Important aspects of occupational therapy assessment

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Sammendrag
Ergoterapi-kartlegging er et viktig element for å kunne tilby klienter evidensbaserte tilbud av høy kvalitet. I denne artikkelen vil følgende temaer bli diskutert: begrunnelsene for å evaluere, stadier i evalueringsprosessen, kjennetegn ved evalueringsinstrumenter, og «top-down» og «bottom-up» tilnærminger til evaluering. Det gis dessuten en beskrivelse av hvordan begrepsvaliditet (construct validity) oppfattes i dag.

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Introduction

Occupational therapists often work with clients from across the age span presenting with a range of medical, physical, learning, developmental, and psychosocial issues using holistic, client-, and/or family-centered approaches (Case-Smith, 2005; Crepeau, Cohn & Schell, 2003; Reed & Sanderson, 1999). Through a systematic approach based on evidence and professional clinical reasoning, occupational therapists plan and deliver services in conjunction with clients and caregivers/families based on their priorities, goals, and objectives (Canadian Association of Occupational Therapists, 2002). Occupational therapists appraise many aspects of their clients' lives in the context of occupation. These aspects can include components of behaviour, development, function, physical, cognitive, psychosocial, and clinical domains (American Occupational Therapy Association, 2002; Townsend & Polatajko, 2007).

In occupational therapy practice, to complete an assessment means to judge, observe, or describe some aspect of occupational performance. Assessment can also refer to measuring, quantifying, or assigning a score to the foundation skills required to complete an occupation (Asher, 2007; Law & Baum, 2005). Evaluation involves the formulation of conclusions and hypotheses based on the test data obtained from the assessment process. Occupational therapy assessment ranges from complex to simple, general to specific, and holistic to single issues. This article will provide an introduction and overview to occupational therapy assessment issues by discussing the following issues:
(1)reasons for assessment,
(2) stages in the assessment process,
(3) types of assessment,
(4) characteristics of assessment tools, and
(5) top-down and bottom-up approach to assessment.
The contemporary conceptualization of construct validity is also described.

Reasons for assessment

«Assessment has to be undertaken for a reason. It is a means to an end, not an end in itself» (Hagedorn, 2000, p. 138). The assessment of occupational performance can take place at different stages of the occupational therapy process (such as initial referral, during the intervention process, or after clinical services have ended) and in different settings (such as in the client's home, school, work place, community locations as well as hospital/clinical settings). There are several reasons why occupational therapists complete assessments. First, assessment is necessary to establish a baseline of a client's occupational performance skills (including play/leisure, self-care, or productivity) on which service planning and therapy intervention can be based. Assessment is used to inform our decisions regarding specific clients and programs. For instance, a therapist who works in the early intervention system or primary school system will often evaluate a child who is referred for occupational therapy services in order to establish goals for the Individualized Education Program. Second, assessment can be a means of documenting change in the clinical status of a client. Third, objective assessment results can be used as a means of supplemen-

