

PEERING INTO THE BLACK BOX OF REHABILITATION: CONTENT  
VALIDITY OF A NEW TAXONOMY FOR INTERVENTIONS

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BY  
SANDRA M. WHISNER B.B.A., B.S.O.T, M.A.

DENTON, TEXAS

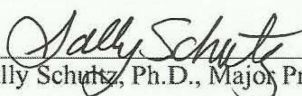
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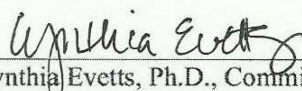
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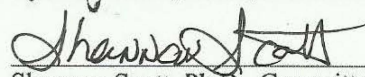
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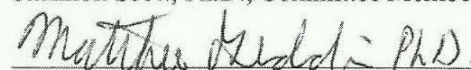
I am submitting herewith a dissertation written by Sandra M. Whisner entitled "Peering Into the Black Box of Rehabilitation: Content Validity of a New Taxonomy for Interventions." I have examined this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy with a major in Occupational Therapy.

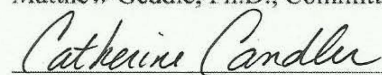
  
Sally Schultz, Ph.D., Major Professor

We have read this dissertation and recommend its acceptance:


  
Cynthia Evetts, Ph.D., Committee Member

  
Shannon Scott, Ph.D., Committee Member

  
Matthew Geddic, Ph.D., Committee Member

  
Director

Accepted:

  
Dean of the Graduate School

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## ABSTRACT

SANDRA M. WHISNER

### PEERING INTO THE BLACK BOX OF REHABILITATION: CONTENT VALIDITY OF A NEW TAXONOMY FOR INTERVENTIONS

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The research for this dissertation included three inter-related studies that systematically examined the validity of a new taxonomy, the Occupational Therapy Taxonomy of Rehabilitation Interventions (OT-TRI). The overarching question for this research was whether the OT-TRI is a valid observational measure that captures the key components of occupational therapy intervention processes in stroke rehabilitation. Study One used an expert panel review process to examine the relevance, clarity, and inter-observer agreement of the OT-TRI categories and items. Findings suggest that the OT-TRI can be used to identify the categories of the therapeutic process, but that further delimitation of items will be necessary to improve the consistency of observers' coding. Study Two examined the content validity of the OT-TRI through a comparison of it and the most widely published taxonomy in the stroke rehabilitation literature. The results demonstrated that the OT-TRI not only represented the domains presented in the published taxonomy but also provided additional information about interventions (e.g., observable components of client-therapist interactions). Study Three examined the OT-TRI's capacity to capture change in intervention methods over time. The findings demonstrated the sensitivity to change of a few items within each of the OT-TRI categories. Overall, the results of this dissertation research support the perspective that

the OT-TRI provides a more domain-complete taxonomy in comparison to taxonomies published in the past 20 years. The results also provided valuable information toward needed revisions of the OT-TRI and subsequent assessment of the inter-observer agreement and sensitivity to change of specific items.

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## CHAPTER I

### INTRODUCTION

A review of the rehabilitation literature substantiates the need for an accurate description of the nature of rehabilitative interventions. Health care researchers have referred to rehabilitation therapy as a “black box” of unknown strategies (e.g., Ballinger, Ashburn, Low, & Roderick, 1999; Bode, Heinemann, Semik, & Mallinson, 2004a; Dijkers, Hart, Tsaousides, Whyte, & Zanca, 2014). The term black box is used in the rehabilitation literature to signify that the components comprising most rehabilitative therapy interventions are essentially unknown, indefinite, and obscure. It is customary for research articles comparing interventions to use global terms (e.g., traditional, comprehensive, customary) to describe the therapy treatment provided rather than identify the specific methods of intervention provided. The absence of the objective description of the actual practice techniques and methods is a barrier to conducting comparative effectiveness research (e.g., Whyte & Hart, 2003; Dijkers et al., 2014).

#### **Statement of the Problem**

The lack of clarity about what constitutes effective rehabilitative intervention poses a conundrum for practitioners, educators, students, researchers, payers, policy makers, and most importantly, the recipients of rehabilitative services. Over the past decade, health care researchers have attempted to identify and classify the multiple components that characterize physical, occupational, and speech therapy interventions.

Previous research efforts to unpack the black box yielded a handful of taxonomies (i.e., Ballinger et al., 1999; Bode et al., 2004a; De Jong, et al., 2009; DeJong, Horn, Gassaway, Slavin, & Dijkers, 2004; Richards et al., 2005; van Langeveld et al., 2008). A *taxonomy* is defined as a system of classification or categorization based on characteristics that have important pragmatic or theoretical implications (Dijkers, 2014).

The resulting rehabilitation taxonomies attempted to name and frame the components that form rehabilitation interventions (e.g., Bode et al., 2004a; DeJong et al., 2004). Accurate and comprehensive identification of intervention variables is a necessary precursor for determining the *active ingredients* of rehabilitative processes. The term active ingredient, borrowed from pharmacology, refers to the key elements required to produce a positive effect or outcome. Standardized, detailed identification of the active ingredients is essential for researchers to compare the effectiveness of two or more interventions (e.g., Heinemann, 2008; Schulz, Czaja, McKay, Ory, & Belle, 2010). More importantly, the precise identification of active ingredients is a necessary step in the creation of evidence to improve rehabilitation treatments (Dijkers, 2014).

Previous research on the active ingredients of rehabilitation therapy incorporated taxonomies that accounted for what are considered standard active ingredients of rehabilitation (e.g., type of activity, dosage, impairment targeted, and frequency/duration of therapy over time). However, the resulting evidence on the direct relationship between these active ingredients and treatment outcomes remains largely inconclusive (e.g., Conroy, Hatfield, & Nichols, 2005; Heinemann, 2008; Richards et al., 2005). Hart (2009) and Gordon (2010) addressed the inherent challenge and complexity of defining

and measuring rehabilitation effectiveness. They proposed that the lack of evidence with regard to the active ingredients of interventions confounds the ability to correlate interventions with outcomes.

Whyte et al. (2014) presented a conceptual framework for a rehabilitation treatment taxonomy (RTT) that is theory based. The RTT contains three components (i.e., target, ingredient, mechanism of action) that are proposed to provide a basis for identification of the various approaches, practices, procedures, services, and treatments used by rehabilitation professionals.

Occupational therapy is one of the rehabilitation therapies most frequently represented in physical medicine and rehabilitation. To date, the profession does not have a specific taxonomy to identify the key components (or active ingredients) of the therapeutic process. While the Occupational Therapy Practice Framework (AOTA, 2008) provides an organized set of terminology, it is frankly stated in the document that the framework should not be perceived as a taxonomy. The lack of precise identification of the active ingredients of occupational therapy interventions impedes the understanding of the direct relationship between intervention and treatment outcome. Consequently, comparative effectiveness studies cannot be conducted.

### **Statement of the Purpose**

The purpose of this dissertation research is to articulate and systematically examine the validity of a new taxonomy for occupational therapy stroke rehabilitation. The new taxonomy includes not only the customary active ingredients (e.g., activity, duration, target), but also presents a categorization system designed to capture the nature

of the therapeutic interactions that occur between the therapist and the patient, i.e., the therapeutic process. The therapeutic process is espoused to be the missing piece in examining the relationship between occupational therapy interventions and treatment outcomes.

### **Specific Aims**

The research for this dissertation included three inter-related studies to systematically examine the validity of a new taxonomy, the Occupational Therapy Taxonomy of Rehabilitation Interventions (OT-TRI). Study One aimed to utilize a panel of experts to objectively analyze the OT-TRI in terms of content validity. Study Two examined the content validity of the OT-TRI by comparing similarities and differences of the OT-TRI and the most widely recognized occupational therapy taxonomy in stroke rehabilitation literature. Study Three conducted further content validation procedures to examine if the OT-TRI could capture changes in intervention methods during the course of treatment. The overarching question for this research was whether the OT-TRI is a valid observational measure that captures the key components of occupational therapy intervention processes in stroke rehabilitation. The specific research questions for each of the three studies are stated below.

- Study One had two research questions. Is there an acceptable level of inter-observer agreement (for occurrences of items) among experts using the OT-TRI to view video-recorded treatment sessions? To what extent do experts agree that OT-TRI items adequately characterize the domain of occupational therapy interventions in stroke rehabilitation?

- Study Two had one research question. How are characteristics of the OT-TRI similar to and different from a widely published stroke rehabilitation taxonomy for occupational therapy?
- Study Three had one research question. Is the OT-TRI sensitive enough to capture changes in intervention methods during the course of treatments?

The remainder of this dissertation presents this researcher's work toward validation of the new taxonomy (i.e., OT-TRI). Chapter II acquaints the reader to published taxonomies within the rehabilitation literature relevant to this research and presents a summary of the development and preliminary testing of the OT-TRI. Chapters III, IV, and V each present one of the three inter-related studies that examined the content validity of the OT-TRI. The final chapter, Chapter VI, provides a synthesis of the findings of the three studies and a discussion of the implications of this research for occupational therapy.

## CHAPTER II

### BACKGROUND AND SIGNIFICANCE

Chapter II presents: (a) a review of literature on research that has incorporated rehabilitation taxonomies to study treatment effectiveness of occupational therapy interventions in stroke rehabilitation; (b) a discussion on the premise that the therapeutic process should be included as a key component of a taxonomy for occupational therapy rehabilitation interventions; and (c) an overview of recognized guidelines for the development of a rehabilitation taxonomy. Chapter II concludes by describing the need for continued taxonomy development to fully capture the complexity of rehabilitation therapy interventions and an overview of the new taxonomy being examined by this dissertation research.

#### **Overview of Published Taxonomies**

This researcher conducted a review of the literature within the past 20 years to identify taxonomies that intended to name and frame the active ingredients of rehabilitation therapy. This review identified several taxonomies that included hip and knee replacement rehabilitation (i.e., DeJong et al., 2009), spinal cord injury rehabilitation (i.e., van Langeveld et al., 2008), and stroke rehabilitation (i.e., Ballinger et al., 1999; Bode, Heinemann, Semik, & Mallinson, 2004b; DeJong et al., 2004). The following discussion involves those taxonomies that addressed occupational therapy as



part of stroke rehabilitation (i.e., Ballinger et al., 1999; Bode et al., 2004b; Richards, et al., 2005).

Ballinger et al. (1999) developed the earliest classification system (taxonomy) of stroke rehabilitation interventions provided by occupational therapists. Six occupational therapists identified 12 activity codes that constituted the content for the taxonomy form. The codes were: personal activity of daily living (ADL), domestic ADL, physical function, perception, cognition/mood, home visit/assessment, social/leisure activities, education of patient, education of care giver, wheelchair/seating, aids/equipment, and other. The same six occupational therapists completed the taxonomy forms to record the duration of the treatment session, the treatment delivery, and the types of activities that occurred in occupational therapy treatment sessions for a total of 89 clients with strokes during twelve weeks. Descriptive analysis revealed that physical function, social/leisure, and other as the most common treatment activity codes. Researchers concluded that the codes were too simple to adequately describe the intervention process.

Bode et al. (2004a) used discipline-specific taxonomies for stroke rehabilitation interventions to investigate treatment activity patterns among occupational therapy, physical therapy, and -language pathology. Therapists completed the discipline-specific taxonomies for 177 inpatients receiving stroke rehabilitation in one of 13 facilities. The occupational therapy taxonomy contained 25 activity codes that researchers grouped into five categories: evaluation and screening; function-focused activities; impairment-focused activities; discharge planning; and case management. Descriptive analysis revealed that inpatients spent more time on impairment-focused activities during

occupational therapy as opposed to more time spent on function-focused activities during physical and speech therapy. Researchers stated that future research should consider a finer classification of interventions to identify types of activities that are beneficial for specific types of patients.

The most widely published taxonomy in the stroke rehabilitation literature included standardized documentation forms developed as part of the Post-Stroke Rehabilitation Outcomes Project (PSROP) (DeJong et al., 2004). PSROP researchers and clinicians developed the documentation forms to capture processes of care for various disciplines: occupational therapy (Richards et al., 2005), physical therapy (Latham et al., 2005), and speech therapy (Hatfield et al., 2005). The occupational therapy taxonomy identified characteristics of the treatment process that included 16 activities (i.e., type, intensity, and duration) and 54 intervention codes. The researchers correlated the identified processes (i.e., type, intensity, and duration) with functional outcomes as measured by the Functional Independence Measure (FIM). The link between intervention processes and outcomes was limited. Results showed that patients who obtained higher FIM scores (requiring no more than supervision for upper extremity dressing) spent a greater amount of time in higher-level activities (e.g., home management, leisure); whereas, patients with lower FIM scores spent a greater amount of time in lower-level activities (e.g., sitting balance, grooming). Data suggested that lower-level activities were not associated with improved function; however, the researchers stated that the type of activities likely reflected patients' ability. The researchers noted

that the study's findings might have been limited due to the taxonomy not being fine-grained enough to accurately examine effectiveness of interventions.

To date, all of the published taxonomies of occupational therapy interventions within the stroke rehabilitation literature are limited to identifying treatment activities, impairments targeted, and intensity (e.g., Ballinger et al., 1999; DeJong et al., 2004). None of the previously published taxonomies contain components of the therapeutic process that include the actions of the therapist and the client's response to intervention. Previous taxonomies have identified what the patient did in therapy without identification of what the therapist did to facilitate the therapeutic process. The impact of what the therapist does in therapy has not been related to treatment outcomes.

A 2010 systematic review of 13 studies on physical rehabilitation found a positive correlation between the nature of the client-therapist interactions and treatment outcomes (Hall, Ferreira, Maher, Latimer, & Ferreira, 2010). Other rehabilitation therapy researchers have recommended that future studies on the classification of therapy interventions should include components related to the client-therapist interactions (e.g., Hart, 2009; Latham et al., 2006; Smallfield & Karges, 2009). These findings support the need for a systematic tool to conduct research on not only the usual active ingredients, but also what may be the missing ingredient – the therapeutic process that occurs between the therapist and the client.

### **The Missing Piece in Research on Rehabilitation Therapy: Therapist Actions**

The classification of the therapeutically applied actions of the therapist, and the corresponding client responses, is proposed as the missing piece for a taxonomy that will

encompass the complete domain of occupational therapy intervention. The Occupational Therapy Practice Framework (AOTA, 2008) identifies five types of interventions utilized by occupational therapy practitioners: therapeutic use of self, therapeutic use of occupation and activities, consultation, education, and advocacy. Four of the five specified interventions are enacted through verbalizations and actions of the therapist. What the occupational therapist says and does in response to the client is clearly recognized as an integral and necessary component of therapeutic intervention.

The term therapeutic use of self has been ever-present in the occupational therapy literature. There are multiple references to its significance since the earliest years of the profession. Therapeutic use of self refers to the use of timely verbalizations and actions to facilitate the client's progress in therapy. Finlay (2004) uses the term conscious use of self to describe the way therapists communicate with and engage clients in the therapeutic process. Such therapeutic use of self may be directed at increasing the client's self-agency, motivation, problem solving, and performance. Researchers have studied occupational therapists' perceptions of therapeutic use of self, including the intent of the therapeutic strategies applied (e.g., Allison & Strong, 1994; Cole & McClean, 2003). Allison and Strong (1994) examined occupational therapists' perceptions of communication strategies in direct client encounters. Findings suggested that the utilization of four specific verbal strategies improved the effectiveness of the client-therapist interaction and promoted the client's optimal performance. Cole and McLean (2003) surveyed 129 practitioners about their understanding and use of therapeutic

relationships with clients. Results showed that the therapists perceived the relationship as critical to the effectiveness of therapy.

Research describing the observable, explicit actions of therapists is scarce and incomplete. There have been few attempts to describe the observable actions of therapists within the context of the treatment. Booth, Davidson, Winstanley, & Waters (2001) compared the interaction styles of occupational therapists and nurses with patients in a stroke rehabilitation unit. Interaction style was coded based on the level of assistance provided by either the nurse or therapist (e.g., supervision, prompting/instructing, facilitation). Findings demonstrated that therapists more frequently instructed or used a neurodevelopmental treatment approach to facilitate the clients' performance of washing and dressing tasks, whereas nurses provided more supervision while clients completed the same morning routines. Guidetti and Tham (2002) conducted a qualitative study to characterize the strategies used by 12 occupational therapists working with clients with stroke or spinal cord injuries. The researchers identified eight specific strategies used by occupational therapists in self-care training with clients. All of the strategies focused on developing a therapeutic relationship and providing enabling experiences as opposed to teaching compensatory techniques and modifying environments.

The most comprehensive description of therapeutic strategies is detailed in Taylor's Intentional Relationship Model (2008). This conceptual practice model describes occupational therapists' use of therapeutic modes to establish therapeutic relationships, facilitate clients' occupational engagement, and promote therapeutic outcomes. The six therapeutic modes are advocating, collaborating, empathizing,

encouraging, instructing, and problem-solving. Taylor, Lee, & Kielhofner (2011) surveyed 563 occupational therapists from a wide range of settings with regard to therapeutic mode use when interacting with clients. Overall, the most frequent modes used were encouraging and collaborating; the least frequent modes used were instructing and empathizing. Descriptive analysis showed that therapists who reported more experience with more difficult client behaviors also reported greater use of all modes. Results of the study provide some evidence regarding the type of interaction strategies used by occupational therapist during treatment sessions.

A review of the occupational therapy literature with regard to therapeutic use of self reveals that therapist perceptions of therapeutic use of self and related constructs have been explored and described. However, a lack of explicit description of the observable actions of the therapists during occupational therapy treatment sessions remains lacking. Smallfield and Karges (2009) recommended that future taxonomy research include components involved in client-therapist interactions during the therapeutic process as a necessary component of a comprehensive taxonomy of occupational therapy interventions.

### **Taxonomy Development**

The rehabilitation literature includes a set of guidelines for the development and testing of taxonomies in rehabilitation (DeJong et al., 2004). The following provides a brief explanation of each component included in the guidelines.

- Theoretical integrity: The taxonomy makes theoretical and conceptual sense to the user.

- Domain completeness: All domains that are involved in the intervention are reviewed and addressed.
- Multiple dimensions: The taxonomy addresses aspects of the interventions that are considered multi-dimensional.
- Granularity: The taxonomy is detailed in a way that adequately describes the interventions.
- Parsimony: The taxonomy describes the interventions in a precise, simplistic, and non-repetitive manner.
- Clinical and research utility: The taxonomy is useful in the practice of clinicians, researchers, and third-party users.
- Reliability: The taxonomy has the ability to be used and interpreted in a similar manner among different settings, various users, for different diagnoses, and over time.
- Future development: The taxonomy has the ability for growth and development as new interventions are developed and utilized in practice.

Based on these guidelines, it appears that the taxonomies used in rehabilitation research are in the early stages of development. In particular, current published taxonomies lack domain completeness by not including important components of the therapeutic process. Continued research efforts are needed to develop classification systems that not only identify the therapeutic activities and impairments targeted, but also identify the therapeutic actions of the therapist during the intervention process. The

inability to adequately characterize the therapeutic process is a barrier to the measurement of the effectiveness rehabilitation interventions (e.g., Gordon, 2010; Whyte & Hart, 2003).

The aforementioned guidelines provided ongoing guidance during the development of each version of the new taxonomy (i.e., OT-TRI). The OT-TRI developers intentionally evaluated and sought input regarding the OT-TRI in terms of domain completeness, clinical utility, and granularity. The next section introduces the OT-TRI and describes the processes that guided the refinement of the new taxonomy.

### **A New Taxonomy**

Over the past three years, this researcher has participated in the systematic inquiry related to the development of the Occupational Therapy Taxonomy of Rehabilitation Interventions (OT-TRI). The section provides an overview of the development and preliminary evaluation of the OT-TRI.

An inductive approach guided the development of the OT-TRI by this researcher, her research mentor, and several occupational therapists who were doctoral students at the time. Following a review of published taxonomies from the rehabilitation literature, the group collectively generated items believed to characterize occupational therapy interventions. The initial developers categorized items and developed a method for linking multiple categories with an effort to characterize the multi-dimensional nature of interventions. An advisory panel of three nationally recognized researchers in occupational therapy provided an initial review of the relevance and objectivity of the components as well as the overall purpose of the taxonomy.



## **Testing and Refinement of the OT-TRI**

Workshops at two state occupational therapy conferences provided a platform for the initial developers to gather input from practicing clinicians regarding the face validity of the OT-TRI. Face validity improves the likelihood that the tool will be accepted because the items appear plausible and relevant to the intended audience (Anastasi & Urbina, 1997). At the 2009 Mountain Central Conference, the initial development team introduced the first version of the OT-TRI to a group of 13 occupational therapy practitioners, which included but was not limited to nursing home administrators, inpatient rehabilitation managers, and a regional manager for school-based practice (Schultz, Whisner, & Shierk, 2009). The workshop was classified (in the conference program) as an expert level course that sought feedback from professionals within an informal focus group format. Practitioners critiqued categories and respective items in terms of relevance and clarity as well identified the need for the inclusion of additional items. Unfavorable ratings of items were identified and discussed within each of the small groups. Attendees made suggestions for improving the clarity and relevance of existing items as well as the inclusion of additional items. As a result, developers clarified and modified components as well as the structure of the taxonomy.

This researcher presented the second version of the OT-TRI at the 2010 Iowa Occupational Therapy Association conference to approximately 25 practitioners and academicians (Whisner, Schultz, Thom, & Jewell, 2010). Each attendee used the taxonomy to identify components of three intervention sessions presented in a written case vignette. Next, groups of four to five attendees discussed agreement among the

items selected within a small group discussion. Items with low agreement were further discussed to determine ways to improve clarity of and agreement in the selection of those items. Additionally, attendees provided feedback to promote the feasibility of using the tool in practice. The feedback resulted in the development of the OT-TRI manual that included item definitions.

In 2011, two of the primary developers conducted a qualitative study designed to identify and describe the observable actions of therapists through naturalistic observation (Whisner, Schultz, & Owens, 2011). Through review of video-recorded therapy sessions, preliminary categories emerged as well as difficulties in delimiting the categories. Preliminary categories included: Physical Assistance (e.g., gave tactile cue, provided standby assistance), Verbal Instructions (e.g., gave command, asked indirect question), Psychosocial Facilitation (e.g., affirmed client's effort, encouraged) and Modification (e.g., increased demands of task, provided assistive device). Although difficult to accomplish, the delimitation of categories proves to be an essential step for the objective measurement of therapist actions.

To date, OT-TRI developers have conducted an analysis of the taxonomy's face validity; however, the content validity of the new taxonomy needs to be systematically examined. Content validity refers to how well a measure represents the complete domain of content of a concept or phenomenon (e.g., Anastasi & Urbina, 1997; Sim & Wright, 2000). Examples of content validation procedures relevant to the OT-TRI include: classification of items in terms representativeness of the stroke rehabilitation interventions by subject matter experts; comparison of the OT-TRI to relevant content

sources (published taxonomies); and examination of the depth of the OT-TRI dimensions associated with intervention processes over time.

The purpose of this dissertation research was to conduct a systematic examination of the validity of the OT-TRI. It is essential to systematically validate the content of the OT-TRI to determine whether items are representative of the multi-dimensional domain of occupational therapy intervention in stroke rehabilitation. It is the belief of this researcher that a valid taxonomy that incorporates client-therapist interaction components in addition to the customary ingredients included in previous taxonomies would constitute a significant contribution to the occupational therapy profession.

This chapter presented an overview of the published taxonomies in the rehabilitation literature that specifically addressed occupational therapy stroke rehabilitation, the suggested guidelines for taxonomy development, and a description of the development and testing of the OT-TRI. The next chapter presents the methodology and results of the first of three studies examining the validity of the OT-TRI.

## CHAPTER III

### STUDY ONE: CONTENT VALIDATION OF OT-TRI USING EXPERT PANEL

Chapter I presented the need for rehabilitation therapies to precisely identify the active ingredients of rehabilitative interventions as a vital step prior to the examination of the effectiveness of interventions. Chapter II presented an overview of the published taxonomies that have attempted to identify the salient components of occupational therapy interventions in stroke rehabilitation. Chapter II concluded with a discussion of the need for the continued development of a comprehensive taxonomy for rehabilitation interventions.

The current chapter presents the first of three inter-related studies that investigated the validity of the Occupational Therapy Taxonomy of Rehabilitation Interventions (OT-TRI). The specific aim of Study One was to conduct a systematic examination of the content validity the OT-TRI using a panel of experts in occupational therapy stroke rehabilitation. The two research questions were:

- Is there an acceptable level of inter-observer agreement (for occurrences of items) among experts using the OT-TRI to view video-recorded treatment sessions?
- To what extent do experts agree that OT-TRI items adequately characterize the domain of occupational therapy interventions in stroke rehabilitation?

Study One required the collection of video recordings of occupational therapy treatment sessions for clients receiving inpatient stroke rehabilitation as data for the expert panel review process. This researcher obtained the video recordings under an IRB approved study initiated prior to the establishment of the research committee for this dissertation. The institutional review boards (IRB) of both Texas Tech University Health Sciences Center (TTUHSC) and Texas Woman's University (TWU) approved the study. This researcher submitted two study modification requests. Both IRBs approved the first modification request that increased time for the expert panel review process from 10 hours to 14 hours and acknowledged the earning of four continuing education credits for expert panel participants following the completion of the training sessions. (Note: The Education Committee of the Texas Board of Occupational Therapy Examiners approved four hours of continuing education credits.) Both IRBs approved the second modification to approve study personnel changes (e.g., addition of masters-level student research assistants). This study was conducted at an inpatient rehabilitation facility (IRF) in Lubbock, Texas. This researcher served as the principal investigator (PI). Co-investigators (CIs) included this researcher's TWU faculty advisor, a faculty member from TTUHSC, and master's level occupational therapy students from TTUHSC.

