KEY WORDS
- adolescent
- occupational therapy
- pediatrics
- research
- research design

We reviewed 22 articles on children and youth published in 2011 in the *American Journal of Occupational Therapy* and organized the articles by level of research and research type according to a framework adapted from the *International Classification of Functioning, Disability and Health* (ICF; World Health Organization, 2007). The largest percentage of articles described intervention effectiveness studies classified as Level III or IV. The bulk focused on the Body Function/Body Structure construct of the ICF, but as a whole the studies addressed all the constructs except Biomedical Molecular/Cellular. Rigor remains a concern, although laudable efforts have been made to increase strength of the evidence. Longitudinal, efficacy, and qualitative studies, as well as studies examining adolescents and the transition to adulthood, were absent from articles in this review and are important areas for future investigation. Several studies explicitly addressed intervention fidelity, an imperative in evidence-based research needed to move the profession toward the *Centennial Vision*.


The *Centennial Vision* of the American Occupational Therapy Association (AOTA) states that occupational therapy will be a “powerful, widely recognized, science-driven, and evidence-based profession with a globally connected and diverse workforce meeting society’s occupational needs” (AOTA, 2007, p. 613). Supporting this effort, the *American Journal of Occupational Therapy* (*AJOT*) has the potential to guide practitioners in making evidence-based decisions by disseminating well-designed clinical trials; making practitioners, clients, and third-party payers aware of science-driven and evidence-based innovations that have the potential to improve participation and quality of life; and, eventually, influencing health care decisions for present and future clients.

Several of the elements viewed as relevant to a shared vision in AOTA’s *Centennial Vision* support engagement in rigorous research. They include the “power to influence,” “evidence-based decision making,” and “science-fostered innovation in occupational therapy practice” (AOTA, 2007, p. 614). For these elements, it is important to examine the level of rigor in research that informs occupational therapy practice. Another *Centennial Vision* element that may be addressed by research is “expanded collaboration for success” (p. 614), which could include collaborative research and measures to assess attitudes and opinions of various stakeholders.

*AJOT* has identified six main practice areas of focus with regard to publication of evidence-based practice: (1) productive aging; (2) children and youth; (3) rehabilitation, disability, and participation; (4) mental health; (5) work and industry; and (6) health and wellness (Corcoran, 2007). These areas of focus help the profession track research production and evolution with the desired result of facilitating practitioners’ use of evidence.

In 2006, the AOTA Children and Youth Ad Hoc Committee responded to a request by AOTA President Carolyn Baum to address issues related to children and youth. The committee’s report (AOTA, 2006) identified the following key areas of research to inform practice in the area of children and youth:

- Basic and applied scientific studies related to skills, processes, and foundations for childhood and adolescent occupations
- Factors that contribute to the success or failure of a specific frame of reference
Both qualitative and quantitative methodologies to address multiple facets of above
Efficacy studies that examine interventions (efficacy, effectiveness, outcomes development)
Theory development and development of conceptual models that promote integration of theory and practice
Empirical studies conducted in context
Translational research providing information on applications to practice, policy development, systems change, program development
The roles and participation of parents, siblings, and other family members within family centered services
Longitudinal studies of the participation of children with special needs in their daily lives as they transition through childhood and adolescence into adulthood
Studies that examine factors central to the children, youth and their families such as finding a friend, participating in community life, and procuring and maintaining jobs
Studies that examine the emotional and social cost of occupational deprivation and occupational injustice for children and youth such as depression, alcohol and substance abuse, and suicide in disenfranchised youth, and what this is costing emotionally to youth and family as well as to society. (p. 8)

In their most recent review of studies involving children and youth, Bendixen and Kreider (2011) used the International Classification of Functioning, Disability and Health (ICF; World Health Organization [WHO], 2001) and the ICF–Children and Youth Version (ICF–CY; WHO, 2007) as frameworks for categorizing the areas of study addressed in AJOT. Recently, Baum (2011) expanded the ICF categories to incorporate levels of rehabilitation science. We used this classification framework with a pediatric focus to examine the areas addressed for children and youth because it offers a more comprehensive categorization of these levels of research (Table 1).

Evidence-based research is particularly crucial in the focus area of children and youth because a substantial proportion of occupational therapy practitioners work with this population. According to the AOTA (2010) Workforce Study, 21.7% of occupational therapists and 21.4% of occupational therapy assistants currently practice in schools, in addition to the 5.2% of occupational therapists and 1.8% of occupational therapy assistants who practice with children and their caregivers in early intervention programs. In this review, we examined the AJOT articles published in the area of children and youth during 2011 and identified the types of research published; determined whether the published research has the rigor to provide evidence for practice; and discussed implications for use of this evidence by practitioners, clients, and third-party payers.

