

CONSTRUCT VALIDITY OF A MEASURE OF RELATIVE MASTERY BASED ON
THE THEORY OF OCCUPATIONAL ADAPTATION

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ABSTRACT

The Relative Mastery Measurement Scale (RMMS), based on the theory of Occupational Adaptation, was developed to measure clients' perception of their occupational functioning. The specific construct measured by the RMMS is relative mastery which is a proposed indicator of occupational adaptation. Based on Schkade and Schultz's (1998) definition of relative mastery, the instrument includes items related to one's sense of effectiveness, efficiency, and satisfaction to self and society.

This line of research examined the content and construct validity of this measure of occupational adaptation. The first study statistically evaluated the content validity of the RMMS based on the ratings of 6 experts in Occupational Adaptation. In the second and third studies, the construct validity of the RMMS was examined using a combination of Rasch analysis and traditional measurement statistics. Participants were 275 rehabilitation clients.

Findings of the first study resulted in the experts' excellent agreement that the 12 RMMS items defined the construct of relative mastery. Results of the second and third

studies provided preliminary evidence of the validity of the RMMS as a measure of relative mastery for adult clients undergoing rehabilitation. It appears that with continued development, the RMMS has potential to quantitatively measure clients' phenomenological experience of relative mastery as defined by the theory of Occupational Adaptation.

Contributions of this line of research included: (a) preliminary support for the validity of the RMMS as a measure of relative mastery, (b) support for the construct of relative mastery as postulated by the theory of Occupational Adaptation, (c) advancement of the profession in available assessment procedures for involving clients in assessment and treatment planning, and (d) the application of measurement rigor in developing a measure of a phenomenological construct.

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CHAPTER 1

Background and Significance

Current health care trends suggest that consumers of tomorrow will have a strong desire to participate in decision making about their care and will demand even greater accountability of health care professionals than consumers of today (Baum & Law, 1997, 1998; Davies & Gavin, 1999; Neistadt, 1995; Pew Health Professions Commission, 1991, 1993). As a health care profession, occupational therapy was founded on the belief that the client should be involved in the intervention planning process. However, over the years many therapists have abandoned this focus (Baum & Law, 1997; Kielhofner & Burke, 1977; Shannon, 1977). It has been suggested that our adoption of medical model practices has influenced occupational therapists to employ reductionistic approaches to practice and instrumentation (Baum & Law, 1997; Custard, 1998). In spite of the American Occupational Therapy Association's (AOTA) stated position regarding client involvement in treatment planning (AOTA, 1994a, 1994b, 1995a, 1995b, 1995c), evidence is building that occupational therapists are not involving clients at the level recommended (Brown & Bowen, 1998; Neistadt, 1995; Northern, Rust, Nelson & Watts, 1995).

In 1995, Neistadt examined the practices of occupational therapists in assessing clients' priorities. According to 267 physical disability department directors, the majority of therapists use an informal interview as an intake procedure. Examples of client priority statements generated through informal interviews (e.g. "to take care of myself

again”, “to walk”, “to go home”), caused Neistadt to question whether this approach is sufficient to identify clients’ priorities and facilitate collaborative goal setting. It was her perception that occupational therapists were not collaborating effectively with their clients. Based on this finding, she recommended that educational institutions “spend more time teaching students and practicing therapists how to use formal tools to set collaborative treatment goals that can contribute to the effectiveness of occupational therapy treatment programs in physical dysfunction settings” (p. 345).

Northern, Rust, Nelson, and Watts (1995) qualitatively and quantitatively examined the degree to which clients were being involved in the assessment and treatment planning process by 30 occupational therapists in adult physical disability settings. The authors developed the Patient Participation Evaluation Form (PPEF) that was used to code and analyze the data collected through interviews, document reviews, and participant observation. The lack of depth and consistency in involving clients in a goal-setting process was the predominant finding. Time constraints were cited as one reason for the decreased involvement of clients in treatment planning. The authors encouraged maximizing client involvement to achieve maximum effectiveness of occupational therapy treatment. Finally, the authors called for more studies that “identify ways to involve patients in their own health care as needed” (p. 219).

Brown and Bowen (1998) assessed the degree of emphasis placed on the consumer and the environment in a study that focused on analyzing written treatment plans. The authors mailed a case study and treatment plan format to 200 randomly

selected occupational therapists. Included in the treatment plan was the client's stated goal of returning to work. The results revealed that the goals identified in the 29 completed treatment plans were not directly related to the client's stated goal of returning to work. For example, 21 respondents (72%) included no plan of intervention that addressed the environment or the person/ environment fit. According to the authors, most respondents identified interventions that focused on changing the person versus changing the environment or facilitating a person/ environment fit. While acknowledging the lack of generalizability due to the small sample size, the authors stated that "at times, therapists may become overly concerned with performance components and lose sight of the consumer's wants and needs" (p. 55). Based on their findings, the authors made the following recommendations: (a) place the individual receiving intervention "in charge" of the service delivery process, (b) consider the potential role of the environment in facilitating and inhibiting performance, and (c) realign assessment practices with the philosophical beliefs of the profession and with the rights of consumers it serves. They also suggested that as occupational therapists begin to practice in community-based consumer-oriented service delivery systems such as supported employment, occupational therapy must shift away from a focus on fixing the person" (p. 56).

The present line of research demonstrates a response to the need expressed for the development of formal intake procedures that facilitate client-based intervention focused on occupational functioning (Baum & Law, 1997, 1998; McColl & Pranger, 1994;

Neistadt, 1995; Nelson & Payton, 1991; Northern, et al., 1995; Pollock, 1993; Radomski, 1995; Trombly, 1993).

Assessment of Occupational Functioning

The discussion that follows outlines and describes current intake procedures available for occupational therapy assessment at the level of occupational functioning. Few formal instruments are available that guide the assessment of occupational functioning (Neistadt, 1995; Trombly, 1993). The two most commonly used instruments to assess occupational functioning include the Occupational Performance History Interview (OPHI) developed by Kielhofner, Henry, and Walens (1989), and the Canadian Occupational Performance Measure (COPM) developed by Law, Baptiste, et al. (1994).

The OPHI (Kielhofner, et al, 1989) is a therapist-rated assessment of occupational functioning based on the Model of Human Occupation (Kielhofner & Burke, 1985). The assessment is comprised of an historical interview guide that addresses the client's past and present occupational performance in five content areas: organization of daily living routines; life roles; interests, values, and goals; perception of abilities and assumption of responsibility; and environmental influences. The guide provides a total of 39 recommended questions. Based on client responses to questions asked, the therapist uses a 5-point Likert scale to rate past and present "adaptive status" in each content area. A rating of one (1) would indicate that the client was "maladaptive" while a five (5) would indicate that the client was "adaptive". The therapist also rates the influence of the client's environment on their "adaptation" using a 5-point scale.

In contrast to the OPHI, the COPM is a client-rated assessment based on the Canadian Guidelines for the Client-Centered Practice of Occupational Therapy (Law, Baptiste, et al., 1994). The instrument has been described as an individualized outcome measure designed to assess changes in a client's perception of their performance and satisfaction on specified activities over time. Clients are asked to identify daily activities that they want, need, or are expected to do, but that are difficult for them now. Using a scale ranging from 'not important at all (1)' to 'extremely important (10)', the client rates each activity listed. The client then rates their current performance and satisfaction for the five most important activities using a 10-point scale. For each scale, the client's ratings are totaled and divided by the total number of problems identified by the client. To assess changes in performance and satisfaction, the authors have recommended subtracting the initial performance and satisfaction ratings from subsequent ratings. A score change of 2 or greater on either scale has been reported to be a clinically important change (Law, Baptiste, et al., 1994).

By standardizing an interview process, each of these instruments has contributed to the profession a process for assessing occupational functioning. However, the use of these instruments in scholarly research is questionable due to the limitation of the ordinal ratings that result from the scoring procedures (Christiansen, 1993; A.G. Fisher, 1992b; Merbitz, Morris, & Grip, 1989; Short-Degraff & A.G. Fisher, 1993). This psychometric limitation of a revised version of the OPHI has been addressed recently through the

transformation of ordinal ratings to interval level data through the use of Rasch analysis (Mallinson, Mahaffey, & Kielhofner, 1998).

While the limitations of the OPHI-R have begun to be addressed, those of the COPM remain. Additionally, neither instrument includes all of the recommendations that have been made for achieving a top-down approach to client-centered assessment (AOTA, 1994b, 1995b; Baum & Law, 1997, 1998; Brown & Bowen, 1998; Christiansen, 1993; Law, Polatajko, et al., 1994; McColl, 1994; Trombly, 1993).

Suggestions for a top-down assessment have included: (a) consistently assess performance areas and performance contexts (AOTA 1994a, 1994b; Baum & Law, 1997, 1998; Brown & Bowen, 1998; Christiansen, 1993; Law, 1993), (b) collaborate with clients or their family to determine goals and priorities (AOTA, 1994a, 1994b; Baum & Law, 1997, 1998; Brown & Bowen, 1998), (c) develop treatment plans based on individual needs and life roles (AOTA, 1994a, 1994b; Baum & Law, 1997, 1998), (d) meaningfully involve the client in treatment planning (AOTA, 1995b; Baum & Law, 1997, 1998; Brown & Bowen, 1998; Law, Polatajko, et al., 1994), and (e) assess all the layers of function we intend to treat (Trombly, 1995). With regard to the layers of function we treat, A.G. Fisher and Short-Degraff (1993) proposed that an assessment of needs and wants should precede the assessment of performance components.

Occupational Adaptation offers a theoretical perspective with excellent potential to elicit the active involvement of clients in the assessment and treatment planning processes (Schkade & Schultz, 1992; Schultz & Schkade, 1992). Based on the beliefs of

our founders, the goal and measure of the effectiveness of this approach is the facilitation of change in a client's state and process of internal occupational adaptation. The process of occupational adaptation has been described as the normal process by which individuals develop competence in occupational functioning. Schultz and Schkade (1992) proposed that the internal occupational adaptation process may be measured through an assessment of relative mastery, as well as observed through signs of initiation, and generalization. While practice models for various areas of practice have begun to be developed based on this approach (Ford, 1995; Garrett & Schkade, 1995; Jackson & Schkade, 2001), it was believed that an interview guide and measurement scale of relative mastery would facilitate practice based on the theory of Occupational Adaptation. Further, a measurement scale would provide a method for quantitatively measuring of the effectiveness of this theoretical perspective.

To date, the effectiveness of the theory of Occupational Adaptation has been evaluated using qualitative (Johnson & Schkade, 2001; Pasek & Schkade, 1996) and quantitative methods (Buddenberg & Schkade, 1998; Gibson & Schkade, 1997; Jackson & Schkade, 2001). Assessment methods have focused on clients' own assessment of relative mastery (Buddenberg & Schkade, 1998; Gibson & Schkade, 1997) and therapists' observations of signs of relative mastery, initiation and generalization (Buddenberg & Schkade, 1998; Johnson & Schkade, 2001; Pasek & Schkade, 1996). Quantitative measures of occupational adaptation have involved the use of ordinal scales developed for measuring relative mastery (Buddenberg & Schkade, 1998; Gibson &

Schkade, 1997). While results of these studies reflect improvement in relative mastery as an indicator of internal occupational adaptation, findings may be questioned due to the lack of a valid and reliable measure.

Purpose

The purpose of this research was to develop an assessment instrument that facilitates a top-down approach to client-centered assessment based on Occupational Adaptation. The emphasis of this line of research was on the development, evaluation, and refinement of the RMMS as a measure of the construct of relative mastery. Three studies were performed that evaluated the psychometric properties of the instrument with clients in rehabilitation.

The long term impact of the research is related to the potential usefulness of the instrument in future practice and research. Development of a valid and reliable measure of relative mastery, as an indicator of internal occupational adaptation, will allow an evaluation of the progress of individual clients as well as testing of the assumptions of Occupational Adaptation with groups of clients.

Methodology

This line of research involved the development and evaluation of the psychometric properties of the RMMS through three related studies. In the first study, the content validity of the RMMS was evaluated by six content experts in the theory of Occupational Adaptation. Data were analyzed at the item, subtest, and test levels. Item level data were evaluated by the index of item-objective congruence and experts'

percentage of agreement (McDermott & Watkins, 1979; Rovinelli & Hambleton, 1977; Thorn & Dietz, 1989). Subtest and test level analyses involved the use of Lu's coefficient of agreement (Lu, 1971).

Construct validity of the RMMS was examined in the second and third studies through Rasch analysis (Wright & Masters, 1982). Rasch analysis is currently being recognized as the preferable measurement framework for the development of instruments that assess unidimensional variables (W.P. Fisher, 1993; Fox & Jones, 1998; Velozo, Kielhofner, & Lai, 1999). A major advantage of Rasch analysis over traditional measurement approaches is that it transforms ordinal level data into interval level data (logits) thus meeting the requirement of a true measure. Additionally, Rasch analysis allows for a person free item measure and an item free person measure. In this measurement tradition, construct validity is established through an evaluation of item ordering and unidimensionality. The consistency of item difficulty contributes to information regarding item ordering. An assumption of this approach is that items should form a unidimensional scale with items ranging from easy to more difficult.

Unidimensionality was examined by goodness-of-fit statistics, confirmatory factor analysis, and point-biserial correlation (Fox & Jones, 1998; Wright & Masters, 1982). Internal consistency reliability was evaluated by item and person separation reliabilities. Concurrent validity was evaluated by a correlational analysis of the relationship between client-rated RMMS scores and therapists' ratings of clients' performance on lower extremity dressing using the Functional Independence Measure (FIM) (Uniform Data Set,

1993).

RESULTS

The second study, performed in two phases, included a total of 200 inpatient rehabilitation clients who met the criteria of being over 21 years of age and cognitively able to participate in an interview lasting 15-20 minutes. In phase 1, fifty senior occupational therapy students administered the RMMS orally to one client each. Clients responded to the RMMS based on their most recent performance of a task of their choosing. In the second phase of this study, a single researcher administered the RMMS orally to 150 participants who rated themselves based on their most recent performance of a client-chosen task and lower-extremity dressing. Clients in this study met an additional criteria of having performed lower-extremity dressing under the supervision of their occupational therapist. Concurrent validity was examined by comparing clients' RMMS ratings with therapists' FIM ratings on lower-extremity dressing.

In the third and final study, 12 registered occupational therapists administered the RMMS orally to a total of 108 clients in six inpatient rehabilitation facilities. Clients responded to the RMMS with regard to their most recent performance of a client-chosen task performed in occupational therapy and observed by their occupational therapist. Following their observation of the client's performance on the task, therapists rated clients' functional performance using the FIM criteria ranging from 1= dependent to 7=Independent. Concurrent validity was evaluated through a correlational analysis of clients' RMMS ratings and therapists FIM ratings on the same task occurrence.

CHAPTER II

EVALUATING THE CONTENT VALIDITY OF THE RELATIVE MASTERY MEASUREMENT SCALE

Abstract

The Relative Mastery Measurement Scale (RMMS), based on the Occupational Adaptation theoretical perspective, was developed to measure clients' perception of their competency in occupational functioning. This article describes development and evaluation of the content validity of this measure of occupational adaptation. Based on Schkade and Schultz's (1998) definition of relative mastery, the instrument measures one's sense of effectiveness, efficiency, and satisfaction to self and society. Content validity was evaluated at the item, domain, and test levels based on ratings of six Occupational Adaptation experts. Item level data were evaluated by the index of item-objective congruence and experts' percentage of agreement (McDermott & Watkins, 1979; Rovinelli & Hambleton, 1977; Thorn & Dietz, 1989). Domain and test analyses were performed using Lu's Coefficient of Agreement (Lu, 1971).

Facilitating the internal adaptation process of consumers of our services has been an aim of occupational therapy since its inception. In today's health care environment, the need to evaluate the effectiveness of occupational therapy in facilitating this internal adaptation process has become an important challenge. Several barriers have impeded progress toward this goal. One obstacle is that many occupational therapists and researchers direct intervention and measure the effectiveness of services with regard to the immediate effect on body functions and structures and/ or therapist-determined activities (Bonder & Christiansen, 2001). A second obstacle is the limited reliance of occupational therapists and researchers on theoretical approaches that guide them to direct intervention and research efforts around clients' participation in everyday occupations (Bonder & Christiansen, 2001). As a result, few studies have examined the impact that participation in occupations has on the internal adaptation process.