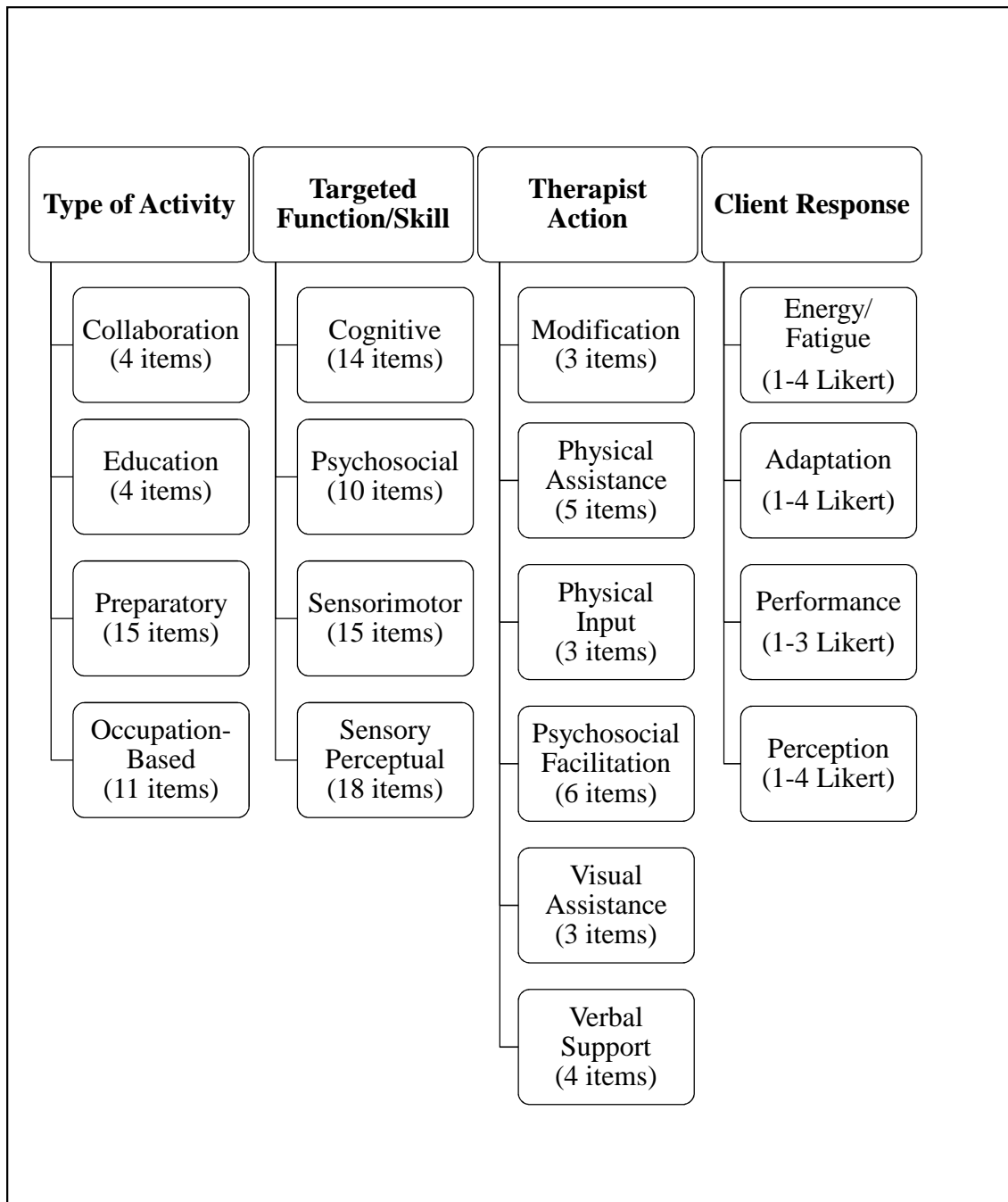
The current chapter is organized into three sections. Section one presents a concise description of the OT-TRI and its associated categories, sub-categories, and items. Section two presents the methods used to obtain video recordings of occupational therapy treatment sessions and the selection process for video clips. The section concludes with a description of the resulting set of video clips that was utilized in the

expert panel review process. Section three presents the methodology used in the expert panel review process, the results of the expert panel review process, and a discussion of the findings.

### **Section One: Description of the OT-TRI**

The OT-TRI is a new taxonomy for occupational therapy interventions within rehabilitation. The specific content of this taxonomy was developed to capture the multi-dimensional nature of occupational therapy interventions specific to inpatient stroke rehabilitation. The OT-TRI includes key components of interventions that have not been included in previous attempts to characterize the rehabilitation process. The OT-TRI attempts to name and frame the observable therapist actions that occur within treatment sessions as well as capture aspects of the client's response to intervention. These components of practice-based evidence are suggested as being the missing pieces in the study of the relationship between therapy activities and treatment outcomes.

The OT-TRI includes an excerpt of the OT-TRI instrument (see Appendix A). The OT-TRI instrument contains four primary categories with corresponding sub-categories and specific items within each sub-category. The first two categories reflect customary components that are included in previously published taxonomies; whereas the other two categories reflect the new components included to characterize aspects of client-therapist interaction. Figure 1 presents a diagram of the four categories and respective sub-categories of the OT-TRI.



*Figure 1.* Organization of the Occupational Therapy Taxonomy of Rehabilitation Interventions (OT-TRI). The OT-TRI includes four broad categories that characterize the components of the therapeutic process.

Each of the four categories and the respective associated sub-categories are provided in the list below. Selected item descriptors are also provided for each of the sub-categories.

- *Type of Activity (Activity)* is the first category and includes four sub-categories: Collaboration (e.g., Goals/Activities/Interests, Rapport), Education (e.g., Purpose of Session, Use of Device), Occupation-Based (e.g., Hygiene, Meal Management), and Preparatory (e.g., Fine Motor Tasks, Resistive Exercise).
- *Targeted Function or Skill* is the second category and includes four sub-categories: Cognitive (e.g., Decision Making, Self-Awareness), Psychosocial (e.g., Behavior Modification, Self-Efficacy), Sensorimotor (e.g., Dexterity, Postural Control), and Sensory Perceptual (e.g., Vestibular Processing).
- *Therapist Action* is the third category and includes six sub-categories: Modification (e.g., Modified Environment, Provided Assistive Device), Physical Assistance (e.g., Minimum Assistance), Physical Input (e.g., Handling, Positioning), Psychosocial Facilitation/Motivation (e.g., Provided Feedback, Elicited Client Input); Visual Assistance (e.g., Pointed to Objects, Demonstrated Task), and Verbal Support (e.g., Provided Instruction, Asked Open Question).



- *Client Response* is the fourth category and includes four sub-categories: Generalization of Skill/Behavior (Adaptation), Level of Energy/Fatigue (Energy/Fatigue), Performance Consistent with Targeted Function or Skill (Performance), and Perception of Outcome of Intervention (Perception).

The names of the OT-TRI categories, sub-categories, and items are capitalized and italicized within the text for the remainder of this dissertation. The presentation of these taxonomy terms in italics is to improve the readability of the information for the reader. The next section presents the methods used to obtain the video recordings of occupational therapy treatment sessions and to select video clips for the expert panel review process.

## **Section Two: Collection of Video Clips**

### **Method**

Participants consisted of two groups. Both the treating occupational therapists and their occupational therapy clients were consented to be in this study. Researchers intentionally designed the inclusion criteria for occupational therapists to be reflective of typical practice. The criteria for therapists were: (a) The occupational therapist must be a licensed occupational therapist; and (b) The occupational therapist must provide occupational therapy services at the approved study site. The PI and CIs initiated contact with occupational therapists at the approved study site (an IRF) to set up a face-to-face informational meeting regarding the purpose of the study and informed consent process. Three of the six occupational therapists who attended the informational meeting provided consent and were enrolled as participants. The PI met with one additional therapist at a

later date regarding purpose of the study and informed consent process. This therapist consented to participate in the study.

Researchers approached potential clients as they were referred by their occupational therapists who were enrolled in this study. The PI or CI scheduled a face-to-face meeting with interested clients and discussed the purpose of the study, inclusion criteria, and consent process. The inclusion criteria for clients were: (a) The client must be 18 years of age or older; (b) The client must have a diagnosis of cerebral vascular accident (CVA), and (c) The client must be a current occupational therapy client at the approved study site. Exclusion criteria: Clients who were unable to restate the purpose and participation requirements were excluded from study participation. The PI and CIs enrolled clients who met the inclusion criteria and completed both an informed consent form and video consent form, and the associated hospital's HIPPA authorization form.

**Data collection.** Investigators adhered to the following conditions of the IRB-approved video-recording protocol.

1. Each video-recorded session was the length of the regular scheduled therapy session, and the therapist was not asked to modify the session in anyway.
2. No more than two investigators (PI and/or CI) were present during the video recording of the therapy session.
3. The PI or CI completed an observation form (used to describe client participants and therapy session details).
4. No more than ten sessions were video-recorded per therapist.

5. No more than five sessions were video-recorded per client.

The PI uploaded the video recordings of therapy sessions into iMovie, version 9 (Apple, Inc.), the video editing software used to create video clips from the video recordings. Investigators adhered to the following conditions of the IRB-approved protocol for editing and selection of video content.

1. The PI and/or CI viewed video recordings and selected video content (video clips), which were determined to depict the various OT-TRI items.
2. The PI and/or CI removed “dead time” (periods of no action/verbalization) and redundant action(s)/verbalization(s) to create concise video clips.
3. The PI identified which categories of the OT-TRI were presented in a video clip. This identification process produced a record of OT-TRI categories and associated items that were determined as depicted in the video clips.
4. The PI used the record to monitor the content of the video clips in order to determine when the video clip content was sufficient (i.e., reflected the scope of the OT-TRI).
5. The PI ceased the collection of the video-recorded therapy sessions once the PI determined that the set of selected video clips was sufficient to examine the content of the OT-TRI. The following guidelines provided the criteria for determining the adequacy of the set of video clips:

- a. Eighty percent of the *Activity* items for each of the activity categories (i.e., *Education*, *Collaboration*, *Preparatory*, and *Occupation-Based* activities) were depicted in the video clips,
- b. Ninety percent of the *Therapist Action* items were depicted in the video clips, and
- c. One hundred percent of the *Client Response* items were depicted in video clips.

## Results

A total of four occupational therapists (3 female and 1 male) participated in the study. Five clients (1 female and 4 male) consented to participate in the study. All of the clients had a diagnosis of CVA and were receiving occupational therapy at the IRF. The clients' ages ranged from 58 to 70 years of age. Investigators filmed a total of 10 therapy sessions ranging from 20 to 45 minutes in duration. The number of sessions filmed ranged from one to six sessions for therapists and one to three sessions for clients. Locations of the treatment sessions included the clients' private hospital rooms and three different therapy gyms.

The video editing and selection process yielded 31 video clips from the video recordings of the ten occupational therapy sessions. These 31 video clips constituted the video data used for the expert panel review process. Percentages of the OT-TRI items depicted in the final set of video clips by category were 80% (i.e., *Preparatory Activity* items), 82% (i.e., *Occupation-Based Activity* items), 91% (i.e., *Therapist Action* items), and 100% (i.e., *Collaboration*, *Education*, and *Client Response* items). The video clips

ranged from 30 seconds to 5 minutes 45 seconds in duration. The length of video clips was dependent upon whether the video clip depicted a discrete activity with few components or an activity with several components occurring over a longer period of time.

### **Section Three: Expert Panel Review Process**

#### **Method**

The PI and CI identified a list of 20 known occupational therapists (in Lubbock, Texas) believed to be qualified subject-matter experts who met the criteria for inclusion in the study. Inclusion criteria were: (a) The person must be licensed occupational therapist by the Texas Board of Occupational Therapy Examiners; and (b) The therapist must have a minimum of five years of experience treating clients having diagnosis of CVA.

The PI discussed the research study, participation requirements, and consent process with therapists who responded to the email solicitation. The first five therapists who met the inclusion criteria and consented to participate in the study were enrolled as expert panel participants. All five therapists completed the study. Three of the expert panel participants had between 8 and 9 years of experience in stroke rehabilitation. The remaining two expert panel participants had 17 and 19 years of experience in stroke rehabilitation. The expert participants worked in a range of therapy settings that provided stroke rehabilitation (e.g., acute care hospital, IRF, outpatient facility). Refer to Table 1 for a specific description of the expert panel participants' expertise.

Table 1

*Characteristics of Expert Panel Participants*

Characteristic	Frequency	Percentage
Gender		
Female	4	80
Male	1	20
Highest Degree Earned		
Master's Degree (e.g., MOT)	3	60
Post-professional Master's Degree	1	20
PhD	1	20
Current Facility/Institution*		
Acute Care Hospital	1	20
Sub-acute Rehabilitation Hospital (Inpatient)	2	40
Post-acute Brain Injury Rehabilitation	1	20
Outpatient Facility or Clinic	1	20
Skilled Nursing Facility	1	20
Patient's Home/Home Health Care	1	20
Academic Institution	1	20
Certification		
Certified Brain Injury Specialist	1	20
Neurodevelopmental Treatment Certified	2	40
Big Program Certified	1	20
Low Vision Certified	1	20
Vestibular Rehabilitation Certified	1	20
Hemiplegia Certification	1	20
Alzheimer's/Dementia Certified Practitioner	1	20
Kinesiotaping Practitioner License	1	20

Note: \*Percentages of frequencies for the facility/institution and certifications/ memberships greater than 100% reflects that some participants work in multiple settings and have multiple certifications.

**Measures.** Investigators used OT-TRI instrument and the OT-TRI Item Questionnaire to collect data from the expert panel. Section one of this chapter provided a general description of the content of the OT-TRI. More specific details regarding the completion of the OT-TRI is provided in the following section.

The OT-TRI instrument (see Appendix A) contained a total of 119 items for the four categories (i.e., *Activity*, *Targeted Function or Skill*, *Therapist Action*, and *Client Response*). There were four items that the expert panel participants used to record the client's response using a Likert scale: *Adaptation*, *Energy/Fatigue*, *Performance*, and *Perception*. The instrument also contained a total of 115 items that expert panel participants recorded if the item occurred in the treatment session. The 115 items were organized as follows:

- Thirty-six items for *Activity* categories (i.e., *Collaboration*, *Education*, *Occupation-Based*, *Preparatory*);
- Fifty-six items for *Targeted Function or Skill* categories (i.e., *Cognitive*, *Psychosocial*, *Sensorimotor*, and *Sensory Perceptual*);
- Twenty-three items for *Therapist Action* categories (i.e., *Modification*, *Physical Assistance*, *Physical Input*, *Psychosocial Facilitation*, *Verbal Support*, *Visual Assistance*).

The other measure was OT-TRI Item Questionnaire (see Appendix B). The PI developed the questionnaire to examine relevance and clarity of the OT-TRI items. PI and CIs pilot-tested the questionnaire a few months prior to the expert panel process. Four masters-level student CIs completed the questionnaire and provided feedback

regarding the completion time, ease of use, and confusing items/format. The PI clarified several definitions and corrected formatting issues based on the feedback. Table 2 presents additional details of the specific feedback and associated revisions.

Table 2

*OT-TRI Item Questionnaire Pilot Feedback*

Area	Feedback	Response/Revision (if applicable)
Time	Completion time ranged from 45 to 60 minutes to complete the form.	Acceptable completion time. No revision.
Content	A few typos were identified.	Corrected all spelling errors and other typos.
Format	Required expansion of columns to view complete definition.	Corrected formatting issues to ensure complete definition was fully visible.
Content	Content asked for columns 3 (Is the item clear and distinct from other items?) and 4 (Does the item overlap with another item?) was considered redundant.	Redundancy was acknowledged. Omitted column 4 from final rating form.
Definitions	<p>A few confusing definitions were identified for the following items:</p> <ul style="list-style-type: none"> <li>• Open-Ended Question</li> <li>• Traction vs. Distraction</li> <li>• Vibration</li> <li>• Eat/Drink</li> <li>• Environmental Mobility</li> <li>• Functional Mobility</li> <li>• Transfer</li> <li>• Self-Correcting vs. Self-Inhibiting vs. Self-Monitoring</li> </ul>	<p>Clarified definitions for the following items:</p> <ul style="list-style-type: none"> <li>• Open-Ended Question</li> <li>• Traction vs. Distraction</li> <li>• Vibration</li> <li>• Environmental Mobility</li> <li>• Functional Mobility</li> <li>• Transfer</li> </ul> <p>Modified “Eat/Drink” item to include aspects of feeding. Revised item “Eat/Drink/Feed”</p> <p>Collapsed “Self-Correcting” and “Self-Inhibiting” into “Self-Monitoring” definition.</p>



The revised OT-TRI Item Questionnaire contained a total of 152 items; whereas the OT-TRI instrument contained 115 items. (Note: The discrepancy is due to some of the items on the OT-TRI instrument [e.g., *Modalities*] being separated into discrete specific modalities [e.g., *Cryotherapy*, *Heat Therapy*] on the OT-TRI Item Questionnaire.) The questionnaire contained a Likert scale and a dichotomous scale for each of the 152 OT-TRI items. The Likert scale anchors were as follows: *Not Relevant*, *Somewhat Relevant*, *Relevant*, and *Extremely Relevant*. The dichotomous scale was as follows: Is the item clear and distinct from other items? (Yes/No). All five expert panel participants completed the OT-TRI Item Questionnaire and provided comments regarding the inclusion of additional items to ensure the completeness of each of the OT-TRI categories (e.g., *Education*, *Preparatory Activity*, *Verbal Support*).

**Expert panel training and review process.** The expert panel training and review process occurred over a two-day period. On day one, the expert panel completed two OT-TRI training sessions, each session lasted two hours. During the first training session, the PI presented a brief overview of the rehabilitation taxonomy literature and introduced the expert panel to the OT-TRI. Next, the PI and a CI oriented the expert panel to the OT-TRI instrument and manual. The manual contains operational definitions of the items and coding procedures. During the second training session, the expert panel viewed 15 training video clips and practiced using the OT-TRI instrument to code intervention components observed in each of the video clips. All expert panel participants completed a post-training discussion and informal review to confirm the participants' understanding and readiness to begin the expert panel review process. The

PI instructed the expert panel participants to individually complete the OT-TRI Item Questionnaire at home and return the completed questionnaire to the PI the next day. Expert panel participants received a certificate of completion for four hours of continuing education approved by the Texas Board of Occupational Therapy Examiners at the completion of the training.

At the beginning of day two, the PI collected the completed OT-TRI Item Questionnaires from the expert panel participants. Next, the PI and CI initiated the expert panel review process that incorporated the nominal group technique process (NGT). Originally, the NGT process was to precede the completion of the OT-TRI Item Questionnaire. However, the PI reversed the order based on request of the expert panel to complete questionnaire prior to NGT process. The completion of the OT-TRI Item Questionnaire provided participants with more exposure to the OT-TRI items prior to NGT process. The PI believed that increased familiarity with the OT-TRI items would increase the meaningfulness of data generated from the NGT process.

***Nominal group technique process.*** Investigators used the NGT process to examine agreement among expert panel participants with regard to the occurrences of OT-TRI items observed in video clips of treatment sessions. NGT is a research method that uses an expert panel approach to synthesize qualitative data into quantitative estimates using a rating system (Jones & Hunter, 1995). The NGT structured rating process provided a systematic approach to calculate the percent of agreement among experts for the OT-TRI's categorical data. The following procedure was applied during the four-hour NGT process.

1. The expert panel viewed 11 of the 31 video clip(s) created from the video editing/selection process (described in section two of this chapter) as a group.
2. The PI monitored the time and selected video clips to depict the broadest range of interventions.
3. Each expert panel participant completed the OT-TRI while viewing a video clip with other panel participants. To do this, each participant anonymously marked the occurrence of OT-TRI items (e.g., *Activity* item code[s], *Therapist Action* item code[s]) observed in each video clip.
4. Four student research assistants collected the completed OT-TRI instruments from the expert panel participants and totaled the markings for each item. This process yielded frequencies for each of the various OT-TRI items (e.g., 1 of 5 participants marked the item *Education-Use of Device*, 3 of 5 marked the item *Cognitive-Learning Skill/Technique*). The frequencies of the marked OT-TRI items formed the pre-NGT discussion data set for the video clip.
5. The PI and CI presented the frequencies of the pre-NGT discussion data for a video clip to the expert panel participants (e.g., 2 of 5 participants marked the occurrence of *Item A*; 3 of 5 participants marked the occurrence of *Item B*; 5 of 5 marked the occurrences of *Items C, D*).

6. Next, the PI and CI facilitated a panel discussion regarding the agreements and discrepancies for each of the item outcomes in the pre-NGT discussion data set.
7. After the panel discussion, panel participants viewed the video clip a second time as a group and anonymously marked occurrences of OT-TRI items.
8. Four student research assistants collected the completed OT-TRI instruments from the second viewing of the video clip and totaled markings for each item. The frequencies of the marked OT-TRI items formed the post-NGT discussion data set for the video clip.
9. This same procedure was repeated for each of the 11 video clips during the four-hour nominal group technique process.

**Data analysis.** The PI examined the degree of agreement among expert panel participants for (a) data obtained from OT-TRI Item Questionnaire and (b) observational data obtained from OT-TRI instrument during the NGT process. The PI entered the OT-TRI Item Questionnaire data into IBM SPSS version 21 and completed data analysis using the following procedure.

1. PI entered data for Likert scale items (i.e., relevance of items) as follows:  
1, for *Highly Relevant*; 2, for *Relevant*; 3, for *Minimally Relevant*; and 4, for *Not Relevant*.

2. The PI entered data for dichotomous items (i.e., clarity of item) as follows:  
1, for items rated as *Clear/Distinct* and 0, for items that were rated as *Not Clear/Distinct*.
3. The PI generated frequencies, median, and mode for the relevance ratings for each of the 152 items.
4. The PI generated frequencies of clarity the ratings for each of the 152 items.

The observational data consisted of expert panel participants' OT-TRI instrument ratings for the set of video clips. Expert panel participants independently completed the OT-TRI for each of the 11 video clips twice, which generated a total of 110 completed OT-TRI instruments for the 11 clips. The PI entered Likert scale items (i.e., *Client Response* items) from the completed OT-TRI instruments into IBM SPSS version 21 and completed data analysis using the following procedure.

1. PI entered Likert scale items by assigning values of 1 – 4. For example: 1, most desirable response in the scale (e.g., *No Fatigue, Self-Initiated Adaptation*); and 4, least desirable response on the scale (e.g., *Mostly Negative Response, No Adaptation*). Note: The *Client Response* item *Performance* only had three possible selections; therefore, the range of values assigned was 1 -3.
2. PI calculated intraclass correlation coefficients (ICC) to determine the agreement among the expert panel participants with regard to the four

*Client Response* items. High agreement coefficients show that items are internally consistent and that experts agree about the true value of the construct (Nunnally & Bernstein, 1994).

Each completed OT-TRI instrument also contained 115 dichotomous items (i.e., *Activity*, *Targeted Function or Skill*, and *Therapist Action* items). The PI entered these items into IBM SPSS version 21, as follows: 1, items marked as occurring in the video clip; and 0, items that were not marked. Because the prevalence of occurrence (and non-occurrence) varied for the 115 dichotomous items, a staged process of descriptive and statistical analysis (i.e., Fleiss Kappa) was conducted. The PI applied three stages of the analysis of the observational data for the dichotomous items using the following procedure.

1. Stage One: The PI conducted descriptive analysis of items that at least one expert panel participant marked as occurring in one or more video clips. PI generated frequencies of the five possible proportions of agreement (e.g., 1 of 5, 2 of 5) for these items. Item and category frequencies were calculated for both pre-NGT and post-NGT data for each of the 11 clips.
2. Stage Two: The PI conducted descriptive analysis of items and categories that met the following criteria: At least one expert panel participant identified the item/category as occurring in three or more of the 11 video clips. For example, the item *Therapist Action-Provided Assistive Device* met the criteria because one or more of the experts marked the item for

clips 1, 5, 7, 9, and 10. The PI entered data into ReCalc 3 (Freelon, 2010) and calculated the average observed percentage of agreement (which accounted for both the occurrence and non-occurrence) for these items and categories using both pre-NGT and post-NGT data.

3. Stage Three: The PI conducted statistical analysis of items that met the following criteria: the item was recorded as occurring in at least four but not more than seven of the 11 clips. PI calculated Fleiss kappa values for these items and categories using ReCalc3.

Kappa coefficients, including Fleiss Kappa, have been used to determine the agreement among experts when classifying whether a condition is present or absent (Watkins & Pacheco, 2000). Kappa is regarded as a preferential method to overall percentages of agreement because it specifies the proportion of agreement beyond that which occurs by chance. However, factors, such as prevalence, can influence the magnitude of the Kappa coefficient and must be considered when using and interpreting Kappa coefficients (Sim & Wright, 2005). The PI applied the aforementioned prevalence criterion to identify which OT-TRI categories and items were appropriate for Fleiss Kappa analysis. The rationale for this criterion was to minimize the influence of the prevalence effect that can occur in Fleiss Kappa statistical analysis.

## Results

Analysis of the questionnaire and observational data provided information regarding the content validity of the OT-TRI. Results of the OT-TRI Item Questionnaire data analysis are presented first followed by results of the observational data analysis.

**Experts' perception of the relevance and clarity of OT-TRI content.** The questionnaire data provided information regarding the ability of the OT-TRI to adequately characterize the domain of occupational therapy interventions in stroke rehabilitation. Adequate characterization was measured in terms of agreement among expert panel participants with regard to the relevance and clarity of the OT-TRI items. Medians for all OT-TRI items showed that expert panel participants perceived 124 of the 152 items as extremely relevant and the remaining 28 items as relevant. None of the items received a rating of somewhat relevant or not relevant. The percentages of items within its corresponding category perceived as extremely relevant were as follows: *Collaboration* (100%), *Education* (100%), *Preparatory Activity* (48%), *Occupation-Based Activity* (87%), *Targeted Function or Skill* (88%), and *Therapist Action* (96%), and *Client Response* (100%).

Table 3 presents the median frequencies for all categories and respective sub-categories. The medians for all items were either 4 (i.e., *Extremely Relevant*) or 3 (i.e., *Relevant*) with the majority being rated as *Extremely Relevant*.



Table 3

*Perceived Relevance of OT-TRI Categories and Items*

Category/Item	Extremely Relevant	Relevant	Somewhat Relevant	Not Relevant
All Items	124	28	0	0
<i>Type of Activity</i>	48	19	0	0
Collaboration	4	0	0	0
Education	4	0	0	0
Preparatory Activity	14	15	0	0
Occupation-based Activity	26	4	0	0
<i>Targeted Function or Skill</i>	57	8	0	0
Cognitive	14	1	0	0
Psychosocial	10	3	0	0
Sensorimotor	15	1	0	0
Sensory Perceptual	18	3	0	0
<i>Therapist Action</i>	23	1	0	0
Modification	2	1	0	0
Physical Assistance	5	0	0	0
Physical Input	3	0	0	0
Psychosocial Facilitation	6	0	0	0
Verbal Support	4	0	0	0
Visual Assistance	3	0	0	0
<i>Patient Response</i>	4	0	0	0

Note: OT-TRI=Occupational Therapy Taxonomy of Rehabilitation Interventions; This table presents frequency counts of medians for the all of the OT-TRI items as well as presenting median counts for each of the categories and respective items. Medians were obtained from the 5 expert panel participants' ratings on the OT-TRI Item Questionnaire.