Method
We analyzed 22 research studies related to children and youth published in AJOT during 2011. We identified the research design used in each published study and categorized it into one of the following six research categories: (1) systematic reviews, (2) intervention effectiveness studies, (3) efficacy studies, (4) basic research, (5) instrument development and testing studies, and (6) professional issues.

We used the level-of-evidence hierarchy system developed by the AOTA Evidence-Based Literature Review Project (Lieberman & Scheer, 2002) to classify the reviewed articles. Level I consists of systematic reviews, meta-analyses, and randomized controlled trials. Level II includes two-group pretest–posttest designs in which control is present and randomization is not (e.g., cohort designs, case control studies). Level III designs involve neither control nor randomization but instead use a one-group pretest–posttest design. Level IV includes single-subject designs, descriptive studies, and case series. Level V involves case study or expert opinion that is not based on systematic review.

Results
Of the 22 articles, 45.5% (10) were intervention effectiveness studies, 22.7% (5) were instrument development and testing studies, 27.3% (6) were basic research, and 4.5% (1) was a professional issues study.

### Table 1. Language of Rehabilitation Science

<table>
<thead>
<tr>
<th>Framework Category</th>
<th>Terms Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomedical</td>
<td>Plasticity, Synapse, Neurogenesis, Receptor, Neurotrophic factors, Neurotransmitters, Neuromodulators</td>
</tr>
<tr>
<td>Body function/body structure (ICF)</td>
<td>Executive function, Sensory processing, Mood, Motivational state, Motor planning and praxis, Language, Attention, Arousal, Sleep, Intellectual function, Theory of mind</td>
</tr>
<tr>
<td>Functional limitations</td>
<td>Gait, Strength, Postural control, Grasp and pinch, Problem solving, Range, Mobility, Endurance, Planning, Social skills, Self-regulation</td>
</tr>
<tr>
<td>Activity (ICF)</td>
<td>Stair climbing, Standing, Walking, Dressing, Grooming and hygiene, Feeding, Toileting, Writing, Listening, Learning, Communication, Social interaction</td>
</tr>
</tbody>
</table>

(Continued)
We identified no systematic reviews or efficacy studies published during 2011. Table 2 summarizes the studies.

**Intervention Effectiveness Studies**

All the intervention effectiveness studies were quantitative. Ages of children examined in the studies were 3–12 yr. Three of the 10 studies were Level I (Golos et al., 2011; Fedewa & Erwin, 2011; Golos et al., 2011), 3 were Level III (Bendixen et al., 2011; Lust & Donica, 2011), 2 were Level II (Collins & Dworkin, 2011; Fedewa & Erwin, 2011), and Environment (Bendixen et al., 2011; Lust & Donica, 2011).

A frequent limitation of past intervention effectiveness studies—a very small research cohort ($n \leq 10$)—plagued 3 of the studies (Collins & Dworkin, 2011; Fedewa & Erwin, 2011; Golos et al., 2011). Limited generalizability of findings was also a concern for the 2 studies that examined only boys (Golos et al., 2011; Umeda & Deitz, 2011) and the 2 that examined children from only one classroom (Case-Smith et al., 2011; Umeda & Deitz, 2011). Issues regarding potential bias were a concern in several of the studies. In 1 study, the occupational therapist who was conducting the study also administered the assessments (Hahn-Markowitz et al., 2011). In another, the experimental group consisted of all students in one classroom, and the control group consisted of all students in another classroom, introducing a potential selection bias (Lust & Donica, 2011).

Several of the studies incorporated measures into their protocols to increase scientific rigor. Four included fidelity measures or examined procedural reliability to ensure consistency across interventions (Case-Smith et al., 2011; Collins & Dworkin, 2011; Hahn-Markowitz et al., 2011; Umeda & Deitz, 2011). Another study included a social validity scale to assess the degree to which teachers believed the intervention was helpful for the students, thus incorporating the opinions of a stakeholder into the study (Fedewa & Erwin, 2011). Three of the studies used blinded coders who were unaware of the study’s purpose or assignment of the participants for scoring to reduce the potential for assessment bias (Collins & Dworkin, 2011; Silva et al., 2011; Umeda & Deitz, 2011).