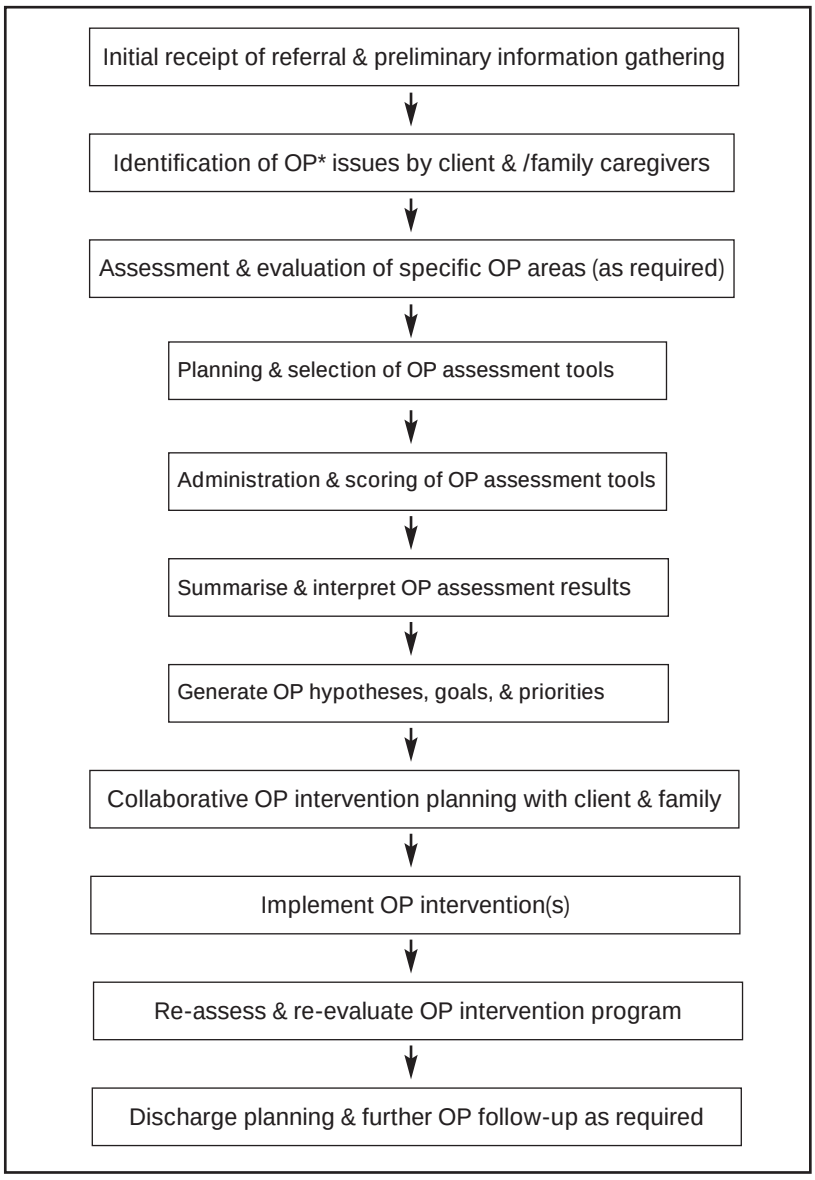

*Figure 1: Steps in occupational therapy assessment & intervention process * OP: occupational performance*

ting subjective clinical observations. Fourth, assessment results are sometimes used as a goalpost or marker for funding thresholds for publicly funded services (such as the eligibility for funding for an educational assistant within a classroom environment or attendant care within a client's home context).

Fifth, assessments are completed as a means to assist with client-centered or family-centered program planning for clients since it fosters collaborative goal setting and intervention planning with clients and caregivers. Sixth, assessment is an important component in providing or generating evidence (e.g., evidence-based practice) about the efficacy of occupational therapy services, thus contributing to the knowledge base of occupational therapy practice and theory. Finally, assessments can be used as outcome measures. Potential uses of outcome measures include:

i) to demonstrate that a clinical intervention is effective,
ii) to facilitate change that leads to improvement in client satisfaction,
iii) to demonstrate to a funding agency that a contracted service has been provided to a client,
iv) to show areas where service development might be required or more resources need to be made available, and
v) to provide evidence of the effective use of health care resources and funding.

Rogers and Holm (1989) classified the purposes of assessment as: predictive, discriminative, descriptive, and evaluative. *Predictive assessment* provides some indication of expected skill levels in regards to future occupational performance. For example, a child exhibiting poor visual motor integration skills in kindergarten might be a reliable predictor of that child having difficulties with hand writing skills Year three at primary school. Discriminative assessment involves using norms to measure and compare performances for the purpose of diagnosis, placement, or establishing the level of function in comparison to the normative group. A child who exhibits poor gross motor skills can, for example, be assessed using a standardized test where his/her gross motor skill performance is compared to a matched age-level norm to determine if performance is above or below average. Descriptive assessment is simply determining a profile of client's occupational performance skills, interests, roles, values, habits and routines. Evaluative assessment involves testing methods that are sensitive enough to detect clinical change when used sequentially. An example would be a client's self-care skills being evaluated before an eight-week intervention program is started, then at four weeks into the program, and then after the program is finished at the end of the eight-week program.

In summary, assessment may be a management, clinical, client-perspective, or professional tool. Therapists have a professional and ethical responsibility to assess the need for service, design interventions based on information gathered from assessment, and evaluate the results of the intervention based on re-assessment results. Administrators and managers may use assessment information to make informed decisions about the continuation of program funding or the need to establish new clinical programs. Different types of assessment are completed at different stages of the assessment process. These stages will now be described.

