
Coping Abilities in Children with Sensory Integrative Dysfunction

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Research Questions

- » Do preschool and school-aged children with sensory integrative dysfunction demonstrate poorer coping skills than their typical peers?
- » If so, is there a significant relationship between sensory processing and coping skills?

Definitions

- **Coping:** A general term used to describe learned adaptive behaviors that help an organism to survive mentally, physically, socially and emotionally and that allow one to meet personal needs and to adapt to the demands of one's environment.
(Zeitlin)
- **Sensory Integrative Dysfunction:** A deficit in modulation or discrimination of sensory information that results in difficulties with maintenance of arousal state or development of motor coordination skills including praxis.

Instruments

- **Coping Inventory (Zeitlin, 1985)**
 - » 48 Items divided into 2 domain areas: Coping with Self, Coping with the Environment and a total test Adaptive Behavior Index
- **Early Coping Inventory (Zeitlen, Williamson & Szczepanski, 1988)**
 - » 48 Items divided into 3 domain areas: Sensorimotor Organization, Reactive Behavior, Self-Initiated Behavior and a total test Adaptive Behavior Index
 - » **Both Coping Inventories: 5 Point Scale:** 1 = Child's behavior is not effective to 5=Child's behavior is consistently effective across situations
- **OTA-Watertown Developmental & Sensory History (Koomar, et al)**
 - » 126 Items divided into 7 sensory, motor and behavioral domains
 - » 3 Point Scale: 2 = Often, 1 = Sometimes, 0 = Rarely/Never

Participants

- **Early Coping Study**

- » 2 groups of 22 matched children: SI/typical
- » Age: 2.0 - 3.10 years matched by age and sex
- » Sex: 5 females, 17 males

- **Coping Study**

- » 2 groups of 30 matched children: SI/typical
- » Age: 4.0 - 14.8 years, mean age 6.5 years matched by age and sex
- » Sex: 9 females, 21 males

- **Coping and Sensory History Study**

- » 47 children with sensory integrative dysfunction
- » Age: 4.0 to 12.3 years
- » Sex: 12 females and 35 males

Method

- **Coping and Early Coping Study**
 - » SI Group: Coping inventories completed at time of evaluation or initial treatment
 - » Typical Group: Matched subjects obtained through sample of convenience
- **Coping and Sensory History Study**
 - » Coping inventories and Sensory Histories obtained at time of evaluation or treatment
 - » Data collection occurred over a two year period.

Early Coping Results

Mean Scores, Standard Deviation, & Effect Size of Typical and Treatment Children

| | | | |
|---------------------------|------------|------------|------|
| Sensorimotor Organization | 4.77 (.29) | 3.70 (.67) | 2.23 |
| Reactive Behavior | 4.49 (.53) | 3.46 (.76) | 1.61 |
| Self-Initiated Behavior | 4.65 (.39) | 3.40 (.95) | 1.87 |
| Adaptive Behavior Index | 4.65 (.39) | 3.52 (.77) | 1.95 |

Coping Results

Means Scores, Standard Deviations, & Effect Size of Typical and Treatment Children

| | | | |
|-------------------------|------------|------------|------|
| Self Score | 4.47 (.35) | 3.39 (.73) | 2.00 |
| Environment Score | 4.68 (.25) | 3.65 (.66) | 2.35 |
| Adaptive Behavior Index | 4.61 (.28) | 3.54 (.67) | 2.25 |

