European Conference on Psychological Theory and Research on Intellectual and Developmental Disabilities (ECIDD). 8th Biennial Conference: Programme and Abstracts

Hessels, Marco G.P. (ed.)

ECIDD

EUROPEAN CONFERENCE ON PSYCHOLOGICAL THEORY AND RESEARCH
ON INTELLECTUAL AND DEVELOPMENTAL DISABILITIES

8th Biennial Conference

June 17 – 19, 2010
Geneva, Switzerland

Programme and Abstracts

Edited by Marco G.P. Hessels

University of Geneva
Faculty of Psychology and Educational Sciences

Uni Mail
Boulevard du Pont d'Arve 40
1205 Geneva
Room R060

8th Biennial ECIDD

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Programme and Abstracts

Contents

Welcome to Geneva

It is with great pleasure that we welcome you to the *8th European Conference on psychological theory and research on Intellectual and Developmental Disabilities* taking place at the University of Geneva from Thursday, June 17 until Saturday, June 19, 2010.

The ECIDD was first established in 1996 under the name PTRMR. Recently, the scientific committee has decided to change its name to ECIDD, so that it is in line with current terminology (see for instance the American Association on Intellectual and Developmental Disabilities).

The main themes of the ECIDD are psychological aspects of both cultural-familial intellectual disabilities and genetic syndromes (for instance autism, Down syndrome, Williams syndrome or Fragile X). The biennial conference offers a forum for the exchange of findings in psychological fundamental and applied research on intellectual and cognitive developmental disabilities. The conference aims at extending our understanding of causes and conditions of intellectual disabilities, advancing our knowledge on successful prevention and intervention procedures as well as broadening our scientific networks.

The meeting includes individual paper presentations and a poster session. Each day, the conference will begin with a keynote address. On Thursday **Tracy Packiam Alloway**, University of Stirling (Scotland, UK), will address the issue of working memory, on Friday **Ina van Berckelaer-Onnes**, University of Leiden (The Netherlands) will talk about diagnostics and treatment of autism and on Saturday **Derek Moore**, University of East London (England, UK) will speak about social cognition in Down syndrome.

We hope this conference will be an intellectually exciting and enriching experience, as well as a pleasant social event.

On behalf of the Scientific and Local Committee,

Marco Hessels
Chair of the 8th ECIDD Conference

Organised by the COGED-SOCO research group

COGnitive EDucation and SOcio-emotional COmpetences:
Research and implementation in special education
Department of Special Education
Faculty of Psychology and Educational Sciences
University of Geneva

With support of the

Department of Educational Sciences of the
Faculty of Psychology and Educational Sciences
University of Geneva

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General information

Conference venue

The conference will take place at the University of Geneva, Uni Mail, Room R060, Boulevard du Pont d'Arve 40, CH-1205 Geneva, Switzerland. Posters will guide you to the conference desk in the Uni Mail building, which is on the ground floor on the park side.

Registration

The registration desk will be open on Wednesday from 8:00 am to 9:00 am and on Thursday and Friday from 8:45 am to 9:00 am. During conference hours, the assistants at the desk are pleased to answer any questions you may have.

Fees

The registration fee includes the conference materials such as the abstract and programme book, and coffee/tea breaks and lunch. You will find a voucher for your lunch in the conference package.

The social event fee includes dinner and wine at “La Mère Royaume” on Friday evening.

Fees (in CHF)	Until April 21,2010	After April 21, 2010	After May 21, 2010
Full registration	340	425	500
PhD registration	250	325	400
Student registration	190	235	300
Social event	75	75	75

* Master and PhD students must send a signed certificate from the supervisor or head of department that confirms their status. Master students must also send a scanned copy of their student card. Electronic (scanned) versions (jpeg or pdf file) should be send to ECIDD2010@unige.ch.