While adaptation has been a consistent theme since the profession began in 1917 (Schultz & Schkade, 1997), only recently has a theoretical approach explicitly stated that the goal of occupational therapy was to directly impact the internal adaptation process of clients served (Schkade & Schultz, 1992; Schultz & Schkade, 1992). This approach, Occupational Adaptation, was based on the beliefs of the founders and leaders of the profession. The authors of this model proposed inclusion of the client in the process, emphasized the importance of the environment, and the interaction between the client and the environment. They identified three factors critical for adaptation to occur: (a) the

person must be active in the process, (b) the activity must have meaning for the person, and (c) the product (tangible or intangible) is an outcome of a process.

In addition to identifying the goal of facilitating internal adaptation, Schultz and Schkade (1992) were the first to specify the manner in which one would target and evaluate the adaptation process. Prior to their articulation of this process, limited information was available in the occupational therapy literature regarding signs of adaptation. The few examples included Kielhofner's (1977) suggestion that consistency between one's roles and their use of time would reflect adaptation and Fidler and Fidler's (1978) belief that adaptation can be assumed when the individual has performed automatically in their natural environment or is able to fluctuate between automatic and deliberate performance.

Schkade and Schultz (1992) expanded this area of the literature by defining internal occupational adaptation and specifying behaviors indicative of a change or improvement in the occupational adaptation process. According to Schkade and Schultz (1992), occupational adaptation refers to the phenomenon in which occupation and adaptation become integrated within each person as they interact with the environment while striving to overcome occupational challenges. They proposed that an assessment of the internal occupational adaptation process may be measured through an assessment of relative mastery, as well as observed through signs of initiation and generalization. In fact they suggested that "an increase in relative mastery is the best indicator that change in the occupational adaptation process is taking place" (Schultz & Schkade, 1992, p.

920). Relative mastery is believed to be a phenomenological assessment of one's perception of their own competence in occupational functioning. An assessment of relative mastery includes the properties of efficiency, effectiveness and satisfaction to self and society (Schkade & Schultz, 1998). The facilitation of a client's occupational adaptation process is both the goal and outcome measure for the success of occupational therapy. While work continues to address the validation of this approach, there is a need for a psychometrically sound instrument for measuring occupational adaptation as defined by the Occupational Adaptation Frame of Reference (Schkade & Schultz, 1992; Schultz & Schkade, 1992).

A review of the occupational therapy literature revealed that instruments are available that are purported to measure occupational adaptation (Kaplan & Kielhofner, 1989; Lai, Haglund, & Kielhofner, 1999; Mallinson, Mahaffey, & Kielhofner, 1998). Kaplan and Kielhofner (1989) stated that the Occupational Case Analysis Interview and Rating Scale (OCAIRS) was developed to provide "a structure for gathering, analyzing, and reporting data on the extent and nature of an individual's occupational adaptation" (p. 1). Lai et al. supported this intent in their statement that the OCAIRS was developed to assess patients' occupational adaptation. Following an interview, a therapist administers the OCAIRS using a 5-point Likert scale to rate clients in the areas of personal causation, values and goals, interests, roles, habits, skills, output, physical environment, social environment, feedback, and history.

The Occupational Performance History Interview-Revised (OPHI-R) is another instrument that has been cited as a measure of occupational adaptation (Mallinson, et al,1998). The authors indicated that the OPHI-R includes a “life history narrative component designed to render the life history from the client’s perspective and a rating scale designed to measure the client’s past and present occupational adaptation” (p. 219). Following an interview, the therapist uses a 5-point Likert scale to score the client in the following five areas: (a) organization of daily living routines, (b) life roles, (c) interests, values, and goals, (d) perception of abilities and assumption of responsibility, and (e) environmental influences.

Several limitations have been noted with regard to the potential of each of these instruments in providing measures of occupational adaptation as defined by the Occupational Adaptation Frame of Reference. One limitation is that neither instrument provides an operational definition of occupational adaptation. A second limitation is that scores resulting from these instruments reflect the therapist’s perception of the client’s adaptation rather than the client’s perception of their own adaptation. The passive role of the client in these assessments is inconsistent with Occupational Adaptation. A third limitation is the use of ordinal level data. A frequently cited limitation in instrumentation today both inside and outside occupational therapy is the use of ordinal scales (Christiansen, 1993; A.G. Fisher, 1992a; W.P. Fisher, 1993; A.G. Fisher & Short-Degraff, 1993; Law, 1993, 1995; Merbitz, Morris & Grip, 1989; Short-Degraff & A.G. Fisher, 1993).

To date, the effectiveness of the Occupational Adaptation theoretical perspective in influencing the occupational adaptation of clients served has been evaluated using qualitative (Johnson & Schkade, 2001; Pasek & Schkade, 1996) and quantitative methods (Buddenberg & Schkade, 1998; Gibson & Schkade, 1997; Jackson & Schkade, 2001). Methods of assessment have focused on clients' own assessment of relative mastery (Buddenberg & Schkade, 1998; Gibson & Schkade, 1997) and therapists' observations of signs of relative mastery, initiation and generalization (Buddenberg & Schkade, 1998; Johnson & Schkade, 2001; Pasek & Schkade, 1996). Quantitative measures of occupational adaptation have involved the use of ordinal scales developed for measuring relative mastery (Buddenberg & Schkade, 1998; Gibson & Schkade, 1997). While the results of these studies are optimistic in that they reflect improvement in clients' relative mastery over time, findings may be questioned due to the lack of a valid and reliable measure of relative mastery.

The authors of this study chose to develop a measure of relative mastery. As defined by Schkade and Schultz (1998), relative mastery consists of the client's perception of their "efficiency (time, energy and resources), effectiveness (extent to which the desired goal was achieved), and satisfaction to self /society (extent to which the individual was personally satisfied with the response and the extent to which societal influences assessed the response as congruent with performance expectations)" (p. 530).

Methods

The following describes the development and examination of the content validity of the Relative Mastery Measurement Scale (RMMS). The study was performed in two phases: Phase one involved the development of the RMMS. In the second phase, a panel of experts in the Occupational Adaptation examined the validity of the RMMS at the item, subtest, and test levels.

Instrument Development

Criteria for an instrument based on Occupational Adaptation were developed. A table of specifications, comprised of three domains, was developed based on Schkade and Schultz's (1998) definition of the construct of relative mastery. With knowledge that typically the longer the instrument the more reliable the measure and the longer the measure the less clinically practical, a compromise of nine items was selected to represent each domain. Nine items were chosen as it was anticipated that some items would not meet the criteria for inclusion in the final instrument. This would allow for an instrument of feasible length with multiple questions in each domain. Therefore, a scale resulted that consisted of 27 positively or negatively worded statements to which subjects would be asked to agree or disagree with regard to their performance of a specified activity. The following are representative items from each domain: (a) efficiency- "The task took a great deal more time than is typical for me", (b) effectiveness- "My performance was not adequate to complete the task", (c) satisfaction - "Overall, I am satisfied with myself regarding this activity". An attempt was made to develop an equal number of positively

and negatively worded statements. Once developed, items were piloted on occupational therapy students, colleagues, and clients. Initial item revisions were made based on responses and observations resulting from administration of the instrument.

Content Validity Examination Procedures

The following procedures were followed for developing a rating scale and evaluating the content validity of the RMMS. As recommended by Brown (1983), the rating scale included Schkade and Schultz's definition of relative mastery. This definition preceded directions for rating and the 27 RMMS items. Items were rearranged to ensure that they were no longer organized by domain and so that positively and negatively worded items were interspersed.

Following the development of the rating scale, an assessment of the validity of the instrument was initiated. Content validity was evaluated by six occupational therapists who were identified as experts in Occupational Adaptation. Experts were selected based on the following inclusion criteria: (a) registered/ licensed occupational therapists currently practicing or teaching in the field of occupational therapy, and (b) considered by their peers to have extensive knowledge of Occupational Adaptation.

The six experts were contacted by telephone or E-mail and invited to participate. All six agreed to participate. A packet (Appendix B), including a cover letter, informed consent form, the 27-item RMMS rating form, and a background form was mailed to each participant. Experts were advised to read and complete all forms and to return them in the self-addressed stamped envelope provided. Experts who had not returned the rating

forms by the requested date were contacted and encouraged to complete and return the packet by an extended deadline. All six packets were completed.

Data from the experts' ratings of the 27-item instrument were analyzed, revealing the need for revisions. After making the necessary changes, the same experts were invited to examine the content validity of a revised 21-item scale (Appendix C). Five of six experts returned the 21-item rating scale. Based on the analyses of the 21-item instrument, 12 items were retained for inclusion in the final version of the instrument.

Participants

Of the six Occupational Adaptation experts, two held a Doctorate, one held a Masters of Arts Degree, and 3 held Master's of Occupational Therapy degrees. Experts had a mean of 14 years of clinical experience in occupational therapy with a range of 6 to 30+ years. Mean years of experience with the Occupational Adaptation Frame of Reference was seven with a range of 3 to 10 years. All participants were currently teaching or practicing in the field of occupational therapy. Four participants worked full-time in academia (Full- Time Lecturer, Instructor, Clinical Instructor, and Assistant Professor), one worked as an independent contractor, and one was the lead occupational therapist for a school district. Participants have used their knowledge of Occupational Adaptation in one or more of the following practice settings: (a) school-based practice, (b) physical disabilities (acute care, sub-acute, rehabilitation), (c) community settings (with adults who have multiple disabilities and a community center-refugees), (d) psychiatry (chronic, acute, inpatient, outpatient), (e) academia, (f) transitional living

program, (g) geriatrics, (h) home health, (i) skilled nursing, (j) long term care, and (k) fieldwork settings. Current methods for evaluating relative mastery included interview, observation, weekly self-evaluations, and use of a 5-point Likert scale for clients to evaluate themselves in each domain. Two participants believed their current method was “definitely adequate” while four indicated that their current method was “somewhat adequate”.

Data Analysis

Data were analyzed at the item, subtest, and test levels. Item level analyses were evaluated by the index of item-objective congruence as described by Thorn and Deitz (1989). Data for these analyses were experts’ ratings of the degree to which each item was a measure of each domain. Experts were asked to indicate a “+1” if an item is definitely a measure of a domain, a “-1” if an item is definitely not a measure of a domain, and a “0” if they were undecided. Experts were also asked to identify the domain they believed each item best measured.

Item level data were also utilized to examine the experts’ percentage of agreement that each item is a measure of the intended domain. Thorn and Dietz’s (1989) formula ($P_{ik} = N_{ik} / N$) for calculating experts’ percentage of agreement was employed. Where P_{ik} is the percentage of agreement for item i and domain k , N is the total number of judges, and N_{ik} is the number of judges assigning i to domain k .

As recommended by Thorn and Deitz (1989), the following criteria were established *a priori* for making decisions regarding which items would be retained,

revised, or eliminated from the measure: (a) items that achieve a majority agreement of the experts [that an item is a measure of a domain] and have item-congruence values of $\geq .70$ will be retained, and (b) items that achieve a majority agreement of the experts [that an item is a measure of a domain] and have item-objective congruence values ranging from .50 - .69 may be retained or revised, and (c) items that achieve less than a majority agreement of the experts [that an item is a measure of a domain] and have an item-objective congruence value of $\leq .49$ will be eliminated.

Lu's Coefficient of Agreement was used for analysis of data at the subtest (domain) and test levels (Lu, 1971). Lu's coefficient was initially developed to allow a measure of the intensity of agreement of multiple judges classifying subjects into ordered categories. The resulting statistic, theta, is comparable to a reliability coefficient and may range from -1 to +1. A -1 would indicate a strong negative correlation and a +1 would indicate a strong positive correlation. To test the significance of Lu's coefficient of agreement, theta is compared with the critical value of chi-square divided by the appropriate degrees of freedom. For this study, a coefficient of less than .60 was considered poor, .60-.79 adequate, and greater than .80 excellent (Law, 1999).

Results

Analysis of the 27 Item Scale

Results from the calculation of the index of item-objective congruence for each item (McDermott & Watkins, 1979; Rovinelli & Hambleton, 1977; Thorn & Dietz, 1989), which allowed examination of the content validity of each item, are reported in

Table 1 along with the percentage of agreement among experts that each item is a measure of the intended domain. The majority of the experts agreed that 18 items were a measure of the intended domain. Of these, twelve items achieved 100% agreement, four items achieved 83%, and two items achieved 67%. Of the nine items that failed to achieve greater than 50% agreement, one item achieved 50%, three items achieved 33%, four items achieved 17%, and one item achieved 0% agreement. A majority of experts agreed that six of these items were a better measure of a domain other than the intended domain. Table 2 presents the experts' percent of agreement for all items yielding a majority agreement in a domain other than the intended domain. All positive values of the index of item-objective congruence are presented in Table 3.

Table 1

Intended Domain Items and Percent Agreement for the 27 item RMMS Scale.

Intended Domain	Item Number	Item-Objective Congruence	Percent Agreement
Efficiency	5	.63	100
	9	.54	100
	12	.71	100
	14	-.04	67
	16	.71	100
	19	0	33
	21	.33	67
	22	.50	100
	24	.38	83
Effectiveness	2	-.42	0
	6	.17	33
	8	.13	17
	10	.08	17
	15	0	17
	17	.63	100
	23	.29	50
	25	.13	17
	27	.21	33
Satisfaction	1	.71	100
	3	.92	100
	4	.63	100
	7	.88	100
	11	.71	100
	13	.75	100
	18	.38	83
	20	.71	83
	26	.46	83

Table 2
Percent Agreement for Items Yielding Majority Agreement in a Domain other than the
Intended Domain (27 Item RMMS Scale)

Intended Domain	Item Number	Efficiency	Effectiveness	Satisfaction
Effectiveness	2	100		
	6			
	8			67
	25			
	27	67		83
				67
Satisfaction	5	100		

Table 3

Positive Values for the Index of Item-Objective Congruence for the 27 Item RMMSScale.

Intended Domain	Item Number	Efficiency	Effectiveness	Satisfaction
Efficiency	5	<u>.63</u>		
	9	<u>.54</u>		
	12	<u>.71</u>		
	14		<u>.21</u>	
	16	<u>.71</u>		
	19			<u>.13</u>
	21	<u>.33</u>	.08	
	22	<u>.50</u>		
	24	<u>.38</u>	.13	
Effectiveness	2	<u>.71</u>		
	6		.17	<u>.29</u>
	8		.13	<u>.25</u>
	10		<u>.08</u>	<u>.08</u>
	15			<u>.38</u>
	17		<u>.63</u>	
	23		<u>.30</u>	
	25	<u>.25</u>	.13	
	27		<u>.21</u>	
Satisfaction	1			<u>.71</u>
	3			<u>.92</u>
	4			<u>.63</u>
	7			<u>.89</u>
	11			<u>.71</u>
	13			<u>.75</u>
	18			<u>.38</u>
	20			<u>.71</u>
	26		.08	<u>.46</u>

Note. Highest value obtained for each item is underlined.

Domain analysis revealed Lu's coefficient of agreement was .82 for efficiency, .23 for effectiveness, and .87 for satisfaction. Lu's Coefficient of Agreement achieved statistical significance ($p < .05$) for the domains of efficiency and satisfaction, but did not achieve statistical significance for the domain of effectiveness. Lu's Coefficient of Agreement at the test level ($L = .04$) indicated almost no agreement.

When items were examined individually, five of nine items in the domain of efficiency met the criteria to be retained in the final instrument, six of nine items in the domain of satisfaction met the criteria to be retained, and one of nine items in the domain of effectiveness met the criteria to be retained. Additionally, one item in the domain of effectiveness (item 2) was rated highest in the domain of efficiency.

Based on these analyses it was decided that the instrument must be revised due to unacceptable ratings, especially in the domain of effectiveness. Decisions regarding retaining, revising, or eliminating items were based on the criteria established *a priori*. The results indicated that no more than six items in any domain achieved the established criteria. Therefore, it was decided to limit the number of items in each domain to six. Only four items in the domain of efficiency achieved the criteria for inclusion. However, in spite of a .50 Item-Objective Congruence value, a decision was made to retain efficiency item 22 based on 100% agreement of the experts that this item is a measure of the domain of efficiency. Item 2, originally intended to measure the domain of effectiveness, was changed to the domain of efficiency based on a 100% agreement of the experts that this item is a measure of efficiency and an index of item-objective

congruence value of .71 in the domain of efficiency. In the domain of effectiveness, only item 17 achieved the criteria to be retained. Therefore, in an attempt to achieve six items that met the established criteria, eight new items were developed for the domain of effectiveness. Based on these decisions, the revised rating scale included a total of 21 items, six items in the domain of satisfaction, six items in the domain of efficiency, and nine items in the domain of effectiveness.