Table 4 specifies the items that were identified as lacking clarity. The table also presents the modes, minimum, and maximum values for the items within the OT-TRI categories and respective sub-categories. Modes for all OT-TRI items showed that expert panel participants perceived 142 of the 152 items as clear and distinct from the other items. All of the categories had a mode of 1: A value of 1 indicated that experts perceived most items within the category as clear and distinct. There were 10 OT-TRI items that the experts rated as lacking clarity: four *Occupation-Based Activity* items, three *Preparatory Activity* items, two *Targeted Function or Skill* items, and one *Therapist Action* item. Nine of those 10 items were rated as lacking clarity by only one of the five experts (Note: It was not the same rater for every item). Only one of the 10 items was rated as lacking clarity by two of the five experts.

The expert panel participants also identified overlapping items for any item that was rated as lacking clarity. The following presents the items rated as lacking clarity with the specified overlapping item(s) in parentheses: *Casting (Serial Casting)*, *Joint Traction (Joint Distraction)*, *Mobility-Repositioning (Environmental Mobility, Transfers)*, *Sleep (Rest)*, *Learning Skill/Technique (Education)*, *Self-Monitoring (Self-Awareness)*, and *Positioning (Postural Alignment, Postural Control)*.

Table 4

*Perceived Clarity of OT-TRI Categories and Items*

OT-TRI Categories	Mode	Min	Max	Items Identified as Lacking Clarity
Education (4 items)	1	1	1	
Collaboration (4 items)	1	1	1	
Preparatory activities (29 items)	1	0	1	Casting*, Joint Traction*, Joint Distraction*
Occupation-based Activities (30 items)	1	0	1	Mobility (Repositioning)*, Rest*, Sleep*, Transfers*
Targeted Function/Skill				
Cognitive (14 items)	1	0	1	Learning (Skill/Technique)*, Self-monitoring*
Psychosocial (10 items)	1	1	1	
Sensorimotor (15 items)	1	1	1	
Sensory Perceptual (18 items)	1	1	1	
Therapist Actions				
Modification (3 items)	1	1	1	
Physical Assistance (5 items)	1	1	1	
Physical Input (3 items)	1	0	1	Positioning**
Psychosocial Facilitation (6 items)	1	1	1	
Verbal Support (4 items)	1	1	1	
Visual Assistance (3 items)	1	1	1	
Client's Response (4 items)	1	1	1	

Note: OT-TRI=Occupational Therapy Taxonomy of Rehabilitation Interventions; Min=minimum; Max=maximum; 0=item rated as not clear and distinct from other items; 1=item rated as clear and distinct from other items; Mode, minimum (Min), and maximum (Max) values were obtained from the 5 expert panel participants' ratings on the OT-TRI Item Questionnaire. \*Item was identified by 1 of the 5 raters as lacking clarity. \*\* Item was rated by 2 of the 5 raters as lacking clarity.

**Inter-observer agreement among experts for OT-TRI content.** The observational data provided information regarding the level of inter-observer agreement for OT-TRI items and categories. Results present only observational data obtained from the final stage of the NGT process (i.e., previously referred to as post-NGT discussion data). This researcher asserts that the post-NGT data is the primary data source for answering the research question regarding the level of inter-observer agreement among experts using the OT-TRI instrument to code key components of interventions. The purpose for the pre-NGT discussion ratings was to follow the NGT procedures not to compare pre-and post-NGT ratings. The results of the analysis of the *Client Response* items are presented first followed by the analyses pertaining to the *Activity, Targeted Function or Skill*, and *Therapist Action* items.

The PI analyzed the post-NGT discussion data of the Likert scale ratings for the four *Client Response* items for each of the 11 video clips. Intraclass correlation coefficient (ICC) analysis revealed an overall degree of agreement for all items, ICC = 0.86 CI [0.76, 0.92]. Specific items varied in degree of agreement, ICC = 0.41 (*Perception*) to ICC = 0.86 (*Adaptation*). Table 5 presents the ICCs with confidence intervals for each of the four *Client Response* items. The ICC for the item *Energy/Fatigue* was not calculated due to the absence of variance within each of the experts' ratings for this item. All experts assigned a rating of 5 for the *Energy/Fatigue* item (i.e., *Client completed intervention with no signs of fatigue*) for every video clip.

Table 5

*Agreement Among Experts for Client Response Items*

Item	N	ICC (95 % CI)
<b>All Items</b>	5	.86 (.76, .92)
Adaptation	5	.86 (.76, .92)
Energy/Fatigue	<sup>a</sup>	-
Perception	4 <sup>b</sup>	.41 (-.13, .85)
Performance	3 <sup>c</sup>	.85 (.49, .97)

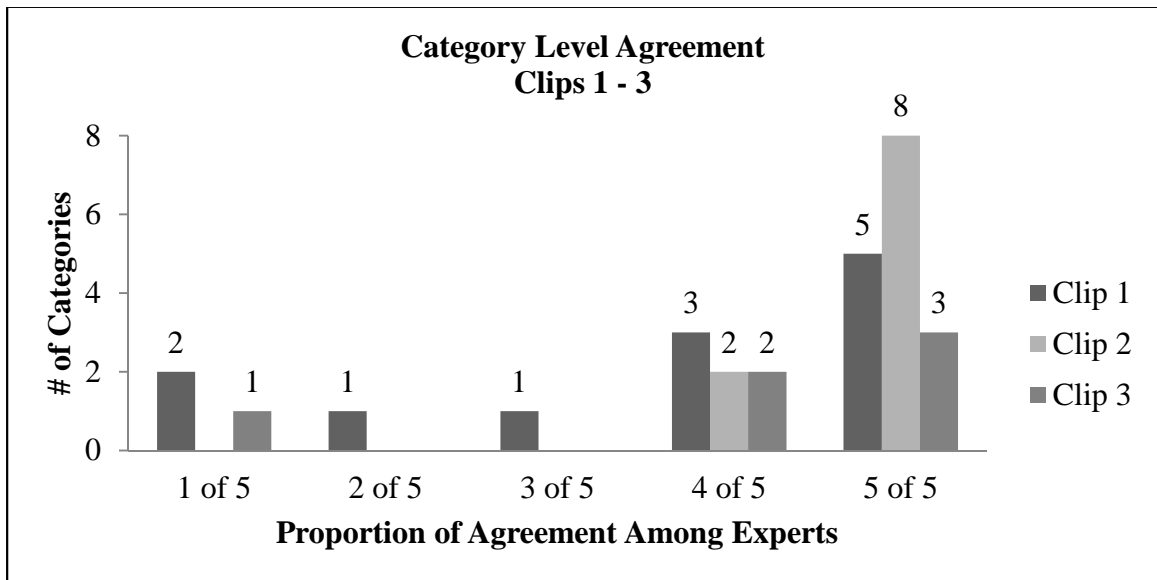
Note: N=5 expert panel participants; ICC=intraclass correlation coefficient; CI=confidence interval; <sup>a</sup> Dropped all Raters from scale due to zero variance in ratings; <sup>b</sup> Dropped Rater 5 from scale due to zero variance in ratings; <sup>c</sup> Dropped Raters 3 and 5 from scale due to zero variance in ratings.

The PI used a three-staged process to analyze the post-NGT discussion data with regard to the *Activity*, *Therapist Action*, and *Targeted Function or Skill* items. The following presents results of the three-staged analysis.

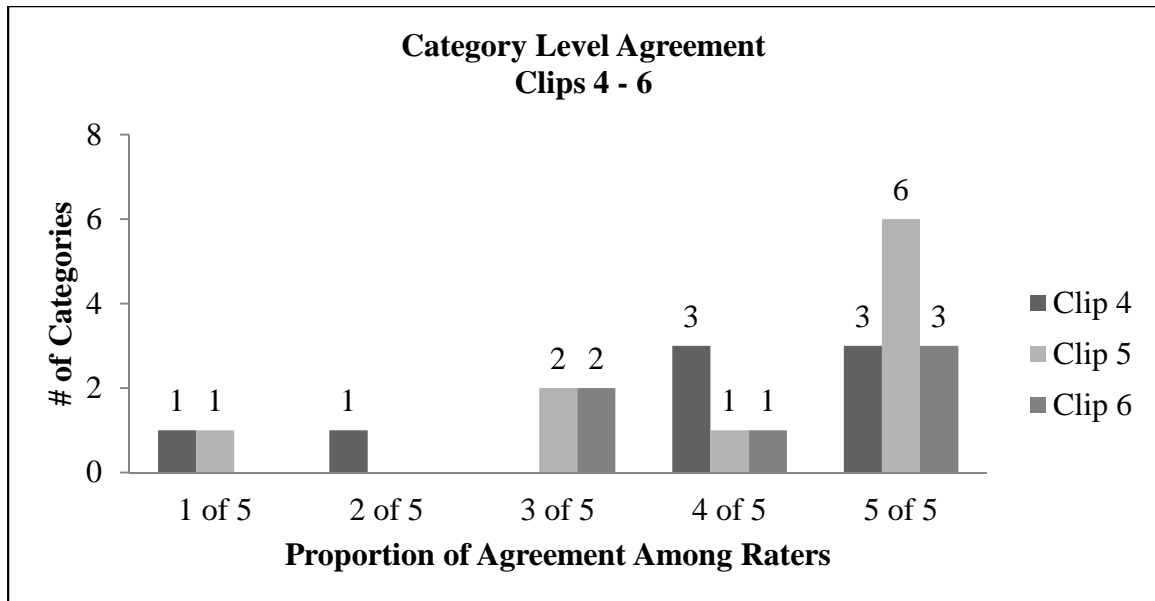
***Stage One: Descriptive analysis of inter-observer agreement by video clip.*** The first stage of analysis examined the level of inter-observer agreement among the experts for OT-TRI categories and items in terms of the proportion of agreement (e.g., 1 of 5 experts, 2 of 5 experts). Data used for this analysis included only those OT-TRI categories and items marked as occurring in a specific video clip. This data contained occurrences of items from all categories (with the exception of the *Client Response*

category) and 82 occurrences of the possible the 111 items for the *Activity*, *Therapist Action*, and *Targeted Function or Skill* items.

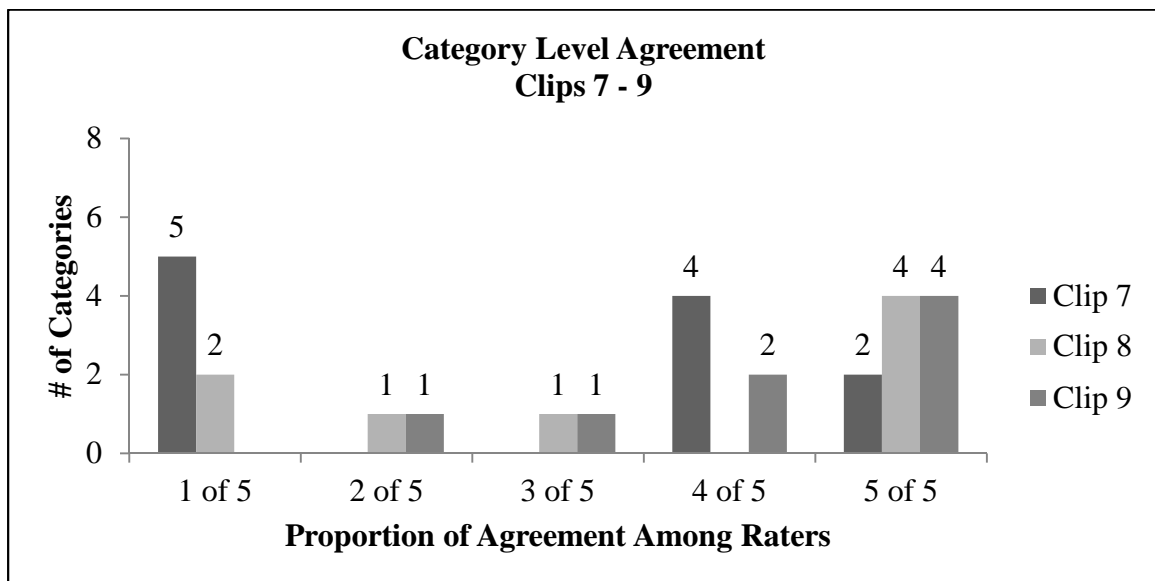
Descriptive analysis revealed that expert panel participants identified that OT-TRI categories occurred a total of 93 times within the 11 video clips. Overall, frequency counts (at the category level) for the various proportions of agreement were: 49 times (5 of 5 experts), 18 times (4 of 5 experts), 9 times (3 of 5 experts), 4 times (2 of 5 experts), and 13 times (1 of 5 experts). Figures 2 through 5 present bar graphs illustrating the number of categories identified by experts according to the proportion of agreement for each of the 11 video clips.



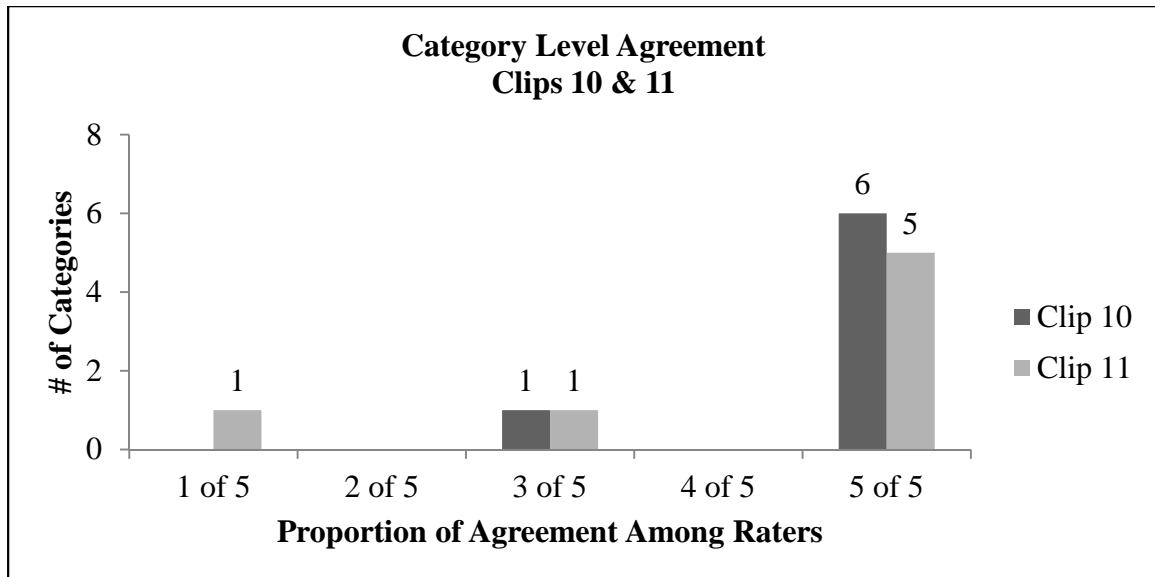
*Figure 2: Proportion of agreement of categories among experts for video clips 1–3.*  
 Note: Graph presents the number of categories (y axis) identified as occurring in a clip according to proportion of agreement of among experts (x axis) (e.g., 1 of 5 experts).



*Figure 3:* Proportion of agreement of categories among experts for video clips 4–6.  
 Note: Graph presents the number of categories (y axis) identified as occurring in a clip according to proportion of agreement of among experts (x axis) (e.g., 1 of 5 experts).



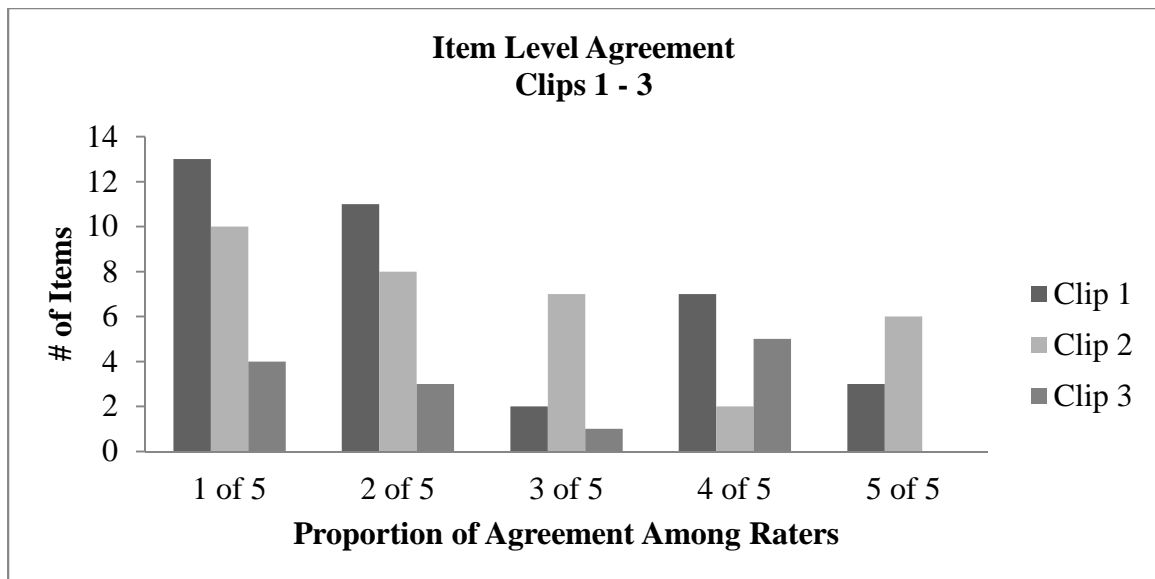
*Figure 4:* Proportion of agreement of categories among experts for video clips 7–9.  
 Note: Graph presents the number of categories (y axis) identified as occurring in a clip according to proportion of agreement of among experts (x axis) (e.g., 1 of 5 experts).



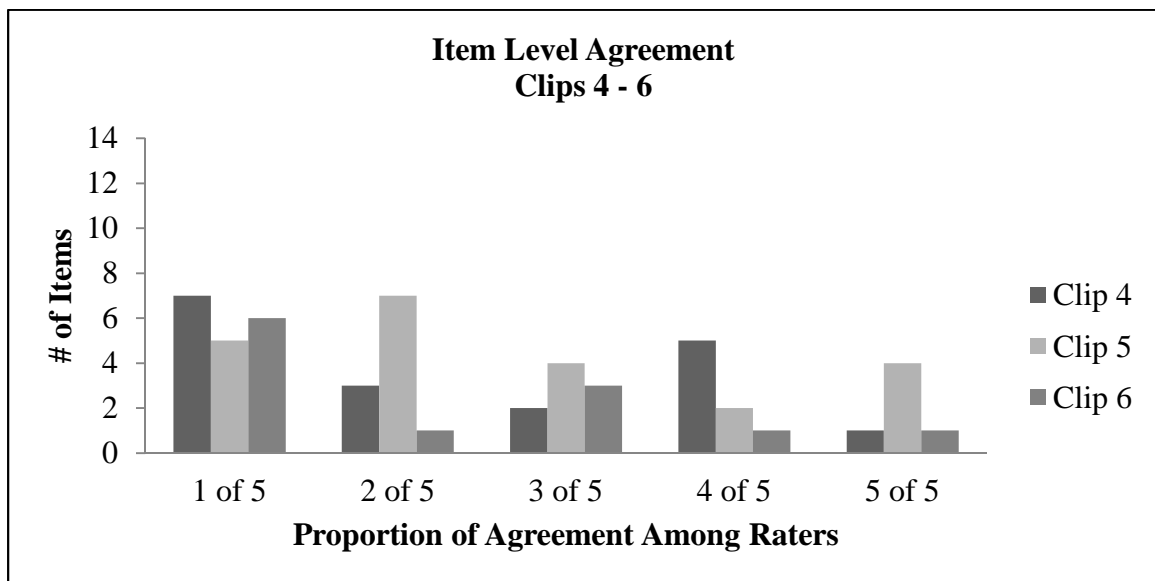
*Figure 5: Proportion of agreement of categories among experts for video clips 10 and 11. Note: Graph presents the number of categories (y axis) identified as occurring in a clip according to proportion of agreement of among experts (x axis) (e.g., 1 of 5 experts).*

Descriptive analysis revealed that expert panel participants also marked items that occurred a total of 227 times within the 11 clips. Overall, frequency counts (at the item level) for the various proportions of agreement were: 25 times (5 of 5 experts), 31 times (4 of 5 experts), 31 times (3 of 5 experts), 60 times (2 of 5 experts), and 80 times (1 of 5 experts). Figures 6 through 9 present bar graphs illustrating the number of items identified by experts according to the proportion of agreement for each of the 11 video clips.

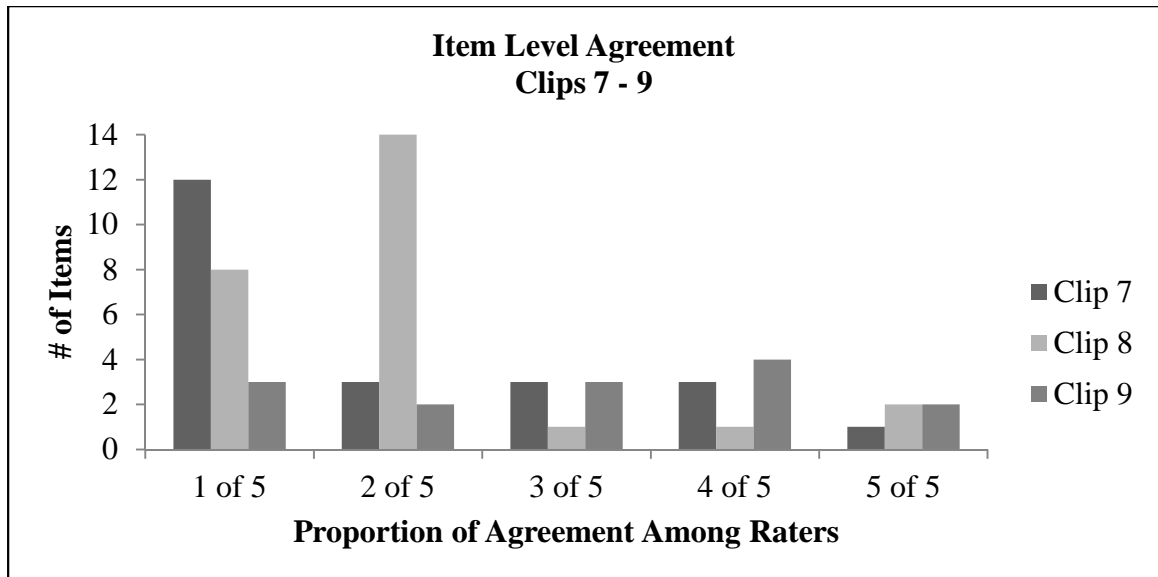




*Figure 6:* Proportion of agreement of items among experts for video clips 1–3. Note: Graph presents the number of items (y axis) identified as occurring in a clip according to proportion of agreement of among experts (x axis) (e.g., 1 of 5 experts).

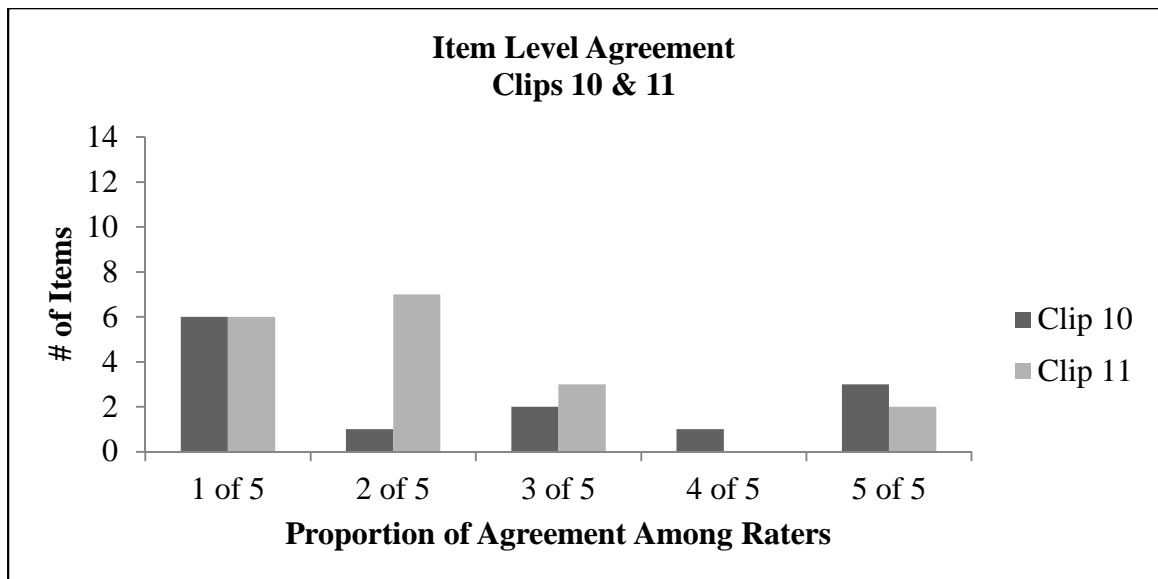


*Figure 7:* Proportion of agreement of items among experts for video clips 4-6. Note: Graph presents the number of items (y axis) identified as occurring in a clip according to proportion of agreement of among experts (x axis) (e.g., 1 of 5 experts).



*Figure 8:* Proportion of agreement of items among experts for video clips 7-9.

Note: Graph presents the number of items (y axis) identified as occurring in a clip according to proportion of agreement of among experts (x axis) (e.g., 1 of 5 experts).