Social events

On Thursday evening a guided city tour will take place from 18:00 to 19:00. Departure from the entrance of Uni Mail in front of the park. The tour will end at Place Neuve.
On Friday from 19:00 a dinner party with wine and food will take place at “La Mère Royaume”, place Simon-Goulart 4, 1201 Genève, Switzerland. Tel. +41 22 731 29 20.

Internet

Free wireless internet access will be available for all conference participants.

Information

For further information please contact Marco Hessels, phone +41 22 379 9088
Email: ECIDD2010@unige.ch
Or look at the website:
http://www.unige.ch/fapse/SSE/teachers/hessels/ECIDD/Index.html

Keynote speaker: Thursday

Tracy Packiam Alloway
University of Stirling (Scotland, UK)

Thursday, June 17, 9:30 – 10:30

Working Memory: Turning disability to ability.

Working memory is our ability to remember and manipulate information. Working memory has important consequences for learning, particularly for those with intellectual disabilities, which can also include those with Language Impairments, Development Coordination Disorder (motor disorder), ADHD/ADD, and Autistic Spectrum Disorder. Can we increase our working memory space? Brain training is a growing and exciting new area in scientific research. In particular, there is a lot of evidence of our brain's plasticity: that it can actually change - shrink or grow - depending on what we do. This has powerful implications for learning in those with intellectual disabilities. If our brains keep growing as adults, it is so much more important to train our children's brains while they are still developing. I illustrate how the brain responds to training and trends and evidence for programs that work in improving classroom functioning.

Keynote speaker: Friday

Ina van Berckelaer-Onnes
University of Leiden (The Netherlands)

Friday, June 18, 9:00 – 10:00

Autism: According to the letter.

Autism is a neurobiological disorder. Research in this field is done on different levels: the behavioural level, the cognitive level and the neurobiological level. Today, however, autism can be classified on the level of behaviour only, following the DSM IV rules. Classifications, however, can also be dimensional. With regard to autism the dimension intelligence or - in a broader sense- cognition is very interesting. Three current cognitive constructs (Theory of Mind, Executive Function and Central Coherence) are trying to unravel the enigma of autism. They might explain the behavioural characteristics and will attempt to find dysfunctions of the brain. The Theory of Mind (Baron-Cohen, 1995) refers to the ability to attribute mental states to oneself and others. Executive Function (Ozonoff,1997) refers to the cognitive processes that support the self-control necessary for the attainment of a future goal. It is an umbrella term for a constellation of various mental operations. The Central Coherence (Frith, 1989; Happé, 1999) refers to the natural tendency to process incoming stimuli globally and in context, pulling information together to acquire higher-level meaning. In this presentation autism will be linked to the three cognitive constructs with diagnostics and treatment in mind.