Analyses of the 21 Item RMMS Scale

The index of item-objective congruence of each item (Rovinelli & Hambleton, 1977; Thorn & Dietz, 1989) and the expert's percent agreement (McDermott & Watkins, 1977; Thorn & Dietz, 1989) for each item within the intended domains are reported in Table 4. All positive values of the index of item-objective congruence are presented in Table 5. Eighteen of the 21 items achieved a majority agreement of judges that the items measured the intended domain. Of these, 100% agreement was achieved for 14 items, 80% agreement was achieved for 2 items, and 60% agreement was achieved for 2 items. Only three items failed to achieve a majority agreement of the experts that the items were a measure of the intended domain (items 4, 16, 21). These items were all in the domain of effectiveness. All items in the domain of efficiency met the criteria for inclusion. Five of six items in the domain of satisfaction met the criteria for inclusion. The remaining item in the domain of satisfaction achieved an 80% agreement and an index of item-objective congruence value of .35. In the domain of effectiveness six items achieved a majority agreement by the experts that the items were a measure of the intended domain:

(a) three achieved 100% agreement, (b) one achieved 80% agreement, and (c) two achieved 60% agreement. Of these, the lowest item-objective congruence value was .50. Of the remaining three items, two achieved experts' agreement ratings of 40%, and one achieved an agreement of 20%. Index of item-objective congruence values for these three items ranged from .05 to .30.

Table 4

Intended Domain Items and Percent Agreement for the 21 item RMMS Scale

Intended Domain	Item Number	Item-Objective Congruence Values	Percent Agreement
Efficiency	3	.70	100
	7	.90	100
	10	.90	100
	12	.80	100
	13	.80	100
	19	.75	100
Effectiveness	1	.50	60
	4	.30	40
	8	.20	60
	9	.50	100
	14	.55	100
	16	.05	40
	18	.60	80
	20	.50	100
	21	.05	20
Satisfaction	2	.75	100
	5	.80	100
	6	.35	80
	11	.75	100
	15	.80	100
	17	.80	100

Table 5

Positive Values for the Index of Item-Objective Congruence for the 21 Item RMMS Scale

Intended Domain	Item Number	Efficiency	Effectiveness	Satisfaction
Efficiency	3	<u>.70</u>		
	7	<u>.90</u>		
	10	<u>.90</u>		
	12	<u>.80</u>		
	13	<u>.80</u>		
	19	<u>.75</u>		
Effectiveness	1		<u>.50</u>	.05
	4		<u>.30</u>	<u>.30</u>
	8	<u>.35</u>	.20	
	9		<u>.50</u>	
	14		<u>.55</u>	<u>.10</u>
	16		.05	<u>.35</u>
	18		<u>.60</u>	
	20		<u>.50</u>	.05
	21	<u>.35</u>	.05	
Satisfaction	2			<u>.75</u>
	5			<u>.80</u>
	6			<u>.35</u>
	11			<u>.75</u>
	15			<u>.80</u>
	17			<u>.80</u>

Note. Highest value obtained for each item is underlined.

Domain analysis revealed Lu's coefficient of agreement was .94 for efficiency, .65 for effectiveness, and .94 for satisfaction. Lu's Coefficient of Agreement achieved statistical significance ($p < .05$) for all domains. Although statistically significant at the .05 level, Lu's Coefficient of Agreement at the test level was poor (.42).

Based on the results of these analyses it was decided to retain the four items from each domain that: (a) achieved the highest percentage of agreement of the experts, and (b)

had the highest Item-Objective Congruence Values. Efficiency items 7,10,12, and 13 were retained as they all achieved 100% agreement and Item-Objective Congruence values of .80 and above. Effectiveness items 9,14,18, and 20 were retained as they achieved 80-100 percent agreement and index of item-objective congruence values ranging from .50-.60. All satisfaction items achieved 100% agreement of the experts. Decisions for selection in the domain of satisfaction were based on index of item-objective congruence values as well as the need to select an equal number of items reflective of satisfaction to self and others. Items 5 and 15, which reflected the satisfaction of others, were retained as they achieved index of item-objective congruence values of .80. Items 2 and 11, which reflected satisfaction to self, were retained as they achieved index of item-objective congruence values of .75.

Table 6 presents index of item-objective congruence values and percentage agreement for the final 12-items. Domain analysis for this scale revealed Lu's Coefficient of Agreement was 1.0 for efficiency, .92 for effectiveness, and 1.0 for satisfaction ($p < .05$). Additionally, Lu's Coefficient of Agreement for the final 12-item RMMS was excellent at .95 ($p < .05$).

Table 6

Item-Objective Congruence Values and Percent Agreement for the 12-Item RMMS Scale

Domain	Item Number	Item-Objective Congruence Values	Percent Agreement
Efficiency	7	.90	100
	10	.90	100
	12	.80	100
	13	.80	100
Effectiveness	9	.50	100
	14	.55	100
	18	.60	80
	20	.50	100
Satisfaction	2	.75	100
	5	.80	100
	11	.75	100
	15	.80	100

Discussion and Conclusions

Measurement of occupational therapy’s effectiveness in facilitating the internal adaptation of clients served has been and will continue to be an important challenge for our profession. This is of particular importance for therapists who employ the Occupational Adaptation theoretical perspective, since the goal and outcome of this approach is to facilitate a change in clients’ occupational adaptation process. Development of a valid and reliable measure of relative mastery is one step in overcoming this challenge as this process involves the client in self-assessment.

This research, based on Occupational Adaptation, developed and evaluated the validity of the RMMS as a measure of relative mastery (phenomenological sense of

one's effectiveness, efficiency, and satisfaction to self and others). The content validity of the RMMS was evaluated at three stages during its development. Based on these analyses, a 12-item instrument resulted that with further development appears to have excellent potential as a measure of relative mastery in the context of internal occupational adaptation. Pilot tests using the RMMS are currently underway in clinical settings. Data generated from these pilot tests will be subjected to Rasch analysis (Wright & Master, 1982; Wright & Stone, 1979) to evaluate the validity and reliability of the instrument when used with clients who present with a variety of disabilities and who are rating themselves on therapist-selected and client-chosen activities. To further evaluate the validity of the RMMS, future research will also examine the correlation between clients' perceptions of their relative mastery and therapists' objective ratings of their performance.

CHAPTER III

RASCH ANALYSIS OF THE CONSTRUCT VALIDITY OF THE RELATIVE MASTERY MEASUREMENT SCALE

Abstract

The Relative Mastery Measurement Scale (RMMS), based on the Occupational Adaptation theoretical perspective was developed to measure clients' perception of their competency in occupational functioning. This article describes the evaluation of the construct validity of this measure of occupational adaptation. The study was performed in two stages and included three analyses. Construct validity was evaluated using a combination of Rasch and traditional statistical procedures. Fifty rehabilitation clients participated in the first phase and 150 in the second. Preliminary findings supported the validity of the RMMS as a measure of relative mastery through consistency in item ordering and unidimensionality.

Current health care trends suggest that consumers of tomorrow will have a strong desire to participate in decision making about their care and will demand even greater accountability of health care professionals than consumers of today (Baum & Law, 1997, 1998; Davies & Gavin, 1999; Neistadt, 1995; Pew Health Professions Commission, 1991, 1993). In response to the concerns of consumers, the American Occupational Therapy Association (AOTA) has encouraged therapists to actively involve clients in the assessment and treatment planning processes (AOTA, 1994a, 1994b; 1995a, 1995b). However, research indicates that occupational therapists are still not involving clients to the fullest extent possible (Brown & Bowen, 1998; Neistadt, 1995; Northern, Rust, Nelson, & Watts, 1995). This documented need for greater involvement of clients in the occupational therapy process has led researchers and leaders in the profession to encourage the development of assessment procedures that facilitate client-centered intervention (Baum & Law, 1997, 1998; Dickerson, 1996; McColl & Pranger, 1994; Nelson & Payton, 1991; Pollock, 1993; Radomski, 1995; Spencer, Krefting, & Mattingly, 1993; Townsend, Brintnell, & Staisley, 1990; Trombly, 1993).

Eliciting the active involvement of clients in the assessment and treatment planning processes is a basic premise of the Occupational Adaptation frame of reference (Schkade & Schultz, 1992; Schultz & Schkade, 1992). Based on the beliefs of our occupational therapy forebears, the goal and measure of the effectiveness of this approach is the facilitation of change in a client's state and process of internal

occupational adaptation. The process of occupational adaptation has been described as the normal process by which individuals develop competence in occupational functioning. According to this theoretical perspective, changes in occupational adaptation are reflected in one's assessment of their relative mastery, signs of initiation, and generalization (Schultz & Schkade, 1992). This approach appears to have excellent potential to elicit the active involvement of clients' in their own assessment and treatment planning. However, the lack of a valid and reliable measure of the construct of occupational adaptation, as defined by the theory of Occupational Adaptation, precludes statistical testing of the assumptions of this client centered approach.

The validity of two measures of occupational adaptation, based on the Model of Human Occupation, have been evaluated for use in occupational therapy practice (Kielhofner, Mallinson, Forsyth, & Lai, 2001; Lai, Haglund, Kielhofner, 1999; Mallinson, Mahaffey, & Kielhofner, 1998). These instruments, the Occupational Case Analysis Interview and Rating Scale (OCAIRS) (Kaplan & Kielhofner, 1989) and the Occupational Performance History Interview-Revised (Mallinson, et al., 1998), direct therapists to rate a client's occupational adaptation based on their perception of the client's personal causation, values, goals, roles, habits, skills, and environment.

The potential of these instruments to evaluate the effectiveness of the theory of Occupational Adaptation is limited since the constructs being measured are not consistent with the operational definition of internal occupational adaptation according to theory of Occupational Adaptation (Schkade & Schultz, 1998). Lai, et al. (1999), in

their examination of the construct validity of the OCAIRS, indicated the components measured were occupational identity and occupational competence. Analysis of the OPHI-R revealed measurement of the defined constructs of occupational competence, identity, and environment (Mallinson, et al., 1998). Measurement of occupational adaptation based on these instruments differ from measurement of occupational adaptation according to the theory of Occupational Adaptation since the latter would include an assessment of relative mastery, initiation, and generalization. To be consistent with the theory of Occupational Adaptation, one or more of these indicators of occupational adaptation would need to be included in an assessment. Of these, relative mastery appeared to be the most conducive to quantitative measurement. Therefore, the Relative Mastery Measurement Scale (RMMS) was developed as a quantitative indicator of occupational adaptation (Buddenberg, Schkade, Ishee, 2001).

Purpose

The purpose of this study was to examine the validity and reliability of the RMMS when used with adult clients undergoing rehabilitation. Statistical procedures of Rasch analysis were combined with traditional test development methods to evaluate the RMMS.

Methods

Instrument

The Relative Mastery Measurement Scale (RMMS) is a 12-item scale designed to measure clients' perception of their sense of relative mastery related to an identified

activity. Consistent with Schkade and Schultz's (1998) definition of relative mastery, RMMS items relate to one's sense of their own "efficiency (time, energy, and resources), effectiveness (extent to which the desired goal was achieved), and satisfaction to self/ society (extent to which the individual was personally satisfied with the response and the extent to which societal influences assessed the response as congruent with performance expectations)" (p. 530).

The RMMS contains four items representative of each of the three domains of relative mastery (effectiveness, efficiency, and satisfaction). To ensure that individuals gave appropriate thought to each item, six items were positively stated and six were negatively stated. An example of a positively worded item in the domain of effectiveness was "I successfully completed the task". A negatively worded effectiveness item read "I did not produce the result I expected". The two categories of responses for the dichotomous scale were "agree" and "disagree". Responses to positively worded statements were scored one for agree and zero for disagree. Negatively worded statements were reverse scored. Accordingly, a client's raw score could range from 0, suggesting a very limited sense of relative mastery, to 12 suggesting a perception of significant relative mastery.

A previous study (Buddenberg, Schkade, & Ishee, 2001), described the development of the RMMS and examined the content validity using Lu's Coefficient of Agreement (Lu, 1971). Excellent agreement (.95) was achieved among five

Occupational Adaptation experts that the resulting 12 items provided a measure of relative mastery.

Participants

The study was conducted in two phases resulting in different samples of clients recruited from two inpatient facilities in central Arkansas. Fifty clients were recruited in phase one to rate their performance on a client-chosen task. Twenty-seven clients were from a 100-bed facility and 23 were from a 60-bed facility. Data for five participants were not included in the analysis: Of these, two had missing data and three were excluded secondary to cognitive impairment that did not become apparent until during the administration of the RMMS. Additionally, clients who scored a 12 or 0 on a task were eliminated from item calibrations since they did not provide useful information. Demographic data were not collected for participants in this phase of the research.

In phase two, 150 clients were recruited from the same facilities to rate their performance on a client-chosen task and a researcher chosen task (lower-extremity dressing). Participants ranged in age from 22 to 92 with a mean age of 69 (S.D. 14.5). Separate analyses were performed for each task. As in phase one, data were eliminated from either analysis if the score was 0 or 12.

Data for 144 phase two participants were used in the item calibrations with regard to the client-chosen task. Ninety participants were female and 54 were male. One-hundred fifteen participants had orthopaedic conditions and 29 had neurological

conditions. Eighty-four of these participants were from the 100-bed facility and 60 were from the 60-bed facility.

Phase two participants whose data were used in the lower-extremity dressing analysis (N=142) were predominantly female (89 female and 53 male) and primarily admitted for orthopaedic conditions (114 orthopaedic and 28 neurological). Eighty-one participants in this analysis were from the 100-bed facility and 61 were from the 60-bed facility.

Procedures

Staff occupational therapists and physical therapists from two inpatient facilities assisted in the recruitment of participants for both phases of the study. The facilities included a 100-bed facility located in Little Rock, and a 60-bed facility in Sherwood. Inclusion criteria for the study were: (a) admission to inpatient rehabilitation, (b) over 21 years of age, and (c) cognitively able to meaningfully participate in an interview lasting 15-20 minutes. All participants signed an informed consent approved by Texas Woman's University's Institutional Review Board.

In phase one, 50 occupational therapy students administered the RMMS orally to one client each. Rehabilitation clients responded to the RMMS based on their performance of a client-chosen task performed since being admitted to the rehabilitation facility. Students recorded client responses to each item by circling agree or disagree. Phase two participants completed the RMMS with regard to their most recent performance on two activities: lower-extremity dressing and a client-chosen task.

A single researcher administered the RMMS to all participants orally and recorded all responses in phase two of the study. Tasks were alternated in presentation to control for the potential effect of order. Participants in the second phase met an additional criteria of having performed lower-extremity dressing under the supervision of their primary occupational therapist at least one time since their admission. Clients' responded to the RMMS with regard to their most recent performance of lower-extremity dressing. Also, the primary occupational therapist of each client reported their most recent Functional Independence Measure (FIM)(Uniform Data System, 1993) rating for lower-extremity dressing. Since it is the policy of the facilities to update each client's FIM ratings in their weekly progress note, it was assumed that the therapists' ratings were reflections of clients' current performance.

Data Analysis

Rasch analysis is currently being recognized as the preferable measurement framework for the development of instruments that assess unidimensional variables (W.P. Fisher, 1993; Fox & Jones, 1998; Velozo, Kielhofner, & Lai, 1999). Several reasons have been cited for the rise in the popularity of this approach over traditional approaches in instrument development. One advantage of the Rasch approach is that it addresses the limitation of ordinal-level scales (Fox & Jones, 1998; Merbitz, Morris, & Grip, 1989). Rasch analysis converts ordinal-level data resulting from Likert-type scales into interval level data (logits) allowing for the development of a true measure (Fox & Jones, 1998; Wright & Masters, 1982). A second advantage of Rasch analysis is that it

provides a sample-free item calibration and a scale-free person measurement (Fox & Jones, 1998; Velozo, et al., 1999, Wright & Stone, 1979). This allows for each item in the instrument to be evaluated independent of the sample. Additionally, the influence of item difficulty can be removed from the estimation of a person's ability. While items and persons are examined independently, Rasch is based on the assumptions that items should form a unidimensional scale ordered from easy to difficult, and persons passing easy items are more likely to pass more difficult items (Fox & Jones, 1998).