**Instrument Development and Testing**

The 5 instrument development and testing studies examined assessments addressing body function (Little et al., 2011; Spirtos, O’Mahony, & Malone, 2011; Vanvuchelen, Roeyers, & De Weerdt, 2011), participation (Taylor, Lee, Kramer, Shirashi, Kielhofner, 2011), and intervention fidelity (Parham et al., 2011). Two studies were Level II (Spirtos et al., 2011; Taylor et al., 2011), and 3 were Level III (Little et al., 2001; Parham et al., 2011; Vanvuchelen et al., 2011). All instruments were quantitative and addressed issues in assessment of children between preschool and 18 yr. All studies examined the validity and reliability of the instruments. The assessments addressed Body Function/Body Structure (Little et al., 2011; Spirtos et al., 2011; Vanvuchelen et al., 2011), Participation (Taylor et al., 2011), and Environment mechanisms (Parham et al., 2011). No studies examined assessments addressing Functional Limitations or Activity mechanisms.

The small size of the research cohorts ($n \leq 30$) was a concern for 3 of the studies (Little et al., 2011; Parham et al., 2011; Spirtos et al., 2011). Little et al. (2011) used a larger sample for their examination of internal consistency ($n = 358$) but a small number for test–retest reliability ($n = 24$).

**Basic Research**

The 6 basic research studies were all quantitative and examined children from age 4 mo through adulthood or their care providers. None of the studies were longitudinal. Mechanisms examined included Biomedical (electroencephalography; Gavin et al., 2011), Body Function/Body Structure (sensory processing; Mailloux et al., 2011), Functional Limitations (postural control, fine motor skills; Bigsby et al., 2011), Environment (parent knowledge; Zachry & Kitzmann, 2011). Only 1 study examined a very small cohort ($n \leq 10$; Clayton et al., 2011); most examined more substantial cohorts ($n \geq 100$; Bigsby et al., 2011; Mailloux et al., 2011; Wang et al., 2011; Zachry & Kitzmann, 2011). For 3 of these studies, the implications for occupational participation were not clearly articulated (Bigsby et al., 2011; Clayton et al., 2011; Gavin et al., 2011). Four of the basic research studies were Level IV (Gavin et al., 2011; Mailloux et al., 2011; Wang et al., 2011; Zachry & Kitzmann, 2011), and 2 were Level III (Bigsby et al., 2011; Clayton et al., 2011).
<table>
<thead>
<tr>
<th>Author/Year</th>
<th>Study Objectives</th>
<th>Level/Design/Participants</th>
<th>Intervention and Outcome Measures</th>
<th>Results</th>
<th>Comments and Study Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Golos, Sarid, Weill, &amp; Weintraub (2011)</td>
<td>To examine results of a preschool-based multidisciplinary early intervention program</td>
<td>Level I RCT N = 81 boys at risk for or diagnosed with developmental delays Age: Preschool Intervention group n = 27 Control group n = 54</td>
<td>Intervention 8 mo of intervention through a monitoring model and collaborative consultation model Outcome Measures Developmental Test of Visual–Motor Integration Movement Assessment Battery for Children Miller Assessment for Preschoolers Structured Preschool Observation</td>
<td>All children in the intervention group scored significantly better than control participants on most performance skills and participated more fully in preschool activities.</td>
<td>The study examined only boys, and no fidelity measure was used.</td>
</tr>
<tr>
<td>Pfeiffer, Koenig, Kinnealey, Sheppard, &amp; Henderson (2011)</td>
<td>To establish a model for RCT research, identify appropriate outcome measures, and address the effectiveness of sensory integration interventions in children with autism spectrum disorders</td>
<td>Level I RCT N = 37 (32 boys and 5 girls, 21 diagnosed with autism and 16 with pervasive developmental disorder—not otherwise specified) Intervention group n = 20 Control group n = 17 Age: 6–12 yr</td>
<td>Intervention The treatment group received a sensory integration (SI) intervention. The control group received a fine motor (FM) intervention. Outcome Measures Goal Attainment Scaling (GAS): sensory processing/regulation, functional FM skills, and social-emotional skills VABS (2nd ed.), used as a covariant Social Responsiveness Scale (SRS) SPM Quick Neurological Screening Test (2nd ed.; QNST–II)</td>
<td>SI participants displayed significantly fewer autistic mannerisms than the FM group, as measured by a subscale of the SRS. SI participants who were able to complete the QNST–II showed a significant change from pretest to posttest, whereas the FM group did not. Significant improvements occurred in GAS scores in both groups; the SI group demonstrated more improvement.</td>
<td>The study used a convenience sample. The researchers and parents or caregivers who completed the pre- and posttests were blinded to group assignment. Issues with objective measurement tools for children on the autistic spectrum: The SPM and the QNST–II have not yet been established psychometrically to measure changes over time, and several of the assessments were not developed specifically for children with autism spectrum disorders. The authors recommended use of intervention manuals and fidelity measures.</td>
</tr>
<tr>
<td>Silva, Schalock, &amp; Gabrielsen (2011)</td>
<td>To evaluate the effect of the parent-delivered component of Qigong Sensory Training (QST).</td>
<td>Level I RCT N = 57 Age: Preschool Treatment group n = 24 children Wait-list control group n = 33 children</td>
<td>Intervention 4 mo of QST directed at improving sensory and self-regulatory impairment. Outcome Measures Autism Behavior Checklist Pervasive Developmental Disorders Behavior Inventory</td>
<td>Findings showed efficacy in improving measures of autism. Effect sizes were all in the medium to large range.</td>
<td>Teacher evaluators were blinded to group assignment.</td>
</tr>
</tbody>
</table>
Collins & Dworkin (2011) Pilot study to determine the effectiveness of a weighted vest on attention to task for 2nd-grade general education students with difficulty attending Level II