Stages of the assessment process

The steps of the assessment process of

client service provision fall into a continuum of steps that are outlined in Figure 1.

Types of assessment methods

Measurement is the process that entails the assessment, calculation, or judgment of the magnitude, quantity, or quality of a trait or characteristic. Assessment refers to a set of procedures used to find out information where as evaluation refers to specific procedures used in the assessment process. Assessment involves the collection, appraisal, and classification of facts gathered into an organized manner (Law & Baum, 2005). Specific assessment tools and assessment approaches (e.g., quantitative and qualitative) are developed and evaluated to ensure that they are reliable, valid, consistent, responsive, and useful. There are several types of assessment tools which occupational therapists use in their clinical practice. There are both standardized and non-standardized assessments as well as formal and informal instruments. There are also normreferenced and criterion-referenced tests. The final types of tests are self-report versus performance-based.

Standardized assessments have preestablished protocols for the administration and scoring of scale items. Clients' performance scores are recorded and then compared to the normative data. After administering and scoring the test items, the clinician looks up the client's raw score to obtain a standard score. The standard score provides a comparison of the client's performance to other individuals who are the same age and/or may be healthy or have the same diagnosis. A number of scores are associated with standardized assessment including scaled scores, t-scores, percentile ranks, stanines, and age-equivalents (Kielhofner, 2006). Standardized tests are more rigid in their administration protocols and usually have well-established reliability, validity, and responsiveness data published in their test manuals (Asher, 2007; Benson & Schnell, 1997).

Formal tests have a manual that documents its development, theoretical rationale, potential uses, standardization, reliability, validity, and responsiveness to change (Asher, 2007). They also have a test manual that includes set of instructions to follow and scoring criteria. Informal non-standardized tests are frequently designed and used by occupational therapists. These are often home-made checklists or assessment task kits created by clinicians for their own specific local use. They lack norms, a test manual, and evidence of established reliability and validity. Often informal scales augment the clinical observations made by therapists during the assessment process.

Norm-referenced tests (similar to standardized tests) have scale items that are scored and then their scores are compared to a large sample of participant's scores in order to determine how a client's test score compares to the normative sample scores (Anastasi & Urbina, 1997). Norm-referenced tests are often used as scholastic achievement tests. Criterion-referenced tools tests are those that have scale items based on the published empirical research findings instead of the average performance scores of a norm group at different age levels.

The final type of test is based on their format. There are a number of ways tests can be completed. For example, some tests have scale items where clients have to complete a task and then their task performance is scored based on a number of specific criteria. Some tests are self-report/arent-report inventories or scales. Tests can take several other formats as well including interview schedules, surveys with open ended questions, rating scales, true/false scales, and Likert scales (Law, Baum, & Dunn, 2005; McDowell, 2006).

Characteristics of assessment tools

Assessment tools need to meet a specific number of criteria in order for their test scores to be considered useable and practical. The criteria include reliability, validity, responsiveness to change, and clinical utility/practicality (Asher, 2007). These are summarized in Table 1. However, validity how we traditionally know it has been reconceptualized and therefore, it is important that therapists are familiar with this contemporary definition of validity in the context of occupational performance assessment.

A new definition of test validity

To ensure that tests are accurately assessing what they purport to measure, they must demonstrate evidence of reliability and validity. Traditionally validity was viewed as a three part concept made up of content, criterion-related, and construct validity (Cook & Beckman, 2006; Downing, 2003) (see Figure 3). In the most recent edition of the *Standards of Psychological and Educational Testing* (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 1999), the conceptualization of validity markedly changed. The view of validity theory prevailing today is largely based on the seminal work of Messick (1989, 1994, 1995). The current emphasis states that all validity is subsumed under construct validity and is concerned with «an overall evaluative judgment of the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of interpretations and actions on the basis of test scores or other models of assessment» (Messick, 1989, p. 741). Although there are numerous methods available to determine validity, validity is now viewed as a unitary/single concept. The various approaches to it are related components that can be combined to evaluate what inferences can be made from test scores (Smith, 2001).