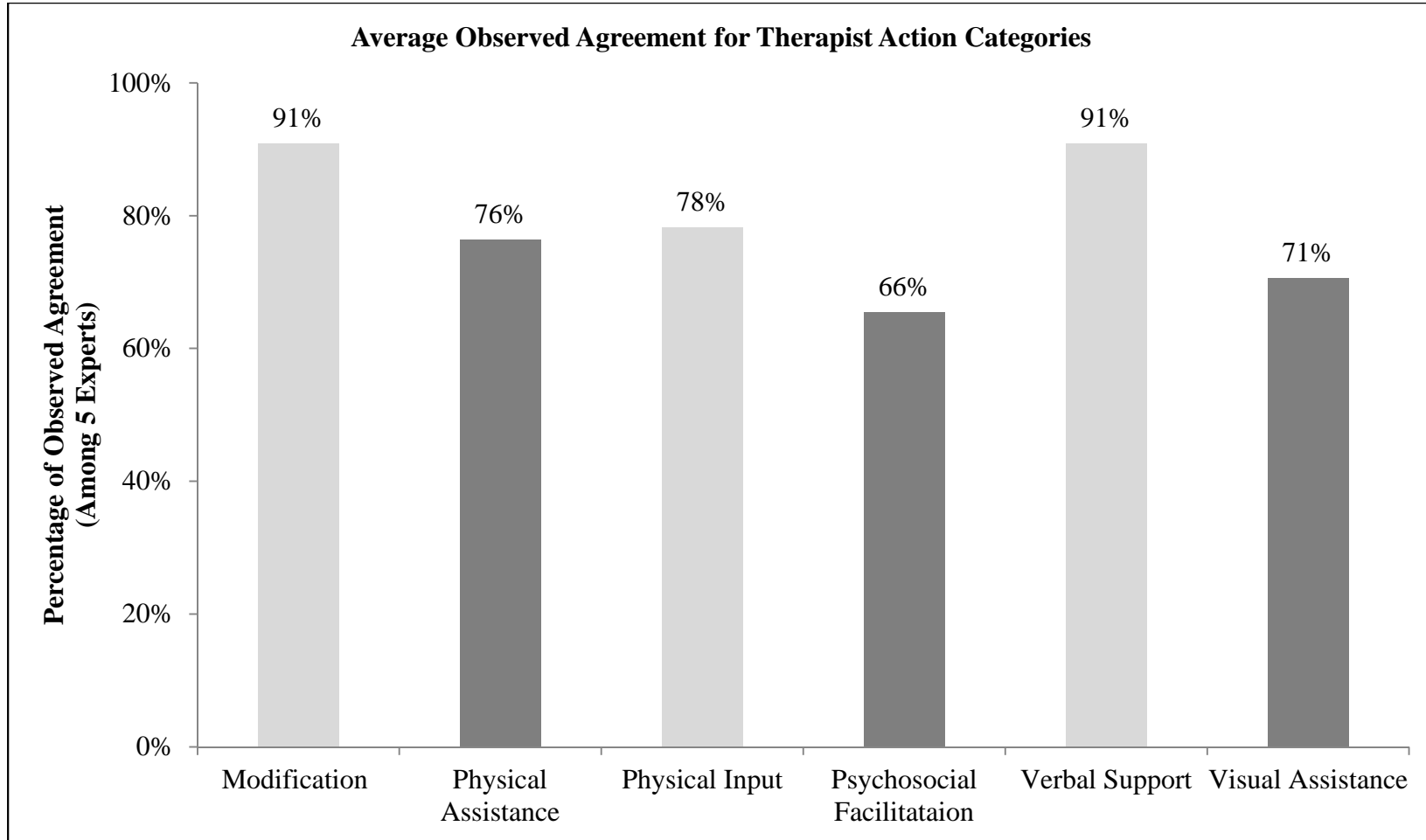
*Figure 9:* Proportion of agreement of items among experts for video clips 10 and 11.

Note: Graph presents the number of items (y axis) identified as occurring in a clip according to proportion of agreement of among experts (x axis) (e.g., 1 of 5 experts).

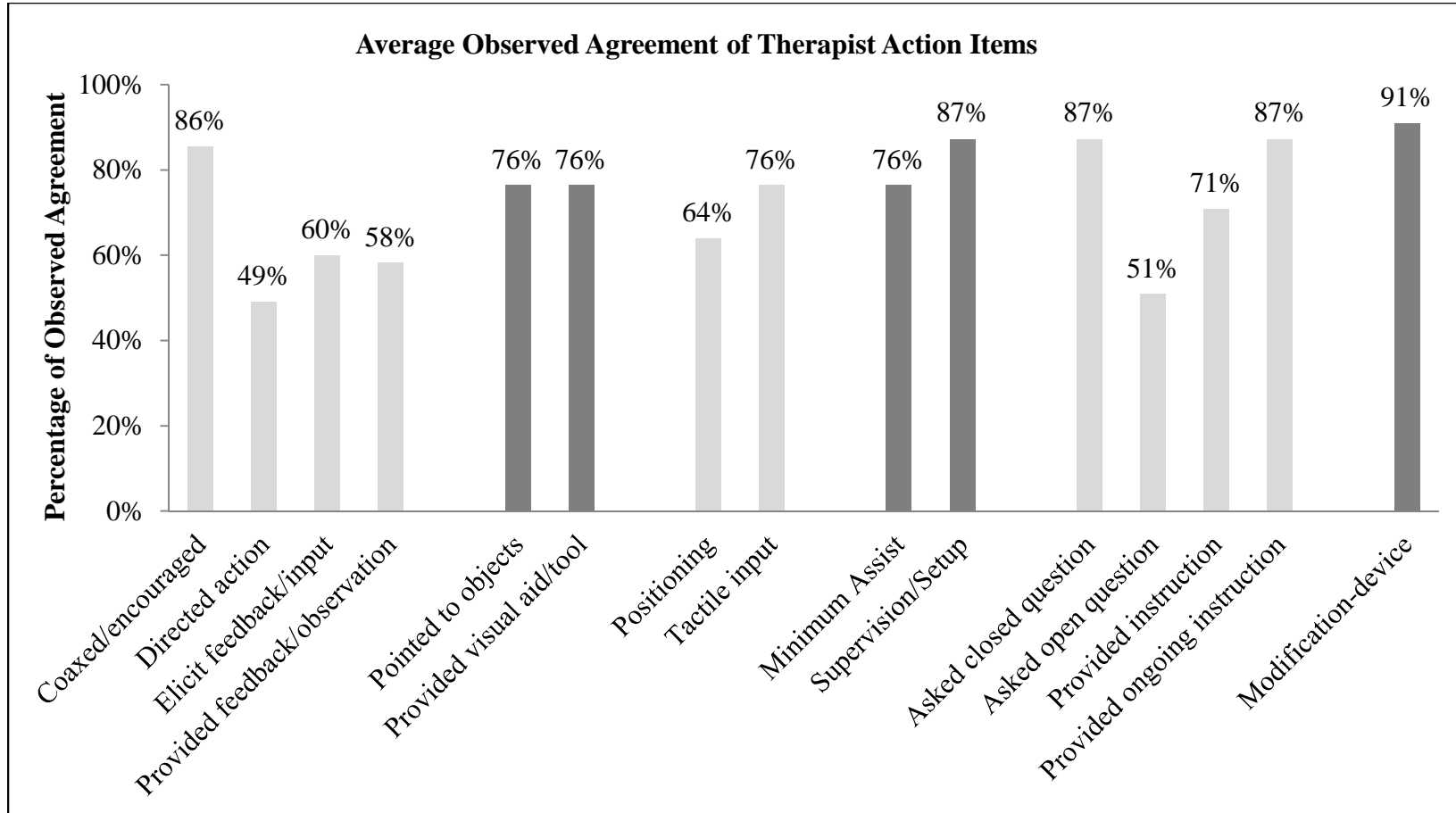
***Stage Two: Descriptive analysis of inter-observer agreement of specific items.***

The next stage of analysis examined level of agreement among the experts for OT-TRI categories and items in terms of average percentage of observed agreement. Average percentage of observed agreement calculations requires that the specific item (or category) occurred multiple times; therefore, the PI established a criterion for data to be included in the second stage of analysis. Criterion: The item (or category) was marked as occurring in at least 3 video clips. Data used for this analysis included both the occurrence and non-occurrence of OT-TRI in the post-NGT discussion data that met the criterion. A total of 15 items from the six *Therapist Action* categories and 11 items from the two *Targeted Function or Skill* categories met the criterion. The results that pertain to the *Therapist Action* categories are presented first followed by the *Targeted Function or Skill* results.

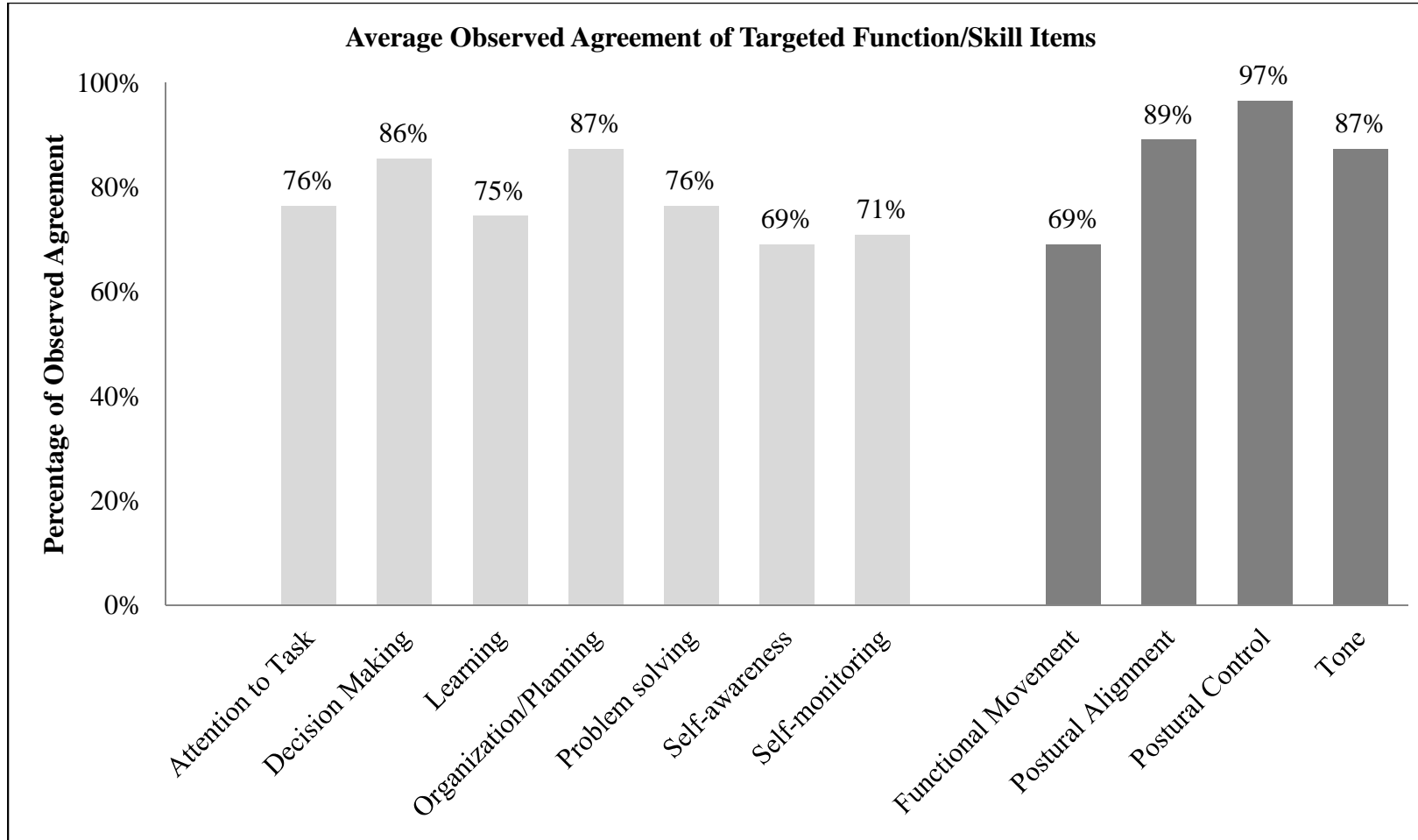
Descriptive analysis of *Therapist Action* categories revealed a range of average observed percentages of agreement among experts from 66% (i.e., *Psychosocial Facilitation*) to 91% (i.e., *Modification, Verbal Support*). Descriptive analysis of specific *Therapist Action* items revealed a range of average observed agreement percentages of agreement from 49% (i.e., *Psychosocial Facilitation-Directed Action*) to 91% (i.e., *Modification-Use of Device*). Figure 10 illustrates the average observed percentages of agreement among experts for each of the six categories, and Figure 11 illustrates the average observed percentages of agreement for 15 specific *Therapist Action* items.



*Figure 10:* Average percentage of observed agreement among experts for Therapist Action categories. Note: Graph presents the percentage of observed agreement (y axis) according to the specific Therapist Action category (x axis).



*Figure 11: Average percentage of observed agreement for Therapist Action items. Note: Graph presents the percentage of observed agreement (y axis) according to the specific Therapist Action item (x axis). Items are arranged in clusters from left to right according to respective categories: Psychosocial Facilitation, Visual Assistance, Physical Input, Physical Assistance, Verbal Support, and Modification.*



*Figure 12:* Average percentage of observed agreement among experts for Targeted Function or Skill items. Note: Graph presents the percentage of observed agreement (y axis) according to the specific Cognitive and Sensorimotor item (x axis). Items are arranged in clusters from left (Cognitive) to right (Sensorimotor).

Descriptive analysis of the *Targeted Function or Skill* data revealed the average observed percentage of agreement among experts as 96% percent for the *Cognitive* category and 87% for the *Sensorimotor* category. The average observed percentage of agreement for specific *Cognitive* and *Sensorimotor* items ranged from 69% (i.e., *Cognitive-Self-Awareness*) to 97% percent (i.e., *Sensorimotor-Postural Control*). Figure 12 illustrates the average percentages of agreement among experts for each of the 11 specific *Targeted Function or Skill* items.

***Stage Three: Statistical analysis of inter-observer agreement of specific items.***

The final stage of analysis determined the agreement among experts for those OT-TRI items that met the criterion for third stage of analysis. Criterion: The item was identified as occurring in at least four but no more than seven video clips. Data used for this analysis included both the occurrence and non-occurrence of three categories and 12 items (from *Therapist Action* and *Targeted Function or Skill* categories). Table 6 presents the Fleiss kappa coefficient, average percentage of observed agreement, and average percentage of expected agreement for each of the items. Fleiss kappa calculations revealed kappa coefficients ranging from 0.82 (i.e., *Therapist Action-Modification*) to -0.08 (i.e., *Cognitive: Decision Making*). Interpretation of Fleiss kappa values is as follows: poor agreement, less than 0; slight agreement, .01-.20; fair agreement, .21-.40; moderate agreement, .41-.60; substantial agreement, .61-.80; and almost perfect, .81-1.00 (Landis & Koch, 1977). Negative values indicate that disagreement among raters was greater than that expected.

Table 6

*Agreement Among Experts for Therapist Action and Targeted Function or Skill Items*

OT-TRI Categories	Prevalence*	Number of Experts	Number of Video Clips	Fleiss Kappa**	Observed Agreement (%)	Expected Agreement (%)
<b>Therapist Action</b>						
Modification	6	5	11	0.815	0.91	0.51
Use of Device	5	5	11	0.799	0.91	0.55
Physical Assistance	7	5	11	0.527	0.76	0.50
Physical Input	5	5	11	0.518	0.78	0.55
Tactile Input	4	5	11	0.261	0.76	0.68
Positioning	5	5	11	0.45	0.84	0.70
Visual Assistance						
Pointed to Objects	6	5	11	0.345	0.76	0.64
Visual Aid/Tool	5	5	11	0.136	0.76	0.73
Verbal Support						
Ongoing Instruction	7	5	11	0.745	0.87	0.50
<b>Targeted Function/Skill</b>						
Cognitive						
Attention to Task	5	5	11	0.049	0.76	0.75
Decision Making	4	5	11	-0.078	0.86	0.87
Learning	7	5	11	0.404	0.75	0.57
Problem Solving	5	5	11	0.307	0.76	0.66
Self-Awareness	7	5	11	0.186	0.69	0.62
Self-Monitoring	7	5	11	0.394	0.71	0.52

Note: \* Number of video clips that item was observed by at least one expert \*\*Agreement according to Landis & Koch (1977): Poor=less than 0; slight=.01-.20; fair=.21-.40; moderate=.41-.60; substantial=.61-.80; almost perfect=.81-1.00. Negative values indicate that disagreement among raters was greater than that expected.



## Discussion

Study One aimed to examine the content validity of the OT-TRI using a panel of experts who completed the OT-TRI for several video clips of therapy sessions and completed a questionnaire on the relevance and clarity of the OT-TRI items. Expert panel members perceived all OT-TRI items as highly relevant to stroke rehabilitation interventions provided by occupational therapists. Likewise, the expert panel indicated that the vast majority of items were clear and distinct: Less than 7% of the items were identified as lacking clarity. It should be noted that the expert panel did recommend that a few definitions should be clarified at the conclusion of the expert panel review process. In particular, experts panel participants expressed the need for item definitions to better distinguish the items *Self-Awareness* and *Self-Monitoring*. They also recommended the addition of the term *Safety Awareness* as either a new item or explicitly stated in the *Self-Awareness* and *Self-Monitoring* definitions. The expert panel expressed difficulty in differentiating between the items *Provided Instruction* and *Provided Ongoing Instruction* as well as delimiting *Bilateral Coordination* from *Dexterity* when the task involved dexterity using both hands. Overall, the OT-TRI appears to contain highly relevant items with an adequate degree of clarity. The high degree of relevance and clarity of most of the items is likely attributed to earlier pilot projects in which initial developers established the face validity of the measure.

This study also examined the level of agreement among experts when using the OT-TRI instrument to code components of the therapeutic process while viewing

video clips of occupational therapy interventions in stroke rehabilitation. Overall, the proportion of agreement among experts was higher at the category-level than the specific item-level. Findings suggest that the OT-TRI contains several categories that can be consistently identified by experts in order to characterize relevant components of the therapeutic process. The lower level of agreement among raters at the item-level as compared to the category-level was not an unexpected finding. Findings suggest the need to further delimit items to improve consistency among observers coding interventions using the OT-TRI. This process will likely require combining those items not considered distinctively different as well as revising item definitions to ensure precision in item description. It will be important to continue to balance the granularity and parsimony of the items within the categories. A noteworthy finding is that the proportion of agreement was higher when considering what the expert panel participants marked as occurring as well as what did not occur. Experts often agreed when items did not occur in the treatment session. Consideration of what does not occur in an intervention provides an intriguing avenue of inquiry. It seems that it is not sufficient to only capture the occurrence of key components. Additionally, the recognition of the deliberate omission of components may be an integral part of the characterization of the therapeutic process as well. Lastly, expert panel participants provided several positive comments regarding the process of identifying key components of interventions and the OT-TRI instrument. Experts commented that the OT-TRI made them realize how much they thought about when treating clients.

Several limitations must be noted. Limitations within the data prevented a more rigorous analysis of agreement that accounts for agreement by chance for the majority of the items due to prevalence effect. Several of the items were marked in less than four clips or more than seven clips. This resulted in the exclusion of these items from the Fleiss Kappa analysis. It is recommended that future studies select a set of video clips that has approximately the same number of occurrences and non-occurrence of the items being examined. However, some items (e.g., *Provide Instruction*) are found in most therapeutic interventions and present an inherent challenge in assessing inter-observer agreement. It is also important to mention that the complexity of therapeutic process presents a challenge for the observer coding the intervention.

Findings support the content validity of the OT-TRI despite the study's limitations. Categories and items of the OT-TRI have a substantial degree of relevance to occupational therapy interventions in stroke rehabilitation. Revision of the OT-TRI, particularly at the item-level, is an essential step prior to further validation and reliability studies. Chapters IV and V present the other two studies in this research that investigated the validity of the OT-TRI.

## CHAPTER IV

### STUDY TWO: COMPARISON OF THE OT-TRI AND PSROP OT TAXONOMY

Chapters I and II in this dissertation provide background on the current state of rehabilitation taxonomies and the need for continued efforts to develop taxonomies to name and frame what is done in therapy sessions. Chapter III presents the first of the three inter-related studies that comprise this dissertation. Study One examined the content validity of the Occupational Therapy Taxonomy of Rehabilitation Interventions (OT-TRI) using an expert panel comprised of occupational therapists. This chapter presents Study Two. The aim of this study was to conduct a systematic comparison of the similarities and differences between the OT-TRI and a published occupational therapy (OT) taxonomy in the stroke rehabilitation literature. The Post-Stroke Rehabilitation Outcomes Project (PSROP) research presents a set of three rehabilitation taxonomies that includes an OT specific taxonomy (DeJong et al., 2004). The research question for this study was: How are the characteristics of the OT-TRI similar to and different from the PSROP OT Taxonomy? The rationale for the comparison was to examine the content validity of the new taxonomy in two ways: (a) to examine the OT-TRI's potential to capture the same information of a therapy session as the PSROP OT Taxonomy and (b) to examine the OT-TRI's potential to capture additional information of a therapy session that is beyond the scope of the

PSROP OT Taxonomy. Video recordings of actual therapy sessions provided the basis to collect data of therapy sessions using the two taxonomies.

Study Two received approval under two institutional review boards (IRBs) following submission for dual review by both Texas Tech University Health Sciences Center (TTUHSC) and Texas Woman's University (TWU). Study Two included two modification requests. Both IRBs approved an increase in the therapist enrollment limit from 4 to 6 therapists. Both IRBs also approved the deletion of a research support staff member who was no longer an employee of TTUHSC. This researcher served as the principal investigator (PI) in Study Two. The co-investigators (CIs) included this researcher's TWU faculty advisor and a faculty member from TTUHSC. The PI, a faculty member of TTUHSC, collaborated with the TTUHSC Clinical Research Institute (CRI) on this study. The institute provides research consultation and support services to TTUHSC faculty. Four CRI research coordinators and one regulatory specialist were affiliated with this study and included in IRB approvals. One CRI research coordinator assisted with recruitment for this study. Study Two was conducted at an inpatient rehabilitation facility (IRF) in Lubbock, Texas.

The remainder of this chapter is organized into two sections. Section one presents the methods used to obtain the video recordings of the therapy sessions. This section concludes with a description of the resulting videos that were collected and subsequently used to compare the OT-TRI and PSROP OT Taxonomy. Section two presents the methodology used in the comparative process, the results of the

similarities and differences between the two taxonomies, and a discussion of these findings.

## **Section One: Collection of Videos**

### **Method**

Participants consisted of two groups. Both the treating occupational therapists and their occupational therapy clients were consented to be in this study. Researchers intentionally designed the inclusion criteria for the occupational therapists to reflect typical practice. The inclusion criteria were: (a) The occupational therapist must be a licensed occupational therapist; and (b) The occupational therapist must provide occupational therapy services at the approved study site. The PI arranged face-to-face meetings with the occupational therapists at the approved study site. The PI met with those therapists who expressed interest in the study to discuss the purpose of the study and the informed consent process. Six of the seven occupational therapists at the IRF provided consent and were enrolled as participants. One therapist withdrew her participation in the study prior to video recording any therapy session in which she was the treating therapist. Three of the six therapists completed the study (i.e., were video-recorded while providing therapy sessions). The remaining two therapists were not video-recorded because no clients of these two therapists consented for the study.

The recruitment of clients involved collaboration among the PI, the IRF rehabilitation department supervisor, and the CRI research coordinator. The PI and the IRF rehabilitation supervisor communicated on a regular basis. The IRF rehabilitation supervisor was aware of the inclusion criteria. The supervisor notified

the PI of clients who met the criteria, were a patient of a therapist participating in the study, and expressed interest in learning about the study. The PI or the CRI research coordinator approached potential clients as the supervisor referred them. The PI or the CRI research coordinator scheduled a face-to-face meeting with potential clients and discussed the purpose of the study, the inclusion criteria, and the informed consent process. The inclusion criteria for clients were: (a) The client must be 18 years of age or older; (b) The client must have a diagnosis of cerebral vascular accident (CVA); and (c) The client must be a current occupational therapy client at the approved study site. Exclusion criteria: Clients who were unable to restate the purpose and participation requirements were excluded from study participation. The PI enrolled clients in the study who met the inclusion criteria and completed an informed consent form, a video consent form, and the associated IRF's HIPPA authorization form. Seven clients consented. One of the clients became ineligible due to her treating therapist's withdrawal from participating in the study. The client was removed from the study prior to video recording her therapy session. Two other clients also withdrew consent for study participation prior to any video recording of their therapy sessions. The remaining four clients completed the study (i.e., were video-recorded during one or more therapy sessions).

**Procedures to collect the video data.** The PI video-recorded each of the 12 occupational therapy sessions. The PI adhered to the following conditions of the video-recording protocol.

1. Each video recording was the actual length of the regular scheduled therapy session; the therapist was not asked to modify the session in any way.
2. No more than two investigators were present during the video recording of the therapy session.
3. No more than ten sessions were recorded per therapist.
4. No more than five sessions were recorded per client.

The PI transferred all videos from the camera to an external storage drive designated for this research. Video files were password protected, and the PI secured the storage drive in a locked file cabinet in her office. The PI imported video recordings into iMovie, version 9 to view the videos. Both the therapist and client informed consent forms provided an option for participants to allow researchers to use videos for educational purposes. Participants who chose this option completed an educational consent form. The PI transferred copies of the videos that were specific to those therapists and clients who signed an educational consent form to a storage drive designated for educational purposes.