The Rasch measurement model was employed to evaluate the construct validity of the RMMS through the evaluation of item ordering and unidimensionality. The Bigsteps software package for all two-facet models was used to analyze the data (Wright & Linacre, 1991). Information related to the ordering of items allows researchers to determine the consistency of item difficulty (Fox & Jones, 1998). Unidimensionality was examined by goodness-of-fit statistics, principal components factor analysis, and point-biserial correlation (Fox & Jones, 1998; Wright & Masters, 1982). Concurrent validity was evaluated by a correlational analysis of the relationship between client-rated RMMS scores and therapists' ratings of clients' performance on lower extremity dressing using the FIM (Uniform Data System, 1993).

Internal consistency reliability was evaluated through Rasch separation reliability. Within the classical psychometric framework, internal consistency reliability typically involves calculating Chronbach's alpha for responses on the scale of interest. Fox and Jones (1998), advocate the use of Rasch analysis over Chronbach's alpha, since

the Rasch model provides examination of the reliability of items and persons. While indicating that there are no universally acceptable cutoffs for this coefficient, they indicated that reliabilities higher than .80 are generally acceptable.

Results

Unidimensionality

Item Ordering..

A well constructed test contains items that are hierarchically arranged in a predictable order of difficulty (W.P. Fisher, 1993; Wright & Stone, 1979). Thus, item difficulty statistics can be used to represent items on a continuum of the construct being measured (Wright & Stone, 1979). The position of each item is referred to as the item's calibration and is reported in logits. Item logit measure calibrations for RMMS items in the first phase of the study are presented in Table 1. Items 4, 9, 2, and 10 were developed to measure the domain of efficiency, items 6,1, 8, and 12 were intended to measure effectiveness, and 3,11, 7, and 5 were items related to satisfaction.

Rasch Item Statistics for Client-Chosen Task (N=40) in Phase 1

Item # / Description / Domain (E=Effectiveness, I= Efficiency, and S=Satisfaction)	Item Logit	Item Error	Infit MnSq	Infit ZSTD	Outfit MnSq	Outfit ZSTD	PTBIS
4* Physically or mentally tired (I)	2.31	.40	1.38	1.8	2.86	2.9	-.11
9 Great deal of time (I)	1.85	.38	.85	-1.0	.69	-1.0	.40
6 Produce desired results (E)	.89	.37	.98	-.1	1.01	.0	.33
1 Performance adequacy (E)	.75	.37	1.05	.3	.93	-.3	.29
2 Time frame (I)	.75	.37	.96	-.2	.84	-.7	.39
8 Completion of all steps (E)	.18	.39	1.05	.3	.97	-.1	.31
3 Satisfaction (S)	-.84	.45	.73	-1.2	.50	-1.2	.56
11 Family would not be happy (S)	-.84	.45	.98	-.1	1.75	1.1	.32
12 Successfully completed (E)	-.84	.45	1.02	.1	.71	-.6	.35
7 Pleased with performance (S)	-1.06	.47	.47	-2.4	.26	-1.8	.75
5 Happiness of others (S)	-1.29	.50	.92	-.3	.65	-.6	.37
10* Aware of resources (I)	-1.86	.57	1.31	.8	4.55	2.1	-.11

* Item with MnSq (>1.2) and ZSTD (>2.0).

This analysis revealed that items 1 and 2 had the same frequency count and logit measure and items 3, 11, and 12 had the same frequency count and logit measure. The item error was identical for each set of items. Statistically, this implied a similarity of choice and duplication along the RMMS scale continuum. However, when examined for their contribution to the scale, items that performed similarly from a statistical perspective were actually representative of different domains of relative mastery. For example, item 1 was intended as a measure of effectiveness while item 2 was developed as a measure of efficiency. Items 3 and 11 were developed to contribute information about satisfaction and item 12 was included to gain information related to clients' sense of their effectiveness. A decision to retain all items was made based on the theoretical basis for the contribution of each item and the potential influence of the small sample size in study one.

The item logit order, on the chosen-task analysis in phase two of the study, is presented in Table 2. A comparison of logit order between the chosen-task scales for phase one and phase two revealed that items 10 and 11 were ordered differently: Item 11 was a more difficult item in phase one and item 10 was more difficult in phase two. The logit order for items in the lower-extremity dressing task in phase two is reported in Table 3. The item order for this analysis was similar to the chosen-task analysis in phase two. No item duplication resulted in either analysis in phase two of the study. Figure 1 presents RMMS data on lower-extremity dressing on a scaled continuum with a .5 logit unit spacing. Frequency counts indicated the number of clients who passed each item

with a score of one. Based on this representation of the data, it appeared that a few more items would be beneficial in the positive logit range 1.0 to 2.5 and the negative logit range -1.5 to -2.5. The addition of items may provide a more even distribution of item difficulty over the range of possible logit scores.

Rasch Item Statistics for Client-Chosen Task (N=144) in Phase 2

Item # / Description / Domain (E=Effectiveness, I= Efficiency, and S=Satisfaction)	Item Logit	Item Error	Infit MnSq	Infit ZSTD	Outfit MnSq	Outfit ZSTD	PTBIS
4 Physically or mentally tired (I)	3.66	.26	1.10	.7	1.66	1.1	.28
9 Great deal of time (I)	1.69	.21	.82	-2.1	.78	-1.2	.64
2 * Time frame (I)	.72	.22	1.32	2.8	1.56	2.6	.40
6 Produce desired results (E)	.48	.22	.81	-1.8	.70	-1.6	.67
1 Performance adequacy (E)	.34	.22	.88	-1.0	.82	-.9	.63
10* Aware of resources (I)	.13	.23	1.96	6.1	3.02	5.7	.04
7 Pleased with performance (S)	-.43	.25	.68	-2.5	.44	-2.3	.70
8 Completion of all steps (E)	-.76	.26	.74	-1.9	.42	-2.0	.66
12 Successfully completed (E)	-.97	.27	.67	-2.3	.34	-2.2	.67
3 Satisfaction (S)	-1.05	.28	.95	-.3	.76	-.6	.52
11 Family would not be happy (S)	-1.29	.29	.88	-.7	.52	-1.2	.55
5 Happiness of others (S)	-2.53	.40	.77	-.9	.23	-1.3	.47

* Item with MnSq (>1.2) and ZSTD (>2.0).

Rasch Item Statistics for Lower-Extremity Dressing(N=142) in Phase 2

Item # / Description / Domain (E=Effectiveness, I= Efficiency, and S=Satisfaction)	Item Logit	Item Error	Infit MnSq	Infit ZSTD	Outfit MnSq	Outfit ZSTD	PTBIS
4 Physically or mentally tired (I)	2.24	.23	1.06	.6	.99	.0	.61
9 Great deal of time (I)	1.59	.22	.85	-1.5	1.25	.7	.67
2 Time frame (I)	1.06	.22	1.19	1.7	1.09	.2	.57
1 Performance adequacy (E)	.60	.23	.64	-3.6	.43	-1.6	.74
6 Produce desired results (E)	.18	.24	.85	-1.2	.68	-.7	.66
10* Aware of resources (I)	-.29	.25	2.35	7.1	3.60	3.3	.08
8 Completion of all steps (E)	-.35	.25	.91	-.6	.60	-1.0	.62
7 Pleased with performance (S)	-.48	.25	.58	-3.4	.33	-1.9	.70
3 Satisfaction (S)	-.67	.26	.63	-2.9	.39	-1.7	.67
12 Successfully completed (E)	-.95	.27	.88	-.8	.65	-.8	.57
11 Family would not be happy (S)	-1.25	.28	1.14	.9	1.45	.8	.53
5 Happiness of others (S)	-1.67	.30	.75	-1.5	.67	-.7	.52

* Item with MnSq (>1.2) and ZSTD (>2.0)

Figure 1

Relative Mastery Continuum Lower-Extremity Dressing (N= 142)

Frequency	Logit	RMMS Item
129	-2.5	Happiness of others (S)
	-2.0	
119	-1.5	Family would not be happy (S)
115		Satisfaction (S)
111	-1.0	Successfully completed (E)
108	-.5	Pleased with performance (S)
106		Completion of all steps (E)
105		Aware of resources (I)
	0	
97	.5	Produced desired results (E)
89		Performance adequacy (E)
80	1.0	Time Frame (I)
69	1.5	Great deal of time (I)
	2.0	
56	2.5	Physically or mentally tired (I)

E = Effectiveness, I = Efficiency, S = Satisfaction

On the scale representing the continuum of relative mastery, easier items are positioned near the top of the figure and more difficult items are near the bottom. A visual examination of the data revealed that items related to satisfaction to self and others (5, 11, 3, 7) tended to be easier items, effectiveness items (12, 8, 6, 1) fell around the middle of the scale, and efficiency items (10, 2, 9, 4) were generally more difficult.

Rasch Fit-Statistics.

Goodness-of-fit statistics were performed to test the validity of the RMMS for this sample by examining the conformity of items to a single underlying construct of relative mastery. Test items fit the Rasch measurement model when more able persons pass more difficult items and easier items are more likely to be passed by any person than more difficult items. Item fit, reported in mean square fit statistics (MnSq), evaluates the difference between observed residual variance and expected residual variance (W.P. Fisher, 1993; Lai, A.G. Fisher, Magalhaes, Bundy, 1996; Wright & Stone, 1979). These statistics help identify the items which are representative of the construct. Two types of fit statistics are typically calculated: Outfit (outlying) statistics assess item ratings for people who possess extremes of the trait being measured and infit statistics (information weighted) assess item ratings for people who possess a mid-range of the trait or construct being measured. Positive or negative misfit may occur as a result of unlikely responses to items across subjects or as a result of a person's unlikely responses across items. Positive misfit results when more difficult items are passed by persons who possess less

of the construct being measured. Responses that are too predictable result in negative misfit.

Statistically, items are said to fit the Rasch measurement model when the corresponding MnSq is 1.0 ($\pm .3$) and the associated standardized indices (ZSTD) or t-value is ± 2 (Wright & Linacre, 1994; Kielhofner, et al., 2001). Mean square indices of >1.4 or $<.6$ and/or ZSTD of >2 or less than <-2 have frequently been established as criteria for misfit (A.G. Fisher, 1993; Kielhofner, et al., 1999; Mallinson, et al., 1998; Tesio & Cantagallo, 1998). For this study, item misfit was said to be present when infit and outfit MnSq >1.2 and the ZSTD was > 2 . This conservative criterion was selected based on the recommendation of Wright and Linacre (1994).

According to the misfit criteria, three total items (10, 4, and 2) misfit the scale in at least one of the three analyses. Phase one statistics on client-chosen tasks revealed that items 10 and 4 were misfitting (Table 1). The fact that some clients exceeded the outfit ZSTD indicated that responses on these items were far from their ability level. Table 2 shows that items 10 and 2 were misfitting in the chosen-task analysis in phase two. Item misfit statistics for the lower-extremity dressing analysis in phase two, illustrated in Table 3, revealed item 10 as the only misfitting item in this analysis.

Item 10, "I am aware of people, equipment, and techniques that would help make this task easier", was misfitting in all three analyses. Although participants frequently agreed with this item in phase one (-1.86 logit), it was placed around the center of the scale in the other two analyses ($.13$ and $-.29$ respectively). Based on these findings, item

10 did not appear to elicit a clear response pattern from less able to more able clients. Item 4, “I felt physically or mentally tired after finishing the task” was misfitting in the client-chosen analysis in phase one. Many clients agreed with this statement (A=0) rather than disagreed (D=1), hence the low frequency counts. Item 2, “I completed the task within about the same time frame it usually takes”, was only misfitting in the analysis of the client-chosen task in phase two of the study.

Confirmatory Factor Analysis.

Confirmatory factor analysis was performed to evaluate how items work together to define the construct of relative mastery (Grimm & Yarnold, 1995). The criterion for factor loadings was .30 and above (Tabachnick & Fidell, 1996). Factor analysis of the data for the client-chosen task in phase one identified a four factor model (Table 4). Factor 1, representing a unidimensional scale of relative mastery, consisted of 10 items that explained 33% of the total variance. Items representative of each domain of relative mastery loaded on this factor: All items developed as measures of effectiveness, satisfaction, and two of the four items related to efficiency defined the factor. Loadings for all items in factor 1 exceeded .30. Effectiveness items loaded above .47, satisfaction items above .61, and efficiency items were above .58. The second and third factors consisted of two items each. While loadings for each item in factor two and three exceeded .50, items loading on these factors were not consistent with the theoretical expectations. Each factor was composed of one effectiveness item and one efficiency

item. The fourth factor consisted of only efficiency item 10, which had a factor loading of .67.

Table 4

Confirmatory Factor Analysis of Client-Chosen Task Data in Phase 1

Item #	Item Description and Domain	Factor 1	Factor 2	Factor 3	Factor 4
1	Performance adequacy (E)	.47	.70		
2	Time frame (I)	.65			
3	Satisfaction (S)	.72			
4	Physically/mentally tired (I)			.83	
5	Happiness of others (S)	.61			
6	Produce desired results (E)	.56			
7	Pleased with performance (S)	.87			
8	Completion of all steps (E)	.53		.51	
9	Great deal of time (I)	.58			
10	Aware of resources (I)		.57		.67
11	Family would not be happy (S)	.62			
12	Successfully completed (E)	.57			

The first factor in the client-chosen task analysis in phase two accounted for 36% of the total variance in this three-factor solution (Table 5). Factor 1 contained 10 items, of which nine had loadings above .55. Consistent with the analysis of the client-chosen task in phase one, all items developed to measure effectiveness, satisfaction, and two of the four items designed to measure efficiency comprised factor 1. The second and third factors were each defined by one item. These items, 10 and 4, were also found to be

misfitting according to the Rasch fit statistics. No items in this analysis had factor loadings above .30 on more than one factor.

Table 5

Confirmatory Factor Analysis of Client-Chosen Task Data in Phase 2

Item #	Item Description and Domain	Factor 1	Factor 2	Factor 3
1	Performance adequacy (E)	.66		
2	Time frame (I)	.38		
3	Satisfaction (S)	.62		
4	Physically/ mentally tired (I)			.85
5	Happiness of others (S)	.60		
6	Produce desired results (E)	.70		
7	Pleased with performance (S)	.78		
8	Completion of all steps (E)	.71		
9	Great deal of time (I)	.56		
10	Aware of resources (I)		.74	
11	Family would not be happy (S)	.62		
12	Successfully completed (E)	.78		

The two-factor solution resulting from the analysis for lower-extremity dressing data is reported in Table 6. Forty-two percent of the total variance was explained by factor 1. This factor was comprised of 11 items with factor loadings above .35. With the exception of satisfaction item 11 (family would not be happy), which had a loading of .36, all loadings on factor 1 exceeded .52. Eighty percent of the items exceeded .60. The second factor was defined only by item 10 with a factor loading of .73.

Table 6

Confirmatory Factor Analysis of Lower-Extremity Dressing Data in Phase 2

Item #	Item Description and Domain	Factor 1	Factor 2
1	Performance adequacy (E)	.82	
2	Time frame (I)	.52	
3	Satisfaction (S)	.80	
4	Physically/ mentally tired (I)	.52	
5	Happiness of others (S)	.65	
6	Produce desired results (E)	.73	
7	Pleased with performance (S)	.84	
8	Completion of all steps (E)	.69	
9	Great deal of time (I)	.66	
10	Aware of resources (I)		.72
11	Family would not be happy (S)	.36	
12	Successfully completed (E)	.68	

The majority of the items in each analysis loaded on factor one. This was particularly true of the lower-extremity dressing analysis where 11 of the 12 items loaded on the first factor. These results supported the theoretical assumption that relative mastery is a unidimensional construct defined by effectiveness, efficiency, and satisfaction to self and others.

Point-Biserial Correlation.

Point-biserial correlation is a traditional test statistic that provides an index of item fit (A.G. Fisher, 1993). The point-biserial correlation between each item and the clients' total score on the RMMS for each of the three analyses are presented in Tables 1,

2, and 3 respectively. Consistent with Pearson product moment, point-biserial correlations range from -1.0 to 1.0 with a coefficient of .00 reflective of a random distribution indicating no relationship (Portney & Watkins, 1993). Items with negative or low correlations with total RMMS scores do not measure the same construct as the remaining items included in the instrument. The correlations for the chosen-task analysis in phase one ranged from -.11 to .75. Correlation ranges for the analyses in phase two were .04 to .70 for the chosen-task and .08 to .74 for the lower-extremity dressing task.