In the 1999 *Standards*, validity was defined as «the degree to which evidence and theory support the integration of test scores entailed by proposed uses of tests» (AERA, APA & NCME, 1999, p.9). The most important issue in the development and evaluation of measures is the process of validation that involves the accumulation of evidence to provide a sound empirical foundation for proposed interpretations of test scores. Downing (2003) eloquently states this as «validity requires an evidentiary chain which clearly links the interpretation of the assessment scores or data to a network of theory, hypotheses

1. **Reliability:** the ability of the items of a test or scale to measure a construct, attribute, or trait on a cosistent basis. Specific types of reliability include:
   - **Internal consistency**: the degree to which the items of a test are correlated with one another; is the degree of homoge neity between test items. It is a measure of the item's testing the same construct and should be greater than 0.80.
   - **Alternate-form reliability/Equivalent-forms reliability:** the use of alternate or equivalent test forms to obtain correlati ons between parallel forms of the same test; the scores from two versions of the same test are compared for consisten cy; each test is expected to have item equality thus making the tests equal at a given point in time; correlations should be greater than 0.80.
   - **Split-half reliability**: the items of a test or scale are split into two groups, then combined into a two forms; the scores from the two tests are then correlated together; the results from performance on the first half of the test are correlated with the second half or the scores on all evennumbered items are compared to the odd-numbered ones.
   - **Covariance procedures:** the average of all split-half tests and is expressed at KR20 or KR21; is the consistency of responses between all items on a test.
   - **Test-retest reliability:** the ability of a test to exhibit some degree of score stability between two administrations of the same test (usually one or two weeks between the first and second administrations of the test);
   - **Intra-rater reliability:** the ability of the same person to score test items consistently between two administrations; is intended to ensure that individuals rate the same construct or trait in the same way; and
   - **Inter-rater/inter-observer reliability:** the ability of two different people to score test items consistently between two administrations; correlations of 0.85 or higher are typically expected to ensure the consistency between two raters of the same test.
2. **Content validity:** the representativeness or sampling adequacy of the items of an instrument; how well a test measures the sco pe of the attribute or trait under consideration that it purports to evaluate.
3. **Criterion-related validity:** an outside criterion is compared to the test to determine its accuracy in measuring a phenome non and refers to how well the test scores compare to what is being measured. Two types of criterion-related validity include:
   - **Concurrent/Congruent validity:** the relationship between the instrument in question and other already validated instruments that measure the same phenomenon; the extent of agreement between two simultaneous measures of the same skill or aptitude; and
   - **Predictive validity:** the ability of an instrument to forecast future behaviour, abilities, or performance of participants who complete a test; the extent of agreement between the current testresults and a future assessment. It is used to make pre dictions about future behaviour or skill aptitude.
4. **Construct validity:** how well a test measures the theoretical facets of a construct it purports to measure. Specific types of construct validity include:
   - **Convergent validity:** the extent to which a construct is correlated with constructs believed to be similar; the scale results of a test should correlated highly with another scale that measures the same variable or construct. It infers a degree of agreement measuring the same trait with two different tests of the same trait or construct.
   - **Divergent validity:** the extent to which a construct is dissimilar from other constructs believed to be unrelated or diffe rent;
   - **Discriminant validity:** the ability of a test to differentiate between two groups of participants with known differences (e.g., group with a clinical diagnosis compared with a group who is clinically normal); the test scores should not correla te with another scale of the same variable or construct. It infers the degree of agreement measuring the same trait with two different tests of the same trait or construct; and
   - **Factor analysis validity:** items of test group together to measure the construct they were intended to measure. It also includes the identification of interrelated behaviours, abilities, or functions in an individual that contributes to the collec tive abilities or functions. It involves the correlation of the test with other groups to define the common traits a test measures.
5. **Face Validity:** the items of a scale appear to address the purpose of the test and the variables that it purports to measure. It is subjective and is based on the local judgement by the author or experts on the topic.
6. **Clinical validity:** how well the scores of a test can be used to predict future performance and
7. **Responsiveness to change:** how sensitive to change in the clinical status of a person a test or instrument is
8. **Clinical utility:** the usefulness of a tool in terms of length, time to complete (also known as respondent burden), scoring format, and complexity of items

Table 1: Assessment tool selection criteria

and logic which are presented to support or refute the reasonableness of the desired interpretations» (p. 831). In this contemporary context, validity refers to evidence generated to support or refute the meaning or interpretation assigned to test results. «Validity is never assumed and is an ongoing process of hypothesis generation, data collection and testing, critical evaluation and logical inference» (Downing, 2003, p. 831).