**ABA**

Intervention group $n = 11$

Control group $n = 4$, with at least 3 of 4 identified attention problems.

Age: 2nd grade

**Intervention**

Participants wore weighted or nonweighted vests. Videotapes were made of nine 10-min sessions. Teacher fidelity to the instructions was examined by means of teacher questionnaires.

**Outcome Measure**

- Teacher questionnaires

Weighted vests were not effective in increasing time on task.

The sample size was small. Coders and participants were blinded. Teacher fidelity to instructions was examined.

Lust & Donica (2011) To measure skill improvement in prewriting skills, kindergarten readiness, first-name writing, and (handwriting-nonspecific) fine motor skills of students at Head Start who participated in Handwriting Without Tears®-Get Set for School (HWT–GSS) programming

Intervention

Participants in both groups showed significant improvements, but the intervention group showed greater improvements in all tests.

Participants were not randomized; potential bias may have resulted from different classrooms.

Level II

**Pretest–posttest**

$N = 32$

Intervention group $n = 17$

Control group $n = 15$

All participants were of minority ethnicity and low socioeconomic status.

Age: 4 yr

**Intervention**

HWT–GSS programming

**Outcome Measures**

- Learning Accomplishment Profile—3rd Edition
- Check Readiness tool in HWT–GSS student workbook

Bendixen et al. (2011) To explore parental differences before and after an interdisciplinary in-home training program for children with autism

Intervention

12-wk in-home training for fathers in 4 strategies designed to improve their child’s social reciprocity and communication. Mothers were then trained.

Before intervention, both mothers and fathers reported high levels of stress. After intervention, fathers’ stress was reduced but not significantly, possibly because of the variability in their scores; mothers’ stress was reduced significantly. Parenting styles were significantly different pre- and postintervention. Subscale scores on the FACES—II indicated that mothers were more adaptable, whereas fathers were more structured.

No control group was used.

Mothers experienced more change than fathers.

Level III

**Quasi-experimental**

$N = 19$ children with autism and their parents

Age: 3–8 yr

**Intervention**

12-wk in-home training for fathers in 4 strategies designed to improve their child’s social reciprocity and communication. Mothers were then trained.

**Outcome Measures**

- Autism Diagnostic Interview—Revised
- Autism Diagnostic Observation Schedule
- VABS
- Parenting Stress Index Short Form Total
- Family Adaptability and Cohesion Evaluation Scales II (FACES II)—Compatibility
- FACES II—Adaptability

Before intervention, both mothers and fathers reported high levels of stress. After intervention, fathers’ stress was reduced but not significantly, possibly because of the variability in their scores; mothers’ stress was reduced significantly. Parenting styles were significantly different pre- and postintervention. Subscale scores on the FACES—II indicated that mothers were more adaptable, whereas fathers were more structured.

No control group was used.