Items 4 and 10 were negatively correlated with the total score on the RMMS in phase one of the research and poorly correlated with the total RMMS score on the chosen-task analysis in phase two. Additionally, item 10 did not correlate well with total RMMS scores in the lower-extremity dressing task.

Concurrent Validity

Concurrent validity was examined by comparing clients' RMMS ratings on lower-extremity dressing to their primary therapists' most recent FIM rating for lower-extremity dressing. Each rating was based on performance of the same task but not necessarily the same occurrence. The number of paired responses was 142. Clients' RMMS scores ranged from 1 to 12 with a mean of 8.25 (S.D. 3.27). Therapists' FIM ratings ranged from 1=dependent to 7=complete independence with a mean rating of 4.48 (S.D. 1.40). The correlation between clients' ratings on the RMMS and therapists' ratings was $r=.50$ ($p=.0001$). This indicated a statistically significant but moderate positive relationship between clients' ratings of relative mastery and therapists' ratings of

the clients' independence with regard to lower-extremity dressing.

Reliability

The internal consistency reliability of item responses was .88 for the chosen-task analysis in phase one, .97 for the chosen-task analysis in phase two, and .95 for the lower-extremity dressing analysis. Item separation reliability indicated that RMMS items were adequately separated into distinct strata along a continuum of the variable of relative mastery. Person separation reliabilities were .67 for the chosen-task analysis in phase one, .69 for phase two chosen-task analysis, and .74 for the lower-extremity dressing analysis. Person separation reliability indicated that clients produced consistent responses to the twelve items in all three analyses and that these reliabilities were slightly better in the analysis involving the lower-extremity dressing task.

Discussion

The RMMS was developed to quantitatively measure the construct of relative mastery as defined by the Occupational Adaptation Frame of Reference. Based on Occupational Adaptation, an evaluation of relative mastery provides an indication of one's state and process of occupational adaptation. Results indicated that 10 of the 12 RMMS items consistently represented the construct of relative mastery across the three analyses and two items were consistently problematic. Unidimensionality, of the 10 items, was supported by results of the ordering of item difficulty, goodness-of-fit statistics, factor analysis, and point-biserial correlations. Further evidence of construct validity was provided by results of the correlational analysis between clients' RMMS

scores with their primary therapists' FIM ratings on lower-extremity dressing. While modest, the findings indicated that a positive relationship existed between measures. It is possible that a higher correlation coefficient would have resulted if the therapists' and clients' ratings had been based on the same occurrence of lower-extremity dressing. This finding of a statistically significant relationship between relative mastery and a measure of functional independence was consistent with the Gibson and Schkade's report for a sample of clients after cerebrovascular accident.

The mean RMMS score, on both the chosen task and lower-extremity dressing analysis performed in phase two, was 8 and the standard deviation was 3. This implied that 68% of the scores fell between 5 and 11. The diagnostic utility of the RMMS would normally be determined in reference to one standard deviation below the raw score mean. This suggested that a score of 5 or below would indicate a client's poor perception of relative mastery. The Rasch utility for poor relative mastery would be recommended based upon a client logit threshold value that would fall approximately $-.50$ logit or below. The client logit value of $-.50$ corresponds to a raw score of 5 out of 12 items. Four out of twelve items would yield a -1.0 client logit value.

According to the criteria for misfit ($MnSq > 1.2$ and $ZSTD > 2.0$), items 10 and 4 were misfitting in two or more of the analyses. Both items were misfitting in the chosen-task analyses and item 10 was also misfitting in the lower-extremity dressing analysis. Findings from the confirmatory factor analysis and point-biserial correlation provided further evidence of problems with items 10 and 4. Neither item contributed to the factor

representing relative mastery in either chosen-task analysis. In fact, item 4 defined its own factor in both chosen-task analyses and item 10 defined a its own factor in both analyses in phase two. Additionally, point-biserial correlations for items 4 and 10 were negative or low the majority of the analyses.

Based on these findings, it appeared that items 10 and 4 did not adhere to the unidimensional scale measuring relative mastery. There are several plausible explanations for the misfit of these items. The misfit of item 10 may be related to the wording of the item. As written, participants were required to consider their awareness of three different categories of resources (people, equipment, and techniques) that would make the task easier. A second reason is that clients may have been unable to identify any resources beyond the therapists, equipment, and therapeutic techniques already made available to them. A third explanation is that individuals with greater relative mastery did not believe that additional resources were needed to make the task easier. This final explanation would be consistent with the increased awareness of resources by individuals with decreased relative mastery.

Item 4, regarding clients' being physically or mentally tired after finishing the task, did not correlate well with the total RMMS score in the chosen-task analyses in phases one and two. It is possible that the inclusion of two different types of fatigue may have complicated this item. Another possibility is that the direction of the item was potentially confusing. To obtain the highest score on this item, clients had to disagree that they felt physically or mentally tired after finishing the task.

With the exception of item 10, the RMMS appeared to have utility when the task was specified by the researcher and when each client was allowed to specify their own task. This was a theoretically important finding due to the client-centered nature of the theory of Occupational Adaptation. According to this theory, it is important to allow clients to generate a list of occupational activities to be addressed in therapy and to involve them in the evaluation of their progress.

In conclusion, preliminary findings regarding the validity of the RMMS as a measure of relative mastery were encouraging. Further testing should be performed after revisions or replacements have been made to items 4 and 10. Future research should address the validity of the RMMS with clients of various ages, include recipients of occupational therapy in settings other than rehabilitation, and evaluate the impact of the test administrator on results.

CHAPTER IV

CONSTRUCT VALIDITY OF THE REVISED RELATIVE MASTERY MEASUREMENT SCALE

Abstract

The Relative Mastery Measurement Scale (RMMS), based on the Occupational Adaptation theoretical perspective, was developed to measure relative mastery, as an indicator of occupational adaptation. This article describes the evaluation of the construct validity of a revised version of the RMMS. Data for 91 rehabilitation clients were evaluated through a combination of Rasch analysis and traditional statistical procedures. Findings of the study supported the validity of the instrument through consistency in item ordering, unidimensionality, and concurrent validity. Evidence also supported internal consistency reliability.

Schultz and Schkade (1992), in their articulation of a practice model based on the theory of Occupational Adaptation, suggested that the most beneficial effect of occupational therapy may be interventions that focus on the internal processes of our clients. As a client-centered approach, Occupational Adaptation has guided therapists to shift the focus of intervention away from the performance of discrete functional skills toward clients' abilities to generate, evaluate, and integrate adaptive responses. It was proposed that focusing treatment toward this new layer of intervention, which was referred to as internal occupational adaptation, would result in a more significant improvement in occupational functioning than intervention focused on the acquisition of specific functional skills. It was further suggested that improvement of the occupational adaptation process should be the ultimate goal of occupational therapy. Methods of assessing the effectiveness of this approach in facilitating change in clients' occupational adaptation process include an assessment of relative mastery, signs of initiation, and generalization. Schultz and Schkade (1992) stated that frequency counts could be used to measure self-initiation and generalization but indicated that a different approach would be necessary to measure clients' phenomenological experience of relative mastery. A method for assessing relative mastery was proposed and therapists were challenged to test the measurement assumptions associated with this method. No evidence could be found in the occupational therapy literature that this had been initiated much less completed. To date, research aimed at quantitatively measuring occupational adaptation through an assessment of relative mastery has involved some adaptation of their proposed method of

assessment (Buddenberg & Schkade, 1998; Gibson & Schkade, 1997; Jackson & Schkade, 2001). No valid and reliable measure of relative mastery exists. This absence of a psychometrically sound measure of relative mastery, as an indicator of occupational adaptation precludes the quantitative testing of the assumptions of this client centered approach.

This is the third study in a line of research performed for the purpose of developing the Relative Mastery Measurement Scale (RMMS) as a quantitative measure of relative mastery based on the theory of Occupational Adaptation. The long term goal of the research was to develop a psychometrically sound measure of relative mastery for use in testing the assumptions of the Occupational Adaptation theoretical perspective. The purpose of the this study was to examine the validity and reliability of a revised version of the RMMS for sample of adult clients undergoing rehabilitation.

Methods

Instrument

The RMMS is a 12-item, self-assessment questionnaire designed to measure clients' perception of relative mastery as an indicator of occupational adaptation (Appendix A). Consistent with Schkade and Schultz's (1998) definition of relative mastery, items were included to measure the domains of efficiency, effectiveness, and satisfaction to self and others. RMMS items were written as statements rated on a dichotomous scale with possible responses being "agree" or "disagree". Four items were developed to represent each domain. To ensure that individuals gave appropriate thought

to each item, six were stated in the positive and six in the negative. For example, in the domain of efficiency, a positively worded item was “I completed the task within about the same time frame it usually takes” and a negatively worded item was “I felt exhausted after finishing the task”. Positively worded items were scored one for agree and zero for disagree. Negatively worded items were reverse scored. Scores on the items were totaled with possible scores ranging from 0, suggesting no perceived relative mastery, to 12, suggesting a perception of significant relative mastery.

Previous research has addressed the content validity (Buddenberg, Schkade, & Ishee, 2001) and construct validity (Buddenberg, Ishee, & Schkade, 2001) of the RMMS. Buddenberg, Schkade, and Ishee (2001) statistically evaluated the content validity based on ratings from five experts in the theory of Occupational Adaptation. Lu’s Coefficient of Agreement, indicating agreement of experts’ that items measured relative mastery, was calculated at the domain and test levels (Lu, 1971). At the domain level, Lu’s coefficients of 1.0 for efficiency, .92 for effectiveness, and 1.0 for satisfaction were all statistically significant ($p < .05$). Analysis of data at the test level also indicated a statistically significant agreement .95 ($< .05$) among experts that the 12-items worked together as a measure of relative mastery.

Preliminary findings regarding the construct validity of the RMMS have also been encouraging (Buddenberg, Ishee, & Schkade, 2001). Data for a total sample of 184 rehabilitation clients were evaluated through Rasch analysis (Wright & Stone, 1979). Support for the construct validity, of 10 of the 12 RMMS items, was evidenced through

the consistency of item ordering, goodness-of-fit statistics, point-biserial correlation, factor analysis, and concurrent validity. A limitation of the instrument was the finding that two items (#4 and #10) were consistently problematic across all analytic criterion.

Participants

Recruitment of therapists was initiated through telephone contact with occupational therapists in eight rehabilitation departments within a 150 mile radius of Little Rock, Arkansas. Therapists were informed that the purpose of the call was to recruit 15 occupational therapists to participate in a study designed to evaluate the construct validity of the RMMS. An inservice was provided to therapists in the six occupational therapy departments where an interest in participating was expressed. Inservices included an overview of the line of research, an introduction to the RMMS, and a review of the research procedures for the study. An invitation to participate in data collection was extended to registered occupational therapists who were certified to report FIM scores.

A total of 12 occupational therapists from six facilities participated in the study. Three therapists who had originally agreed to participate were unable to complete data collection: (a) one therapist changed jobs, (b) one therapist was transferred to another unit within her facility, and (c) one therapist failed to return the data collected. The number of RMMS instruments administered by each therapist varied depending on factors such as patient census, client diagnoses, and staffing levels. The average number of administrations was 9.75 (range 3-20) per therapist.

Rehabilitation clients whose data were used in the study were recruited by participating occupational therapists. To be included, clients had to be an inpatient in rehabilitation, at least 18 years of age, and cognitively able to participate in an interview lasting about 15 minutes. One-hundred eight adults between 21 and 98 years of age (mean 72; SD 12.5) agreed to participate and signed an informed consent. Demographics revealed that 71 participants were female and 37 were male. Sixty clients (55.6%) were admitted with an orthopaedic condition, 31 (28.7%) had a neurological condition, and 17 (15.7%) were classified as other. Examples of diagnoses classified as other included pneumonia and generalized weakness.

Clients who scored a 12 or 0 on a task were eliminated from item calibrations since they did not provide useful information. Accordingly, data for 17 participants were eliminated from the analysis because one client had a score of 0 and sixteen scored 12. This resulted in the availability of data for 91 clients for the Rasch analysis.

Procedures

After obtaining approval of the Texas Woman's University's Institutional Review Board, recruitment procedures were initiated to identify occupational therapists to assist in client recruitment and collection of data. All participating therapists were provided with a research protocol to ensure consistency in following the procedures for recruitment of clients, obtaining informed consent, and administering the RMMS and FIM. Each therapist was asked to recruit and administer the RMMS to 10 clients. In addition to identifying the inclusion criteria, recruitment procedures requested therapists to include

an equal number of males and females and an equal number of clients with orthopedic and neurological diagnoses. This procedure was suggested in an attempt to obtain a diverse sample with regard to gender and diagnosis. Procedures for obtaining informed consent directed therapists to review the consent form, obtain clients' written consent, and provide each client with a copy. Administration procedures instructed therapists to give the RMMS orally to each client with regard to an activity performed recently in occupational therapy and considered important by the client. Seventeen activities, recently performed in occupational therapy, were identified as important by clients (Table 1). The five most commonly selected activities were: (a) dressing ($n = 52$), (b) kitchen activities ($n = 10$), (c) bathing/ showering ($n = 9$), (d) walking ($n = 7$), and (e) toileting ($n = 7$).

Table 1

Client-Chosen Activities Rated According to the RMMS

Activity	Frequency	Percent
Dressing	52	48.1%
Kitchen Activities	10	9.3%
Bathing/ Showering	9	8.3%
Walking	7	6.5%
Toilet Transfers	7	6.5%
Standing Tasks	6	5.6%
Tub Transfers	4	3.7%
Toileting	3	2.8%
Eating	3	2.8%
Wheelchair Transfers	2	1.9%
Grooming	1	.9%
Getting In/ Out Bed with a Walker	1	.9%
Balance Activity	1	.9%
Shower and Dress	1	.9%
Writing	1	.9%

Therapists were advised to circle the letter corresponding to the client response of “agree” and “disagree” after reading each of the 12 RMMS items. Therapists were also asked to rate each client’s performance of the task, using the Functional Independence Measure (FIM) criteria (Uniform Data System, 1993). The order of the administration of the RMMS and therapists’ ratings of the FIM were alternated to reduce the effect of order. Following completion of data collection, therapists mailed all completed RMMS and consent forms to the principal investigator.

Data Analysis

Rasch analysis was chosen as the primary measurement approach to evaluate the RMMS due to the advantages of this approach over traditional measurement models (W.P. Fisher, 1993; Fox & Jones, 1998; Velozo, Kielhofner, & Lai, 1999). The Bigseps software package for all two-facet models was used to analyze the data (Wright & Linacre, 1991). One significant advantage of Rasch analysis is that it transforms ordinal level data into interval level data (logits) thus allowing instruments such as the RMMS to meet the requirement of a true measure. Rasch analysis also allows for a person-free item measure and an item-free person measure.

Examination of construct validity through Rasch analysis included an evaluation of item ordering and an examination of the unidimensionality of the instrument. Item ordering, reported in logits, provides a measure of item difficulty. According to Fox and Jones (1998), the ordering of items in some meaningful and predictable manner supports the validity of an instrument. Item logit calibrations also allow a statistical representation of items on a continuum of the construct being measured.

The examination of unidimensionality was performed through goodness-of-fit statistics, confirmatory factor analysis, and point-biserial correlations (Fox & Jones, 1998; Wright & Masters, 1982). Goodness of fit statistics were used to evaluate the conformity of the items to a single underlying construct of relative mastery. Items are said to fit the model when more capable persons pass more difficult items and when easier items are passed by more persons than harder items (Wright & Stone, 1979).

Confirmatory factor analysis contributed a second view of how items defined the construct of relative mastery through the identification of the number of factors on which the items loaded. A third source for evaluating item fit or unidimensionality of the RMMS was point-biserial correlations. These correlations depicted the degree to which each item correlated with clients' total scores. Concurrent validity was also evaluated through a correlational analysis between clients' RMMS scores and therapists' FIM ratings based on each client's performance of a client-chosen task recently performed in occupational therapy. Additionally, since no measure can be valid without reliability (Black, 1999), internal consistency reliability was evaluated by item and person separation reliabilities.

Results

Unidimensionality

Item Ordering.