This conceptualization of validity, known as «construct validity,» integrates the traditional components of content, criteria, and construct validity. In the 1999 *Standards* (AERA, APA & NCME, 1999), five subcomponents of construct validity evidence are included as a means of addressing the central issues implicit in the notion of validity as a unified concept. These subcomponents are:
(1) content,
(2) substantive/content,
(3) structural/response processes,
(4) generalizability/internal structure-

/relations to other variables/external, and (5) consequential aspects of construct validity (see Figure 4).

They function either as general validity criteria or as standards for all measurement. In summary, it is important for occupational therapists to be conversant with this contemporary view of construct validity as it applies to the assessment of occupational performance.

For therapists, this new view of construct validity is important in relation to the assessments, scales, and tests they use in their daily clinical practice. As new tests are developed or as older tests are revised, the new conceptualization of construct validity should be reported in tests' manuals. Occupational therapists might also participate in studies that contribute to the body of validity knowledge about a test or scale.

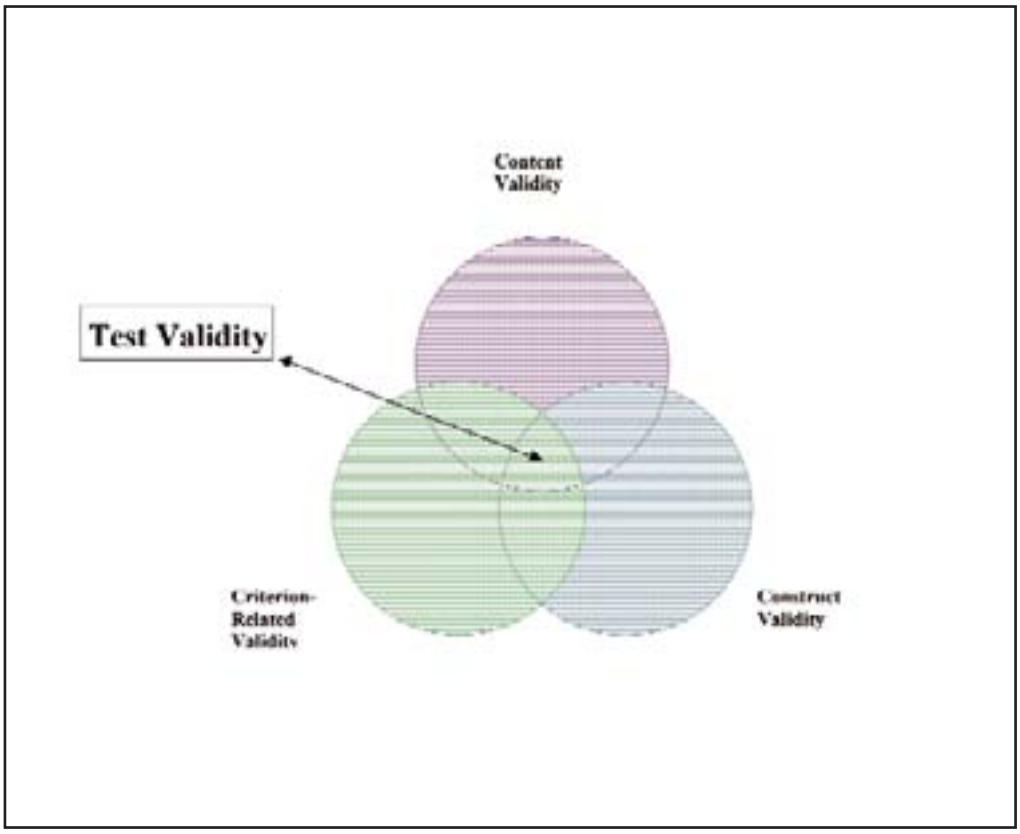

Figure 3: Traditional Tripartite View of Test Validity

Bottom-up & top-down approaches to assessment

Approaches to assessment have been described as either top-down and bottom-up (Weinstock-Zlotnick & Hinojosa, 2004). Bottom-up assessments are much more common in occupational therapy practice and fit easily into the traditional medical model approach to evaluation. As well, bottom-up instruments tend to assess smaller sub-components of a client's skills or occupational performance instead of taking a holistic perspective. «A bottom-up approach to assessment and treatment focuses on the deficits of components of function, such as strength, range of motion, balance, and so on, which are believed to be prerequisites to successful occupational performance or functioning» (Trombly, 1993, p. 253).

