Cognitive development

1. **Full title**
   
   Cognitive development

2. **Research group**
   
   Developmental Psychology
   
   *Program director: Richard Ridderinkhof*

3. **Members of the group**
   
   **Senior staff**
   
   Eveline Crone, Birte Forstmann, Hilde Huizenga, Brenda Jansen, Marija Maric, Maurits van der Molen, Saskia van der Oord, Annemie Ploeger, Pier Prins, Maartje Raijmakers, Richard Ridderinkhof, Elske Salemink, Patrick Snellings, Ingmar Visser, Reinout Wiers, Wery van den Wildenberg
   
   **Postdoctoral fellows**
   
   Anneke Alkemade, Mike Cohen, Thomas Gladwin, Caroline Junge, Kiki Nikolaou, Helle Larsen, Matthias Mittner, Tessa van Schijndel
   
   **PhD’s**
   

4. **Membership Research School and other Research Institutes**

   Nearly all staff members participate in the Experimental Psychology Graduate School (EPOS), the Interuniversitary Graduate School for Psychometrics and Sociometrics (IOPS), or in the Research School of Experimental Psychopathology (EPP). The staff has close ties with the Cognitive Science Center Amsterdam (CSCA) of the University of Amsterdam.

5. **Research topics**

   The major focus of the UvA-DP program is on normal and deviant cognitive development. The research program on normal development covers the entire
life-span: from infants and toddlers to the elementary school age to adolescence to senescence). The program on deviant development also covers much of the life-span, but focuses on a limited set of strongholds (detailed below).

**Normal Development.** This program has a three-fold focus.

- One cluster of related topics capitalizes on learning, decision-making, and cognitive control (including category learning, value-based decision-learning, risky decision-making, and the planning, selection, inhibition, and flexible coordination of action). This cluster is studied across the life span, in relation to neural maturation and deterioration.
- Another cluster of topics centers on the development of school and pre-school capabilities. This cluster studies fundamental mechanisms of cognitive development (prominently including language and mathematical abilities) as well as educational ramifications (prominently including the training and monitoring of such skills, and science learning).
- The program is traditionally characterized by a strong emphasis on methodological innovation that innervates the analysis approach entertained in the other clusters. Sophisticated methods are developed for the analysis of data arising in developmental psychology (including analysis of time series, reaction-time distributions, latent variables, EEG/fMRI data), and mathematical modeling of theories of neurocognitive development.

**Deviant Development.** Assessment and intervention present two separate yet essentially integrated outlooks. While converging on largely the same clusters of abilities, with similar methodological accents, as the normal development program, some domains are accentuated:

- One domain is addiction, centering on adolescence, and capitalizing on the balance between impulsive (implicit) versus control (executive) processes. Assessment focuses on the etiology of dysfunction in these (and related) processes, and on the prediction of substance abuse and addictive behaviors. Novel interventions (such as re-training) are developed aiming to directly influence these processes, with promising results, in patients as well as young heavy drinkers.
- Additional domains of deviant development related to the cluster of decision-making and cognitive control are biological psychopathology (mild to severe retardation; autism spectrum disorder), and neuropsychiatric disorders among elderly (in particular Parkinson’s disease).
- We focus on moderators and mediators of psychological interventions for children and adolescents with externalizing and internalizing problems, linking treatment outcome research with basic developmental psychopathology models to examine mechanisms of change. For instance, potential moderators are psychopathic traits and co-morbidity in aggressive boys, and working memory and reinforcement in ADHD. Innovative interventions are developed
for ADHD, using computer- and internet technology, to improve executive functions.

- A final domain pertains to the cluster of school-age capabilities (in particular reading- and other learning disabilities). Methodological innovations specific to deviant development include small-sample (including N=1) analysis, novel (neuro)psychological assessments, and techniques to assess treatment effectiveness.

Transversal and translational perspectives. A number of prominent perspectives, cutting across normal and deviant development, distinguish UvA- DP from other DP departments.

- Rather than focusing on social or emotional development per se, UvA-DP studies environmental, social, affective, and motivational modulations of cognitive development across its subprograms. This allows us to maintain a coherent focus yet include (structurally or incidentally) those variables that prove indispensible for a deeper appreciation of the processes and mechanisms of normal and deviant cognitive development.

- UvA-DP is well-renowned, within NL and internationally, for its pioneering work and long-standing traditions involving a strong focus on a) the relation between cognitive development and brain maturation; b) the theoretical, mathematical/computational, and statistical modeling of (neuro-)cognitive development; and c) the development and application of innovative techniques for the statistical analysis of behavioral, neuropsychological, and neural developmental data.

- Across its normal/deviant subprograms, and across its experimental and analytical approaches, UvA-DP engages individual-differences techniques as starting points for analysis beyond traditional group analyses. Inter-individual variability within age/clinical groups, explored using various types of covariance-based and latent-class analyses, provides a basis for a deeper understanding of the nature of cognitive (dys)function, and allows a richer articulation of how and why individuals differ in the efficiency and maturation of these functions.

- Rooted firmly in our long-standing experimental approach, UvA-DP increasingly endeavors to combine its efforts in fundamental research efforts with practice-oriented work. As prominent examples, we develop science-education programs for very young children, and we train science/practitioners at PhD level to put clinical developmental research on a more solid footing.

6. Program Development

2013 has been a year largely of consolidation and extension.
• We have continued our focus on two broad but unified clusters of cognitive development (outlined above). This allowed for a coherent research program with abundant cross-links. Methodological and brain maturation perspectives are integrated with these clusters, cutting across age groups and normal and deviant development, which further enhances their relevance for the discipline. The dramatic rise in the number of publications seen in 2010 has been consolidated once more in 2013, with increased productivity in many of our staff.