Mothers experienced more change than fathers.
<table>
<thead>
<tr>
<th>Author/Year</th>
<th>Study Objectives</th>
<th>Level/Design/Participants</th>
<th>Intervention and Outcome Measures</th>
<th>Results</th>
<th>Comments and Study Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case-Smith, Holland, &amp; Bishop (2011)</td>
<td>To pilot test a program for 1st-grade students to promote development of legible handwriting and writing fluency</td>
<td>Level III Single-group pretest–posttest N = 19 (17 with complete data) Age: 1st grade</td>
<td>Intervention 12-wk Write Start program using a coteaching model in which occupational therapists and teachers collaborated to develop and implement a handwriting program Outcome Measures - Evaluation of Children’s Handwriting Test - Minnesota Handwriting Assessment - Woodcock–Johnson Fluency and Writing Samples tests</td>
<td>The students made significant gains in handwriting legibility and speed and in writing fluency and samples pre-to posttest. Handwriting legibility and speed scores were maintained, and writing fluency scores continued to improve 6 mo after the intervention ended.</td>
<td>A fidelity measure was included. Future research is needed with a more rigorous study design, including a control group and larger sample, to test how and to what degree these skills are linked.</td>
</tr>
<tr>
<td>Fedewa &amp; Erwin (2011)</td>
<td>To evaluate the use of stability balls to increase the frequency of on-task and in-seat behavior for students identified with attention and hyperactivity concerns</td>
<td>Level III Single-subject, AB continuous time series N = 8 children with ADHD (5 diagnosed, 3 with symptoms) Age: 4th–5th grade</td>
<td>Intervention 12-wk intervention using stability balls Outcome Measures - Attention Deficit Hyperactivity Test - Teacher Social Validity Scale, a questionnaire developed by the primary investigator to assess social validity</td>
<td>Participants showed increased levels of attention, decreased levels of hyperactivity, and increased time on task and in seat/on ball; teachers preferred the stability balls over chairs.</td>
<td>The sample for in-seat and on-task behaviors was small. No control group was included. A social validity scale was used to assess the degree to which teachers and students believed the balls helped students.</td>
</tr>
<tr>
<td>Hahn-Markowitz, Manor, &amp; Maerir (2011)</td>
<td>To describe initial assessment of the Cognitive–Functional (Cog–Fun) program, an intervention focused on cognitive strategies to enable occupational performance for children with ADHD</td>
<td>Level III Single subject N = 17 Age: 7–8 yr</td>
<td>Intervention Ten 1-hr weekly sessions of the Cog–Fun program Outcome Measures - Behavior Rating Inventory of Executive Functions - Tower of London - Canadian Occupational Performance Measure - Wechsler Intelligence Scale for Children</td>
<td>Participants showed significant improvements with medium to large effects on outcome measures after treatment; most improvements were maintained at follow-up.</td>
<td>No control group was used. An occupational therapist administered the assessments. One investigator checked fidelity using a log kept by the occupational therapist.</td>
</tr>
<tr>
<td>Study</td>
<td>Objective</td>
<td>Design</td>
<td>Sample</td>
<td>Intervention</td>
<td>Outcome Measures</td>
</tr>
<tr>
<td>-------</td>
<td>-----------</td>
<td>--------</td>
<td>--------</td>
<td>--------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Umeda &amp; Deitz (2011)</td>
<td>To assess the effects of therapy cushions on the classroom behaviors of children with autism spectrum disorder</td>
<td>Level III&lt;br&gt;Single-subject ABABC &lt;br&gt;&lt;br&gt;( N = 2 ) boys with autism spectrum disorder &lt;br&gt;Age: 5–6 yr</td>
<td></td>
<td>Participants used chairs during baseline phases (A) and cushions during intervention phases (B). A choice phase (C) was included to determine participants’ seating preferences.</td>
<td>&lt;ul&gt;&lt;li&gt;SSP&lt;/li&gt;&lt;li&gt;Observation of in-seat, out-of-seat, on-task, and off-task behaviors&lt;/li&gt;&lt;/ul&gt;</td>
</tr>
<tr>
<td>Spirtos, O'Mahony, &amp; Malone (2011)</td>
<td>To examine the interrater reliability of the Melbourne Assessment of Unilateral Upper Limb Function (MAUULF)</td>
<td>Level II&lt;br&gt;Interrater reliability study &lt;br&gt;&lt;br&gt;( N = 3 ) occupational therapists with experience using the MAUULF</td>
<td></td>
<td></td>
<td>High correlation was found between raters’ total scores (ICC = .961). Correlations for test components between raters included fluency (ICC = .902), range of movement (ICC = .866), target accuracy (ICC = .786), and quality of movement (ICC = .683). The ICC for individual test item scores ranged from .368 to .899.</td>
</tr>
<tr>
<td>Taylor, Lee, Kramer, Shirashi, &amp; Kielhofner (2011)</td>
<td>To examine the psychometrics of the Occupational Self Assessment (OSA)</td>
<td>Level II&lt;br&gt;Construct validity study &lt;br&gt;&lt;br&gt;( N = 296 ) adolescents with acute mononucleosis &lt;br&gt;Age: 12–18 yr</td>
<td></td>
<td>OSA items captured the intended constructs; the rating scales functioned as intended. More than 90% of the adolescents were validly measured. The OSA showed adequate sensitivity and stability over time. The OSA measure of competence was moderately associated with infectious symptoms, fatigue severity, health status, and stress, and the measure of values was not. Neither measure was associated with age, gender, or ethnicity.</td>
<td>The sample size was moderate.</td>
</tr>
</tbody>
</table>