«An assumption inherent in the bottom-up approach is that acquisition or re-acquisition of motor, cognitive, and psychological skills will ultimately result in successful performance of activities of daily living» (Weinstock-Zlotnick & Hinojosa, 2004, p. 594). One potential limitation of the bottom-up approach is that practitioners may not connect the foundational factors to occupational performance. Strengths of the bottom-up approach include the fact that they are easily incorporated with most client groups, are suitable for time sensitive physical disabilities (such as a bone fracture, spinal cord injury or burn), are often directed by applied scientific inquiry, and many assessment tools are readily available for clinicians to use.

Practice models and theories that incorporate a bottom-up approach are Sensory Integration (Ayres, 1980), Neurodevelopmental Therapy (Bobath, 1990), Proprioceptive Neuromuscular Facilitation (Voss, Ionta, & Myers, 1985), Rood's Sensorimotor Approach (McCormack, 1996), and Motor Relearning (Carr & Shepherd, 2003). Examples of bottom-up assessment tools often used with children include the *Motor-Free Test of Visual Perception – Third Edition* (MVPT-3; Colarusso & Hammill, 2003), *Peabody Developmental Motor Scales, second edition* (PDMS-2; Folio & Fewell, 2000), *Bruininks-Oseretsky Test of Motor Proficiency, 2nd Edition* (BOT-2; Bruininks & Bruininks, 2005), *the Miller Assessment for Preschoolers* (MAP; Miller, 1988) (MAP), *Movement Assessment Battery for Children-2 Second Edition* (MABC-2; Henderson, Sugden, & Barnett, 2007), and *Developmental Test of Visual Perception – 2* (DTVP-2; Hammill, Pearson, & Voress, 1993).

A top-down test takes a much broader perspective and attempts to view the client in their context and determine what is important to them and their families/caregivers. A top-down assessment approach fits with client-centered approach to occupational therapy practice and within an occupational performance perspective (Edwards, Millard, Praskac & Wisniewski, 2003; Schemm, 2003). Occupation-based assessment fits much more readily under a top-down approach. In a top-down assessment approach, «one that starts with inquiry into role competency and meaningfulness,