• Our paradigmatic approach is largely embedded in the broad theoretical framework of decision-making and cognitive control. We have consolidated our outlook on cognitive development vis-à-vis brain maturation during childhood, adolescence and aging; our expertise for developmental neuroimaging research; and the societal exposure of our efforts in developmental cognitive neuroscience.

• We have consolidated our deviant development research, in terms of volume, funding, and scientific impact. This research program benefits from collaboration with, a.o., de Bascule (one of the largest NL institutions in this field), and from networks for research into the neurocognitive bases of Parkinson’s disease.

• Transversal perspectives, described above and so characteristic for UvA-DP, have been and will be amplified further, with special emphasis on the much-needed training of science/practitioners at the PhD level (in 2013: 2 staff members, 3 PhD-students), on the development of algorithms for informed clinical decisions during treatment/interventions, and on science education in the national Platform Betatechniek, to bridge the gap between the academy and applied clinical work.

• One of our senior staff members, Prof.dr. Prins, has retired after summer 2013. He has remained, and will remain actively involved in our research program afterwards, e.g. by supervising a new postdoc project that he has recently acquired. In the short run, several postdocs will under his guidance fill the void of his clinical research; within a few years we aim to recruit a full-time scientist/practitioner.

• One of our staff members, Dr. Forstmann, has in 2013 been appointed a personal professorship in Neuroimaging in Cognitive Neuroscience, stationed at the Cognitive Science Center Amsterdam (renamed in 2013 into Amsterdam Brain & Cognition, ABC). Forstmann has been extremely successful in setting up a research program, generating output, and acquiring grant money. Her research program has been developed relatively independently, but fits well with our transversal perspectives and hence will gradually become more integrated with the UvA-DP research program.
### 7. Composition of research input of academic staff in 2013

<table>
<thead>
<tr>
<th>FTE</th>
<th>wp1</th>
<th>wp2</th>
<th>wp3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full professor (HL)</td>
<td>0.83</td>
<td>0.50</td>
<td>0.30</td>
<td>1.63</td>
</tr>
<tr>
<td>Associate professor (UHD)</td>
<td>0.87</td>
<td>0.15</td>
<td></td>
<td>1.02</td>
</tr>
<tr>
<td>Assistant professor (UD)</td>
<td>2.65</td>
<td>0.87</td>
<td></td>
<td>3.52</td>
</tr>
<tr>
<td>Postdoc</td>
<td>1.42</td>
<td>3.00</td>
<td>1.78</td>
<td>6.20</td>
</tr>
<tr>
<td>Ph.D. students (AIO)</td>
<td>4.71</td>
<td>10.38</td>
<td>2.60</td>
<td>17.69</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>10.49</td>
<td>14.90</td>
<td>4.68</td>
<td>30.07</td>
</tr>
</tbody>
</table>
RESEARCH OUTPUT

1. Academic publications
   1.a. Refereed articles


Duijvenvoorde, A.C.K. van, Jansen, B.R.J., Griffioen, E.S., Molen, M.W. van der & Huizenga, H.M. (2013). Decomposing developmental differences in


DEVELOPMENTAL PSYCHOLOGY
Experimental Research, 37(10), 1737-1744.


Sonuga-Barke, E.J.S., Brandeis, D., Cortese, S., Daley, D., Ferrin, M., Holtmann,


Woud, M.L., Wiers, R.W., Pawelczak, S., Becker, E.S., Lindenmeyer, J. & Rinck, M. (2013). Does Negative Affect Prime Alcohol in Alcohol-Dependent
DEVELOPMENTAL PSYCHOLOGY


1.b. Non-refereed articles

1.c. Books

1.d. Book Chapters

1.e. Conference Papers.


Jahfari, S., Ridderinkhof, K.R., Waldorp, L. & Scholte, H.S. (2013). The prefrontal cortex and higher sensory areas co-direct the basal ganglia to pass the most optimal response. In Society for Psychophysiological Research, Abstracts for the Fifty-Third Annual Meeting, Firenze Fiera Congress & Exhibition Center, Florence, Italy, October 2–6, 2013 Vol. 50. Psychophysiology (pp. S22).

1.f. Reports


2. Ph.D. Thesis

2.a. Internally prepared


Duijvenvoorde, A.C.K. van (2013, Juni 26). On the art of choosing:


2.b. Externally prepared


2.c. Doctorates at other faculties/universities, co-supervised by program
Members

3. Professional Publications


4. **Publications aimed at the general public**


Ploeger, A. (2013, Juli 01). In lust we trust. Glamour


5. **Other results**

5.a **Book editors**

5.b **Journal editorships**

5.c **Inaugural lectures**


5.d **Prizes**

5.e **Organisation of conferences and symposia**


Salemink, E. (2013). Member of the scientific committee for the 2014 annual convention of European Association for Behavioural and Cognitive Therapies.


5.f Research grants

Forstmann, B.U. (2013). The project 'Subdivisions of the Subthalamic Nucleus' was awarded a two-year €35.000,- grant. Erkenning.


Huizenga, H.M. (2013). NWO VICI research grant for Why speeding on your scooter is a good idea: Decision strategies in childhood and adolescence. Erkenning.


5.g Keynote speeches at conferences


Boyer, B.E., Geurts, H.M., Prins, P.J.M. & Oord, S. van der (2013, oktober 03). Cognitive Behavioral Treatment of Adolescents with ADHD. Prague,
DEVELOPMENTAL PSYCHOLOGY


6. Radio / television performance