Data related to the order of difficulty for the 12 RMMS items are reported in Table 2 and presented hierarchically in Figure 1. Item order in this study was consistent with the findings of Buddenberg, Ishee, and Schkade (2001). Items measuring the domain of efficiency (9, 4, 2, 10) were the most difficult, effectiveness items (1, 6, 8, 11) fell around the of the middle of the scale, and satisfaction items (7, 12, 3, 5) were the easiest.

Table 2

Rasch Item Statistics for Client-Chosen Task (N=91)

Item # / Description / Domain (E=Effectiveness, I= Efficiency, and S=Satisfaction)	Item Logit	Item Error	Infit MnSq	Infit ZSTD	Outfit MnSq	Outfit ZSTD	PTBIS
9 Great deal of time (I)	1.26	.24	.89	-1.1	.89	-.8	.32
4* Physically or mentally tired (I)	1.20	.24	1.19	1.8	1.49	3.0	.06
2 Time frame (I)	.97	.24	1.16	1.5	1.21	1.4	.15
10* Aware of resources (I)	.79	.24	1.68	5.2	2.09	5.5	-.25
1 Performance adequacy (E)	.29	.26	.84	-1.3	.73	-1.6	.46
6 Produce desired results (E)	.22	.26	.87	-1.1	.71	-1.6	.43
8 Completion of all steps (E)	.22	.26	.73	-2.2	.61	-2.3	.56
11 Family would not be happy (S)	-.55	.30	.99	-.1	1.07	.2	.29
7 Pleased with performance (S)	-.84	.32	.87	-.7	.58	-1.3	.42
12 Successfully completed (E)	-1.06	.34	.67	-1.8	.34	-2.1	.60
3 Satisfaction (S)	-1.18	.35	.83	-.8	.62	-1.0	.41
5 Happiness of others (S)	-1.31	.36	.93	-.3	.60	-1.0	.34

* Item with MnSq (>1.2) and ZSTD (>2.0)

Figure 1

Relative Mastery Continuum – Chosen Task (N = 91)

Frequency	Logit	RMMS Item
	-1.5	
81		Happiness of others (S)
80		Satisfaction (S)
79	-1.0	Successfully completed (E)
77		Pleased with performance (S)
74	-.5	Family would not be happy (S)
64	0	Completion of all steps (E)
64		Produced desired results (E)
63		Performance adequacy (E)
	.5	
55	1.0	Aware of resources (I)
52		Time frame (I)
48		Mentally / physically tired (I)
47		Great deal of time (I)
	1.5	

E = Effectiveness, I = Efficiency, S = Satisfaction

Rasch Fit Statistics.

Goodness-of-fit statistics were employed to evaluate item fit. Items 4 and 10 were misfitting according to the conservative a priori criteria for misfit (>1.2 MnSq and > 2.0 ZSTD) recommended by Wright and Linacre (1994). Item 4 “I felt exhausted after finishing the task” was misfitting according to the outfit MnSq and ZSTD, indicating that some client responses were far from their ability level. Item 10 “I am aware of ways to make this task easier”, was misfitting according to both infit and outfit MnSq and ZSTD criteria.

Confirmatory Factor Analysis.

A two-factor solution resulted from the confirmatory factor analysis. Data revealed that 11 of the 12 RMMS items exceeded the a priori criteria ($\geq .30$) and loaded on the first factor (Table 3). Factor loadings for the 12th item (item 10) did not exceed the $\geq .30$ a priori criteria. Factor loadings for items intended to contribute information regarding individuals’ satisfaction were $\geq .60$, effectiveness item loadings exceeded $\geq .53$, and with the exception of item 10, efficiency items had factor loadings that were $\geq .30$.

Table 3

Confirmatory Factor Analysis of Client-Chosen Task

Item #	Item Description and Domain	Factor 1
1	Performance adequacy (E)	0.66
2	Time frame (I)	0.38
3	Satisfaction (S)	0.63
4	Physically/mentally tired (I)	0.3
5	Happiness of others (S)	0.58
6	Produce desired results (E)	0.6
7	Pleased with performance (S)	0.6
8	Completion of all steps (E)	0.76
9	Great deal of time (I)	0.53
10*	Aware of resources (I)	
11	Family would not be happy (S)	0.54
12	Successfully completed (E)	0.77

* Item did not exceed *a priori* criteria of $\geq .30$

Point-Biserial Correlation

Point-biserial correlations for each item, indicating the relationship of the item to the clients' total RMMS score, were presented in Table 2. Correlations may range from -1.0 to 1.0 with coefficient of .00 indicative of a random distribution (Portney & Watkins, 1993). Correlations for items in the domain of satisfaction ranged from .46 to .56., items in the domain of effectiveness ranged from .32 to .42, and efficiency items ranged from -.25 to .06. According this analysis, efficiency items 10 and 4 were the most problematic due to their negative or low correlations with the total RMMS. These findings were consistent with results of the goodness-of-fit statistics and the factor analysis in this

study and those of Buddenberg, Ishee, and Schkade (2001). While positive in that there was consistency in the results of these two studies for the 10 items performing optimally, the revisions made to previously misfitting items did not result in a better performance of these items.

Concurrent Validity

Concurrent validity was evaluated by correlational analysis between clients' RMMS ratings and therapists' FIM ratings, on the same occurrence of the client-chosen task. The correlation coefficient between the RMMS score and the FIM score ($N = 108$) was $r = .463$, $df=107$, $p < .0001$. This statistically significant correlation between clients' RMMS ratings and therapists objective ratings of clients' performance on self-selected activities supported the validity of using this instrument for rating the unique occupational activities chosen by each client. It is possible that the low correlation coefficient was related to the brevity of each instrument (FIM scores 1-7 and RMMS scores 1-12). According to Safrit and Wood (1989) the shorter the length of a test the smaller the correlation coefficient may be.

While modest, the finding of a statistically significant correlation between FIM and the RMMS ratings was deemed an important finding since the theory of Occupational Adaptation is based on the assumptions that: (a) the therapy program must be related to clients' occupations of daily living, and (b) improvement in relative mastery is the best indicator that change in the occupational adaptation process is occurring (Schultz & Schkade, 1992).

Reliability

The Rasch item and client reliabilities, comparable to Chronbach's Alpha, were .90 for item reliability, and .51 for client reliability. According to Fox and Jones (1998) there are no acceptable values for these reliabilities, however, values greater than .80 are considered as acceptable. In this study, item reliabilities indicated that items were consistently ordered, while, client reliabilities suggested that responses were not consistent across items.

Discussion

In summary, 10 of the 12 RMMS items defined the construct of relative mastery. These items performed consistently well across all analyses. Items were consistently ordered in a predictable manner (item ordering), fit the Rasch model (goodness-of-fit), confirmed one factor (confirmatory factor analysis), and correlated well with the total RMMS score (point-biserial correlation). In spite of the misfit of 2 of the efficiency items, concurrent validity of the scale was supported by the correlational analysis between clients' RMMS ratings and therapists' FIM ratings with regard to clients' chosen tasks.

Efficiency items 4 (I felt exhausted after finishing the task) and 10 (I am aware of ways to make this task easier) were misfitting according to the criteria for misfit (>1.2 MnSq and >2.0 ZSTD) and had negative or low correlations with the total RMMS score. Of these, item 10 had the most unexpected response pattern, a negative point-biserial correlation, and was the most misfitting item (Table 2). Additionally, item 10 did not

exceed the $>.30$ criteria established a priori for factor loadings on the unidimensional construct of relative mastery.

These results were consistent with previous findings reported by Buddenberg, Ishee, and Schkade (2001). In spite of revisions to efficiency items 4 and 10, the items in this domain have continued to be problematic. Prior to the implementation of this study, item 4 was simplified from “I felt mentally or physically tired after finishing the task” to “I felt exhausted after finishing the task”. Results of this study indicated that the item was misfitting according to the outfit MnSq and ZSTD, suggesting that some client responses were far from their ability level. This could mean that some clients who scored high on the scale may have agreed that they felt exhausted after finishing the task and / or some clients who scored low on the scale disagreed with feeling exhausted. Therefore, the misfit could have been related to client participants misuse of the scale. It is possible that the use of the adjective ‘exhausted’ may have been too extreme of a criterion for this item. The item may have performed differently if the word ‘tired’ had been retained instead. The direction of the item could also have caused a problem with the item. As mentioned previously in Buddenberg, Ishee, and Schkade, to obtain the highest score on this item clients had to disagree with the item. To evaluate these hypothesized reasons for the misfit of item 4 in future research, it would be advisable to either reword the item to state, “I did not feel tired after finishing the task” or develop a new efficiency item.

Item 10, which previously read “I am aware of people, equipment, and techniques that would make this task easier” was also revised for this study. Based on the discussion of possible reasons for item misfit in a previous study (Buddenberg, Ishee & Schkade, 2001), the item was simplified in the present study to read “I am aware of ways to make this task easier”. It was anticipated that simplifying this item would improve its performance on the scale. Instead of an improvement, the results of this study indicated continued misfit, negative point-biserial correlation, and a failure of the item to load on the unidimensional construct identified as relative mastery. A review of the previously suggested reasons for the misfit of item 10 (Buddenberg, Ishee & Schkade, 2001) revealed the possibilities that: (a) clients were unable to identify any resources beyond the current resources available to them, and (b) individuals with greater relative mastery may not believe additional resources are needed to make the task easier.

Another feasible explanation for the consistently poor performance of this item with regard to the RMMS is that one’s awareness and use of resources does not contribute to the definition of relative mastery as originally postulated by Schkade and Schultz (1992). Based on the findings in this study and previous research (Buddenberg, Schakde, & Ishee, 2001), it is suggested that this item be eliminated from the RMMS at this time. Additionally, further research should be performed regarding the potential contribution of the ‘awareness and use of resources’ to the construct of relative mastery.

In conclusion, the results of this study lend support to preliminary evidence of the validity of the RMMS as a measure of the construct of relative mastery with clients

undergoing rehabilitation. It appears that with continued development, the RMMS has potential to quantitatively measure clients' phenomenological experience of relative mastery as defined by the theory of Occupational Adaptation. The ability to quantify relative mastery as an indicator of occupational adaptation will allow testing of the assumptions of the client-centered approach found in the Occupational Adaptation Frame of Reference.

Future directions for research should include refinement of the scale, evaluation of the sensitivity of the RMMS to change, and testing the assumptions of the Occupational Adaptation Frame of Reference. Refinement of the scale should begin with further development of items in the domain of efficiency. Consideration has been given to possible reasons for the difficulty of measuring this property of relative mastery. It is possible that individuals' perceptions of their efficiency is a phenomenological experience that is difficult to define and quantify on a measurement scale. It is possible that basic research related to the notion of efficiency will facilitate the generation of items that are more reflective of the ways in which individuals evaluate their efficiency.

Thought should also be given to allowing clients to weight the domain of relative mastery considered by the client to be the most important. Schultz and Schkade (1992) suggested that clients' should be allowed to determine the relative weight of each property of relative mastery according to the activity being performed and the client's priorities. Evaluation of the sensitivity of the RMMS to change in relative mastery over time is another important direction for future research. Sensitivity of the RMMS to

change is essential due to the assumption of this approach that relative mastery is the best indicator that a change in the occupational adaptation process is taking place (Schultz & Schkade, 1992). Therefore an instrument measuring this construct should be able to detect a change in this process.

After developing further evidence of the validity of the RMMS and obtaining empirical support its sensitivity to change, the next step would be use of the instrument in evaluating the effectiveness of the theory of Occupational Adaptation. Measurement of the effectiveness of Occupational Adaptation will involve testing the assumptions of the theory of Occupational Adaptation. Assertions that could be incorporated into the measurement of the effectiveness of this approach include: (a) a change in the occupational adaptation process is a better predictor of future occupational functioning than clients' ability to perform discrete functional tasks, (b) focusing on clients' internal occupational adaptation process is the optimal pathway for occupational therapy to affect occupational functioning, (c) interventions that affect relative mastery are instrumental in helping patients become more adaptive, thus enhance their the potential for a satisfying and productive life, and (d) improvement in functional skills does not necessarily indicate a change in occupational adaptation.

CHAPTER V

CONCLUSIONS

The emphasis of this research was on the development of a measure of relative mastery as defined by the theory of Occupational Adaptation. According to Occupational Adaptation, measurement of an individual's phenomenological experience of relative mastery is contributory to an assessment of internal occupational adaptation. In their articulation of a practice model based on Occupational Adaptation, Schultz and Schkade (1992), proposed an approach for quantitatively measuring relative mastery. This method of assessment involved the calculation of a composite percentage of relative mastery based on ordinal data. Since 1992, numerous studies have utilized an adaptation of this proposed method in evaluating the effectiveness of the theory of Occupational Adaptation. While results of these studies suggest improvement in client's occupational adaptation based on improvement in relative mastery, findings may be questioned due to the lack of a valid and reliable measure of relative mastery. Therefore, this line of research addressed the lack of a valid and reliable measure of relative mastery.

Contributions of this research to the practice of occupational therapy include: (a) the development of a client-centered assessment instrument that quantitatively evaluates clients' relative mastery as an indicator of the state and process of occupational adaptation, (b) support for the concepts and assumptions of the Adaptive Response Evaluation Subprocess as postulated by the Occupational Adaptation Frame of

Reference, and (c) advancement of the profession in instrumentation through the development of a measure of occupational functioning using advanced statistical methods.

Development of a Client-Based Assessment of Relative Mastery

The development of the Relative Mastery Measurement Scale (RMMS) was addressed through a series of three studies (Table 1). In the first study, six occupational adaptation content experts evaluated the validity of the RMMS items at three stages during its development (27-item, 21-item, and 12-item). While not expected, the first two versions of test did not achieve the a priori criteria needed to establish content validity. However, support for the content validity of the 12-item version was evidenced through statistical procedures performed at the item, domain, and test levels.

The second and third studies examined the construct validity of the 12-item RMMS through Rasch analysis. As theoretically proposed, results of these analyses indicated that RMMS items, representing the domains of effectiveness, efficiency, and satisfaction, defined a unidimensional construct that could reasonably be called relative mastery. Of the 12 items, ten consistently represented the construct of relative mastery across all analyses. Each of the properties of relative mastery, as defined by Schkade and Schultz (1998), were represented by these 10 items: four items represented effectiveness, four items represented satisfaction, and two items were reflective of efficiency.

However, two of the items, intended to contribute to information regarding efficiency, were problematic in each study (items 4 and 10).

Table 1

Overview Research Studies

	Study 1	Study 2	Study 3
Purpose	Evaluate Content Validity	Evaluate the Construct Validity	Evaluate the Construct Validity of the RMMS following revisions to items 4 & 10.
Participants & Methods	6 Content Experts The content validity of the RMMS was evaluated at three stages during its development (27-item, 21-item, and 12 item).	<u>Phase 1</u> : 48 Occupational Therapy students each administered the RMMS to a rehabilitation client with regard to their sense of mastery on a chosen-task. <u>Phase 2</u> : The principal investigator administered the RMMS to 150 Rehabilitation Clients with regard to a client-chosen task and lower-extremity dressing.	12 Therapists administered the revised RMMS to a total of 91 rehabilitation clients
Data Analyses	Statistical analyses were performed at the item, domain, test levels. Item level analyses were performed using Item-Objective Congruence and Expert's percentage of agreement, and domain and test level analyses were performed using Lu's Coefficient of Agreement.	Rasch Analysis of RMMS data generated through clients' ratings of a chosen-task and lower-extremity dressing. Rasch analyses included: item ordering, unidimensionality goodness of fit factor analysis point-biserial correlation Internal consistency reliability Concurrent validity	Rasch Analysis of RMMS data generated through clients' ratings of a chosen-task. Rasch analyses included: item ordering, unidimensionality goodness of fit, factor analysis point-biserial correlation Internal consistency reliability Concurrent Validity
Results	Experts were in agreement that items measured Relative Mastery as defined by the theory of OA	Analyses supported the unidimensionality of 10 of 12 items in the RMMS. Two efficiency items were problematic (Items 4 and 10)	Analyses supported the unidimensionality of 10 of 12 items in the RMMS. Efficiency items 4 and 10 continued to be problematic even after revisions.

Item 10, "I am aware of people, equipment, and techniques that would make this task easier" was revised prior to the implementation of the third study. Based on the discussion of possible reasons for item misfit in study two (Buddenberg, Ishee & Schkade, 2001), the wording of the item was changed to read "I am aware of ways to

make this task easier”. This change was made to reduce any confusion that may have been related to the inclusion of multiple types of resources. It was anticipated that simplifying this item would result in an improvement in its performance on the scale. However, results of the third study indicated continued misfit, negative point-biserial correlation, and a failure of the item to load on the unidimensional construct identified as relative mastery.

