific transfers during family education, and to assess if their intervention with the caregivers is effective. These results demonstrate that the revised CSES is a reliable, valid, and sensitive measure that can be used by therapists in clinical settings to aid caregivers of non-ambulatory children to safely transfer their children without fears of straining their backs.
References


Reliability and validity for revised CSES


Appendix A

**Survey for Parents and Caregivers**

For the question that follows each scene, I will ask you to rate how confident you are that you could do something without straining your back if you were to find yourself in that situation today. By "straining your back" I mean having soreness or pain in your back after lifting your child or lifting the wheelchair. Rate the degree of confidence that you are feeling right now by circling a number from 0 to 10 on the scale given after each question.

**Scene 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?

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**Scene 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?

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**Scene 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?

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Scene 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 5 6 7 8 9 10
not at all confident moderately confident extremely confident

Scene 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?

0 1 2 3 4 5 6 7 8 9 10
not at all confident moderately confident extremely confident

Scene 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 5 6 7 8 9 10
not at all confident moderately confident extremely confident

Scene 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 5 6 7 8 9 10
not at all confident moderately confident extremely confident
Scene 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?

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Scene 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?

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Scene 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?

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Scene 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?

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Scene 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?

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Scene 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?

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Scene 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?

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Thank you for completing this survey!
Appendix B
Letter to Caregivers of Nonambulatory Children

Dear Parents/Caregivers of a Child with Special Needs:

If you have a child who cannot walk, we hope you will help us learn more about what you find hard in taking care of your child with special needs. This survey will help occupational therapists find out when you feel most at risk for hurting your back when taking care of your child.

We are revising a survey for parents/caregivers of children who cannot walk. If you filled out a survey like this before, please note that this is a shorter survey and we would like your help again. If you have not seen this survey before, we would also like your help.

There are two options available to complete this survey. You can fill out the survey and demographic information on your own, and turn them into (individual assisting with the research study) __________. Or, you can fill out the bottom portion of this form, and we will call you and complete the survey in a 15-minute telephone interview. There is one survey in this packet; however, all parents/caregivers are welcomed to participate in this research study.

Your participation is voluntary and confidential. Once we have done the telephone survey, we will remove your name and phone number from our records. If you decide not to do the survey, it will not affect the services provided to you or your child from (facility) ______ and/or the Medical College of Ohio. Please fill out the bottom part of this letter to tell us if you would like to do the telephone survey, and return the bottom part to (individual assisting with the research study) ________________.

If you have any questions about the survey please phone Jessica Craig at (419) 389-1627 or Courtney Pymer (419) 365-8955 or Julie Thomas at (419) 383-5068.
Thank you very much for your help!

Sincerely,

Jessica F. Duke, occupational therapy student

Courtney Pymer, occupational therapy student

Julie Jepsen Thomas, Ph.D., O.T.R./L.

☐ I do not wish to do the telephone survey

Name ______________________________________ (to ensure you will not be contacted)

☐ I am willing to do the telephone survey

Name: ______________________________________ Phone Number_____________

The best time of day to phone me is: _______________________

☐ There is another parent/caregiver in my home who would also like to participate in the survey.
Appendix C

Revised CSES Demographic Collection Sheet

1. How old is your child? ____________________

2. What is your child’s diagnosis? ____________________________

3. What is the approximate weight of your child? __________

4. How much physical assistance do you provide when moving your child in and out of the
   wheelchair or stroller:  (Please check one)

   None (child requires no help) _______
   Minimum (child requires no more help than touching) _______
   Moderate (child requires more help than touching) _______
   Maximum (child requires complete help to transfer) _______

5. What type of wheelchair or stroller does your child use? (Please check one)

   Standard or Manual _______      Power or Electric _______ Stroller _______
   Other (describe)______________