Early Coping Analysis

- **ANOVA**

- » Adaptive Behavior Index Score

- » $F(1,42) = 37.05, p = .0001$

- » Follow-up t-tests showed all items except 3 significant at $p < .05$

- **Discriminative Analysis**

- » Classified subjects into groups 100% accuracy

- **Stepwise-Discriminative Analysis**

- » Identified 5 items sufficient to classify groups

Coping Inventory Analysis

- **ANOVA**

- » Adaptive Behavior Index Score

- » $F(1,58) = 63.90, p = .0001$

- » Follow-up t-tests showed all items except 3 significant at $p < .05$

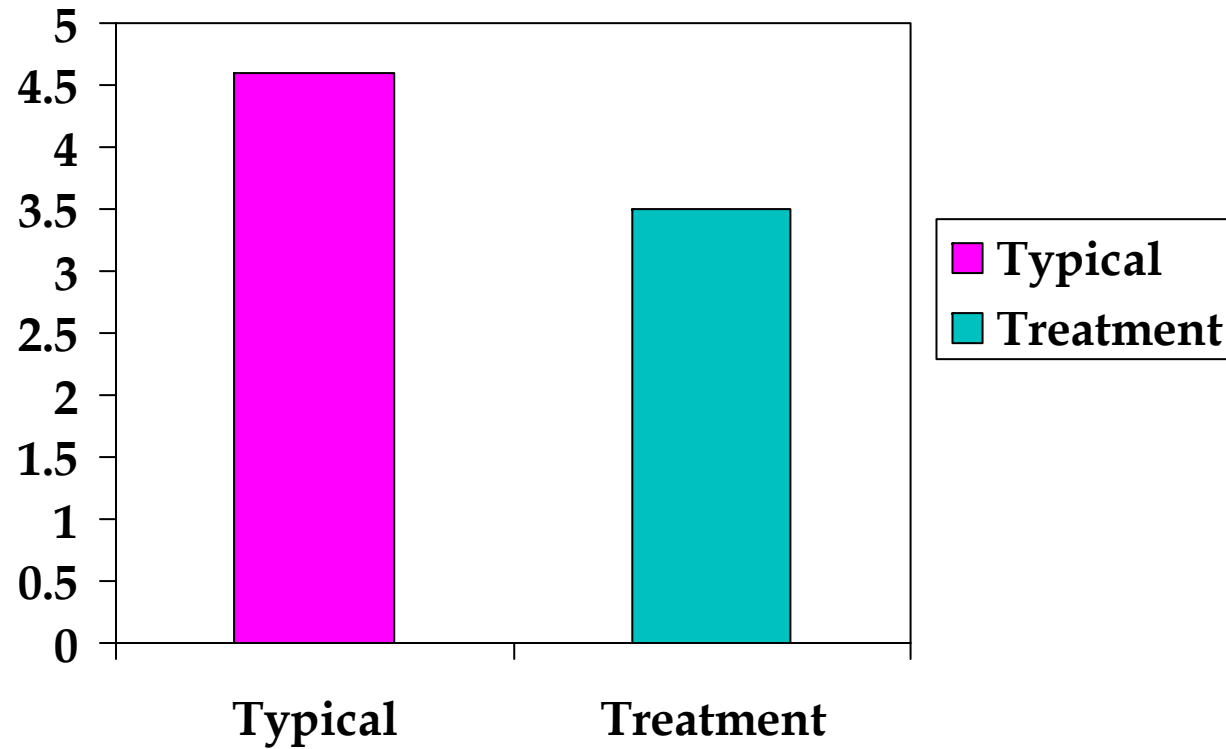
- **Discriminative Analysis**

- » Classified subjects into groups 100% accuracy

- **Stepwise-Discriminative Analysis**

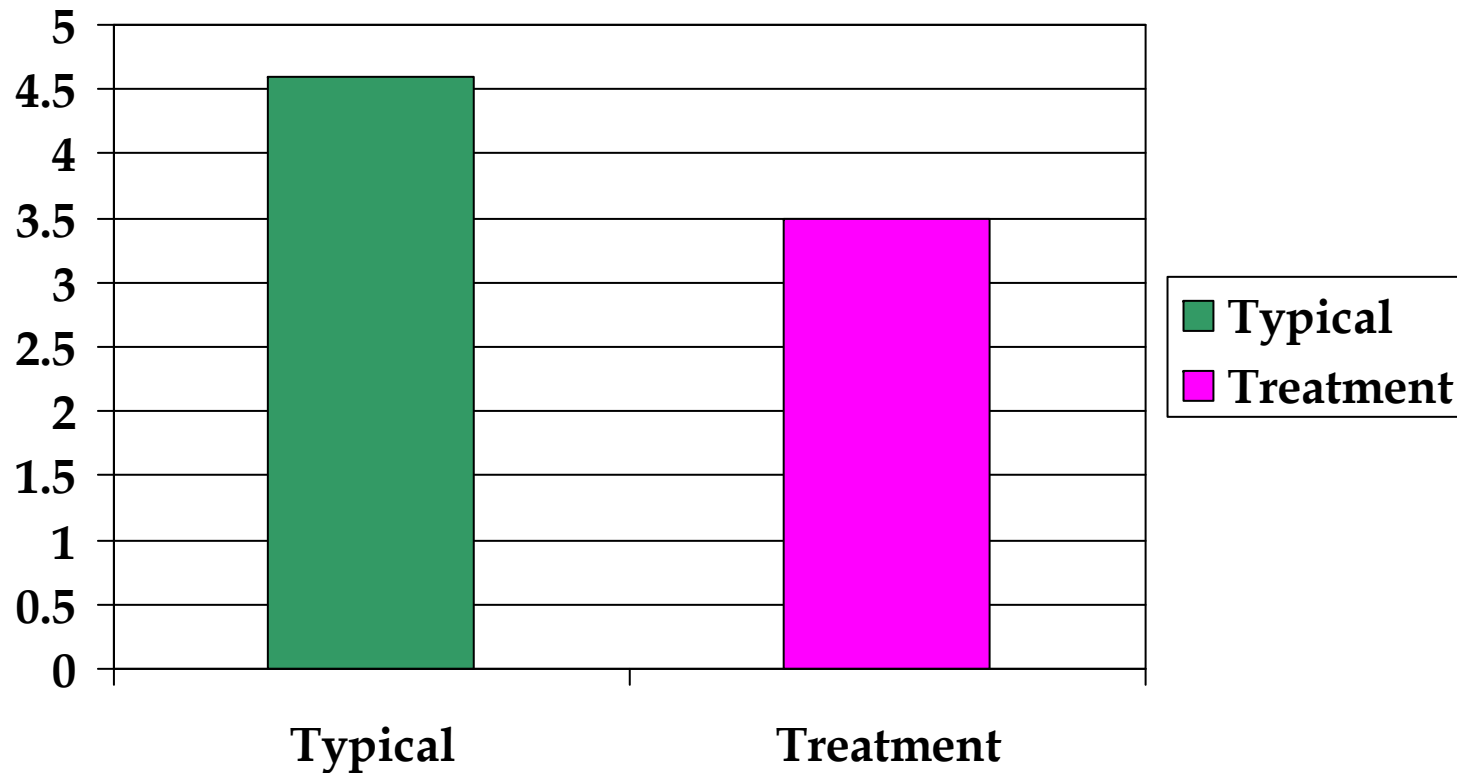
- » Identified 2 items sufficient to classify groups