## **Results**

A total of three occupational therapists (all female) and four clients (two female and two male) completed the study. All of the clients had a diagnosis of CVA and were receiving OT at the IRF. The ages of the clients ranged from 57 to 85 years of age. The PI filmed a total of 12 therapy sessions that ranged in duration from 12 to 54 minutes. The number of sessions filmed ranged from two to five sessions for both



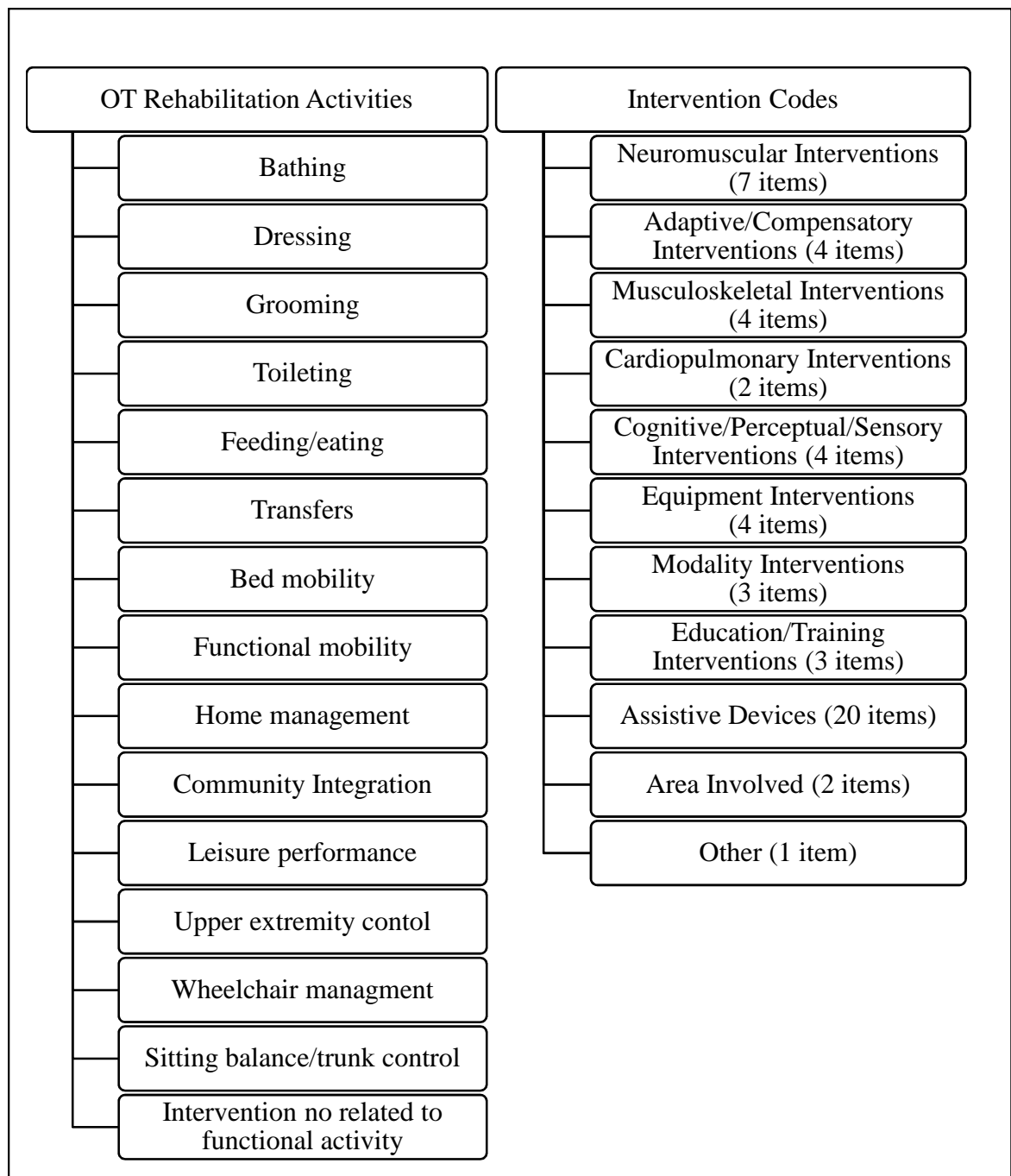
therapists and clients. The locations of the therapy sessions varied according to the therapist's selection of the environment for the session. The environments included the clients' private hospital rooms, two different therapy gyms, and an open area within an office atrium.

## **Section Two: Comparison of the OT-TRI with the PSROP OT Taxonomy**

### **Method**

This portion of the method section is arranged into three parts. The method section begins with an overview of the OT-TRI and the PSROP OT Taxonomy. This is followed by a detailed presentation of the procedures used to create the comparative profile data on the 12 video-recorded therapy sessions. The comparative profile data contained information collected using the OT-TRI and the PSROP OT Taxonomy to characterize what components of therapy were observed in the videos (e.g., activities, interventions). The last part of the method section describes how this researcher analyzed the comparative profile data to identify similarities and differences between the two taxonomies.

**Overview of the PSROP OT Taxonomy and the OT-TRI.** The PSROP research included rehabilitation taxonomies for occupational, physical, and speech therapy (DeJong et al., 2004). The PSROP researchers used these taxonomies to capture processes of care that were then compared to outcomes. This PI selected the PSROP OT Taxonomy (Latham, et al., 2006; Richards et al., 2005) because the PSROP taxonomies have received the most visibility in the stroke rehabilitation literature. Figure 13 presents an abbreviated version of the PSROP OT Taxonomy.



*Figure 13. Organization of the Post-Stroke Rehabilitation Outcomes Project Occupational Therapy (PSROP OT) Taxonomy. The PSROP OT Taxonomy has two broad categories that characterize the components of the therapeutic process. Adapted from “Characterizing occupational therapy in stroke rehabilitation,” by L.G. Richards, N.K. Latham, D.U. Jette, L. Rosenberg, R.J. Smout, & G. DeJong, 2005, Archives of Physical Medicine and Rehabilitation, 86, p. S58.*

The PSROP OT Taxonomy contains 15 occupational therapy rehabilitation activities and 54 intervention codes. The PSROP OT Taxonomy also contains a category to record the duration of each activity. The PI requested and obtained the definitions for the items from the authors who published on the PSROP OT Taxonomy (L.G. Richards, personal communication, September 3, 2013).

The OT-TRI is a new taxonomy designed to name and frame the components of OT interventions in stroke rehabilitation (Schultz, Whisner, & Geddie, 2013). The OT-TRI instrument presents a taxonomy that includes four broad categories, 18 subcategories, and 119 specific items. Refer to Figure 1 in Chapter III for an overview of the organization of the OT-TRI. Appendix A presents an excerpt of the OT-TRI instrument. Note: The categories and items of the two taxonomies are capitalized and italicized to improve the readability of the information for the reader.

**Procedures used to collect comparative profile data.** The PI and a CI used a copy of the OT-TRI and the PSROP OT Taxonomy to characterize the components of the therapy that were observed while viewing the videos. The information documented on each taxonomy yielded two profiles of what was observed in each video (i.e., OT-TRI profile data, PSROP profile data). The OT-TRI and PSROP profile data for all 12 videos comprised the comparative profile data. The following presents the step-by-step procedures followed by the PI and one CI to collect the profile data.

1. The PI and CI separately viewed a video of a therapy session and marked the OT-TRI items (using the OT-TRI instrument, see Appendix

A) that the investigator observed in the therapy session. The PI and CI separately viewed the same video a second time and separately marked the PSROP items (using the PSROP OT Taxonomy) that the investigator observed in the same therapy session. Note: The investigators alternated the order of the two taxonomies to control for ordering effects when viewing the remaining videos. The PI and CI used the same alternation order.

2. The PI and CI met face-to-face to review the OT-TRI items marked by each investigator. During that meeting, the PI and CI also reviewed the items marked using the PSROP OT Taxonomy for that same video.
3. The PI and CI deliberated to reach consensus on the selection (i.e., marking) of each OT-TRI item and each PSROP item. Consensus was reached through one of the following processes: (a) Both investigators agreed upon the selection of the item; (b) Investigators agreed upon the selection of the item after reviewing the definition of the item; (c) Investigators agreed upon the selection of the item after one investigator recognized the “oversight” of the occurrence of the item (no review of definition was required); or (d) Investigators agreed to drop the item from the taxonomy completed for that video.
4. The PI documented the OT-TRI items that the investigators agreed upon during the consensus process; these items constituted the OT-TRI profile data of the therapy session observed in the video. The PI also

documented the PSROP items that the investigators agreed upon during the consensus process; these items constituted the PSROP profile data for the therapy session observed in the same video.

5. Steps 1, 2, 3, and 4 were repeated for each of the remaining 11 videos.

The deliberation process yielded the OT-TRI and PSROP profile data for the 12 therapy sessions observed in the videos. Appendix C presents an example of the profile data for a video. The combined OT-TRI and PSROP profile data from all 12 therapy sessions is considered to be the comparative profile data.

**Process of analyzing the comparative profile data.** The PI analyzed the comparative profile data to determine similarities and differences between the OT-TRI and the PSROP OT Taxonomy. The PI identified similarities between the two taxonomies to examine the OT-TRI's potential to capture the same information of a therapy session as the PSROP OT Taxonomy. Analysis of the comparative profile data revealed several similar items between the OT-TRI and PSROP profile data. The PI applied the following process to match items in the OT-TRI profile data with similar items in the PSROP profile data. The PI matched an OT-TRI item with specific PSROP item (e.g., OT-TRI item *Bath/Shower* matched with PSROP item *Bathing*). The PI labeled these similar items as an *exact match*. The term exact match was used to identify when both an OT-TRI item and its similarly matched PSROP item were marked for the same therapy session.

The PI also identified occurrences in which two or more OT-TRI items matched with a single PSROP item (e.g., three OT-TRI items *Proprioceptive*

*Processing, Visual Processing-Scanning, Visual Processing-Spatial* matched with the single PSROP item *Perceptual Training*). A review of the OT-TRI and PSROP definitions revealed that these three OT-TRI items were within the scope of the PSROP item definition for *Perceptual Training*. The PI labeled these matched items as a *comparable match*. The term comparable match was used to identify when both the PSROP item and the OT-TRI item(s)—that were within the scope of the PSROP item's definition—were marked for the same therapy session. The PI calculated frequencies of all the items that were matched. The PI used paired *t* tests to determine if there were statistically significant differences in the total number of items marked between the two taxonomies. Findings are presented in the results section of this chapter.

The PI also analyzed the comparative profile data to determine differences between the OT-TRI and the PSROP OT Taxonomy. The PI identified differences between the two taxonomies to examine the OT-TRI's potential to capture additional information of a therapy session that was beyond the scope of the PSROP OT Taxonomy. The PI identified dissimilar items between the OT-TRI and PSROP profile data for the therapy sessions. The PI also identified ways that the OT-TRI expanded the domain of the therapeutic process as captured by the PSROP OT Taxonomy. The PI calculated frequencies of the items that were marked by only one taxonomy. Lastly, the PI identified similarities and differences between the two taxonomies with regard to the use of each taxonomy and the deliberation process.

## Results

This section presents the results of the similarities between the OT-TRI and PSROP profile data, followed by the results of the differences between the profile data of the two taxonomies. The results section concludes with a comparison of the use of and deliberation processes for the two taxonomies.

**Similarities between *Activity* items based on the OT-TRI and PSROP profile data.** Analysis of the comparative profile data revealed that both taxonomies included activity of daily living (ADL) items, instrumental activity of daily living (IADL) items, preparatory activity items, and leisure activity items. Additionally, the profile data revealed that several of the OT-TRI items had a similar PSROP item. Table 7 presents the names of the matched *Activity* items and the number of therapy sessions in which these matched items appeared in the comparative profile data.

The PI identified several exact matches between eight OT-TRI and PSROP *Activity* items. An exact match indicated that both the OT-TRI item and its matched PSROP item were marked for the same therapy session. The PI also identified two PSROP activity items (i.e., *Home Management*, *Upper Extremity Control*) that were considered comparable matches with several OT-TRI items. A comparable match indicated that the PSROP item and its matched OT-TRI item(s)—that were within the scope of the PSROP item definition—were marked for the same therapy session.

Table 7

*Similar Activity Items for PSROP OT Taxonomy and OT-TRI*

PSROP Activity Item	OT-TRI Activity Item	Proportion of Sessions (PSROP/OT-TRI)
<i>Exact Match*</i>		
Pre-Functional Activity	Preparatory Activity	4/4
Grooming	Hygiene (e.g., Hair Care)	3/3
Leisure Performance	Leisure	2/2
Transfers	Transfer	2/2
Bathing	Bath/Shower	1/1
Bed Mobility	Mobility (Bed)	1/1
Dressing	Dressing	1/1
Sitting	Sitting	1/1
<i>Comparable Match **</i>		
Home Management	Home Management Meal Management Shopping	7/7
Upper Extremity Control	Fine Motor Tasks Gross Motor Tasks Resistive Exercise	4/4

Note: PSROP = Post-Stroke Rehabilitation Outcomes Project OT Taxonomy; OT-TRI=Occupational Therapy Taxonomy of Rehabilitation Interventions; Frequency count of the number of sessions that a match between a PSROP OT Taxonomy Activity item and an OT-TRI Activity item was identified in the taxonomy profile data for the same session; \*Exact match=OT-TRI item and similar PSROP OT Taxonomy item were identified in the same session; \*\*Comparable match=PSROP item and an OT-TRI item that definition was within the scope of the PSROP item definition were identified in the same session.

Analysis of the PSROP profile data revealed that the item, *Home Management*, was marked for 7 of the 12 therapy sessions. The OT-TRI profile data contained three comparable items—*Home Management*, *Meal Management*, and *Shopping*—that were marked for the same seven therapy sessions. Review of the item definitions verified that the OT-TRI items were within the scope of the PSROP item. The definition of the



PSROP item *Home Management* included meal preparation and shopping in the definition.

Analysis of the PSROP profile data also revealed that the item *Upper Extremity Control* was marked for 5 of the 12 therapy sessions. The OT-TRI profile data contained three comparable items—*Resistive Exercise*, *Fine Motor Tasks*, and *Gross Motor Tasks*—that were marked for 4 of the same 5 therapy sessions. Review of the item definitions verified that the OT-TRI items were within the scope of the PSROP item. The PSROP OT Taxonomy definition for upper extremity control is “training/facilitation of normal movement, strength, range of motion, and alignment in the upper extremity” (L.G. Richards, personal communication, September 3, 2013).

The average number of *Activity* items marked for each therapy session was 3.7 in the OT-TRI profile data and 2.4 in the PSROP profile data. The number of *Activity* items marked for a therapy session ranged from 2 to 6 activities in the OT-TRI profile data and 1 to 5 activities in the PSROP profile data. The next section describes the similarities between other components of the intervention that were present in OT-TRI and PSROP profile data.

**Similarities between Intervention Component items based on the OT-TRI and PSROP profile data.** Both the OT-TRI and the PSROP OT Taxonomy provide a method to further describe interventions beyond the activities included in the taxonomies. The PSROP OT Taxonomy uses the term *Intervention Code*, whereas the OT-TRI uses the term *Targeted Function or Skill*. Because the two taxonomies use different terms, *Intervention Component* will be used as a common term in this

dissertation. Analysis of the comparative profile data revealed several Intervention Component items that were present in both taxonomies. Table 8 presents the names of the matched Intervention Component items and the number of therapy sessions in which these matched items appeared in the comparative profile data. The PI identified five exact and three comparable matches of the Intervention Component items.

Table 8

*Similar Intervention Component Items for PSROP OT Taxonomy and OT-TRI*

PSROP Intervention Code Item	OT-TRI Targeted Function or Skill Item	Proportion of Sessions (PSROP/OT-TRI)
		<i>Exact Match*</i>
Balance Training	Postural Control	8/8
Postural Awareness	Postural Alignment	7/7
Strengthening	Strength	6/6
Aerobic Exercise	Endurance	2/2
PROM/Stretching	Joint Mobility	1/1
		<i>Comparable Match**</i>
Perceptual Training	Sensory Perceptual Category <i>Proprioceptive</i> <i>Visual-Scanning</i> <i>Visual-Spatial</i>	4/4
Cognitive Training	Cognitive Category <i>Learning</i> <i>Self-Monitoring</i>	2/2

Note: PSROP = Post-Stroke Rehabilitation Outcomes Project OT Taxonomy; OT-TRI=Occupational Therapy Taxonomy of Rehabilitation Interventions; Frequency count of the number of sessions that a match between a PSROP OT Taxonomy Intervention Component item and an OT-TRI Intervention Component item was identified in the taxonomy profile data for the same session; \*Exact match=OT-TRI item and similar PSROP OT Taxonomy item were identified in the same session; \*\*Comparable match=PSROP item and an OT-TRI item that definition was within the scope of the PSROP item definition were identified in the same session.

The average number of *Targeted Function or Skill* items marked for each activity was 4.2 in the OT-TRI profile data, with a range from 0 to 12 *Targeted Function or Skill* items per activity. The average number of *Intervention Code* items marked for each activity was 3.9 in the PSROP profile data, with a range from one to nine *Intervention Code* items per activity. This concludes the findings in regard to the similarities between taxonomy items marked in the comparative profile data. The next two sections present the results that demonstrate the differences between the OT-TRI and PSROP OT Taxonomy with regard to *Activity* and Intervention Component items.

**Differences between *Activity* items based on the OT-TRI and PSROP profile data.** Analysis of the comparative profile data revealed a difference between the OT-TRI and PSROP *Activity* items in terms of level of specificity. Five of the OT-TRI *Activity* items included an additional specification that was marked in the selection of that item. Table 9 presents the PSROP *Activity* Item and the related OT-TRI *Activity* item (with specification included) as well as the number of therapy sessions that these items appeared in the comparative profile data. For example, the PSROP profile data contained the item *Grooming* (with no specification) in three sessions. Whereas, the OT-TRI profile data contained the item *Hygiene* with the specifications of *Hair Care* and *Oral Care* in the same three sessions.

Table 9

*Comparison of PSROP OT Taxonomy and OT-TRI Activity Items*

PSROP Activity Item (Total # of Sessions)	OT-TRI Activity Item (Specification)	Proportion of (PSROP/OT-TRI)
Grooming (3 sessions)	Hygiene (Hair Care)	3/3
	Hygiene (Oral Care)	3/3
Transfers (2 sessions)	Transfer (Bed)	1/1
	Transfer (Mat)	1/1
Dressing (1 session)	Dressing (Lower Extremity)	1/1
	Dressing (Upper Extremity)	1/1
Sitting Balance/Trunk Control (1 session)	Sitting (Dynamic)	1/1
Home Management (7 sessions)	Meal Management	3/3
	Home Management (Clean)	2/2
	Home Management (Laundry)	1/1
	Home Management (Other)	1/1
	Shopping	1/1
Upper Extremity Control (5 sessions)	Resistive Exercise	2/2
	Fine Motor Tasks	1/1
	Gross Motor Tasks	1/1
	Education (Home Program)	1/1
Pre-Functional Activity (4 sessions)	Fine Motor Tasks	2/2
	Standing (Dynamic)	1/1
	Neuromuscular	1/1
	Electrostimulation	

Note: PSROP = Post-Stroke Rehabilitation Outcomes Project OT Taxonomy; OT-TRI=Occupational Therapy Taxonomy of Rehabilitation Interventions; Comparison of the number of sessions in which a PSROP Activity item and OT-TRI Activity with greater specificity (i.e., specification-Hair Care for Hygiene) was identified in the comparative profile data.

Table 9 presents another difference between the taxonomies that a definition of a single PSROP *Activity* item was inclusive of three or more OT-TRI *Activity* items. For example, the definition of the PSROP item *Home Management* states that the item “may include clothing care, cleaning, meal preparation and cleanup, shopping, money management, [and] household maintenance” (L.G. Richards, personal communication, September 3, 2013). The related OT-TRI items include: *Home Management*, *Meal Management*, and *Shopping*. Analysis of the comparative profile data revealed that investigators marked three or more OT-TRI *Activity* items for a single PSROP *Activity* item in several therapy sessions.

The PI also identified that the definitions for the OT-TRI and PSROP *Education* items differed in terms of the required duration of time to warrant marking the item. The definition for the PSROP item *Education/Training Intervention* stated that the education activity must last longer than 10 minutes for education to be marked. No time limit was specified for *Education* items according to the OT-TRI definitions.

Analysis of the comparative profile data also revealed that a few *Activity* items were marked only on the OT-TRI or the PSROP OT Taxonomy. Five OT-TRI *Activity* items (i.e., *Collaboration*, *Education-Impairment*, *Education-Purpose of Therapy*, *Education-Home Program*, and *Modality*) did not have a similar PSROP *Activity* item marked. One PSROP *Activity* item (i.e., *Wheelchair Management*) did not have a similar OT-TRI *Activity* item marked.

Descriptive statistical analysis revealed that the OT-TRI contained more *Activity* items in a therapy session as compared to the PSROP OT Taxonomy. The total number of *Activity* items marked in the OT-TRI profile data was 44, whereas 29 *Activity* items were marked in the PSROP profile data. A paired sample *t* test revealed a statistically significant difference in the total number of *Activity* items marked in the 12 therapy sessions between the two taxonomies,  $t(11) = 3.36, p < .006, d = 0.97$ , 95% CI [0.43, 2.07]. A *d* of 0.80 or greater is considered a large effect size (Portney & Watkins, 2009). The next section describes the differences between the two taxonomies with regard to the various Intervention Component items present in the comparative profile data.

**Differences between Intervention Component items based on the OT-TRI and PSROP profile data.** Analysis of the comparative profile data revealed differences between the OT-TRI and PSROP Intervention Component items. The definitions of some PSROP Intervention Component items were inclusive of several OT-TRI Intervention Component items. For example, the definition for the PSROP item *Cognitive Training* states that the item includes “impulse control, attention, orientation, memory, problem solving, sequencing, social skills, safety, insight and goal setting” (L.G. Richards, personal communication, September 3, 2013). The OT-TRI profile data contained eight items, within the *Cognitive-Targeted Function or Skill* category, that related to the PSROP *Cognitive Training* item. Some of these OT-TRI items included: *Adaptive Capacity, Decision Making, Learning-Skill/Technique*. Table 10 presents the single PSROP and the related OT-TRI items as well as the

number of therapy sessions in which these items appeared in the comparative profile data. For example, the PSROP profile data contained the single item *Motor Learning* in eight sessions. For the same eight sessions, the OT-TRI profile data contained the items: *Functional Movement* in eight sessions, *Dexterity* in six sessions, *Grasp* in six sessions, *Coordination-Bilateral* in two sessions, *Learning-Skill/Technique* in two sessions, and *Coordination-Eye/Hand* in one session.

Table 10

*Comparison of PSROP OT Taxonomy and OT-TRI Intervention Component Items*

PSROP Intervention Code (Total # of sessions)	OT-TRI Targeted Function or Skill (Specification)	Number of Same Sessions
Motor Learning (8 sessions)	Functional movement	8/8
	Dexterity	6/6
	Grasp	6/6
	Coordination (Bilateral)	2/2
	Learning Skill/Technique	2/2
	Coordination (Eye-Hand)	1/1
Perceptual Training (5 sessions)	Self-Monitoring	2/2
	Visual Processing (Spatial)	2/2
	Visual Processing (Scanning)	1/1
	Visual Processing (Perception)	1/1
Cognitive Training (2 sessions)	Learning Skill/Technique	2/2
	Self-Awareness	2/2
	Self-Monitoring	2/2
	Adaptive Capacity	1/1
	Alertness	1/1
	Decision Making	1/1
	Organization/Planning	1/1
	Self-Initiation	1/1

Note: PSROP = Post-Stroke Rehabilitation Outcomes Project OT Taxonomy; OT-TRI=Occupational Therapy Taxonomy of Rehabilitation Interventions; Comparison of the number of sessions in which a PSROP Intervention Component item and OT-TRI Intervention Component item with greater specificity (i.e., specification-Dexterity) was identified in the comparative profile data.

Analysis of the comparative profile data revealed that a few Intervention Component items were marked on only the OT-TRI or the PSROP OT Taxonomy. The OT-TRI profile data contained five *Targeted Function or Skill* items (i.e., *Attention to Task, Motivation, Pain, Self-Efficacy, Tone*) that did not have a similar PSROP item. The PSROP profile data contained one *Intervention Code* item (i.e., *Area Involved-Upper Extremity*) that did not have a similar OT-TRI item. Also, the PSROP profile data contained five types of assistive devices (e.g., *Cane, Walker*); whereas, the OT-TRI profile data specified that an assistive device was used but did not specify the type of device.

Descriptive statistical analysis revealed that the OT-TRI profile data contained more Intervention Component items in a therapy session as compared to the PSROP profile data. A total of 117 OT-TRI Intervention Component items were marked for the 12 therapy sessions; 77 PSROP Intervention Component items were marked for the same 12 therapy sessions. A paired sample  $t$  test revealed a statistically significant difference in the total number of Intervention Component items marked in the 12 therapy sessions between the two taxonomies,  $t(11) = 4.16, p < .002, d = 1.2, 95\% \text{ CI } [1.57, 5.1]$ . Despite the difference in the overall the occurrence of Intervention Component items, the OT-TRI and PSROP profile data had the same median value of 4 for the number of Intervention Component items marked for each *Activity* item. This concludes the results pertaining to the Intervention Component items identified in the comparative profile data. The next section presents the differences between the two taxonomies as a result of two categories that are unique to the OT-TRI.



**OT-TRI's unique categories: *Therapist Action* and *Client Response*.** The OT-TRI contains two categories (i.e., *Therapist Action*, *Client Response*) that are not reflected in the PSROP OT Taxonomy. Analysis of the OT-TRI profile data revealed that a total of 280 *Therapist Action* item occurrences were marked in the 12 therapy sessions. The reader is advised that the OT-TRI permits the same *Therapist Action* item to be selected multiple times within a session. For example, the *Therapist Action* item *Provided Instruction* was marked three times for three different activities within one session. Consequently, the large number of *Therapist Action* items could be misleading. The *Therapist Action* item occurrences marked in a session ranged from 10 to 27 item occurrences, with an average of 23 item occurrences in a session. The average number of *Therapist Action* items marked for an activity was 4.4 with a range of 1 to 7 item occurrences. The OT-TRI profile data showed that investigators marked *Therapist Action* items from all six subcategories (i.e., *Modification*, *Physical Assistance*, *Physical Input*, *Psychosocial Facilitation*, *Verbal Support*, *Visual Assistance*). However, one *Therapist Action* item (i.e., *Psychosocial Facilitation-Paraphrased*) was not marked in any of the 12 therapy sessions. Table 11 presents the frequencies and percentages for each of the *Therapist Action* sub-categories and items from the OT-TRI profile. The *Therapist Action* items with the highest percentages from the 12 OT-TRI profiles were *Verbal Support-Provided Instruction* (11.4%), *Psychosocial Facilitation-Provided Feedback/Observation* (11.1%), and *Psychosocial Facilitation-Coaxed/Encouraged* (10%).

Table 11

*Frequency of Therapist Action Categories and Items in the OT-TRI Profile Data*

<b>Therapist Action Categories with Items</b>	<b>Frequency</b>	<b>Percentage*</b>
<b>Modification</b>	<b>16</b>	<b>5.7</b>
Provided Assistive Device.	8	2.8
Modified Environment	3	1.1
Modified Task	5	1.8
<b>Physical Assistance</b>	<b>33</b>	<b>11.8</b>
Supervision/Setup	10	3.6
Minimum Assistance	15	5.4
Moderate Assistance	6	2.1
Maximum Assistance	2	0.7
Total Assistance	0	0
<b>Physical Input</b>	<b>17</b>	<b>6.1</b>
Tactile cue	4	1.4
Positioning	9	3.2
Handling (Facilitation/Inhibition)	4	1.4
<b>Psychosocial Facilitation</b>	<b>92</b>	<b>32.9</b>
Affirmed/Validated	4	1.4
Paraphrased	2	0.7
Elicited Client Feedback/Input	27	9.7
Provided Feedback/Observation	31	11.1
Coaxed/Encouraged	28	10.0
Directed Action (Impaired Volition)	0	0
<b>Verbal Support</b>	<b>90</b>	<b>32.1</b>
Asked Open Question	23	8.2
Asked Closed Question	21	7.5
Provided Instruction	32	11.4
Provided Ongoing Instruction	14	5.0
<b>Visual Assistance</b>	<b>32</b>	<b>11.4</b>
Pointed to Objects	13	4.6
Visual Tool/Aid	7	2.5
Demonstrated Task	12	4.3

Note: OT-TRI=Occupational Therapy Taxonomy of Rehabilitation Interventions;  
280=total number of observed Therapist Actions for the 12 videos

Additionally, analysis of the comparative profile data revealed that three of *Therapist Action* items corresponded with a few of the PSROP *Intervention Code* items. The following presents the OT-TRI *Therapist Action* items and corresponding PSROP *Intervention Code* items as well as the number of therapy sessions in which these items appeared in the comparative profile data.