6. Are you the primary caregiver?  (Please check one)

   Yes _______  No _______

7. What is your relationship to your child? _________________________

8. How would you rate your overall health? (Please check one)

   Excellent (I feel healthy and able to perform my daily routine all of the time) ______
   Good (I feel healthy and able to perform my daily routine most of the time) ______
   Average (I feel healthy and able to perform my daily routine some of the time)_______
   Poor (I rarely feel healthy and able to perform my daily routine) __________

9. How old are you? _______
10. Are there any ailments that you have such as arthritis, back pain, or muscle weakness that makes it difficult to care for your child?
Appendix D

Script for revised CSES

Hello, (caregiver)_____

My name is (research assistant)_____

I am an occupational therapy student at the Medical College of Ohio. I understand that you are willing to participate in our survey for parents or caregivers with a child with special needs. Did you receive the information packet that was sent home with your child?

I enclosed a copy of the survey in the packet if you would like to follow along. This is only going to take 15 minutes of your time. I just want to remind you that your participation is voluntary and confidential. You can withdraw participation at anytime. Once we have completed the telephone survey we will remove your name and phone number from our records.

Before I administer the actual survey I would like to ask you a few general questions about your child:

1. How old is your child?
2. What is the diagnosis of your child?
3. Approximately, how much does your child weigh?
4. What type of wheelchair or stroller does your child use?
   Standard or manual, power or electric, stroller, or other (describe).
5. How much physical assistance do you provide when moving your child in and out of the wheelchair:
   - None (child requires no help)
   - Minimum (child requires no more help than touching)
   - Moderate (child requires more help than touching)
Now I am going to begin the Parent and Caregiver Survey.

Read the survey verbatim

That was the last question on the survey. I just have a few general questions to ask you about yourself.

1. Are you the primary caregiver?
2. What is your relationship to the child? Or to your child?
3. Are there any ailments that you have such as arthritis, back pain, and muscle weakness that make it difficult to care for your child?
4. How would you rate your overall health?
   - Excellent (you feel healthy and able to perform your daily routine all of the time)
   - Good (you feel healthy and able to perform your daily routine most of the time)
   - Average (you feel healthy and able to perform your daily routine some of the time)
   - Poor (you rarely feel healthy and able to perform your daily routine)
5. How old are you?
6. Are there any ailments that you have such as arthritis, back pain, or muscle weakness that makes it difficult to care for your child?

Thank you again for your participation with this survey. If you have any questions feel free to contact myself, (other researcher), or Dr. Julie Thomas. The numbers are located on the first sheet in your packet.
Table 1

*Items in Descending Order of Perceived Difficulty*

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<th>Scene</th>
<th>Item</th>
<th>Measure</th>
<th>Error</th>
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<tbody>
<tr>
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<td>Bathtub Transfer – Hurried</td>
<td>0.75</td>
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<td>4</td>
<td>Floor Transfer – Hurried</td>
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<td>Child out of Car/Van – Hurried</td>
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<td>Child into Car/Van – Calm</td>
<td>-0.22</td>
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<td>Child out of Car/Van – Calm</td>
<td>-0.33</td>
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<td>12</td>
<td>Bed Transfer – Calm</td>
<td>-0.44</td>
<td>0.09</td>
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<td>8</td>
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Table 2

*Factor Analysis via Varimax Rotated Solution*

<table>
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<tr>
<th>Scene</th>
<th>Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
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<tbody>
<tr>
<td>1</td>
<td>Wheelchair into Car/Van - Calm</td>
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<td>4</td>
<td>Floor Transfer – Hurried</td>
<td>0.757</td>
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<tr>
<td>5</td>
<td>Toilet Transfer – Hurried</td>
<td>0.801</td>
<td>___</td>
</tr>
<tr>
<td>6</td>
<td>Child into Car/Van – Hurried</td>
<td>___</td>
<td>0.763</td>
</tr>
<tr>
<td>7</td>
<td>Child out of Car/Van – Hurried</td>
<td>___</td>
<td>0.681</td>
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<td>Wheelchair out of Car/Van – Calm</td>
<td>___</td>
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<td>Bathtub Transfer – Hurried</td>
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<tr>
<td>11</td>
<td>Toilet Transfer – Calm</td>
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<td>Bed Transfer – Calm</td>
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<td>13</td>
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Figure Captions