(Continued)
<table>
<thead>
<tr>
<th>Author/Year</th>
<th>Study Objectives</th>
<th>Level/Design/Participants</th>
<th>Intervention and Outcome Measures</th>
<th>Results</th>
<th>Comments and Study Limitations</th>
</tr>
</thead>
</table>
| Little et al. (2011) | To evaluate the psychometric properties of the Sensory Experiences Questionnaire (SEQ) | Level III Internal consistency and test–retest reliability study  
N = 358 caregivers of children with autism, with developmental delay, or developing typically  
Age: 6–72 mo | Intervention  
No intervention  
Outcome Measures  
• Cronbach’s α  
• ICC | Internal consistency for the SEQ was 5.80. Test–retest reliability for the total score was excellent (ICC = 5.92). | The sample was moderate for examining internal consistency and small for examining test–retest reliability. Future research is needed to consider eliminating items that are less reliable and adding new items to subscales that have few items, test the factor structure, develop item sets for different age groups, and establish the SEQ’s sensitivity to change as a result of maturation or intervention. |
| Parham et al. (2011) | To evaluate the reliability and validity of the Ayres Sensory Integration (ASI) Fidelity Measure | Level III Reliability and validity study  
N = 20 occupational therapists with postgraduate training, mentorship, and practice experience in ASI intervention | Intervention  
No intervention  
Outcome Measures  
• Questionnaires were sent to 20 sensory integration experts from 6 countries who had not participated in the development of the fidelity measure  
• ICC  
• Cronbach’s α | Reliability of the process section was strong for total fidelity score (ICC = 5.99, Cronbach’s α = 5.99) and acceptable for most items. Total score significantly differentiated ASI from four alternative interventions. Expert ratings indicated strong agreement that items in the structural and process sections represent ASI intervention. The ASI Fidelity Measure has strong content validity. The process section is reliable and valid when scored by trained raters with expertise in ASI. | Participants were from 6 countries and had not participated in the development of the ASI Fidelity Measure. The instrument’s process section may not be reliable or valid when scored by an unqualified observer. Whether the section measuring structural elements is adequately reliable remains unknown. |
| Vanvuchelen, Roeyers, & De Weerdt (2011) | To examine rater and test–retest reliability of the Preschool Imitation and Praxis Scale (PIPS) | Level III Interrater, intrarater, and test–retest reliability study  
N = 119 children (50 boys, 69 girls) developing typically  
Age: 1.5–4.9 yr | Intervention  
No intervention  
Outcome Measures  
• ICC  
• Bland and Altman’s limits of agreement on the scale score  
• Smallest detectable difference | Trained examiners administered the PIPS and were videotaped for analysis. They demonstrated acceptable intra- and interrater reliability at the item level (0.45–1.00) and scale level. | Implications for occupational participation are discussed in article. |
## Basic Research Studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Research Question</th>
<th>Design/Quality Level</th>
<th>Intervention</th>
<th>Outcome Measures</th>
<th>Findings/Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bigsby et al. (2011)</td>
<td>To examine the relationship between prenatal cocaine exposure and quality of movement in babies</td>
<td>Level III</td>
<td>Case control</td>
<td>N = 903 (370 exposed to cocaine, 533 inexperienced)</td>
<td>Posture and fine-motor scores were significantly lower in cocaine-exposed children.</td>
</tr>
</tbody>
</table>

| Clayton, Kaiser, de Pue, & Kaiser (2011)    | To compare anteroposterior and mediolateral range of motion and velocity of the center of pressure (COP) between horseback riders without disabilities and riders with cerebral palsy | Level III            | Cohort        | N = 8 (4 riders without disabilities and 4 riders with cerebral palsy)            | The two rider groups differed significantly in anteroposterior range of COP motion, mediolateral range of COP motion, and mediolateral COP velocity. Anteroposterior COP velocity did not differ between groups. All riders rode the same horse. COP analysis is a potential new assessment for monitoring changes in balance as an indicator of core stability during equine-assisted activities. Implications for occupational participation receive little discussion. |