When the item continued to be problematic in the third study alternative reasons for misfit were explored. The investigator’s interpretation of ‘resources’ included people, equipment, and techniques. This definition had resulted in the development of the item “I am aware of people, equipment, and techniques that would make this task easier”. When this item did not perform well in the second study, it was determined that this was possibly related to the inclusion of multiple types of resources. Therefore, the item was simplified to read “I am aware of ways to make the task easier”. What was not considered at that point in the line of research was that investigator’s interpretation did not reflect the meaning intended by the theorists (Schkade & Schultz, 1998; Schultz & Schkade, 1992). Through a discussion with J.K. Schkade (personal communication, October 22, 2001), regarding the continued misfit of this item, it was discovered that the use of the term resources in the 1998 definition related to the efficiency in which clients’ used resources available to them. Even after this discussion, the concept of resources appeared vague. It is recommended that research be employed to explore the ways in which individuals’ perception of their ‘use of resources’ contributes to their sense of

efficiency. An additional limitation of the item was one of scope. As worded, the item limited measurement to clients' awareness of resources and did not assess individuals' sense of their efficiency in using available resources.

Item 4, also simplified prior to the third study, was changed from "I felt mentally or physically tired after finishing the task" in study two to "I felt exhausted after finishing the task" in study three. Results of the third study indicated that the item was misfitting in a way that suggested some client responses were far from their ability level. This could indicate that some clients who scored high on the scale may have agreed that they felt exhausted after finishing the task. It could also mean that some clients who scored low on the scale disagreed with feeling exhausted. Therefore, the misfit appears to be related to client' misuse of the scale. It is possible that participants' interpretation of the adjective 'exhausted' may have contributed to this problem. The item may have performed differently if the word 'tired' had been retained instead. Another consideration related to the direction of the item. As mentioned previously, to obtain the highest score on this item clients had to disagree with the item. Testing of these hypothesized reasons for the misfit of item 4 would require that the item be reworded to state, "I did not feel tired after finishing the task".

In spite of the poor performance of two RMMS items, the concurrent validity of the scale was supported by the correlational analysis between clients' RMMS ratings and therapists' FIM ratings with regard to clients' chosen tasks. This result was consistent with Gibson and Schkade's (1997) finding of a modest, but statistically significant,

relationship between a measure of functional independence and clients' self-evaluation of relative mastery.

Results of these three studies provide preliminary evidence of the validity of the RMMS as a measure of the construct of relative mastery with adult clients undergoing rehabilitation. It appears that with continued development, the RMMS has potential to quantitatively measure clients' phenomenological experience of relative mastery as defined by the theory of Occupational Adaptation.

Uses of the RMMS

With further development, the RMMS has potential to become a clinically feasible alternative to the method of assessment proposed by Schultz and Schkade (1992). The method they proposed required the client to: (a) select one or more occupational activities for outcome measurement, (b) weigh the property of relative mastery most important to them with regard to each activity selected (efficiency, effectiveness, satisfaction), (c) collaborate with the therapist to establish criteria for five levels of expected occupational performance for each property of relative mastery, and (d) determine how often the measurement is to occur. While ideal, this may not be feasible in the clinic due to the difficulty adult rehabilitation clients have in establishing the five levels of performance for each activity. Socialization of clients in the medical model has encouraged them to become disengaged from their assessment and treatment planning processes. While still involving clients in these processes, use of the RMMS would eliminate the time-intensive step requiring the client to establish the five levels of

expected performance for each domain or property of relative mastery. This would make the administration of the RMMS more efficient. All of the other steps stated above could continue to be incorporated into the use of the RMMS; however, it should be noted that the measurement principles associated with weighing the client's most important property of relative mastery would need to be addressed.

Allowing the client to weight the most important property as recommended by Schultz and Schkade (1992) would be clinically important in that this would help the therapist and client in mutual goal setting and selection of the most appropriate treatment methods. For example, a working mother and a retired grandmother may have different priorities with regard to the same client-chosen occupational activity of meal preparation. The working mother may determine that efficiency is the most important property while the retired grandmother may choose effectiveness or satisfaction. Allowing clients to choose activities that are important to them and weight the most important aspect of their performance is consistent with the occupational therapy literature emphasizing client-centered approaches to the assessment of occupational functioning (AOTA, 1995a, 1995b, 1995c; Brown & Bowen, 1998; Christiansen, 1993; Dickerson, 1996; Dunn, 1993; A.G. Fisher, 1992a, 1992b; A.G. Fisher & Short-Degraff, 1993; Law, 1993; McColl & Pranger, 1994; Nelson & Payton, 1991; Peloquin, 1990; Polatajko, 1994; Pollock, 1993).

Collaborating with the client to determine the frequency for reassessment of relative mastery implies that a comparison will be made between RMMS administrations. An important factor to be considered when use of the instrument in this manner relates to the sensitivity of the RMMS to change over time. The establishment of the sensitivity of the RMMS is essential due to the assumption of the Occupational Adaptation Frame of Reference that relative mastery is the best indicator that a change in the occupational adaptation process is taking place (Schultz & Schkade, 1992). Therefore an instrument designed to measure this construct should be able to detect a change in this process. One potentially limiting factor to the instrument's sensitivity in measuring change is the current use of a dichotomous scale. A dichotomous scale was chosen for the simplicity to clients and the avoidance of a neutral category (Wright & Masters, 1982). It is possible that using a Likert-type scale with four response options would allow the RMMS to reflect changes in relative mastery over time. According to A.G. Fisher (1992b), an increase in options may increase the instrument's sensitivity due to the smaller increments that result. Based on this belief, the current response options of agree and disagree could be expanded to include: (a) strongly disagree, (b) disagree, (c) agree, or (d) strongly agree. The use of a four-point scale would also allow the continued avoidance of a neutral category. Additionally, expansion to a four-point scale may allow testing of recent assertions related to the notion of negative relative mastery (Krusen, N., 2001; J.K. Schkade, personal communication, October 22, 2001). In a study of eight occupational therapy students' adaptation during level II fieldwork, Krusen discovered

that one student's self-rating of her occupational responses reflected negative relative mastery. In spite of rating her occupational responses as ineffective, inefficient, and unsatisfying to self and others, this student demonstrated adaptation as defined by passing her level II fieldwork. Krusen reported that this individual's experience of negative relative mastery may have facilitated adaptation in a different manner than others' experiences of relative mastery.

In its current form, the RMMS is capable of detecting the absence of relative mastery but would not allow measurement of negative relative mastery. It is proposed that pilot-tests of the instrument be implemented with four response options. Testing of the scale in this manner would be advantageous since it would still be possible to collapse the four response categories into the original categories of agree and disagree. This would be beneficial in that the statistical results of the two response formats could be compared. One benefit that has been cited for using Rasch analysis has been its usefulness in establishing an optimal number of response categories (Wright & Masters, 1982).

A comparison between what has been done in the development of the RMMS with what has yet to be done has led the investigator to appreciate Wright and Linacre's (1989) assertion that the process of test evaluation is never finished. Future directions for research related to the RMMS include the establishment of an appropriate response format, further testing of the validity and reliability, and evaluation of its sensitivity to change. When further developed, the instrument may be used in efficacy research.

Testing the Concepts and Assumptions of the Adaptive Response Evaluation Subprocess

With further development, it appeared that the RMMS has potential for use in testing the assumptions of the Adaptive Response Evaluation Subprocess, as postulated by the theory of Occupational Adaptation. According to this theory, individuals evaluate their occupational functioning through an assessment of relative mastery which is impacted by the extent to which they perceive their occupational response as efficient, effective, and satisfying to self and society (Schkade & Schultz, 1992). While representative of the three domains of relative mastery, the fit of the RMMS items offers support for the existence of a unidimensional construct that may reasonably be named relative mastery.

Following an assessment of relative mastery, an individual places their evaluation of the occupational event on a continuum that ranges from occupational dysadaptation to occupational adaptation with homeostasis being the midpoint. Rasch analysis (Wright & Stone, 1979) offers a potential method for further developing the assumption related to clients' placement of occupational events on a continuum between occupational dysadaptation and occupational adaptation. While Schkade and Schultz (1992) discussed clients' placement of the occupational event on a continuum, they did not specify what was placed. Since Rasch analysis converts scores to logits, allowing the scores to be meaningfully totaled, a composite score of relative mastery could be placed on a numeric scale representing the continuum. A continuum of relative mastery, as currently defined by the RMMS, ranges from no sense of relative mastery (0) to a sense of complete

relative mastery (12). Using this continuum of 0 to 12, data from the sample in the second study in this line of research, indicated that a score of 5 or below was suggestive of an individual's poor perception of relative mastery. Additional research should be conducted with larger samples of clients to define the meaning of the various points along the adaptation continuum.

Future Development of the RMMS.

Incorporation of the previous suggestions related to increasing the sensitivity of the RMMS would allow expansion of the continuum from 0 (no relative mastery) to +12 (complete relative mastery), to a scale ranging from -12 (complete negative relative mastery) to +12 (complete relative mastery). Expansion of the continuum in this manner would allow testing of the assumptions related to the existence of a continuum of adaptation as well as assertions made by J.K. Schkade (personal communication, October 22, 2001) and Krusen (2001) regarding the notion of negative relative mastery.

Given the process flow in the model described in Schkade and Schultz (1992), it appears feasible to use the composite RMMS score for placement on the continuum since this occurs before learning from the experience is integrated. Therefore, it is possible that while a person's sense of relative mastery with regard to an occupational event may result in placement on the dysadaptive side of the continuum, the learning that occurred from the event may actually facilitate future occupational adaptation. Therefore a composite RMMS score and scores for each property of relative mastery may provide useful information for therapists responsible for facilitating clients' Adaptive Response

Integration Subprocesses and positively influencing clients' future Adaptive Response Generation Subprocesses.

Occupational Functioning and Instrumentation

By developing the RMMS, the investigator has responded to calls from within occupational therapy for the development of valid and reliable measures for the assessment of occupational functioning (Asher, 1996; Trombly, 1993, 1995). The following discussion will: (a) specify the layer of function addressed by the RMMS, (b) discuss the influence of current trends in instrumentation on the development of the RMMS, and (d) describe the potential influence that the development of the RMMS may have on occupational therapy practice.

According to Trombly (1995), the layers of function addressed by occupational therapists include occupational functioning, occupational performance areas, and performance components. Of these layers, A. G. Fisher (1992a, 1992b) has emphasized the need for occupational therapists to develop tests that measure occupational functioning. She expressed a belief that our measures should reflect the uniqueness of what we do as occupational therapists and encouraged the development of assessments that contribute to the knowledge of function. Based on a belief that functioning includes both a process and an outcome, A. G. Fisher (1992b) encouraged the development of instruments that provide insight into the process as well as the outcome. She also indicated that our measures should be driven by our theories and measure what we hope to change (A.G. Fisher, 1992a).

Consistent with these recommendations for theory-based assessments of occupational functioning, the RMMS was developed to measure the layer of occupational functioning as defined by the theory of Occupational Adaptation (Schkade & Schultz, 1992; Schultz & Schkade, 1992). According to this theory, one's state of occupational functioning is reflected through the state and process of internal occupational adaptation and is measurable through an assessment of relative mastery, initiation, and generalization. As a measure of relative mastery, the RMMS was developed to reflect the state and process of occupational adaptation, which has been proposed as the normal process by which individuals develop competency in occupational functioning (Schultz & Schkade, 1992).

Influenced by current trends in the measurement literature, Rasch analysis was chosen as the measurement approach for the development an instrument to measure the unidimensional construct of relative mastery (W.P. Fisher, 1993; Fox & Jones, 1998; Lai, Haglund, & Kielhofner, 1999; Mallinson, Mahaffey, & Kielhofner, 1998; Park, A.G. Fisher, & Velozo, 1994; Velozo, Kielhofner, & Lai, 1999; Wright & Linacre, 1989). An advantage of using the Rasch measurement model for the development of the RMMS, over traditional models of measurement, is that Rasch transforms ordinal level data into interval level data so that a true measure results (Christiansen, 1993; A.G. Fisher, 1992a, 1992b; A.G. Fisher & Short-Degraff, 1993; Law, 1993, 1995; Merbitz, Morris & Grip, 1989; Short-Degraff & A.G. Fisher, 1993; Wright & Linacre, 1989).

Some measures developed for use in occupational therapy practice that have employed Rasch analysis include: the Assessment of Motor and Process Skills (Dickerson & A.G. Fisher, 1993; A.G. Fisher, 1993); Park, A.G. Fisher, & Velozo, 1994), Beery's Developmental Test of Visual-Motor Integration (Mao, Li, Lo, 1999), the Occupational Case Analysis Interview and Rating Scale (Lai, Haglund, & Kielhofner, 1999), the Occupational Performance History Interview (Kielhofner, Mallinson, Forsyth, & Lai, 2001; Mallinson, Mahaffey, & Kielhofner, 1998), the Sensory Integration and Praxis Test (Lai, A.G. Fisher, Magalhaes, & Bundy, 1996), the Volitional Questionnaire (Chern, Kielhofner, de la Heras, & Magalhaes, 1996), and the Work Environment Impact Scale (Kielhofner, Haglund, Ekbadh, & Hedlund, 1999).

As a developing measure of occupational functioning, the RMMS represents a 'unique' response to the numerous calls from within the profession for actively involving clients in the assessment and treatment planning processes (AOTA, 1994a, 1994b; Brown & Bowen, 1998; Dickerson, 1996; Dunn, 1993; A.G. Fisher, 1998; Law, 1993; Law, Baptiste, et al., 1994; McColl, 1994; McColl & Pranger, 1994; Neistadt, 1995; Nelson & Payton, 1991; Northern, et al., 1995; Ottenbacher & Cusic, 1990, 1993; Pollock, 1993; Radomski, 1995; Schkade & Schultz, 1992; Schultz & Schkade, 1992).

Additionally, the RMMS is the only 'measurement' scale available that allows clients to select an activity of importance to them and rate their phenomenological experience with regard to their performance. A review of the previously referenced instruments leads to an awareness that all are therapist-rated measures of clients'

performance in therapist-determined performance areas or with respect to therapist-identified performance components.

To date, Rasch analysis has not been used in the development of a client-rated instrument for occupational therapy practice. Only one instrument, the Canadian Occupational Performance Measure (COPM), could be found that actually allows clients to select and rate their performance on self-identified tasks. However, the use of an ordinal scale prevents the COPM from being a true measure (Wright & Linacre, 1989). While beneficial as a client-centered tool for assessment and treatment planning, the COPM is not useful in research due the inability to meaningfully total and statistically compare scores.

In summary, findings of this research provide preliminary support for the validity of the RMMS as a measure of relative mastery. The significant contribution of this line of research to the profession of occupational therapy lies in the application of measurement rigor in the development of a measure of a phenomenological construct. The evidence supporting the validity of the RMMS demonstrates that as a profession, we do not have to sacrifice scientific methodology in order to measure clients' experiences of their sense of competency in occupational functioning.

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APPENDIX A

Relative Mastery Measurement Scale (RMMS)

Administration Instructions:

1. *Begin administration only after the client has read and signed an informed consent.*
2. *Administer the items in the order they appear on the scale (#1-12).*
3. *Do not attempt to paraphrase or define the terms or words used in any items [e.g. successful/ failed/ desired level]. The meaning of these words is likely unique to each person and therefore each client must interpret the terms/ words for themselves. Allowing clients to define the terms / words will allow an assessment of whether or not the scale works.*
4. *If a client does not understand any item(s) you may repeat them as many times as needed before going on to the next item.*
5. *If after repeating an item a number of times, and after encouraging a client to either agree or disagree with the item, as a last resort, you may circle the item number of any item to reflect a client's inability to respond.*

Read the following instructions exactly as they appear:

“Tell me the name of an important activity that you have recently performed in occupational therapy.” Write in the name of the client's chosen activity

“Thinking back
on your most recent performance of this activity, tell me whether you ‘agree’ or ‘disagree’ with the
12 statements I am about to read to you. I will be recording your responses as we go along.” If a
 client changes their mind before going on to the next question please place an X over their first answer and
 circle their new answer.

(Raters: Circle A for Agree and D for Disagree).