The OT-TRI profile data contained the *Therapist Action* item *Modification-Assistive Device* in nine sessions. In the same nine sessions, the PSROP profile data contained the *Intervention Code* item *Assistive Device* (e.g., *Cane*, *Standard Walker*, *Wheelchair*). The OT-TRI profile data also contained the *Therapist Action* item *Modified Environment* in one session. In the same session, the PSROP profile data contained the *Intervention Code* item *Environmental Adaptation*. Lastly, the OT-TRI profile data contained the *Therapist Action* item *Physical Input-Handling* in one session. In the same session, the PSROP profile data contained the *Intervention Code* item *NDT/Bobath*.

The OT-TRI has a second unique category labeled *Client Response* that does not have a corresponding category in the PSROP OT Taxonomy. Analysis of the OT-TRI profile data revealed that investigators marked items from all four *Client Response* subcategories: *Adaptation*, *Energy/Fatigue*, *Performance*, and *Perception*. Table 12 presents the frequencies for each of the *Client Response* items from the OT-TRI profile data for the 12 videos.

Table 12

*Frequency of Client Response Items in the OT-TRI Profile Data*

Client Response Categories with Items	Frequency	Percentage*
<b>Energy/Fatigue</b>		
Client completed session:		
With no signs of fatigue.	8	67
But showed signs of fatigue (end of session).	2	17
But fatigues throughout session.	4	33
Did not complete session due to fatigue.	0	0
<b>Generalization of Skill/Behavior (Adaptation)</b>		
Client generated:		
Self-initiated adaptations (new activity).	0	0
Self-initiated adaptations (familiar activity).	11	92
Adaptations with assistance (any activity).	10	83
No adaptations generated by the client.	1	.08
<b>Performance</b>		
Client utilized/practiced targeted function/skill(s):		
Independently.	4	33
With assistance.	12	100
Did not utilize/practice Targeted Function/Skill(s).	0	0
<b>Perception</b>		
Client demonstrated/verbalized:		
Mostly positive response.	6	50
Mixed response (positive/negative).	6	50
Neutral response.	1	.08
Mostly negative response.	0	0

Note: OT-TRI=Occupational Therapy Taxonomy of Rehabilitation Interventions;  
 \*Frequencies and percentages do not sum up to 12 or 100% because the PI and CI selected multiple items with the categories so as to characterize the client's response to the various activities observed within a video clip.

The below list presents the items for each of the four *Client Response* categories with the highest percentages from the 12 OT-TRI profiles included the following:

- The highest percentage for *Energy/Fatigue* was 67% (i.e., *Patient completed session with no signs of fatigue*).
- The highest percentages for *Adaptation* were 92% (i.e., *Patient generated self-initiated adaptations*) and 83% (i.e., *Patient generated adaptations with assistance*).
- The highest percentage for *Performance* was 100% (i.e., *Patient practiced targeted function/skill(s) with assistance*).
- The highest percentages for *Perception* were 50% (i.e., *Patient demonstrated/verbalized mostly positive response*) and 50% (i.e., *Patient demonstrated/verbalized mixed response*).

The OT-TRI instrument allows for the selection of multiple items with the *Client Response* sub-categories to characterize the client's response to the various activities observed within a video clip. As a result, the sum of the percentages within the categories was greater than 100 percent.

The PI and CI also noted that *Pain* should be added to the *Energy/Fatigue* item and that *Neutral* should be added as an option for the item *Mixed Response (Positive/Negative)*. The final section of the results presents the investigators' observations the similarities and differences between the two taxonomies that the investigators observed during the use of and deliberation process for each taxonomy.

**Comparison of taxonomy completion and deliberation processes.** The PI and CI observed similarities in the use of the two taxonomies to characterize what was observed in the video-recorded therapy sessions. The investigators referenced OT-TRI and PSROP item definitions to guide their initial selection of items observed in the videos. The investigators also applied the OT-TRI and PSROP item definitions to reach consensus of selected items during the deliberation. The PI and CI observed that both taxonomies contained item definitions that lacked clarity. For example, the investigators encountered difficulty distinguishing between two PSROP items, *Upper Extremity Control* and *Pre-Functional Activity*, during the deliberation process of three videos. Likewise, the investigators encountered difficulty distinguishing between OT-TRI items, *Self-Awareness* and *Self-Monitoring* during the deliberation process of four videos. All of the OT-TRI items had definitions; however, two PSROP *Intervention Code* items did not have a definition.

The deliberation process for each taxonomy resulted in some items being dropped from the taxonomy specific to that video. An item was dropped when consensus for that item was not achieved. The investigators dropped 70 OT-TRI items: 46 *Targeted Function or Skill* items, 22 *Therapist Action* items, and two *Activity* items. The investigators dropped 21 PSROP items: 15 *Intervention Code* items and six *Activity* items. Thus, the PI and CI did not agree on selection of all items for every video irrespective of the taxonomy used.

The PI and CI became aware that they used a different approach when completing the two taxonomies while viewing the videos. The investigators stopped the video and

referred to item definitions more frequently when completing the OT-TRI. The investigators stated that the OT-TRI required a high degree of vigilance to mark what was observed in the video. The PI and CI also observed temporal differences between the two taxonomies during the deliberation process. The deliberation process of the OT-TRI consistently required more time as compared to the deliberation process of the PSROP OT Taxonomy. The PI and CI spent more time discussing the greater number of items marked in the OT-TRI. This concludes the results pertaining to the differences between the OT-TRI and PSROP OT Taxonomy.

In summary, the results of the comparative analysis presented specific similarities and differences between the two taxonomies. The PI identified several matches between OT-TRI and PSROP OT Taxonomy items in the comparative profile data. The PI also identified differences in the level of specificity and the number of items identified between the two taxonomies. The next section will discuss the implications of the findings.

## **Discussion**

Study Two aimed to examine the content validity of the OT-TRI by comparing it with the PSROP OT Taxonomy, the most widely published taxonomy in stroke rehabilitation literature. Analysis of the comparative profile data provided evidence that both taxonomies captured the multi-dimensional nature of therapy. Both taxonomies identified multiple occurrences of Activity items and related Intervention Component (i.e., *Intervention Code* items, *Targeted Function or Skill* items) within the 12 therapy sessions. The comparative analysis revealed that the majority of items captured by the

PSROP OT Taxonomy were also captured by the OT-TRI. This finding supports the validity of the new taxonomy. The results demonstrate that the domain of the published taxonomy is well represented within the OT-TRI.

Analysis of the comparative profile data also provided evidence that the OT-TRI expands upon the PSROP OT Taxonomy's characterization of the therapeutic process. The results demonstrated that the OT-TRI provided substantially more detailed information about the therapy session as compared to the PSROP OT Taxonomy. The OT-TRI consistently identified more items in the therapy session including several items with a greater degree of specificity in comparison to similar PSROP items. Analysis of the OT-TRI profile data revealed that investigators marked approximately 13 therapist actions in a therapy session. The PSROP OT Taxonomy did not capture this information with the exception of whether or not the therapist provided an assistive device or made a modification of the environment. Additionally, only the OT-TRI provided information on the client's response during the therapy session.

In summary, results support the assertion that the OT-TRI not only demonstrates increased granularity with regard to the customary categories of intervention, but it also includes two new categories that characterize client-therapist interactions. Overall, the comparative analysis supports that the OT-TRI provided a more comprehensive characterization of what occurred in the 12 therapy sessions that were used for this study.

The current version of the OT-TRI presented challenges for the PI and CI that should be recognized. The deliberation process exposed problems with certain OT-TRI item definitions as well as the need to reevaluate the necessity of the distinction between



some similar items. A limitation of this study is that not all items of the OT-TRI were observed in the therapy sessions. Therefore, assessing the validity of some items is not possible. Considering the challenges and limitations, this researcher advises caution in the use of the current version of the OT-TRI prior to necessary revisions and further testing. However, the information learned about several items from this comparative analysis will be useful in the revision of the OT-TRI. Despite the limitations of this study, the findings provide valuable support to continue the development of the OT-TRI as a more comprehensive taxonomy to characterize what it is that the occupational therapist does during the therapy session in stroke rehabilitation.

## CHAPTER V

### STUDY THREE: SENSITIVITY OF THE OT-TRI TO CAPTURE CHANGE DURING THE COURSE OF TREATMENT

Chapters I and II in this dissertation provide background on the current state of rehabilitation taxonomies and the need for a comprehensive taxonomy to name and frame what is done in therapy sessions. Chapter III and V present two of the three interrelated studies of this dissertation. Study One examined the content validity of the Occupational Therapy Taxonomy of Rehabilitation Interventions (OT-TRI) using an expert panel comprised of occupational therapists. Study Two examined the content validity of the OT-TRI through a comparison of it and the most widely published occupational therapy taxonomy in the stroke rehabilitation literature. This chapter presents Study Three; it follows a structure similar to that of Chapter IV as the videos of therapy sessions provide the basis to examine the validity of the OT-TRI. The aim of Study Three was to conduct a systematic examination of the sensitivity of the OT-TRI to capture changes in intervention methods during the course of treatment. Sensitivity is considered to be an element of validity. Behavioral observation systems with *sensitivity to change* have the capacity to capture behavior change “as a function of environmental manipulations and to developmental changes over time” (Hintze, 2005, p. 516). For purposes of this study, sensitivity refers to the capacity that the OT-TRI has to differentiate intervention that occurs over the course of treatment. The research question for this study was whether the

OT-TRI is sensitive enough to capture changes in interventions during the course of treatment.

Study Three received approval under two institutional review boards (IRBs) following submission for dual review by both Texas Tech University Health Sciences Center (TTUHSC) and Texas Woman's University (TWU). Study Three included two modification requests. Both IRBs approved an increase in the therapist enrollment limit from 3 to 10 therapists and the client enrollment limit from 3 to 10 clients. The increase in enrollment limits provided for the attrition of clients and/or therapists. Both IRBs also approved the deletion of a research support staff member who was no longer an employee of TTUHSC. This researcher served as the principal investigator (PI). The co-investigators (CIs) included this researcher's TWU faculty advisor and a faculty member from TTUHSC. The PI, a faculty member of TTUHSC, collaborated with the TTUHSC Clinical Research Institute (CRI) on this study. The institute provides research consultation and support services to TTUHSC faculty. Four CRI research coordinators and one regulatory specialist were affiliated with this study and included in IRB approvals. One CRI research coordinator assisted with the recruitment and video recording of therapy sessions for this study. Study Three was conducted at an inpatient rehabilitation facility (IRF) in Lubbock, Texas.

The remainder of this chapter is organized into two sections. Section one presents the methods used to obtain the video recordings of the occupational therapy sessions. This section concludes with a brief description of the resulting videos that were collected and used in the subsequent analysis. Section two presents the methodology used to

examine the OT-TRI's potential to capture change in intervention methods during the course of treatment. Section two concludes with a presentation of the results regarding the sensitivity of the OT-TRI and a discussion of the findings.

## **Section One: Collection of Videos**

### **Method**

Participants consisted of two groups. Both the treating occupational therapists and their occupational therapy clients were consented to be in this study. Researchers intentionally designed the inclusion criteria for the occupational therapists to reflect typical practice. The inclusion criteria were: (a) The occupational therapist must be a licensed occupational therapist; and (b) The occupational therapist must provide occupational therapy services at the approved study site. The PI arranged face-to-face meetings with the occupational therapists at the approved study site. The PI met with those therapists who expressed interest in the study to discuss the purpose of the study and the informed consent process. Four occupational therapists at the IRF provided consent and were enrolled as participants. Three of the four therapists completed the study (i.e., were video-recorded while providing therapy sessions).

The recruitment of clients involved collaboration among the PI, IRF rehabilitation department supervisor, and CRI research coordinator. The PI and the IRF rehabilitation supervisor communicated on a regular basis. The IRF rehabilitation supervisor was aware of the inclusion criteria. The inclusion criteria for clients were: (a) The client must be 18 years of age or older; (b) The client must have a diagnosis of cerebral vascular accident (CVA); and (c) The client must be a current occupational therapy client

at the approved study site. Exclusion criteria: Clients who were unable to restate the study's purpose and participation requirements were excluded from study participation. The next paragraph describes the additional conditions applied to the recruitment process that pertain to the course of treatment.

For purposes of this study, the term *course of treatment* refers to the client's length of stay in the IRF. The PI informed the IRF rehabilitation department supervisor of the following conditions pertaining to IRF admission and length of stay when referring potential client participants.

- Data collection must occur within four days of client's IRF admission.
- The client's length of stay must be at least two weeks.

The IRF rehabilitation department supervisor notified the PI of clients who expressed interest in learning about the study and who met the inclusion criteria as well as the date of admission and length of stay conditions. The PI or the CRI research coordinator approached potential clients as the IRF supervisor referred them. The PI or the CRI research coordinator scheduled a face-to-face meeting with potential clients and discussed the purpose of the study, the inclusion criteria, and the informed consent process.

The PI enrolled clients in the study who met the inclusion criteria and who completed an informed consent form, a video consent form, and the associated IRF's HIPPA authorization form. Four clients consented. One client withdrew consent from study participation after the video recording of one session. The PI deleted this video

recording. The three remaining clients completed the study (i.e., were video-recorded during three or more therapy sessions).

**Procedures to collect the video data.** A total of 13 therapy sessions were video-recorded. The CI video-recorded one of the therapy sessions and one CRI research coordinator video-recorded the remaining 12 therapy sessions (including the one session that was deleted after the client withdrew participation in the study). The CI and CRI research coordinator adhered to the following conditions of the video-recording protocol.

1. Each video recording was the actual length of the regular scheduled therapy session; the therapist was not asked to modify the session in any way.
2. No more than two investigators were present during the video recording of the therapy session.
3. No more than six sessions were recorded per client.
4. No more than eighteen sessions were recorded per therapist.

Additionally, videos were obtained to reflect the client's course of treatment. The CI and CRI research coordinator adhered to the following course of treatment parameters.

1. One initial video must be recorded within four days of the client's IRF admission.
2. One or more intermediary video(s) must be recorded between four days post-admission and four days prior to discharge. Note: The timing of the intermediary videos varied according to the client's estimated length of stay. For example, one intermediary video was recorded on the client's

sixth day of a two-week length of stay; whereas, three intermediary videos were recorded approximately once every 7 to 14 days for an eight-week length of stay.

3. A final video must be recorded within four days prior to the client's discharge from the IRF.

The PI transferred all of the videos from the camera to an external storage drive designated for this research. Video files were password protected, and the PI secured the storage drive in a locked file cabinet in her office. Both the therapist and client informed consent forms provided an option for participants to allow researchers to use videos for educational purposes. Participants who chose this option completed an educational consent form. The PI transferred copies of the videos that were specific to those therapists and clients who signed an educational consent form to a storage drive designated for educational purposes.

## **Results**

The results section presents an overall summary of the videos collected followed by a brief description of the videos for each of the three clients. A total of three occupational therapists (all female) and three clients (two female and one male) completed the study. Each of the clients had a different occupational therapist. All of the clients had a diagnosis of CVA and were receiving occupational therapy at the IRF. The ages of the clients ranged from 39 to 69 years. The length of time of the therapy sessions ranged from 14 to 53 minutes. The duration of time varied according to the therapist's selection of the length of the therapy session (e.g., 30 minutes, 60 minutes) and whether

the client may have requested to not video certain activities (e.g., dressing, toileting). The locations of the therapy sessions varied according to the therapist's selection of the environment for the session. The environments included the clients' private hospital rooms, a therapy gym, a bathroom near the therapy gym, and the hallways to the therapy gym from the clients' hospital rooms. The number of sessions video-recorded for each client ranged from three to five sessions. Each client had an initial video recorded within four days of IRF admission and a final video recorded within four days of IRF discharge. However, the number of intermediary videos ranged from one to three sessions. The remainder of the results section presents a description of the therapy activities that were video-recorded for each of the three clients.

**Description of the therapy activities for Client A.** The first set of videos involved a 65 year old female client who had a CVA that resulted in weakness and incoordination that affected her left upper and lower extremities. A total of three therapy sessions were video-recorded during her two-week stay at the IRF. The initial video was recorded during a 30 minute therapy session that occurred within four days of the client's IRF admission. The activities in the therapy session included practicing a tub transfer with use of a walker and participating in a dynamic standing activity while tossing a rope ball during a ladder ball game. One intermediary video was recorded during a 60 minute therapy session that occurred on the sixth day post-admission. The session activities included two dynamic standing activities that required the client to twist, reach, and bend for objects. The client also visually scanned the environment to locate and retrieve objects while walking through the IRF hallways with a cane. The final video was



recorded during a 30 minute therapy session that occurred within four days of the client's discharge from the IRF. The session activities included: a dynamic standing activity that required the client to bend, reach, and step in all directions; and a series of upper extremity exercises to increase muscular endurance.

**Description of therapy activities for Client B.** The second set of videos involved a 69 year old male client who had a CVA that resulted in hemiplegia of his right upper extremity. He also exhibited weakness and incoordination in his right leg. A total of four therapy sessions were video-recorded during his three-week stay. The initial video was recorded during a 30 minute therapy session within four days of the client's IRF admission. The activities in the therapy session included active assisted range of motion (AAROM) exercises with his right shoulder and a gravity-eliminated activity that required the client to reach for and grasp cones. The second video was recorded during a 30 minute therapy session on the sixth day of post-admission. The session activities included: (a) a writing task with the unaffected but non-dominant hand and (b) a task in which he placed his hemiplegic extremity in a bin of beads for sensory stimulation. The client also worked on moving his unaffected arm to mirror the motions of his hemiplegic arm (being moved by the therapist). The third video was recorded during a 60 minute therapy session on the 12<sup>th</sup> day post-admission. The client completed a dynamic sitting task that required him to twist, bend, and reach for objects with his unaffected arm while weight-bearing on his hemiplegic arm. He also repeated the activity in which he worked on moving his unaffected arm to mirror the motions of his hemiplegic arm (being moved by the therapist). The final video was recorded during a 30 minute therapy session within

four days of the client's discharge from the IRF. The session activities included baking muffins and hand-washing bowls and utensils.

**Description of therapy activities for Client C.** The third set of videos involved a 39 year old female client who had a CVA that resulted in hemiplegia of her left upper extremity. She also exhibited weakness and incoordination in her left leg. A total of five therapy sessions were video-recorded during the client's eight-week stay at the IRF. The initial video was recorded during a 60 minute therapy session within four days of admission. The activities included self-care activities; she brushed her hair, donned her socks, and applied cosmetics. The second video was recorded during a 30 minute therapy session on the 11<sup>th</sup> day post-admission. Therapy consisted of a cooking activity in a kitchen located in the therapy gym. She prepared and baked brownies. The third video was recorded during a 30 minute therapy session on the 27<sup>th</sup> day post-admission. The activities included donning shoes, folding clothes, practicing AAROM exercises, and discussing the purchase of a custom sling for her hemiplegic arm. The fourth video was recorded during a 60 minute therapy session on the 42<sup>nd</sup> day post-admission. The activities included using ultrasound to reduce pain in her hemiplegic shoulder, donning a sling (not the custom sling), practicing AAROM exercises, and discussing the layout of her kitchen and bathroom at home. The final video was recorded during a 60 minute therapy session within four days of the client's discharge from the IRF. The activities included self-care and exercise activities. She donned her shoes, practiced AAROM exercises, donned her custom sling, and transferred into the tub using a tub bench.

This concludes the description of the three sets of videos for each of the clients. The next section presents the methods used to examine the OT-TRI's potential to capture change in the intervention methods observed in the three sets of videos.

## **Section Two: Examination of the Sensitivity of the OT-TRI to Capture Change Method**

This portion of the method section is arranged into two parts. The method section begins with an overview of the OT-TRI. This is followed by a detailed presentation of the procedures used to create the profiles on each of the 12 video-recorded therapy sessions and the subsequent case studies. The profile data of the therapy sessions specific to each of the three clients comprised the three case studies. The last part of the method section describes the process used to analyze the profile data for the three case studies.

**Overview of the OT-TRI.** The OT-TRI is a new taxonomy designed to name and frame the components of occupational therapy interventions in stroke rehabilitation. The OT-TRI not only includes two customary categories of taxonomies (i.e., *Activity*, *Targeted Function or Skill*) but also presents two additional categories designed to capture the nature of the therapeutic interactions that occur between the client and therapist (client-therapist dyad). These new categories are *Therapist Action* and *Client Response*. Refer to Figure 1 in Chapter III for an overview of the four categories of the OT-TRI instrument with the associated subcategories and items. Appendix A presents an excerpt that displays the format of the OT-TRI instrument.

**Procedures used to collect profile data for the three case studies.** The PI began collection of the profile data after all of the video-recordings were completed. The

PI used a copy of the OT-TRI instrument to document the components of therapy that she observed while viewing each of the three sets of videos. The PI was blinded to whether each video was of an initial, intermediary, or final session. The CI randomized the order of the videos prior to making the videos available to the PI. The rationale was to control for the potential bias from knowing whether the session occurred earlier or later in the course of treatment when marking the items on the OT-TRI instrument.

The information documented on each copy of the OT-TRI instrument yielded a profile of what was observed in each video. The PI compiled the profile data into a case study for each of the three clients across the course of his or her treatment. The following presents the step-by-step procedures that the PI and CI followed to create the three case studies.

1. The CI grouped the videos in iMovie, version 9 for each of the three clients. The CI arranged the set of videos for each client in chronological order using the dates the videos were recorded. The CI assigned a random order using the following system: (a) placed an intermediary video as the first video to be viewed for a set of videos, and (b) placed the remaining videos in the set in an order that did not follow a chronological date sequence. The CI renamed the videos to reflect the order in which the videos were to be viewed by the PI.
2. The PI viewed the first video of set of videos for one client and marked the OT-TRI items that she observed in the session on a copy of the

OT-TRI instrument. The PI repeated the process for the remaining videos for that client.

3. Step 2 was repeated for remaining videos of the other two clients in the randomized order provided by the CI.
4. The PI transferred the documented items from the OT-TRI instrument for each video to a profile form. Appendix D presents the OT-TRI profile forms for the 12 videos.
5. The PI matched each profile to the chronological date that the video was recorded. The PI arranged the profiles in chronological order and applied the time periods—Beginning, Middle, and End—to the profiles for each client-therapist dyad.
  - a. The term *Beginning* referred to the initial video that was recorded at the beginning-stage of a client’s course of treatment (i.e., within four days of IRF admission).
  - b. The term *Middle* referred to the intermediary video(s) that was recorded during the mid-stage of the client’s course of treatment.
  - c. The term *End* referred to the final video that was recorded at the end-stage of the client’s course of treatment (i.e., within four days of the discharge from the IRF).
6. The PI organized the completed profiles according to the three clients and their respective course of treatment.

The data collection process yielded a set of profiles for each of the three client-therapist dyads. These set of profiles constituted the three case studies for the data analysis. No medical complications or events occurred for any of the three clients; therefore, reviews of the clients' medical records were not necessary for the case study analysis.

**Process of analyzing the case study profile data.** The aim of this study was to examine the sensitivity of the OT-TRI to capture changes in interventions (e.g., *Therapist Action* items, *Targeted Function or Skill* items) during the course of treatment. The PI analyzed each client's profile data across the three time periods to identify any transitions among the documented OT-TRI items. The term *transition* is used to describe an observed change in an intervention method for the same—or very similar—activity. For example, the PI identified the following transition in a client's profile data: the OT-TRI item *Maximum Assistance* (documented in the Beginning time period for the *Activity* item *Transfer*) changed to the OT-TRI item *Moderate Assistance* (documented in the End time period for the same activity). These items for levels of assistance are within the OT-TRI category *Therapist Action-Physical Assistance*.

The PI applied the following process to analyze the profile data for each case study. First, the PI identified the same—or very similar—activities that occurred across the three time periods of the course of treatment (i.e., Beginning, Middle, End). For example, the OT-TRI item *Preparatory Activity-Gross Motor Tasks* was documented in a client's initial video (i.e., Beginning of the course of treatment), intermediary video (i.e., Middle of the course of treatment), and final video (i.e., End of the course of treatment).

Any activity that was not documented for at least two time periods was excluded from the analysis because no transition in intervention methods for that activity was present. Next, the PI identified any transitions in intervention methods that were present in the profile data for an activity that was documented in at least two time periods. For example, the OT-TRI item *Therapist Action-Minimum Assistance* was marked for an activity in a client's initial video. The *Therapist Action* item *Supervision/Setup* was marked for that same activity in the client's final video, which demonstrated that a change occurred in the type of physical assistance provided to the client during the course of treatment. The PI completed the same process of analysis for each of the three case studies.

## **Results**

The case study analyses revealed some changes in intervention methods that were observable during the course of treatment. The following presents the results of the analysis of the profile data for each of the three case studies.

**Findings of the profile data for Case Study A.** This case study includes the profile data from three therapy sessions (i.e., one Beginning; one Middle; one End) involving a 65 year old female client and her female therapist. A total of eight different activities were present in the resulting profile data. Two of the *Activity* items, *Gross Motor Task* and *Mobility-Environment*, met the conditions for analysis (i.e., the *Activity* items occurred in at least two of the course of treatment time periods). Table 13 presents the observed changes in the intervention methods that occurred for the two activities during the course of treatment.