| Gavin et al. (2011)                        | To determine whether children with sensory processing disorder (SPD) differ from typically developing children on electroencephalographic (EEG) measures | Level IV             | Group comparison | N = 91 (20 with SPD, 71 typically developing)                                       | The SPD group demonstrated significantly smaller P300 amplitudes and shorter N200 latencies. Brain activity correctly distinguished children with SPD from typically developing children with 77% accuracy. Scores on the neurophysiological measures were significantly related to functional performance on sensory and motor tasks. This study provides neurophysiological evidence that children with SPD, when compared with typically developing children, have statistically significant differences in brain processing of simple auditory stimuli. Implications for occupational participation receive little discussion. |

| Mailloux et al. (2011)                     | To examine patterns of sensory integrative dysfunction in children ages 4–9 who received occupational therapy evaluations in 2 private practice settings using a retrospective study | Level IV             | Retrospective chart review | N = 273 (193 boys, 80 girls)                                                       | Exploratory factor analysis revealed 6 factors with eigenvalues >1, verifying patterns of sensory integrative dysfunction that have been studied for nearly 50 yr. Limitations include potential for subjective interpretation in factor analysis, inability to adjust measures available in charts in retrospective research, and subjectivity of tools. |

(Continued)
<table>
<thead>
<tr>
<th>Author/Year</th>
<th>Study Objectives</th>
<th>Level/Design/Participants</th>
<th>Intervention and Outcome Measures</th>
<th>Results</th>
<th>Comments and Study Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wang, Howe, Hinojosa, &amp; Weinberg (2011)</td>
<td>To examine the relationship between postural control and fine motor skills in preterm infants</td>
<td>Level III Retrospective cohort</td>
<td><em>Intervention</em> No intervention</td>
<td>Development of postural control was related to the development of fine motor skills, especially in the group of preterm infants with delayed postural control, supporting the theoretical assumption of proximal–distal development.</td>
<td>Postural control was examined as a whole; previous studies focused on only a single component or position. A longitudinal study is needed to examine developmental motor trajectory.</td>
</tr>
<tr>
<td>Zachry &amp; Kitzmann (2011)</td>
<td>To examine caregiver awareness of the American Academy of Pediatrics’ prone play recommendation and determine the amount of prone play children experienced</td>
<td>Level IV Questionnaire</td>
<td><em>Intervention</em> No intervention</td>
<td>One-fourth of caregivers were not aware of prone play recommendations or potential complications from limited “tummy time.” About half of infants received 30 min of prone play per day; one-third were intolerant of the prone position.</td>
<td>The study used a convenience sample of caregivers.</td>
</tr>
<tr>
<td>Myers, Schneck, Effgen, McCormick, &amp; Shasby (2011)</td>
<td>To identify factors associated with occupational therapists’ involvement as children receiving early intervention services transition into preschool</td>
<td>Level IV Questionnaire survey</td>
<td><em>Intervention</em> No intervention</td>
<td>Relationship with early intervention providers, employer-based supports, and knowledge of the transition process were significantly associated with involvement in two transition planning areas: collaboration with early intervention programs and family support.</td>
<td>The study used a small representational sample.</td>
</tr>
</tbody>
</table>

**Note:** ADHD = attention deficit hyperactivity disorder; AOTA = American Occupational Therapy Association; ICC = intraclass coefficient; RCT = randomized controlled trial; SPM = Sensory Processing Measure; SSP = Short Sensory Profile; VABS = Vineland Adaptive Behavior Scales.
Professional Issues

The study in the professional issues category examined factors associated with the Environment supporting the collaborative nature of early intervention practice (Myers, Schneck, Effgen, McCormick, & Shasby, 2011). Findings suggest that practices to enhance relationships among programs influence occupational therapist involvement. This study was Level IV; the research was quantitative and incorporated descriptive methods and regression analysis. The survey instrument used showed a high degree of internal consistency and reliability.

Discussion

The most common evidence level was Level III (36.4%), followed by Level IV (31.8%), Level II (18.2%), and Level I (13.6%). All studies were quantitative, indicating a failure to address the objective of including both qualitative and quantitative methodologies (AOTA, 2006) in this group of AJOT publications.

Intervention Effectiveness Studies

Inclusion of several Level I and Level II studies supports “power to influence,” “evidence-based decision making,” and “science-fostered innovation in occupational therapy practice” (AOTA, 2007, p. 614). Attention to scientific rigor continues to be an important priority in occupational therapy research, and continued efforts to increase rigor, such as manualizing intervention protocols, including procedural fidelity and social validity measures, and using blinded coders, all support the Centennial Vision elements.

