Attention Span/Task Persistence from Early and Middle Childhood

Kirby Deater-Deckard, Ph.D.

Department of Psychology kirbydd@vt.edu

Individual Differences in Development laboratory at Virginia Tech

1) Etiology and effects of ind diffs in attn/persist
   a) gene-environment processes (beh genetic)
   b) temporal prediction (sem/lgm)

2) Specific links
   a) with anger/frustration
   b) with specific cognitive skills: literacy

...several approaches to measurement

Linear composites

Attention Span/Task Persistence

\[ R^2 = .47 \] (PCA)

CFA, Measurement model (SECCYD)

Quantitative genetic structure of CBQ-SF (WRRP twin study)

Example: Effortful Control
(variance on diagonal, correlation off-diagonal)

<table>
<thead>
<tr>
<th></th>
<th>Genetic</th>
<th>Nonshared Env</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attention</td>
<td>.52</td>
<td>.48</td>
</tr>
<tr>
<td>Inh Control</td>
<td>.48</td>
<td>.66</td>
</tr>
<tr>
<td>Percept Sens</td>
<td>.38</td>
<td>.21</td>
</tr>
<tr>
<td>Low-int Pleasure</td>
<td>.33</td>
<td>.25</td>
</tr>
<tr>
<td></td>
<td>.17</td>
<td>.21</td>
</tr>
<tr>
<td></td>
<td>.08</td>
<td>.23</td>
</tr>
<tr>
<td></td>
<td>.00</td>
<td>.20</td>
</tr>
<tr>
<td></td>
<td>.30</td>
<td>.12</td>
</tr>
</tbody>
</table>

(various informants’ reports on key indicators)
Attn Span/Persistence twin intra-class $r$: Shift from **$c^2$** to **$h^2$**

- **Cross-sectional (age in years)**
  - Attn Span/Persistence twin intra-class $r$:
    - $r = 0.78$ (replicated, infancy to preschool, Mullineaux & DiLalla, 2007)

Longitudinal (1-year lag) stability $r = 0.49$***

- **MZ diff CHANGE in attention/persistence**
- **MZ diff CHANGE in maternal warm supportive behavior**
- $r = 0.28^*$ (replicated, infancy to preschool, Mullineaux & DiLalla, 2007)

Attention Problems and Anger/Frustration
SECCYD data (LGM, heuristic)

- **Attention**
  - intercept: -0.42
  - slope: 0.47
  - intercept: 0.55
  - slope: 0.14

- **Anger**
  - Age: 2yrs, 3yrs, 4.5yrs, 7yrs, 9yrs

Effortful Control and Reading Skills (4-8 year olds)

- **Attention + Inh Control**
  - Reading Skills Composite

Correlation between attention/inhibitory control and early reading skills due to overlapping genetic and nonshared environmental influences

- **Attention**
  - $r_{AE} = 0.59$ (73% of correlation)
  - $r_{Ce} = 0.31$ (27% of correlation)

- **Reading Skills**
  - $A$ = Reading Skills, $E$ = Nonshared Environmental, $C$ = Shared Environmental, $L$ = Unique Liability
Conclusions and future directions

1) Etiology
   a) additive + non-additive genetic influences
   b) nonshared environmental processes

2) links with anger/frustration and reading
   1. temporal prediction
   2. moderate genetic correlation
   3. modest nonshared env correlation

3) next steps: integrating psychophysiological indicators, and testing potential moderating role of contextual variables (e.g. parenting environment)

Thanks to participants, collaborators, research assistants & funding agencies

SECCYD, NICHD HD54481
Jungmeen Kim, Ben Allen (Virginia Tech)

WRRP, NICHD HD38075, 46167
Stephen Petrill (Ohio State)
Lee Thompson (Case Western Reserve University)
Paula Mullineaux (Virginia Tech)
Laura DeThorne (U Illinois)
Chris Schatschneider (Florida State)
David Vandenbergh (Penn State)