Temperament Differences in Children's Approaches to Learning Behaviors
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TEMPERAMENT & SCHOOL OUTCOMES

- There is considerable evidence that temperament affects children's school experiences and outcomes.
- However, there has been little research on the mechanisms through which this effect occurs.
- In a recent study, approaches to learning (ATL) partially mediated the relationship between temperament and academic school readiness.
- Two temperament groups, undercontrolled and overcontrolled, were particularly at risk for poor ATL and academic outcomes compared to their resilient peers.

APPROACHES TO LEARNING

- Approaches to learning (ATL) refers to the behaviors children display when engaged in new or challenging learning tasks.
- ATL behaviors include:
  – Persistence and engagement   - Curiosity and initiative
  – Problem-solving flexibility   - Cognitive inhibition
  – Inventiveness   - Adaptability
- In the previous study, ATL was assessed using a teacher report that provided a global ATL score.
- Recent evidence, however, suggests that ATL may be best understood as multidimensional.
  – Patterns of ATL behaviors may be more important and informative than a single, global score.

CURRENT STUDY

- The purpose of the current study is to investigate temperamental differences in ATL using a direct assessment to assess this multi-dimensionality.
- A greater understanding of temperament characteristics underlying differences in approaches to learning will contribute to the development of child-centered early interventions.

PARTICIPANTS

- $N = 112$ with mean age of 50.33 months ($SD = 6.41$)
- 50% males
- 56% Black, 25% Hispanic, 7% Other, 12% Unknown
- Temperament classifications:
  – 15% Undercontrolled, 67% Resilient, 18% Overcontrolled
  – Percentages are consistent with those reported in the literature.
  – No group differences by gender, age, and ethnicity
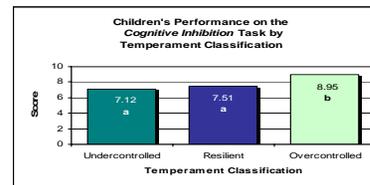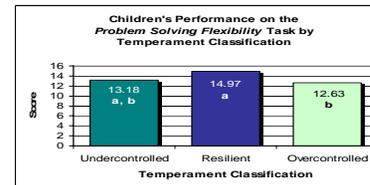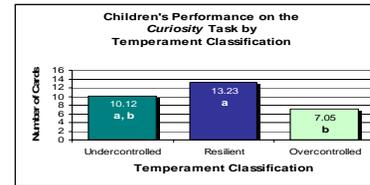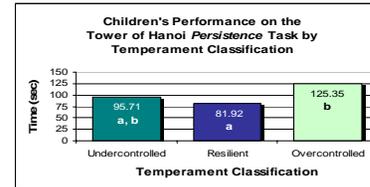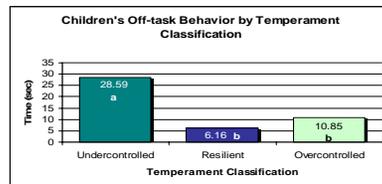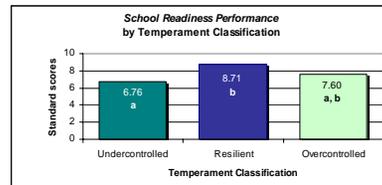
PROCEDURES

- Approaches to learning was assessed in the Fall and Spring.
  – Fall data were used in the current study; Spring data were used for children who were not assessed in the Fall.
- Temperament and school readiness were assessed in the Spring.

MEASURES

- **Preschool Temperament Classification System (PTCS)**
  – Developed for current study to assess temperament
    - Teachers assign children to one of three temperament groups
    - Rank order the children in each group
    - Rate each child on a scale of 1-10
- **Bracken Basic Concepts Scale-Revised, School Readiness Composite** (BBCS-R; Bracken, 1998)
  – Assesses knowledge of Colors, Letters, Numbers, Sizes, Comparisons, and Shapes.
- **Direct Assessment of Approaches to Learning**
  – Persistence (3 tasks): Duration of time spent trying to solve interesting, but unsolvable tasks
  – Curiosity (1 task): Initiative and curiosity in the face of risk
  – Preference for challenge (2 tasks): Choice among tasks that vary in difficulty
  – Problem solving flexibility (1 task): Ability to switch strategies on each trial
  – Cognitive Inhibition (1 task): Ability to suppress a dominate response for a sub-dominate response

RESULTS

- ANOVA techniques were used to assess group differences.
- Due to exploratory nature of the study, a p value of .10 was used.
- Letters on the graphs denote significant group differences using Tukey post-hoc tests.
- Only significant findings are presented below.
  – There were no group differences in two of the persistence tasks and two of the preference for challenge tasks by temperament classification.

School Readiness Performance by Temperament Classification

Children's Off-task Behavior by Temperament Classification

Children's Performance on the Tower of Hanoi *Persistence* Task by Temperament Classification

Children's Performance on the *Curiosity* Task by Temperament Classification

Children's Performance on the *Problem Solving Flexibility* Task by Temperament Classification

Children's Performance on the *Cognitive Inhibition* Task by Temperament Classification

DISCUSSION

- Consistent with the literature on preschool age children and supporting the validity of the global measure of temperament:
  – The undercontrolled group scored significantly lower on school readiness than the resilient group.
  – The overcontrolled group scored in between the resilient and undercontrolled groups on school readiness, but was not significantly different from either group.
  – The undercontrolled group had significantly greater off-task behavior than either group.

DISCUSSION – continued

- Group differences on 4 approaches to learning tasks suggest different patterns of strengths and weaknesses:
  – **Overcontrolled** children displayed the least adaptive pattern:
    - Greater persistence (on an impossible task)
    - Greater cognitive inhibition
    - Lower curiosity
    - Lower problem solving flexibility
    - High persistence with low flexibility may lead to difficulty disengaging from a task or selected strategy, resulting in greater perseveration and lower success.
    - High inhibition with low curiosity in the face of risk may lead to less exploration and lost opportunities.
  – **Resilient** children displayed the most adaptive pattern:
    - Lower, but moderate levels of persistence (on an impossible task)
    - Moderate levels of cognitive inhibition
    - Greater curiosity
    - Greater problem solving flexibility
    - It is likely that there is a curvilinear relationship between learning behaviors and outcomes. For example beyond a certain point, continued persistence is maladaptive.
    - Moderate levels of persistence with high flexibility are likely to contribute to effective problem solving.
    - Greater curiosity with moderate inhibition may encourage children to explore and selectively seek opportunities.
  – **Undercontrolled** children: There were no significant differences between this group and the resilient group; however, in comparison this group exhibited:
    - Greater persistence (on an impossible task)
    - Lower cognitive inhibition
    - Lower curiosity
    - Lower problem solving flexibility
    - Need to look into this further using a larger sample size
    - This group also had the lowest school readiness scores, which may be due to high off-task behavior.

FUTURE DIRECTIONS

- Additional research is needed using larger sample sizes
  – To replicate current findings.
  – To develop a latent variable of approaches to learning, and to test mediation and moderation models using structural equation modeling.
- Expand this research to include other components of approaches to learning that were not included in the current study.