- | | | | |
|-----|---|---|--|
| 1. | A | D | My performance was not adequate to complete the task. |
| 2. | A | D | I completed the task within about the same time frame it usually takes. |
| 3. | A | D | Overall, I am satisfied with myself regarding this activity. |
| 4. | A | D | I felt exhausted after finishing the task. |
| 5. | A | D | People other than my family and friends would be happy with my level of ability on this task <i>(give example that relates to this person and task: e.g. Employer, Spouse, Co-workers, Neighbors, Therapists, Doctor).</i> |
| 6. | A | D | I did not produce the result I expected. |
| 7. | A | D | I am very pleased with my performance of this task. |
| 8. | A | D | I failed to complete all steps of the task. |
| 9. | A | D | The task took a great deal more time than is typical for me. |
| 10. | A | D | I am aware of ways to make this task easier. |
| 11. | A | D | My family members would not be happy with my performance of this task. |
| 12. | A | D | I successfully completed the task. |

Raters: Please scan through all 12 items to be sure that you have recorded the client's response to each statement. If a response was not circled, repeat the item.

APPENDIX B
Content Expert Packet

Dear Content Expert:

I want to thank you in advance for your participation in this research effort. As you know, you have been selected as a content expert on the Occupational Adaptation Frame of Reference. Enclosed you will find the information needed to perform your role as an expert judge. You are one of six occupational therapist judges who will assist in performing a content validity study on a new tool: "The Relative Mastery Measurement Scale".

The estimated time for you to complete this task is between 30- 60 minutes. This would be best done in one sitting, if possible. The procedures for completion are outlined on the informed consent form as well as the Relative Mastery Measurement Scale- Rating Form. I also ask that you complete a background information sheet so that I may better describe my sample of content experts. As outlined in the informed consent form your name will remain confidential.

I hope your experience of completing this rating is pleasant and even somewhat interesting to you. Please use the enclosed envelope to return the packet (informed consent, background sheet, and completed rating form) by Monday, October 4. Thanks again for your assistance.

If you have any questions feel free to contact me at one of the following:

E-mail- LorrieB@mail.uca.edu

Home #- (501)851-3082

Work #- (501)450-3192

Sincerely,

Lorrie A. Buddenberg, MA, OTR/L, BCN

TEXAS WOMAN'S UNIVERSITY
SUBJECT CONSENT TO PARTICIPATE IN RESEARCH

Validation of the Client-Based Assessment of Occupational Adaptation

Lorrie Buddenberg, MA, OTR, BCN.....(501)450-3192
Janette Schkade, PhD, OTR, FAOTA, Research Advisor.....(940)898-2803

Due to your noted expertise in the Occupational Adaptation Frame of Reference, you have been invited to participate in research designed to assess the content validity of the Relative Mastery Measurement Scale. You are one of six individuals who have been selected to assist in this research.

Your involvement in this research will include providing expert judgment on the content of the RMMS. If you agree to participate, you will be asked to rate the degree to which each of the 27 RMMS scale items would yield information within the domains of effectiveness, efficiency, and satisfaction to self and others [based the definition of relative mastery provided (Schkade & Schultz, 1997)]. For each scale item you will be asked to rate the item in one of three ways for each domain: (a) a +1 if you believe the item is a definite measure of a domain, (b) a 0 if you are undecided, and (c) a -1 if you believe the item is definitely not a measure of a domain. The total time estimated for you to complete this rating is between 30 -60 minutes.

Data for the research will include the completed RMMS rating forms. Data will be analyzed using Lu's (1971) coefficient of agreement. All data will be stored in a locking file cabinet in the office of the principal investigator. Any identifiable data (e.g. subject keys) will be shredded in December, 2006.

Your participation in this research is completely voluntary and you may refuse participation or withdraw from the study at any time by contacting the principal investigator. Withdrawal from the study will not result in any penalty or loss of benefits to you. Risks associated with your participation may include loss of time. Efforts will be made to reduce an unnecessary expenditure of time. Enclosed you will find a the RMMS content rating scale and an envelope addressed to the researcher for ease in returning the completed form.

The researchers will try to prevent any problem that could happen because of this research. I should let the researchers know at once if there is a problem and they will help me. I understand, however, that TWU does not provide medical services or financial assistance for injuries that might happen because I am taking part in this research.

If I have any questions about the research study I should ask the researchers: their phone numbers are at the top of this form. If I have questions about my rights as a subject or the way this study has been conducted, I may call Ms. Tracy Lindsay in the Office of Research & Grants Administration at (940)898-3377.

Research

I have read the informed consent and understand that I will receive a copy of the signed consent form to keep. I have been given an opportunity to have any questions answered and have been informed of the procedure for contacting the researcher to have future questions answered.

Research Participant- Occupational Therapy Expert

Date

The above consent form was read, discussed, and signed in my presence. In my opinion, the person signing said consent form did so freely and with full knowledge and understanding of its contents.

Witness

Date

Experts Background Information

Completion of the following information will allow me to describe my sample of content experts:

Name: _____ Initials: _____ Date: _____

Current Position: _____

Years in Practice: _____ Highest Degree Held: _____

Years of experience using the Occupational Adaptation Frame of Reference(OA): _____

Identify settings in which you have utilized your knowledge of OA: _____

Please respond to the following questions:

1. What method(s) do you typically use to assess the Relative Mastery of consumers of your services (e.g. clients, students)?

2. My current approach to assessment of Relative mastery is adequate to meet my consumer's needs. Circle one Definitely Somewhat
Not

Comments:

3. I would like to receive a summary of the content validity study of the "Relative Mastery Measurement Scale". Circle one Yes No

Relative Mastery Measurement Scale- Rating Form

In Neistadt and Crepeau's (1998) *Willard and Spackman's Occupational Therapy*, Schkade and Schultz defined relative mastery as consisting of "the properties of efficiency (use of time, energy, and resources); effectiveness (extent to which the desired goal was achieved); and satisfaction to self and society (the extent to which the individual was personally satisfied with the response and the extent to which societal influences assessed the response as congruent with performance expectations) (p. 530).

Based on this definition, use the rating scale provided to identify the degree to which each Relative Mastery Measurement Scale Item would yield information in the relative mastery domains of **efficiency**, **effectiveness**, and **satisfaction to self and society**. Your thoughtful participation is appreciated as your ratings will be used to make decisions regarding retention, revision, and elimination of items from this scale.

Rating Criteria:

Read each item 1-27 and complete the following ratings:

- 1) Rate each item in each domain (Efficiency, Effectiveness, Satisfaction). Keep in mind that each domain should be rated independently of the other two domains. You *may or may not* perceive items to be a measure of more than one domain.
 - Circle **+1** if you believe the item is a definite measure of a domain
 - Circle **0** if you are undecided
 - Circle **-1** if you believe the item is definitely not a measure of a domain
- 2) Circle the domain (Efficiency, Effectiveness, Satisfaction) that you believe the item best measures.

Item		Domains		
1.	I am very pleased with my performance of this task.	Efficiency	Effectiveness	Satisfaction
		+1	+1	+1
		0	0	0
		-1	-1	-1
2.	Completing the task did not take a lot of energy.	Efficiency	Effectiveness	Satisfaction
		+1	+1	+1
		0	0	0
		-1	-1	-1
3.	People other than my family and friends would be happy with my level of ability on this task (<i>give example that relates to this person and task: e.g. Employer, Spouse, Co-workers, Neighbors, Therapists, Doctor</i>).	Efficiency	Effectiveness	Satisfaction
		+1	+1	+1
		0	0	0
		-1	-1	-1

4.	I do not want to perform this task again for a long time.	Efficiency	Effectiveness	Satisfaction
		+1	+1	+1
		0	0	0
		-1	-1	-1
5.	I felt physically or mentally tired after finishing the task.	Efficiency	Effectiveness	Satisfaction
		+1	+1	+1
		0	0	0
		-1	-1	-1
6.	I performed the activity just the way I wanted.	Efficiency	Effectiveness	Satisfaction
		+1	+1	+1
		0	0	0
		-1	-1	-1
7.	My friends would be satisfied with my performance.	Efficiency	Effectiveness	Satisfaction
		+1	+1	+1
		0	0	0
		-1	-1	-1
8.	I would like to have done better than I did.	Efficiency	Effectiveness	Satisfaction
		+1	+1	+1
		0	0	0
		-1	-1	-1
9.	I am aware of people, equipment, and/ or techniques that would make this task easier	Efficiency	Effectiveness	Satisfaction
		+1	+1	+1
		0	0	0
		-1	-1	-1
10.	This task was very difficult for me.	Efficiency	Effectiveness	Satisfaction
		+1	+1	+1
		0	0	0
		-1	-1	-1

11.	Overall, I am satisfied with myself regarding this activity.	Efficiency +1 0 -1	Effectiveness +1 0 -1	Satisfaction +1 0 -1
12.	The task took a great deal more time than is typical for me.	Efficiency +1 0 -1	Effectiveness +1 0 -1	Satisfaction +1 0 -1
13.	My family members would not be happy with my performance of this task.	Efficiency +1 0 -1	Effectiveness +1 0 -1	Satisfaction +1 0 -1
14.	I need to find and use resources that would help me perform the task better. (e.g. people, equipment, and/ or techniques)	Efficiency +1 0 -1	Effectiveness +1 0 -1	Satisfaction +1 0 -1
15.	I did better than I had expected.	Efficiency +1 0 -1	Effectiveness +1 0 -1	Satisfaction +1 0 -1
16.	I completed the task within about the same time frame it usually takes.	Efficiency +1 0 -1	Effectiveness +1 0 -1	Satisfaction +1 0 -1
17.	I failed to complete all steps of the task.	Efficiency +1 0 -1	Effectiveness +1 0 -1	Satisfaction +1 0 -1

18. My performance was very discouraging to me.

Efficiency	Effectiveness	Satisfaction
+1	+1	+1
0	0	0
-1	-1	-1

19. My performance was automatic requiring little or no thought.

Efficiency	Effectiveness	Satisfaction
+1	+1	+1
0	0	0
-1	-1	-1

20. I did not perform this task at the level expected by the people who are important to me.

Efficiency	Effectiveness	Satisfaction
+1	+1	+1
0	0	0
-1	-1	-1

21. I effectively used the resources to make this task easier (such as: people, equipment, and/or techniques)

Efficiency	Effectiveness	Satisfaction
+1	+1	+1
0	0	0
-1	-1	-1

22. It took longer to complete the task than usual.

Efficiency	Effectiveness	Satisfaction
+1	+1	+1
0	0	0
-1	-1	-1

23. I performed the task as well as I ever have.

Efficiency	Effectiveness	Satisfaction
+1	+1	+1
0	0	0
-1	-1	-1

24. I had to really focus to complete the task.

Efficiency	Effectiveness	Satisfaction
+1	+1	+1
0	0	0
-1	-1	-1

- | | | | |
|--|-----------------------------|--------------------------------|-------------------------------|
| 25. The task was physically, cognitively, or emotionally challenging for me.
(mark agree if any apply). | Efficiency
+1
0
-1 | Effectiveness
+1
0
-1 | Satisfaction
+1
0
-1 |
| 26. I feel that my performance was acceptable for now. | Efficiency
+1
0
-1 | Effectiveness
+1
0
-1 | Satisfaction
+1
0
-1 |
| 27. I performed the task with little or no difficulty. | Efficiency
+1
0
-1 | Effectiveness
+1
0
-1 | Satisfaction
+1
0
-1 |

Thanks again for your participation. Be sure to scan your rating form to assure completeness.

APPENDIX C

Relative Mastery Measurement Scale- Rating Form 2

In Neistadt and Crepeau's (1998) *Willard and Spackman's Occupational Therapy*, Schkade and Schultz defined relative mastery as consisting of "the properties of efficiency (use of time, energy, and resources); effectiveness (extent to which the desired goal was achieved); and satisfaction to self and society (the extent to which the individual was personally satisfied with the response and the extent to which societal influences assessed the response as congruent with performance expectations) (p. 530).

Based on this definition, use the rating scale provided to identify the degree to which each Relative Mastery Measurement Scale Item would yield information in the relative mastery domains of **efficiency**, **effectiveness**, and **satisfaction to self and society**. Your thoughtful participation is appreciated as your ratings will be used to make decisions regarding retention, revision, and elimination of items from this scale.

Rating Criteria:

Read each item 1-21 and complete the following ratings:

- 1) Rate each item in each domain (Efficiency, Effectiveness, Satisfaction). Keep in mind that each domain should be rated independently of the other two domains. You *may or may not* perceive items to be a measure of more than one domain.
 Circle **+1** if you believe the item is a definite measure of a domain
 Circle **0** if you are undecided
 Circle **-1** if you believe the item is definitely not a measure of a domain
- 2) Circle the domain (Efficiency, Effectiveness, Satisfaction) that you believe the item best measures.

Items		Domains		
1.	I performed the task at my desired level.	Efficiency	Effectiveness	Satisfaction
		+1	+1	+1
		0	0	0
		-1	-1	-1
2.	I am very pleased with my performance of this task.	Efficiency	Effectiveness	Satisfaction
		+1	+1	+1
		0	0	0
		-1	-1	-1

3.	Completing the task did not take a lot of energy.	Efficiency	Effectiveness	Satisfaction
		+1	+1	+1
		0	0	0
		-1	-1	-1
4.	I did not complete the task the way I wanted.	Efficiency	Effectiveness	Satisfaction
		+1	+1	+1
		0	0	0
		-1	-1	-1
5.	People other than my family and friends would be happy with my level of ability on this task (<i>give example that relates to this person and task:</i> e.g. Employer, Spouse, Co-workers, Neighbors, Therapists, Doctor).	Efficiency	Effectiveness	Satisfaction
		+1	+1	+1
		0	0	0
		-1	-1	-1
6.	I do not want to perform this task again for a long time.	Efficiency	Effectiveness	Satisfaction
		+1	+1	+1
		0	0	0
		-1	-1	-1
7.	I felt physically or mentally tired after finishing the task.	Efficiency	Effectiveness	Satisfaction
		+1	+1	+1
		0	0	0
		-1	-1	-1
8.	I accomplished the task without help from others.	Efficiency	Effectiveness	Satisfaction
		+1	+1	+1
		0	0	0
		-1	-1	-1
9.	My performance was not adequate to complete the task.	Efficiency	Effectiveness	Satisfaction
		+1	+1	+1
		0	0	0
		-1	-1	-1

10.	I am aware of people, equipment, and/ or techniques that would make this task easier	Efficiency +1 0 -1	Effectiveness +1 0 -1	Satisfaction +1 0 -1
11.	Overall, I am satisfied with myself regarding this activity.	Efficiency +1 0 -1	Effectiveness +1 0 -1	Satisfaction +1 0 -1
12.	I completed the task within about the same time frame it usually takes.	Efficiency +1 0 -1	Effectiveness +1 0 -1	Satisfaction +1 0 -1
13.	The task took a great deal more time than is typical for me.	Efficiency +1 0 -1	Effectiveness +1 0 -1	Satisfaction +1 0 -1
14.	I successfully completed the task.	Efficiency +1 0 -1	Effectiveness +1 0 -1	Satisfaction +1 0 -1
15.	My family members would not be happy with my performance of this task.	Efficiency +1 0 -1	Effectiveness +1 0 -1	Satisfaction +1 0 -1
16.	I performed the task as well as I expected.	Efficiency +1 0 -1	Effectiveness +1 0 -1	Satisfaction +1 0 -1

17. I did not perform this task at the level expected by the people who are important to me.

Efficiency	Effectiveness	Satisfaction
+1	+1	+1
0	0	0
-1	-1	-1

18. I failed to complete all steps of the task.

Efficiency	Effectiveness	Satisfaction
+1	+1	+1
0	0	0
-1	-1	-1

19. It took longer to complete the task than usual.

Efficiency	Effectiveness	Satisfaction
+1	+1	+1
0	0	0
-1	-1	-1

20. I did not produce the result I expected.

Efficiency	Effectiveness	Satisfaction
+1	+1	+1
0	0	0
-1	-1	-1

21. I completed the task with help.

Efficiency	Effectiveness	Satisfaction
+1	+1	+1
0	0	0
-1	-1	-1

Be sure to scan your rating form to assure completeness. You should have circled 4 things for each item:

- 1) a circled numerical rating for efficiency (-1,0,+1),
- 2) a circled numerical rating for effectiveness (-1,0,+1),
- 3) a circled numerical rating for satisfaction (-1,0,+1), and
- 4) a circle around the name of the domain which you believe the item would best measure.

Thanks again for your participation!!!