Table 13

*Case Study A: Change in OT-TRI Items Across Course of Treatment*

OT-TRI Category	Activity	Intervention Methods by Course of Treatment		
		Beginning	Middle	End
<b>Targeted Function/ Skill</b>				
<b>Cognitive</b>	<i>Mobility-Environment</i>	Self-Awareness	Alertness, Self-Monitoring	None
<b>Sensorimotor</b>	<i>Gross Motor Task</i>	Coordination (Hand-Eye), Functional Movement, Postural Control	Coordination (Hand-Eye), Functional Movement, Postural Control, Strength	Coordination (Hand-Eye), Functional Movement, Postural Control, Strength, Functional Ambulation
<b>Therapist Action Modification</b>	<i>Mobility-Environment</i>	Assistive Device (Walker)	Assistive Device (Cane)	Assistive Device (Cane)
<b>Physical Assistance</b>	<i>Mobility-Environment</i>	Minimum Assistance	Supervision/Setup Minimum Assistance	Supervision/Setup
<b>Verbal Support</b>	<i>Gross Motor Task</i>	Provided Instruction	Provided Instruction	None
<b>Visual Assistance</b>	<i>Gross Motor Task</i>	Demonstrated Task	Demonstrated Task	None
<b>Client Response Adaptation</b>	<i>Gross Motor Task &amp; Mobility-Environment</i>	Adaptation with Assistance	Adaptation with Assistance	Self-Initiated Adaptation
<b>Perception</b>	<i>Gross Motor Task &amp; Mobility-Environment</i>	Mixed response (Positive/Negative)	Mostly Positive	Mostly Positive
<b>Performance</b>	<i>Gross Motor Task &amp; Mobility-Environment</i>	With Assistance	Independently	Independently

Note: OT-TRI=Occupational Therapy Taxonomy of Rehabilitation Interventions; The table presents the OT-TRI categories, associated activities, and associated changes in intervention methods that occurred during the course of treatment for Case Study A.



The changes present in the profile data included transitions in the *Sensorimotor-Targeted Function or Skill* and *Therapist Action* items for two items, *Gross Motor Task* and *Mobility-Environment*. The changes in the *Sensorimotor* items for the *Gross Motor Task* activity showed the addition of sensorimotor functions from the Beginning to the End of the client's course of treatment. For example, the profile data for the Beginning session contained the *Sensorimotor* items *Coordination*, *Functional Movement*, and *Postural Control*. During the Beginning session, the client stood while tossing a ball to another person standing approximately 8 feet apart from the client. The profile data for the session at the End of the course of treatment contained the additional *Sensorimotor* items *Strength* and *Functional Ambulation*. The therapist added weights to the client's legs and instructed her to step in various directions while completing the same *Gross Motor Task*.

The changes in the *Cognitive-Targeted Function or Skill* items showed a shift in the cognitive functions that were associated with the item, *Mobility-Environment*. The profile data for the Beginning session contained the item *Cognitive-Self-Awareness*; whereas, the subsequent session contained the item *Cognitive-Self-Monitoring*. To illustrate, the client tripped while stepping from the tile to the carpeted rug when walking with the therapist to the refrigerator to get ice cream. The therapist stated to the client that she needed to be watchful of potential obstacles to safely maneuver in the environment. In the subsequent sessions, the client made comments about the obstacles she encountered as she safely maneuvered through the IRF hallways and retrieved objects.

Other observable changes present in the profile data included transitions in the item *Client-Performance* and three *Therapist Action* items (i.e., *Physical Assistance*, *Verbal Support*, *Visual Assistance*). The therapist provided less assistance at the End of the course of treatment for both the *Gross Motor Task* and the *Mobility-Environment* activity. The profile data also revealed changes in the item *Client Response-Adaptation*. The client transitioned from requiring assistance from her therapist to adapt to challenges encountered during both activities to generating self-initiated adaptations at the End of her course of treatment. Overall, analysis of the profile data for Case Study A revealed 10 transitions in intervention methods that occurred during the course of her treatment.

**Findings of the profile data for Case Study B.** This case study includes the profile data from four therapy sessions (one Beginning; two Middle; one End) involving a 69 year old male client and his female therapist. A total of ten different activities were present in the resulting profile data. Three *Preparatory Activity* items and one *Occupation-Based Activity* item met the conditions for analysis (i.e., the activity occurred in at least two of the time periods). The PI removed two of the *Preparatory Activity* items (i.e., *Fine Motor Task* and *AAROM*) from subsequent analysis because the items did not show any changes in intervention methods in the profile data. The remaining two activities—*Gross Motor Task* and *Transfer-Mat*—revealed a few changes in intervention methods present in the profile data. Table 14 shows the changes in intervention methods for the two activities during the client’s course of treatment.

Table 14

*Case Study B: Change in OT-TRI Items Across Course of Treatment*

OT-TRI Category	Activity	Intervention Methods by Course of Treatment			
		Beginning	Middle 1	Middle 2	End
<b>Therapist Action</b>					
	<b>Physical Assistance</b>				
	<i>Gross Motor Task</i>	Maximum Assistance	Moderate Assistance	Minimum Assistance	N/A
	<i>Transfer-Mat</i>	None	Minimum Assistance	N/A	N/A
<b>Verbal Support</b>	<i>Gross Motor Task</i>	Asked Closed Question Provided Instruction	Asked Closed Question Provided Instruction	None	N/A
	<i>Transfer-Mat</i>	Provided Instruction	None	N/A	N/A
<b>Client Response Perception</b>	<i>Gross Motor Task &amp; Transfer-Mat</i>	Mixed Response (Positive/Negative)	Mostly Positive	Mostly Positive	N/A

Note: OT-TRI=Occupational Therapy Taxonomy of Rehabilitation Interventions; The table presents the OT-TRI categories, associated activities, and associated changes in intervention methods that occurred during the course of treatment for Case Study B. For the task *Transfer-Mat*, the transition of the OT-TRI item physical assistance suggests a decline in ability to transfer; however, the client impulsively transferred to the mat without the therapist. Middle 1 = first session during the middle of the course of treatment; Middle 2 = second session during the middle of the course of treatment; Asked closed question = asked closed ended question; N/A = indicates that the activity did not occur in that session.

The changes present in the profile data included transitions in the *Therapist Action* and *Client Response* items for the *Gross Motor Task* item. The changes in the *Therapist Action* items—*Physical assistance* and *Verbal Support*—showed that the therapist provided the client with more physical and verbal assistance for *Gross Motor Tasks* in the Beginning of his course of treatment and less assistance in the subsequent sessions. These activities were tasks in which the client worked to maintain postural control while reaching and tossing various objects.

The profile data for the item *Transfer-Mat* showed that the client required an increase in physical assistance provided during the course of treatment. The client transferred to the therapy mat before the therapist was in place to provide assistance. In a subsequent session, the therapist provided minimum assistance when the client transferred to the mat. Analysis of the profile data revealed a change in the item *Client Response-Perception* (i.e., client's perception of the outcome of the intervention) during the course of his treatment. The profile data from the Beginning session for the *Gross Motor Task* item—contained the item *Perception-Mixed Response (Positive/Negative)*. The client used his unaffected arm to slide his affected arm (positioned on a towel) across a surface to retrieve objects with physical assistance from the therapist. He expressed frustration regarding the use of a towel stating that it was not sliding across the surface. The profile data for the next two subsequent sessions contained the *Perception* item—*Mostly Positive*—for a similar reaching task in which the client smiled and laughed several times. Overall, the analysis of the profile data for Case Study B revealed five transitions in intervention methods that occurred during the course of treatment.

**Findings of the profile data for Case Study C.** This case study includes data from five therapy sessions (one Beginning; three Middle; one End) involving a 39 year old female client and her female therapist. A total of eleven different activities were present in the resulting profile data. Five *Activity* items met the conditions for analysis (i.e., the activity occurred in at least two of the time periods). The PI removed one of the *Education* items—*Home Program* and *Planning*—from the subsequent analysis because it did not show any changes in the intervention methods present in the profile data. The remaining four activities revealed a few changes in intervention methods present in the profile data.

Table 15 shows the changes in intervention methods during the course of treatment for two *Activity* items, *AAROM* and *Use of Device*. The changes present in the profile data included transitions in the categories of *Sensorimotor-Targeted Function or Skill* and *Therapist Action* for the item—*AAROM*. The therapist assisted the client in doing mobilization and movement exercises with her hemiplegic shoulder using her unaffected arm during three sessions. The profile data contained the items *Sensorimotor-Joint Mobility* and *Therapist Action-Moderate Assistance* for this *AAROM* activity in the first of the three sessions. The profile data at the End of the course of treatment contained the additional *Sensorimotor* items, *Strength* and *Tone*.

Table 15

*Case Study C: Change in OT-TRI Items Across Course of Treatment*

OT-TRI Category	Activity	Intervention Methods by Course of Treatment				
		Beginning	Middle 1	Middle 2	Middle 3	End
<b>Targeted Function/ Skill</b> <b>Sensorimotor</b>	<i>AAROM</i>	N/A	N/A	Joint Mobility	Joint Mobility	Joint Mobility Strength Tone
<b>Therapist Action</b> <b>Physical Assistance</b>	<i>AAROM</i>	N/A	N/A	Moderate Assistance	None	None
	<i>Use of Device</i>	N/A	N/A	N/A	Moderate Assistance	Minimum Assistance
	<b>Psychosocial Facilitation</b>	N/A	N/A	Provided Feedback	Provided Feedback, Coaxed/Encouraged	Provided Feedback, Elicited Feedback, Coaxed/Encouraged, Affirmed

Note: OT-TRI=Occupational Therapy Taxonomy of Rehabilitation Interventions; The table presents the OT-TRI categories, associated activities, and associated changes in intervention methods that occurred during the course of treatment for Case Study C. Middle 1 = first session during the middle of the course of treatment; Middle 2 = second session during the middle of the course of treatment; Middle 3 = third session during the middle of the course of treatment; Asked closed question = asked closed ended question; N/A = indicates that the activity did not occur in that session.

The therapist also provided four *Psychosocial Facilitation* actions (i.e., *Provided Feedback*, *Elicited Feedback*, *Coaxed/Encouraged*, *Affirmed*) during this session at the End of the client's course of treatment. During the Beginning session, the therapist informed the client that it will take time and work to regain shoulder movement when the client expressed concern about lack of movement of her shoulder while doing AAROM exercises. During the End session, the therapist asked the client if she felt the movement of her shoulder, informed the client that her shoulder muscles were contracting, and described the significant improvement in her ability to move her shoulder.

Other changes present in the profile data included transitions in the item *Therapist Action-Physical Assistance* for the item—*Activity-Use of Device* (a sling). The client donned a non-customized sling with moderate assistance from the therapist during the Middle of her course of treatment. The client donned her customized sling with minimal assistance from the therapist at the End of her course of treatment.

Table 16 shows the changes in intervention methods during the course of treatment for the remaining two items, *Dressing-Lower Extremity* and *Transfer-Wheelchair*. The changes present in the profile data for the dressing activity included transitions in the item *Cognitive-Learning Skill/Technique* and three *Therapist Action* items (i.e., *Minimum Assistance*, *Coaxed/Encouraged*, and *Modified Task*).

Table 16

*Case Study C: Change in OT-TRI Items Across Course of Treatment-Two Additional Activities*

OT-TRI Category	Activity	Intervention Methods by Course of Treatment				
		Beginning	Middle 1	Middle 2	Middle 3	End
<b>Targeted Function/Skill</b> <b>Cognitive</b>	<i>Dress</i>	None	N/A	Learning Skill/Technique	N/A	N/A
	<i>Transfer</i>	None	N/A	N/A	N/A	Decision Making Problem Solving
<b>Therapist Action</b> <b>Modification</b>	<i>Dress</i>	None	N/A	Modified Task	N/A	N/A
<b>Physical Assistance</b>	<i>Dress</i>	Minimum Assistance	N/A	None	N/A	N/A
	<i>Transfer</i>	Minimum Assistance	N/A	N/A	N/A	None
<b>Psychosocial Facilitation</b>	<i>Dress</i>	Coaxed/Encouraged	N/A	None	N/A	N/A
	<i>Transfer</i>	None	N/A	N/A	N/A	Provided Feedback
<b>Verbal Support</b>	<i>Dress</i>	None	N/A	Asked Closed Question	N/A	N/A
<b>Client Response</b> <b>Performance</b>	<i>Transfer</i>	With Assistance	N/A	N/A	N/A	Independently

Note: OT-TRI=Occupational Therapy Taxonomy of Rehabilitation Interventions; The table presents the OT-TRI categories, associated activities, and associated changes in intervention methods that occurred during the course of treatment for Case Study C. Middle 1 = first session during the middle of the course of treatment; Middle 2 = second session during the middle of the course of treatment; Middle 3 = third session during the middle of the course of treatment; Asked closed question = asked closed ended question; N/A = indicates that the activity did not occur in that session.



The client donned her shoes in the Beginning session with physical assistance and encouragement from the therapist. In a subsequent session, the therapist modified the task by lacing the shoe differently and discussed how modifications can make performing tasks with one hand easier. The client donned the shoe with the modified lacing without the therapist's physical assistance.

Other changes present in the profile data included transitions for the item *Activity-Transfer* that included: *Cognitive* items (i.e., *Decision Making*, *Problem Solving*); *Therapist Action* items (i.e., *Minimum Assistance*, *Provided Feedback*); and the *Client Response* item (i.e., *Performance*). The client transferred from the bedside to her wheelchair with her therapist's assistance in the Beginning session. The client walked to the tub and independently completed a tub bench transfer in a session at the End of her course of treatment. The therapist provided feedback to the client regarding the client's decision to not order the tub bench recommended by the therapist. Overall, analysis of the profile data for Case Study C revealed 14 transitions in intervention methods that occurred during the course of treatment.

**Synthesis of the findings for the three case studies.** This section of the results focuses on those OT-TRI items that demonstrated observed changes in at least two of the three case studies. The item *Therapist Action-Physical Assistance* documented observed changes for all three clients during the course of their treatments. Each of the three clients required less physical assistance from their therapist to perform certain activities during the Middle to End of course of treatment sessions as compared to Beginning sessions (i.e., Client A: *Mobility-Environment*; Client B: *Gross Motor Task*; Client C:

AAROM, *Dress-Lower Extremity, Transfer-Wheelchair*). The item *Therapist Action-Verbal Support* documented observed changes for two of the three clients. The clients required verbal instruction from their therapists to perform the activities during the Beginning of their treatment but required no verbal support to perform the same activities during the second week of their treatment activity (i.e., Client A: *Gross Motor Task*; Client B: *Gross Motor Task, Transfer-Mat*). Similarly, the item *Client Response-Performance* (i.e., capacity to perform targeted function or skill) documented observed changes for two of the three clients during the course of their treatment. These two clients transitioned from performing the targeted functions of a task *With Assistance* to performing the targeted functions *Independently* for the same task (i.e., Client A: *Mobility-Environment, Gross Motor Task*; Client B: *Transfer-Wheelchair*).

The OT-TRI documented observed changes during the course of treatment for two of the *Targeted Function or Skill* categories (i.e., *Cognitive* and *Sensorimotor*). The *Cognitive* category documented observed changes for two of the three clients. Analysis of the profile data revealed a shift in the *Cognitive* items associated with an activity when comparing the Beginning session to subsequent session(s) in the clients' courses of treatment. The *Cognitive* skill items transitioned from *Self-Awareness* to *Self-Monitoring* as Client A became more independent in safely maneuvering in her environment. For another client, *Cognitive* items reflected a different type of observed change during course of treatment. The profile data for Client C's Beginning session did not contain a *Cognitive-Targeted Function or Skill* item for a dressing and transfer activities; whereas, the profile data for subsequent sessions revealed the three targeted *Cognitive* skills (i.e.,

*Learning Skill/Technique* for the dressing activity; *Decision Making* and *Problem Solving* for the transfer activity).

The *Sensorimotor-Targeted Function or Skill* items also reflected some observed changes within the profile data for two of the three clients. Analysis of the profile data revealed the number of additional *Sensorimotor-Targeted Function or Skill* items increased for an activity when the client repeated the activity in a subsequent session(s). The profile data for Client C's earlier session contained a single item *Sensorimotor-Joint Mobility* for the *AAROM* activity. The profile data for the session at the End of her course of treatment contained *Joint Mobility*, *Strength*, and *Tone*. The client had regained some movement in her right shoulder during the course of her treatment. Similarly, the profile data for Client A contained three *Sensorimotor* items (i.e., *Coordination*, *Functional Movement*, *Postural Control*) associated with the *Gross Motor Task* item in the Beginning session. The profile data for the Middle session contained the additional item *Strength*, and the profile data for the session at the End of her course of treatment contained the all of the previous *Sensorimotor* items plus the *Functional Ambulation* item. This concludes the results of the case study analysis. The next section presents the implications of the findings.

## **Discussion**

Study Three aimed to examine the sensitivity of the OT-TRI to capture changes in intervention methods that occurred during the course of treatment for three clients. The results provide preliminary evidence in the capacity of some of the OT-TRI items to capture observed changes in intervention methods over time. The OT-TRI demonstrated

some sensitivity in its capacity to identify observable changes in the intervention methods as the clients progressed in their treatment. The addition of or shift to more complex *Targeted Function or Skill* items provided evidence in the client's ability to perform a more demanding activity. A few of the *Therapist Action* and *Client Response* items also demonstrated some sensitivity. These items identified a reduction in the amount of physical assistance and verbal support that therapists provided to clients which indicated an improvement in the client's level of independence over the course of treatment.

A limitation of this study is that the several activities did not meet the criteria for analysis because the activities did not occur in at least two of the treatment time periods. The same—or very similar activity—must have occurred in two or more time periods to detect a change in intervention methods. Several activities were observed in only one session, which did not allow for the observation of changes in the intervention methods that were related to those activities. A few *Activity* items were removed from the analysis even though the items were present in the profile data for two or more time periods. Removal of these items was necessary because none of the intervention methods (e.g., *Therapist Action*, *Client Response*) associated with the *Activity* items demonstrated a change from one time period to another time period. There are several reasons that may have contributed to the absence of change in these instances: (a) The change in intervention method may have not been necessary; (b) The therapist may have neglected to make the necessary change in intervention method; (c) The client may not have improved, so no change was expected; (d) The OT-TRI may not be sensitive enough to capture a change in intervention method that did occur; or (e) The PI may have not

observed and documented a change in intervention method that did occur. Altogether, the limitations posed difficulty in assessing the capacity of several OT-TRI items to capture change over time.

Future research is necessary to assess the sensitivity of the OT-TRI's several items. However, this initial attempt to study the sensitivity of the OT-TRI provides some useful information with regard to the design of future studies. The sample size for the current study was small and lacked homogeneity, specifically in terms of length of stay and age. The clients had large differences in terms of length of stay (e.g., 2 weeks versus 8 weeks). Also, the collection of videos represented a limited proportion of the clients' therapy sessions. The proportion of video-recorded therapy sessions to total number of therapy sessions (estimated according to length of stay) was 3:12 for Client A, 4:18 for Client 2, and 5:48 for Client C. It is recommended that future studies increase the number of video-recorded sessions to minimize the number of items removed from analysis due to the occurrence of items in only one therapy session. Also, it is recommended that future researchers set parameters on a maximum the length of stay to obtain greater homogeneity of the sample.

Despite the limitations, this exploratory study yielded valuable information regarding the potential sensitivity of the OT-TRI. The results suggest that the granularity of the OT-TRI categories appears to be sufficient to show change in intervention methods over time. Additional research is required to establish the sensitivity of the OT-TRI at the item level.

This chapter presented the results of the third and final study of this dissertation research that examined the validity of the OT-TRI. The next chapter provides a synthesis of the findings of the three inter-related studies and a discussion of the implications of this research for occupational therapy.

## CHAPTER VI

### DISCUSSION

This dissertation research systematically examined the validity of a new taxonomy, the Occupational Therapy Taxonomy of Rehabilitation Interventions (OT-TRI). This introductory paragraph provides the reader with a brief synopsis of the significance of this research, key findings, and implications for occupational therapy. Researchers have called for the continued development of rehabilitation taxonomies to characterize the *active ingredients* of the therapeutic process. A few taxonomies have received widespread publication. None of these taxonomies included a means to account for the impact of the actual interaction between the client and therapist. In this dissertation, the term *therapeutic process* refers to the ebb and flow of interaction between the client and therapist within a therapy session that brings about a productive change in the client's behavior or performance. The OT-TRI captures components of the therapeutic process that have not been collected by previously published taxonomies. This researcher asserts that the inclusion of the client-therapist interaction component provides a more comprehensive method to identify the active ingredients of occupational therapy interventions. The accurate and complete measurement of active ingredients provides a means to relate occupational therapy interventions with outcomes.

This final chapter is organized into three parts. The first part presents a summary of the findings of each of the three inter-related studies that systematically examined the

content validity of the OT-TRI. The second part discusses this researcher's evolving perspective about the OT-TRI revision process and new insights that emerged with regard its application. This chapter concludes with directions for the continuance of this line of research.

### **Synopsis of the Findings**

The aim of Study One (Chapter III) was to examine the content validity of the OT-TRI using two validation procedures that were completed by a panel of occupational therapists with expertise in stroke rehabilitation. An expected finding was that experts perceived the OT-TRI items as highly relevant with an adequate degree of clarity. As also expected, the evaluation of inter-observer agreement was a complicated process. This researcher did not anticipate the volume of descriptive data and the complexities associated with multiple dimensions of categorical data. Findings suggest that the OT-TRI can be used to identify the categories of the therapeutic process, but that further delimitation of items will be necessary to improve the consistency of observers' coding. The high level of agreement among experts for the non-occurrence of items was an interesting finding. Taxonomies provide a means to not only capture the occurrence of key components but also to identify the non-occurrence of components in the therapeutic process.

The aim of Study Two (Chapter IV) was to examine the content validity of the OT-TRI by comparing it with the PSROP OT Taxonomy, the most widely published taxonomy in stroke rehabilitation literature. As expected, the results demonstrated that the OT-TRI represented the domains presented in the PSROP OT Taxonomy. The



following presents the key differences revealed in the comparison of the OT-TRI with the PSROP OT Taxonomy. The OT-TRI provided additional information about interventions (e.g., observable components of client-therapist interactions) as compared to the PSROP OT Taxonomy. Additionally, the two taxonomies differed with regard to the degree of parallelism within the taxonomies' categories. The categorization of items within the OT-TRI presents a more parallel structure. In the OT-TRI, the *Cognitive-Targeted Function or Skill* category contained only items that related to possible client's cognitive skills and functions that were targets of the intervention. In contrast, items included in the PSROP OT Taxonomy often lacked a parallel structure. For example, the *Intervention Code* category contained items that were a theoretical approach (e.g., *NDT/Bobath* item), a technique (e.g., *One-Handed Skill*), body structure/function (e.g., *Upper Extremity, Memory*), or an assistive device (e.g., *Wheelchair*). The OT-TRI's comprehensive domain of the therapeutic process and the parallel structure of its categories provide support for the overall validity of the new taxonomy.

The aim of Study Three (Chapter V) was to conduct a systematic examination of the sensitivity of the OT-TRI in terms of its capacity to capture change in intervention methods over time. The findings demonstrated the *sensitivity to change* of few items within each of the OT-TRI categories. However, it became apparent during data analysis that the sensitivity of certain items could not be evaluated. The evaluation of these items was limited due to not having the same (or very similar) activity to compare for two time periods of the client's course of treatment. The method for this study did not take into account the customary practice of occupational therapy, which is to vary activities during

the course of treatment. Additional research will be required to establish the sensitivity of the remaining OT-TRI items.

These three studies used different approaches to provide an initial examination of the content validity of the OT-TRI. The results support the perspective that the OT-TRI provides a more domain-complete taxonomy in comparison to taxonomies published in the past 20 years. The results also provided valuable information toward needed revisions of the OT-TRI and subsequent assessment of the inter-observer agreement and sensitivity to change of specific items.

### **Perspective on Revision of the OT-TRI**

The revision of the OT-TRI is an essential first step prior to further validation and reliability studies. Each of the three studies, conducted as part of this dissertation, provided valuable information with regard to the revision of the OT-TRI: particularly for items within the *Targeted Function or Skill* and the *Therapist Action* categories. An unexpected finding that emerged from this research pertains to the change in this researcher's perspective about the OT-TRI revision process. Initially, this researcher expected to revise all of the OT-TRI items that showed poor inter-observer agreement or sensitivity to change. This researcher became aware of the need to narrow the focus of the revision process after the completion of Study One. The difficulties encountered in the collection and review of videos that were representative of all 119 items contributed to this awareness. This researcher recognized the need to focus the content validation on a specific sub-category (e.g., *Cognitive* category of the *Targeted Function or Skill*) rather than the entire OT-TRI. The focus on a specific category and its respective items will

provide a more feasible design to assess the agreement and sensitivity of items within that category.

An additional insight emerged after Study Three. It became apparent to this researcher that the OT-TRI not only provides a method to identify components of the therapeutic process but also provides a method for the development of intervention protocols. This researcher envisions that these intervention protocols would be based on an identifiable treatment approach, e.g., task-oriented approach (Bass-Haugen, Mathiowetz, & Flinn, 2008) or the theory of occupational adaptation theory (Schultz, 2014). The treatment approach (or approaches) provides a framework for *what* specific skill or behavior is the target of the intervention (e.g., the client's development of a habit of locking wheelchair brakes when stationary; the client's accurate judgment of the distance that he can safely reach for objects). A focus on the treatment approach would provide the framework for *how* the therapist facilitates the client's performance or response to the challenge encountered. For example, the therapist calls for an adaptive response from the client when the therapist provides concrete feedback to the client about his balance and withholds instruction when the client's re-engages in problem solving through a task.

This new awareness of the relationship between the OT-TRI and intervention protocols shifted this researcher's perspective again with regard to the revision of the OT-TRI. This researcher now proposes that the most productive revision process would involve the development of intervention protocols based on identifiable treatment approaches and the identification of the associated active ingredients (i.e., using the OT-

TRI items). This revision process would consist of the identification, revision (as applicable), and validation of those items that relate to an intervention protocol based on a specified treatment approach. The following paragraph provides an example of the development of an intervention protocol based on theory of occupational adaptation theory and task-oriented treatment approach.

The aim of this intervention protocol would be to facilitate a client's ability to accurately perceive "safe-reach" distances and to self-monitor postural control while safely reaching for objects. The theory of occupational adaptation and the task-oriented treatment approach would serve as the theoretical basis for this intervention protocol. A few relevant concepts from occupational adaptation theory include acknowledgment that the client (not the therapist) is the agent of change and that intervention should target the client's ability to respond adaptively to the challenges encountered. Relevant concepts from task-oriented treatment approach include context-relevant practice as well as feedback. The integral OT-TRI items that correspond with the overall treatment approach might include: *Activity* (e.g., *Occupation-Based Activity* items relevant to client's roles and context); *Targeted Function or Skill* (e.g., *Postural Control*, *Proprioceptive Processing*, *Self-Awareness*, *Self-Monitoring*); *Therapist Action* (e.g., *Elicited Client Input/Feedback*, *Provided Observation/Feedback*); and *Client Response* (e.g., *Self-Initiated Adaptation* during a familiar activity). Omission of any of the identified OT-TRI items would compromise the fidelity of the treatment.