Instrument Development and Testing

Each of the instrument development studies supports the increased ability of occupational therapists to provide “evidence-based decision making” (AOTA, 2007, p. 614) in client intervention by adding evidence that strengthens practitioners’ knowledge of available measurement tools. Because certain areas of occupational therapy intervention vary widely across geographic locations and practice settings, fidelity is a major concern affecting the validity of the research addressing these areas. Sensory integration is one of these areas, and research addressing its effectiveness has been plagued by problems with fidelity (May-Benson & Koomar, 2010; Miller, 2003; Parham et al., 2007; Pfeiffer et al., 2011). Efforts to achieve greater fidelity for sensory integration intervention in the Parham et al. (2011) study support “evidence-based decision making” (AOTA, 2007, p. 614).

Basic Research

Although basic research studies were generally categorized as lower-level studies, most were of a substantial size and examined a wide range of ages and levels of rehabilitation science. The lack of longitudinal studies indicates a failure to examine two needs identified by AOTA’s (2006) Children and Youth Ad Hoc Committee (2006): (1) “children’s and adolescents’ developmental and occupational patterns with the community, home, and school settings” and (2) “longitudinal studies of the participation of children with special needs in their daily lives as they transition through childhood and adolescence into adulthood” (p. 8).

Professional Issues

The focus of the article addressing professional issues (Myers et al., 2011) was on factors associated with the environment that support the collaborative nature of early intervention practice. This study addressed “power to influence” and “expanded collaboration for success” from the Centennial Vision. Continued research in the area of professional issues is imperative as our profession moves forward to fulfill the vision of becoming powerful, widely recognized, science driven, and evidence based. As we do with our clients, it is important to examine our own profession and its relationship with environmental supports and barriers. To best accomplish this, higher-level research studies examining occupational therapy professional issues are necessary to provide more evidence of influences on practice, development, and implementation of strategies to address these issues.

Conclusion

An important theme in intervention effectiveness studies is that of fidelity, defined as “the strategies that monitor and enhance the accuracy and consistency of an intervention to ensure it is implemented as planned and that each component is delivered in a comparable manner to all study participants over time” (Smith, Daunic, & Taylor, 2007, p. 121). Fidelity was explicitly addressed in several of the research studies but found lacking in others. Fidelity ensures that measurement of the effectiveness of our interventions is consistent; without it, we cannot claim that these interventions are evidence based. Use of larger study cohorts, blinded coders, and social validity scales are other important factors that contribute to strength of the evidence.

In their most recent review of occupational therapy research related to children and youth, Bendixen and Kreider (2011) used the concept of occupational therapy’s impact on positive youth development and the framework of the ICF to assess the research. They found that the bulk of studies fell within the ICF domains of Body Function/Body Structure and Activity. The levels of rehabilitation addressed in the studies published in 2011 were Body Function/Body Structure (50%), Functional Limitations (32%), Environment (23%), Participation (18%), Activity (14%), and Biomedical (5%), with none from Biomedical Molecular/Cellular. In the revised categorization used in this analysis, the largest group of studies continued to be those examining Body Function/Body Structure, but a representation was seen, at least modestly, across the levels, except for the most basic Biomedical Molecular/Cellular, which is not typically addressed by occupational therapy research.

The study authors did not always explicitly translate their findings to implications for participation, an omission that suggests a continuing need to document changes in children’s engagement in everyday life situations to build the evidence of occupational therapy’s efficacy in facilitating participation. None of the studies on children and youth published in AJOT in 2011 focused on efficacy (i.e., the ability of an intervention to produce the effect intended), and only 1 focused on professional issues. Longitudinal studies were not included among the 2011 studies. In addition, none of the intervention studies examined...
adolescents or issues involving the transition to adulthood. These are all important areas for future attention to enable a better understanding of developmental and occupational patterns of children and adolescents and better inform practitioners, clients, and third-party payers.

Gillen (2010) observed that occupational therapists frequently publish their studies in journals outside the discipline of occupational therapy. They may do so for two reasons: (1) the desirability of publishing in a variety of journals and (2) the difficulty of having manuscripts accepted for publication in AJOT. Although sharing our findings in journals outside our own profession may support our Centennial Vision of "expanded collaboration for success" and "power to influence" (AOTA, 2007), it is also important toward these objectives that researchers include AJOT and other occupational therapy journals in their choices of where to publish. Conversely, it is no less important that AOTA support these efforts by maximizing the capacity of AJOT to publish the rapidly expanding evidence being produced by members of this profession. ▲

References


American Occupational Therapy Association. (2010, September 13). Surveying the profession: 2010 AOTA Workforce Survey points to rising demand for and commitment to occupational therapy. OT Practice, 8–11.