Early Coping Study Total Score Means



Coping Study

Mean Adaptive Behavior Scores



Early Coping Items

- **No Significant Difference**

- » SM13: Child demonstrates self-regulation of basic bodily functions.
- » RE11: Child adapts to daily routines and limits set by caregiver.
- » SI5: Child generally demonstrates a happy disposition.

- **Discriminative Items**

- » SM11: Child demonstrates coordinated movements
- » SI12: Child changes behavior when necessary to solve a problem or achieve a goal.
- » SI6: Child expresses a range of feelings.
- » RE2: Child reacts to feelings and moods of other people.
- » RE9: Child uses behavior appropriate to the situation.

Coping Inventory Items

- **No Significant Differences**

- » **SP7:** Child generally demonstrates a happy feeling.
- » **EF1:** Child accepts warmth and support (responds to affection, likes to be held).

- **Discriminative Items**

- » **SA5:** Child reacts to sensory stimulation.
- » **EA1:** Child uses gross and fine motor skills competently.

Coping Inventory/Sensory History Results

- **Correlation Analysis**

- » **Variables:**

- Adaptive Behavior Index
- Sensory History Items

- » **Results:**

- 44 significant correlations at $p < .05$
- r-values between .27 and .47
- Sensory History items from visual, auditory, movement, tactile, motor, & social domains

Coping Inventory/Sensory History Regression Analysis

» Variables:

- Adaptive Behavior Index
- Sensory History Score
(summed score of 44 significant items)

» Results:

- Significant inverse relationship between coping skills and sensory processing
- $F(1,45) = 34.238, p = .0001$
- R-square = .43

Sensory History Items

- **Visual**

- » **V1: become easily distracted by visual stimulation**
- » **V2: dislike having eyes covered**
- » **V4: tend to draw some numbers and letters backwards**
- » **V5: blink at bright lights or seem irritated by them**
- » **V8: avoid or have difficulty with eye contact**

- **Movement**

- » **M3: enjoy merry-go-rounds or fast rides**
- » **M11: bang head on purpose**

● **Touch**

- » **T1: seem excessively ticklish**
- » **T14: often seem overly active**
- » **T20: tend to remove shoes whenever possible**
- » **T22: pinch, bite or otherwise hurt self**

● **Auditory**

- » **A3: at times, seem not to understand what is said**
- » **A5: become distracted by lots of noise**
- » **A6: become distracted by background noises**
- » **A7: seem to have trouble remembering what was said**
- » **A10: unable to follow two or three directions given at once**
- » **A11: misunderstand meaning of words in relation to movement or body position**

● **Motor Skills**

- » **MV2: have difficulty with motor tasks of several steps**
- » **MV3: have an awkward grasp with a pencil**
- » **MV6: seem shaky when going fine motor tasks**
- » **MV7: seem weaker than others their age**
- » **MV8: frequently grasp objects very hard**
- » **MV10: drop things easily**
- » **MV12: seem to deliberately fall or tumble**
- » **MV17: perform movements in slow & plodding fashion**
- » **MV18: take a long time to do motor motor tasks**
- » **MV19: appear reluctant in sports**
- » **MV20: tend to move in and out of chair**
- » **MV24: have difficulty with handling utensils**

- **Motor Skills (cont.)**

- » MV27 keep mouth open most of time
- » MV28: have trouble chewing

- **Social**

- » SOC1: make friends easily
- » SOC7: have strong outbursts of anger, tantrums
- » SOC8: have trouble getting along with children
- » SOC9: tend to be active and aggressive
- » SOC10: tend to be quiet and withdrawn
- » SOC12: tend to be relaxed and patient
- » SOC14: tend to be in perpetual motion
- » SOC16: tend to be very set in routines
- » SOC19: seem discouraged or depressed

- **Bowel and Bladder**

- » **BB1: have trouble learning urinary control**
- » **BB2: have trouble learning bowel control**
- » **BB5: seem to have difficulty registering the need to eliminate**

Conclusions

- **The results of this study show that children with sensory integrative dysfunction demonstrate significantly poorer coping abilities than their typical peers as toddlers and at school-age.**
- **Further, coping inventory scores were able to accurately discriminate and classify children into typical and sensory integrative groups with 100% accuracy.**
- **The results of this study also show that there is a strong relationship between sensory processing and coping abilities in school-age children with sensory integrative dysfunction. Poor sensory processing is associated with poor coping skills.**