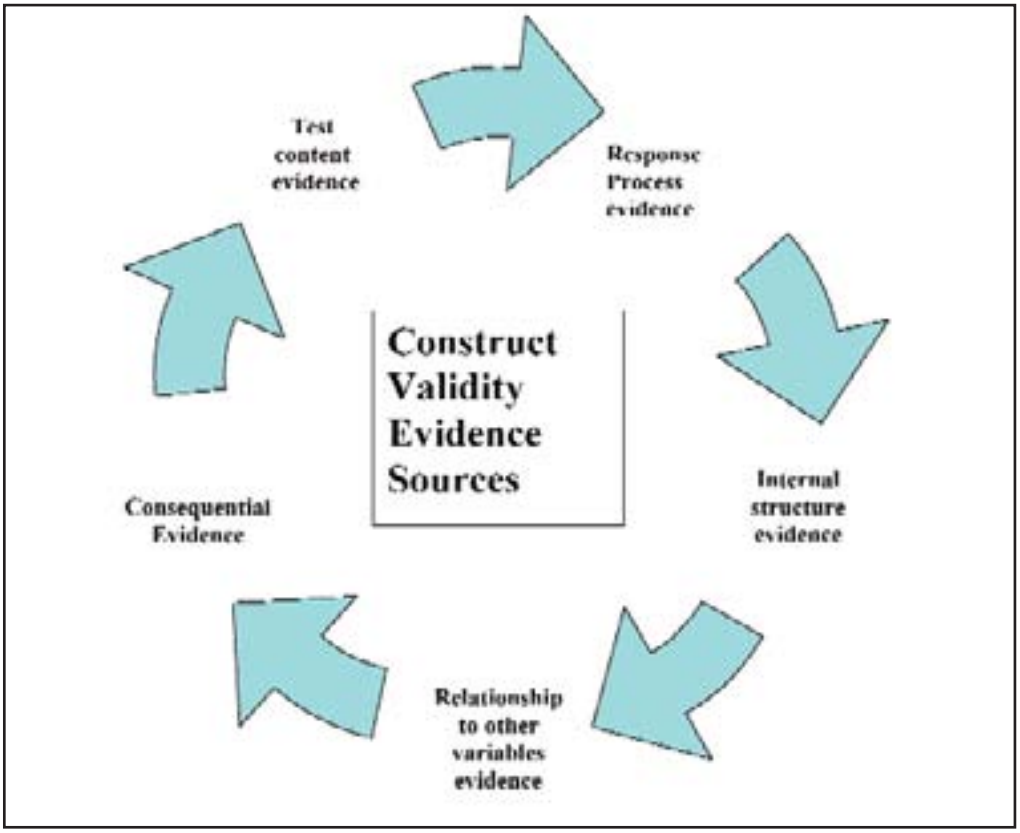

Figure 4: Sources of construct validity evidence

would clarify the purpose of occupational therapy for the client. Those roles that are important to the person, especially the ones that he or she engaged in prior to the illness or trauma, become the focus of inquiry. If a discrepancy among the past, present, and future role performances is detected during the assessment, the person would see the need for treatment. A top-down assessment further determines which particular tasks define each of the roles for that person whether he or she can now do those tasks, and probable reasons for an inability to do so» (Trombly, 1993, p. 253).

As well, in the top-down approach, «the foundational factors» (performance skills, performance patterns, context, activity demands, and client factors) are considered later (Weinstock-Zlotnick & Hinojosa, 2004, p. 594). Limitations of the top-down approach include the limited number of available assessments tools for practitioners to use, difficulties in the assessment and implementation of some practice models associated with this approach, and some models include basic science which is not readily applicable to clinical use (Law, 1998; Weinstock-Zlotnick & Hinojosa, 2004). Positive features synonymous with the top-down approach include the fact that it is related to the basic tenants of the occupational therapy profession, provides clinicians with knowledge of occupations, focuses the clinician on a holistic viewpoint of the client, facilitates theoretical autonomy, and identifies clients with occupational dysfunction (Christiansen & Baum, 1997; Weinstock-Zlotnick & Hinojosa, 2004).

Practice models and theories that incorporate a top-down approach include *Canadian Model of Occupational Performance and Engagement* (Townsend & Polatajko, 2007), *Model of Human Occupation* (Kielhofner, 2002; Kramer & Bowyer, 2007), *Occupational Adaptation Model* (Schkade & McClung, 2001; DeGrace, 2007), *Person-Environment-Occupation Model* (Law & Dunbar, 2007), *Ecology of Human Performance Model* (Dunn, 2007), and the *Person-Environment-Occupational Performance Model* (Christiansen & Baum, 1997). Examples of top-down assessments used with children include the *Canadian Occupational Performance Measure* (COPM; Law, Baptiste, Carswell, McColl, Polotajiko & Pollock, 1998), *School Function Assessment* (SFA; Coster, Deeney, Haltiwanger, & Haley, 1998), *Pediatric Evaluation of Disability Inventory* (Haley, Coster, Ludlow, Haltiwanger, & Andrellos, 1992), Pediatric Interest Profiles (PIP; Henry, 2000), *Children Helping Out: Responsibilities, Expectations and Supports* (CHORES; Dunn, 2000), and the *School Assessment of Motor and Processing Skills* (SAMPS; Fisher, Bryze & Hume, 2002).

Conclusion

An outline of occupational therapy assessment was provided. The stages of the assessment process, types of assessments, and characteristics of assessment tools were presented. The contemporary conceptualization of construct validity was also described. Finally, the topic of top-down and bottom-up assessments was discussed. Using occupational performance assessments with strong measurement properties (such as validity and reliability) is vital for therapists working with clients and their caregivers/families. ❑

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