### **Relevance of the OT-TRI to Research and Practice**

This section presents the relevance of the OT-TRI for practice followed by a discussion of the relevance of the OT-TRI in comparative effectiveness research. The OT-TRI can serve as a mechanism to connect theoretical approaches to practice. The OT-TRI can identify those *Activity, Targeted Function or Skill, Therapist Action*, and *Client Response* items that are integral elements of a theoretical approach as well as identifying any items counter-productive to a theoretical approach. The inclusion of the new components, *Therapist Action* and *Client Response*, are compatible with concepts included in the recently published Rehabilitation Treatment Taxonomy (RTT) (Dijkers, 2014). The RTT is a taxonomy developed by leading rehabilitation researchers that describes what rehabilitation clinicians do in direct interaction with patients to make a difference in the patient's functioning. The RTT provides a method for the dissection of a treatment session to identify the ingredients and how those ingredients are hypothesized to improve aspects of a patient's functioning (Dijkers, 2014). The OT-TRI and the proposed revision process are consistent with and supported by this group of researcher's most recent work.

The utility of a taxonomy is that it provides a method to dissect treatment interventions in an effort to explicate its active ingredients. Hart et al. (2014) discusses how a taxonomy can show how the active ingredients of one intervention would differ from the active ingredients of another intervention. This differentiation of the active ingredients associated with two or more intervention approaches provides a basis for comparative effectiveness research. The differentiation of intervention components

provides a mechanism to test what works, what doesn't work, and what works best.

Taxonomies provide a means to establish and assess the fidelity of interventions provided and produce best practices that are evidence-based.

### **Recommendations for Future Research**

The previous section described the recommended OT-TRI revision process, and the overall significance of the OT-TRI, and an example of how it can be used to operationalize interventions grounded in identifiable treatment approaches. The remainder of this dissertation presents future directions of this line of research.

The next step in this research is to identify intervention protocols based on identifiable treatment approaches. Intervention protocols that are grounded in the theory of occupational adaptation and relevant practice models will be developed. The OT-TRI items essential for the implementation of the intervention protocol should be identified. These items must exemplify the key components of the therapeutic process that facilitate the targeted outcome of the intervention. Additional OT-TRI items may need to be created if it is discovered that a key component of the intervention protocol is not represented by the OT-TRI. The *Therapist Action* and *Client Response* items should provide a mechanism for describing the optimal client-therapist interactions associated with the identifiable treatment approach. Next, the validity and reliability of the identified OT-TRI items associated with an identifiable treatment approach should be tested.

This dissertation research provided valuable information with regard to the design of future studies. It is recommended that future validation studies apply the following guidelines with regard to the collection of videos of therapy sessions.

1. Researcher identifies a few OT-TRI items to be examined at a time (e.g., OT-TRI items related to an intervention protocol).
2. Researcher collects therapy session data with an equal occurrence and non-occurrence of the specified items.
3. Researcher collects therapy session data that contains the same (or very similar) activity and item-related data across course of treatment.

The validation of OT-TRI items associated with various intervention protocols based on identifiable treatment approaches sets the stage for comparative effectiveness studies. Additionally, the OT-TRI could be used as a fidelity measure in research studies that compare the effectiveness of two different theoretically based intervention protocols.

The following presents two other arms for this line of research. One arm aims to assess the OT-TRI training process. Future studies could evaluate training methods to identify the type and extent of training necessary for accurate use of the OT-TRI as a behavioral observation measure. Another arm of this research is to test the effectiveness of the OT-TRI in the development of students' understanding of the therapeutic process and key components of interventions grounded in various treatment approaches.

Similarly, clinicians could engage in participatory action research and use the OT-TRI to

collect data on practice patterns. This research would target the following two-part question:

1. Does the knowledge of the type and frequency of intervention components that comprise 'usual' practice patterns have an observable impact on future practice patterns?
2. Do changes in practice patterns result in improved outcomes (e.g., client's response to intervention, greater functional gains)?

This section identified the next step in validation of the OT-TRI and described a line of research that has formed as a result this dissertation research. The following section provides a final statement with regard to the significance of this research.

### **Conclusion**

The explicit characterization of the therapeutic process is a valuable and necessary area of scholarship that has far reaching implications for research, practice, and education. The AOTA/AOTF research agenda (2009), in accord with health care researchers, calls for the development of methods to measure the effectiveness of rehabilitative interventions. In order to accomplish this charge, occupational therapy needs valid, reliable methods of capturing key components of the therapeutic process. The OT-TRI introduces a method for characterizing specific intervention approaches that includes not just the activity or targeted function but more importantly the way in which the intervention was applied. This new dimension (describing client-therapist interactions) provides a step toward a more comprehensive taxonomy to characterize the therapeutic process for specific occupational therapy interventions.



## REFERENCES

- Allison, H., & Strong, J. (1994). Verbal strategies used by occupational therapists in direct client encounters. *The Occupational Therapy Journal of Research*, 14(2) 113-128.
- Anastasi, A., & Urbina, S. (1997). *Psychological Testing*, (7<sup>th</sup> ed.). Upper Saddle River, NJ: Prentice-Hall, Inc.
- American Occupational Therapy Association (2008). Occupational therapy practice framework: Domain and process, 2nd Ed. *American Journal of Occupational Therapy*, 62(4), 625-683.
- American Occupational Therapy Association & American Occupational Therapy Foundation (2009, November 9). *AOTA and AOTF adopt a research agenda for occupational therapy*. Retrieved March 2010 from <http://aota.org/Educate/Agenda.aspx>.
- Ballinger, C., Ashburn, A., Low, J., & Roderick, P. (1999). Unpacking the black box of therapy: A pilot study to describe occupational therapy and physiotherapy interventions for people with stroke. *Clinical Rehabilitation*, 13, 301-309.
- Bass-Haugen, J., Mathiowetz, V., & Flinn, N. (2008). Optimizing motor behavior using the occupational therapy task-oriented approach. In M. V. Radomski & C. A. Trombly Latham (Eds.), *Occupational Therapy for Physical Dysfunction*, (6th ed., pp. 598–617). Philadelphia: Lippincott Williams & Wilkins.

- Bode, R. K., Heinemann, A. W., Semik, P., & Mallinson, T. (2004a). Patterns of therapy activities across length of stay and impairment levels: Peering inside the “black box” of inpatient stroke rehabilitation. *Archives of Physical Medicine and Rehabilitation*, 85(12), 1901-1908. doi: 10.1016/j.ampr.2004.02.023
- Bode, R. K., Heinemann, A. W., Semik, P., & Mallinson, T. (2004b). Relative importance of rehabilitation therapy characteristics on functional outcomes for persons with stroke. *Stroke*, 35(11), 2537-2542.
- Booth, J., Davidson, I., Winstanley, J., & Waters, K. (2001). Observing washing and dressing of stroke patients: Nursing intervention compared with occupational therapists: What is the difference? *Journal of Advanced Nursing*, 33(1), 98-105.
- Cole, M. B., & McLean, V. (2003). Therapeutic relationships re-defined. *Occupational Therapy in Mental Health*, 19(2), 33-56.
- Conroy, B., Hatfield, B., & Nichols, D. (2005). Opening the black box of stroke rehabilitation with clinical practice improvement methodology. *Topics in Stroke Rehabilitation*, 12(2), 36-48. doi: 10.1310/L3X7-9Y2R-AABF-NF5M
- DeJong, G., Hsieh, C., Gassaway, J., Horn, S. D., Smout, R. F., Putman, K., James, R., Brown, M., Newman, E. M., & Foley, M. P. (2009). Characterizing rehabilitation services for patients with knee and hip replacement in skilled nursing facilities and inpatient rehabilitation facilities. *Archives of Physical Medicine and Rehabilitation*, 90, 1269-1283.

DeJong, G., Horn, S. D., Gassaway, J. A., Slavin, M. D., & Dijkers, M. P. (2004).

Toward a taxonomy of rehabilitation interventions: Using an inductive approach to examine the “black box” of rehabilitation. *Archives of Physical Medicine and Rehabilitation*, 85(4), 678-686.

Dijkers, M. P. (2014). Rehabilitation treatment taxonomy: Establishing common ground. *Archives of Physical Medicine and Rehabilitation*, 95(1), S1-5.

Dijkers, M. P., Hart, T., Tsaousides, T., Whyte, J., & Zanca, J. M. (2014). Treatment taxonomy for rehabilitation: Past, present, and prospects. *Archives of Physical Medicine and Rehabilitation*, 95(1), S41-50.

Finlay, L. (2004). *The practice of psychosocial occupational therapy*, (3<sup>rd</sup> ed.). United Kingdom: Nelson Thornes Ltd.

Freelon, D. (2010). ReCal: Intercoder reliability calculation as a web service. *International Journal of Internet Science*, 5(1), 20-33.

Gordon, W. A. (2010). Perspectives on rehabilitation research. *Archives of Physical Medicine & Rehabilitation*, 91, 169-72

Guidetti, S., & Tham, K. (2002). Therapeutic strategies used by occupational therapists in self-care training: A qualitative study. *Occupational Therapy International*, 9(4), 257-276.

Hall, A. M., Ferreira, P. H., Maher, C. G., Latimer, J., & Ferreira, M. L. (2010). The influence of the therapist-patient relationship of treatment outcome in physical

- rehabilitation: A systematic review. *Journal of the American Physical Therapy Association*, 90(8), 1099-1110.
- Hart, T. (2009). Treatment definition in complex rehabilitation interventions. *Neuropsychological Rehabilitation*, 19(6), 824-840.
- Hart, T., Tsaousides, T., Zanca, J. M., Whyte, J., Packel, A., Ferraro, M., & Dijkers, M. P. (2014). Toward a theory-driven classification of rehabilitation treatments. *Archives of Physical Medicine and Rehabilitation*, 95(1), S33-44.
- Hatfield, B., Millet, D., Coles, J., Gassaway, J., Conroy, B., & Smout, R. J. (2005). Characterizing speech and language pathology outcomes in stroke rehabilitation. *Archives of Physical Medicine & Rehabilitation*, 86, Suppl 2, S61-72.
- Heinemann, A. W. (2008). State of the science on postacute rehabilitation: Setting a research agenda and developing evidence base for practice and public policy-An introduction [The Issue Is]. *American Journal of Occupational Therapy*, 62, 251-55.
- Hintze, J. M. (2005). Psychometrics of direct observation. *School Psychology Review*, 34(4), 507-519.
- iMovie (Version 9). [computer software]. Cupertino, CA: Apple, Inc.
- Jones, J., & Hunter, D. (1995). Consensus methods for medical and health services research. *British Medical Journal*, 311, 376-380.

- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 33, 159-174.
- Latham, N. K., Jette, D. U., Coster, W., Richards, L., Smout, R. J., James, R. A., Gassaway, J., & Horn, S. D. (2006). Occupational therapy activities and intervention techniques for clients with stroke in six rehabilitation hospitals. *American Journal of Occupational Therapy*, 60, 369-378.
- Latham, N. K., Jette, D. U., Slavin, M., Richards, L. G., Procino, A., Smout, R. J., & Horn, S. D. (2005). Physical therapy during stroke rehabilitation for people with different walking abilities. *Archives of Physical Medicine and Rehabilitation*, 86, S41-50
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric Theory*, (3<sup>rd</sup> ed.). McGraw-Hill, Inc.
- Portney, L. G., & Watkins, M. P. (2009). *Foundations of Clinical Research: Applications to Practice*. (3<sup>rd</sup> ed.), Upper Saddle River, NJ: Pearson Education, Inc.
- Richards, L. G., Latham, N. K., Jette, D. U., Rosenberg, L., Smout, R. J., & DeJong, G. (2005). Characterizing occupational therapy practice in stroke rehabilitation. *Archives of Physical Medicine and Rehabilitation*, 86, S51-60.doi: 10.1016/j.apmr.2005.08.127

- Schulz, R., Czaja, S. J., McKay, J. R., Ory, M. G., & Belle, S. H. (2010). Intervention taxonomy (ITAX): Describing essential features of interventions (HMC). *American Journal of Health Behavior*, 31(6), 1-19.
- Schultz, S. (2014). Theory of occupational adaptation. In B.A.B. Schell, G. Gillen, M.E. Scaffa, & E.S. Cohn (Eds.), *Willard & Spackman's Occupational Therapy*, (12th ed.) (pp. 527-540). Baltimore, MD: Lippincott, Williams & Wilkins.
- Schultz, S., Whisner, S. M., & Geddie, M. (2013). *Taxonomy of rehabilitation interventions: Identifying the complexity and granularity of therapeutic interventions*. Manuscript in preparation.
- Schultz, S., Whisner, S. M., & Shierk, A. (2009, November). Build your own practice-based evidence. Workshop presented at the Mountain Central Conference, San Antonio, TX.
- Sim, J., & Wright, C. C. (2002). *Research in health care: Concepts, designs, and methods*. United Kingdom: Nelson Thornes Ltd.
- Smallfield, S., & Karges, J. (2009). Classification of occupational therapy intervention for inpatient stroke rehabilitation. *American Journal of Occupational Therapy*, 63(4), 408-413.
- Taylor, R. R. (2008). *The Intentional Relationship Model: Occupational Therapy and Use of Self*. Philadelphia: F.A. Davis.

- Taylor, R. R., Lee, S. W., & Kielhofner, G. (2011). Practitioners' use of interpersonal modes within the therapeutic relations: Results from a nationwide study. *Occupational Therapy Journal of Research*, 31(1), 6-14.
- van Langeveld, S. A. H. B., Post, M. W. M., van Asbeck, F. W. A., Postma, K., Dam, D., & Pons, K. (2008). Development of a classification of physical, occupational, and sports therapy interventions to document mobility and self-care in spinal cord injury rehabilitation. *Journal of Neurologic Physical Therapy*, 21(1), 2-7.
- Watkins, M. W., & Pacheco, M. (2000). Interobserver agreement in behavioral research: Importance and calculation. *Journal of Behavioral Education*, 10(4), 205-212.
- Whisner, S. M., Schultz, S., & Owens, B. (2011, November). Describing observable actions of therapists in treatment. Workshop presented at the Mountain Central Conference, Frisco, TX.
- Whisner, S. M., Schultz, S., Thom, C., & Jewell, V. (2010, October). Build your own practice-based evidence. Workshop presented at the Iowa Occupational Therapy Association Conference, Des Moines, IA.
- Whyte, J., & Hart, T. (2003). It's more than a black box; it's a Russian doll: Defining rehabilitation treatment. *American Journal of Physical Medicine and Rehabilitation*, 82, 639-652.
- Whyte, J., Dijkers, M. P., Hart, T., Zanca, J. M., Packel, A., Ferraro, M., & Tsaousides, T. (2014). Development of a theory-driven rehabilitation treatment taxonomy:

Conceptual issues. *Archives of Physical Medicine and Rehabilitation*, 95(1), S51-60.



## APPENDIX A

### OT-TRI Instrument (Excerpt)

# OT-TRI Instrument (Excerpt)

Occupation-Based Activity	Therapist Action(s)	Targeted Skill/Function(s)	Occupation-Based Activity	Therapist Action(s)	Targeted Skill/Function(s)
Bath/Shower Dress <input type="checkbox"/> UE <input type="checkbox"/> LE Eat/drink/feed	_____ _____ _____	_____ _____ _____	Mobility (Environment) <input type="checkbox"/> cane <input type="checkbox"/> walker <input type="checkbox"/> W/C <input type="checkbox"/> none	_____ _____ _____	_____ _____ _____
<b>PATIENT'S RESPONSE RELATED TO INTERVENTION</b>					
Energy/Fatigue		Generalization of Skill/Behavior (Adaptation)		Performance	
Perception of Outcome of Intervention					
<i>Example showing how to use codes to complete form: Example session for a client with Hemiplegia completing a preparatory activity targeting normalizing muscle tone and improving postural control and an ADL task of applying lotion to affected extremities.</i>					
Preparatory Activity	Therapist Action(s)	Targeted Function/Skill (s)	Occupation-based Activity	Therapist Action(s)	Targeted Function/Skill (s)
Standing - dynamic	PI03 PF05	SM12 SM15	Personal hygiene <input type="checkbox"/> cosmetics <input checked="" type="checkbox"/> body care <input type="checkbox"/> shave <input type="checkbox"/> hair care	PI01 VS03 PF04	SP04 SM01 C11
<b>CODES: Therapist Action(s) applied during the intervention to facilitate client's performance. (Select for each intervention activity.)</b>					
Modification	Physical Assistance/Input (or Method)		Psychosocial Facilitation/Motivation	Visual Assistance	Verbal Support
M-01 Assistive device M-02 Modified env	PA-01 Supervision/Setup PA-02 Min A	PI-01 Tactile cue PI-02 Positioning	PF-01 Affirmed/validated PF-02 Paraphrased	VA-01 Pointed to objects VA-02 Visual tool/aid	VS-01 Asked open question VS-02 Asked closed question
<b>CODES: Targeted Function or Skill that is the focus in the intervention task. (Select for each intervention activity)</b>					
Cognitive		Psychosocial		Sensorimotor/Perceptual	
C-01 Adaptive capacity C-02 Alertness	P-01 Asserting needs/interests P-02 Awareness (social norms)	SM-01 Coordination (bilateral) SM-02 Coordination (eye-hand)	SP-01 Auditory processing SP-02 Gustatory processing		

## APPENDIX B

### OT-TRI Item Questionnaire (Excerpt)

## OT-TRI Item Questionnaire (Excerpt)

<b>INSTRUCTIONS:</b> The questionnaire is organized according to each of the main sections of the OT-TRI. Read the definition for each of the Items listed in Column 1 and complete the correspondings ratings for Relevance (Column 2) and Clarity (Columns 3 and 4). Answer the question regarding the inclusion of additional items that follows each major section.						
(COLUMN 1)	(COLUMN 2)				(COLUMN 3)	
<b>ITEMS: EDUCATION</b>						
	<b>Place a checkmark for the Relevance Rating (Select only 1)</b>				<b>Is the item clear and distinct from other items?</b>	
<b>Education (impairment/condition)</b>	Not Relevant	Somewhat Relevant	Relevant	Extremely Relevant	No	Yes
<b>Definition:</b> an intervention process that involves imparting knowledge and information about a condition or what to expect from the condition.			1	4		5
<b>Education (purpose of therapy/session)</b>	Not Relevant	Somewhat Relevant	Relevant	Extremely Relevant	No	Yes
<b>Definition:</b> an intervention process that involves imparting knowledge and information about the rationale behind an activity [or intervention]			2	3		4
<b>Education (used of device/material)</b>	Not Relevant	Somewhat Relevant	Relevant	Extremely Relevant	No	Yes
<b>Definition:</b> an intervention process that involves imparting knowledge and information about adaptive equipment or assistive technology			2	3		4
<b>Education (home program)</b>	Not Relevant	Somewhat Relevant	Relevant	Extremely Relevant	No	Yes
<b>Definition:</b> an intervention process that involves imparting knowledge and information [about exercises and/or activities to be completed at home]			1	4		5
<b>For the above category (Education) are there additional items that should be included:</b>						
<b>ITEMS: COLLABORATION</b>						
	<b>Place a checkmark for the Relevance Rating (Select only 1)</b>				<b>Is the item clear and distinct from other items?</b>	
<b>Collaboration (rapport)</b>	Not Relevant	Somewhat Relevant	Relevant	Extremely Relevant	No	Yes
<b>Definition:</b> therapist's deliberate overtures to make a client feel at ease, particularly when first meeting and getting to know the client				5		5
<b>Collaboration (tx progress/evaluation)</b>	Not Relevant	Somewhat Relevant	Relevant	Extremely Relevant	No	Yes
<b>Definition:</b> the therapist's deliberate overtures to make a client feel at ease, particularly when first meeting and getting to know the client and client working together to achieve, conclude, and/or share related to the progress/evaluation of treatment			2	3		5
<b>Collaboration (goals/activities/interests)</b>	Not Relevant	Somewhat Relevant	Relevant	Extremely Relevant	No	Yes
<b>Definition:</b> the therapist and client working together to achieve, conclude, and/or share related to client's interests, goals, and/or desired activities			1	4		5
<b>Collaboration (critical event or situation)</b>	Not Relevant	Somewhat Relevant	Relevant	Extremely Relevant	No	Yes
<b>Definition:</b> the therapist and client working together to achieve, conclude, and/or share related to a critical event or situation (e.g., poor prognosis, stressful situation, loss, etc.)			2	3		5
<b>For the above category (Collaboration) are there additional items that should be included:</b>						

APPENDIX C

EXAMPLE OF PROFILE DATA FOR STUDY TWO

Example of Profile Data for Study Two

<b>PSROP Profile for Therapy Session 1 of 12</b>		
<b>Categories</b>	<b>Item Codes</b>	<b>Item Description</b>
<b>Type of Activity</b>	Upper extremity control	
<b>Intervention Code</b>	MI-12 ET-29 AD-50 AI-53	Musculoskeletal Intervention – Strengthening Education/Training Intervention - Patient Assistive Devices – Walker (standard) Area Involved – Upper extremity
<b>OT-TRI Profile for Therapy Session 1 of 12</b>		
<b>Categories</b>	<b>Item Codes</b>	<b>Item Description</b>
<b>Type of Activity</b>	Education – Home Program (Client) Preparatory - Resistive Exercise	
<b>Therapist Action</b>	M-01 PA-01 PF-03 PF-04 PF-05 VA-02 VA-03 VS-02 VS-03	Assistive Device Supervision/Setup Elicited Client Feedback/Input Provided Feedback/Observation Coaxed/Encouraged Visual Tool/Aid Demonstrated Task Asked Closed Question Provided Instruction
<b>Targeted Function or Skill</b>	C-05 C-12  SM-14	Learning (Skills/Technique) Self-Initiation  Strength
<b>Client Response</b>	<b>Energy</b> Fatigued throughout Session <b>Generalization</b> Adaptations with Assistance (Any Activity) <b>Performance</b> With Assistance <b>Perception of outcome</b> Mostly Positive	

## APPENDIX D

### EXAMPLE OF PROFILE DATA FOR STUDY THREE

Example of Profile Data for Study Three

<b>OT-TRI Profile for Dyad 1 for Therapy Session 1 of 3</b>		
<b>Categories</b>	<b>Item Codes (# of occurrences of item in session)</b>	<b>Item Description</b>
<b>Type of Activity</b>	Mobility (Environment) (1) Transfer – Bath (1) Gross Motor Task (1) Sensory Task (1) Purpose of Therapy Session (1) Planning (1)	
<b>Therapist Action</b>	M-01 (3) M-03 (1) PA-02 (3) PF-03 (3) PF-04 (4) PF-05 (1) VA-02 (1) VA-03 (1) VS-01 (1) VS-03 (4) VS-04 (1)	Assistive Device Modified Task Minimum Assistance Elicited Client Feedback/Input Provided Feedback/Observation Coaxed/Encouraged Visual Tool/Aid Demonstrated Task Asked Open Question Provided Instruction Provided Ongoing Instruction
<b>Targeted Function or Skill</b>	C-05 (1) C-11 (2) P-01 (1) SM-05 (1) SM-06 (3) SM-12 (1) SP-17 (1)	Learning (Skill/Technique) Self-Awareness Asserting Needs/Interests Functional Ambulation Functional Movement Postural Control Visual Processing - Tracking
<b>Client Response</b>	<b>Energy/Fatigue</b> No Signs of Fatigue <b>Adaptation</b> Adaptations with Assistance <b>Performance</b> With Assistance <b>Perception of outcome</b> Mixed Response (Positive/Negative)	



APPENDIX E

IRB APPROVAL LETTERS



**Institutional Review Board**

Office of Research and Sponsored Programs  
P.O. Box 425619, Denton, TX 76204-5619  
940-898-3378 FAX 940-898-4416  
e-mail: IRB@twu.edu

April 18, 2012

Ms. Sandra Whisner  
1210 84th Street  
Lubbock, TX 79423

Dear Ms. Whisner:

Re: *Validity and Reliability of the Occupational Therapy Clinical Improvement Measure (OT-CIM)*  
(Protocol #: 16972)

Your application to the IRB was reviewed and approved on 4/18/2012. This approval is valid for one (1) year. The study may not continue after the approval period without additional IRB review and approval for continuation. It is your responsibility to assure that this study is not conducted beyond the expiration date.

Any modifications to this study must be submitted for review to the IRB using the Modification Request Form. Additionally, the IRB must be notified immediately of any unanticipated incidents. If you have any questions, please contact the TWU IRB.

A final report must be submitted to the IRB at the conclusion of the study. If using a consent form, copies of the signed informed consent are to be submitted with the final report before the study file can be closed.

The Institutional Review Board is pleased to acknowledge your sense of responsibility for ethical research. If you have any questions concerning this review, please contact me at (214) 706-2461 or email SLin@twu.edu.

Sincerely,

Dr. Suh-Jen Lin, Chair  
Institutional Review Board - Dallas

cc. Dr. Catherine Candler, School of Occupational Therapy - Dallas  
Dr. Sally Schultz, School of Occupational Therapy - Dallas  
Graduate School



**Institutional Review Board**

Office of Research and Sponsored Programs  
P.O. Box 425619, Denton, TX 76204-5619  
940-898-3378 FAX 940-898-4416  
e-mail: IRB@twu.edu

November 19, 2012

Ms. Sandra Whisner  
1210 84th Street  
Lubbock, TX 79423

Dear Ms. Whisner:

Re: *Peering Into the Black Box of Rehabilitation Therapy: A Taxonomy for Interventions (Protocol #: 17174)*

Your application to the IRB was reviewed and approved on 11/19/2012. This approval is valid for one (1) year. The study may not continue after the approval period without additional IRB review and approval for continuation. It is your responsibility to assure that this study is not conducted beyond the expiration date.

Any modifications to this study must be submitted for review to the IRB using the Modification Request Form. Additionally, the IRB must be notified immediately of any unanticipated incidents. If you have any questions, please contact the TWU IRB.

A request to close the study file must be submitted to the IRB at the conclusion of the study. If using a consent form, copies of the signed informed consent are to be submitted with this request before the study file can be closed.

The Institutional Review Board is pleased to acknowledge your sense of responsibility for ethical research. If you have any questions concerning this review, please contact me at (214) 689-6571 or email cbailey2@twu.edu.

Sincerely,

Dr. Catherine Bailey, Chair  
Institutional Review Board - Dallas

cc. Dr. Catherine Candler, School of Occupational Therapy - Dallas  
Dr. Sally Schultz, School of Occupational Therapy - Dallas  
Graduate School