Figure 1. Wheelchair into car/van (calm)

Figure 2. Child into car/van (calm)

Figure 3. Child out of car/van (calm)

Figure 4. Floor transfer (hurried)

Figure 5. Toilet transfer (hurried)

Figure 6. Child into car/van (hurried)

Figure 7. Child out of car/van (hurried)

Figure 8. Wheelchair out of car/van (calm)

Figure 9. Bathtub transfer (hurried)

Figure 10. Bed transfer (hurried)

Figure 11. Toilet transfer (calm)

Figure 12. Bed transfer (calm)

Figure 13. Bathtub transfer (calm)

Figure 14. Wheelchair into car/van (hurried)

Figure 15. Item map

Figure 16. Construct validity key map for calm versus hurried conditions

Figure 17. Construct validity key map for indoor versus outdoor transfers

Figure 18. Scree Plot
Figure 1: Wheelchair into Car/Van (Calm)

Mean = 6.5, SD = 2.57

Figure 2: Child into Car/Van (Calm)

Mean = 6.0, SD = 2.82
Figure 3: Child out of Car/Van (Calm)

Mean = 6.0, SD = 2.91

Figure 4: Floor Transfer (Hurried)

Mean = 4.0, SD = 2.78
Figure 5: Toilet Transfer (Hurried)

Mean = 5.0, SD = 2.70

Figure 6: Child into Car/Van (Hurried)

Mean = 4.9, SD = 2.72
Mean = 5.0, SD = 2.50

Mean = 6.2, SD = 2.51
Mean = 3.9, SD = 2.56

Mean = 5.2, SD = 2.55
Reliability and validity for revised CSES

Figure 11: Toilet Tranfer (Calm)

![Bar chart showing confidence levels for toilet transfer (calm)]

Mean = 5.8, SD = 2.78

Figure 12: Bed Transfer (Calm)

![Bar chart showing confidence levels for bed transfer (calm)]

Mean = 6.1, SD = 2.81
Mean = 4.6, SD = 2.88

Mean = 5.1, SD = 2.38
Figure 15.

Item Map

---

**PERSONS MAP OF ITEMS**

<table>
<thead>
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<th>&lt;more&gt;</th>
<th>&lt;rare&gt;</th>
</tr>
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<tr>
<td>2</td>
<td>X</td>
</tr>
<tr>
<td>1</td>
<td>XXXXXX</td>
</tr>
</tbody>
</table>

**Note:**
- **N** = 71
- **H** = Hurried/Adverse Conditions
- **C** = Calm/Optimal Conditions
- **M** = Mean
- **S** = 1 Standard Deviation
- **T** = 2 Standard Deviations

**Items = 14**

**Meaning of Symbols:**
- Bathtub transfer (H)
- Floor transfer (H)
- Child out of car/van (H)
- Toilet transfer (H)
- Wheelchair into car/van (H)
- Bathtub transfer (C)
- Bed transfer (C)
- Child into car/van (H)
- Child into car/van (C)
- Child out of car/van (C)
- Wheelchair out of car/van (C)
- Wheelchair into to car/van (C)
Reliability and validity for revised CSES

Figure 16.

Construct validity key map for hurried (light bars) versus calm (dark bars) conditions

N= 71
Items = 14
M = Mean
S = 1 Standard Deviation
T = 2 Standard Deviations
C = Calm/Optimal Condition
H = Hurried/Adverse Condition
Figure 17.

Construct validity key map for indoor transfers (dark bars) versus outdoor transfers (light bars)

N= 71
Items = 14
M = Mean
S = 1 Standard Deviation
T = 2 Standard Deviations
C = Calm/Optimal Condition
H = Hurried/Adverse Condition
Figure 18.

Scree Plot