Keynote speaker: Saturday

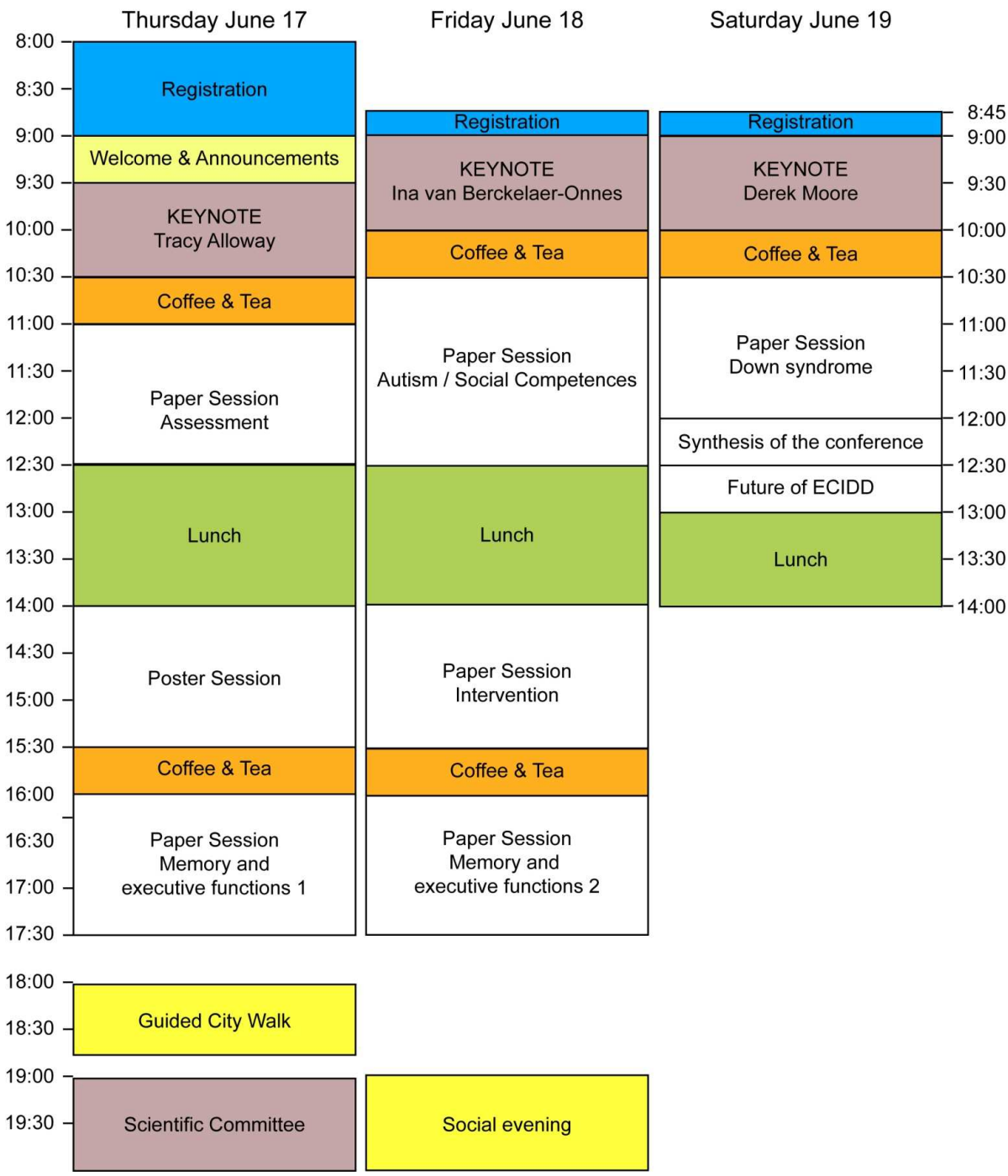
Derek Moore
University of East London (England, UK)

Saturday, June 19, 9:00 – 10:00

Social and cognitive development in children with Down syndrome: trying to build wider developmental models.

Children with Down's syndrome (DS) are often portrayed as being sociable and engaging. This has led some to suggest that their social development is relatively spared in comparison to their cognitive development. This talk will present an overview of the somewhat limited amount of work that has examined the social cognition of children with DS. I will raise questions about whether we have a complete and adequate picture of their social abilities and highlight the importance of taking a developmental approach to these issues and of considering how the social and cognitive domains impact on each other over the course of their development. I will present findings from work looking at the development of infants with DS and present a preliminary model that begins to crystalise out some of the possible developmental pathways that determine the unique profile of social abilities found in children with DS. I will demonstrate how essential it is to consider all levels of explanation (neuro-biological, cognitive, behavioural and social-environmental) when characterising the social and cognitive abilities of children with DS.

Conference Program Overview



Detailed conference programme

Thursday June 17: Morning programme

8 :00 – 9:00	**Registration** (Main Hall, in front of Room 060)
9 :00 – 9:10	**Welcome to the 8th ECIDD** *Marco Hessels*
9 :10 – 9:20	**Welcome to the University of Geneva** *Mireille Bétrancourt, Vice Dean of the Faculty of Psychology and Educational Sciences.*
9:20 – 9:30	**Announcements**
9:30 – 10:30	**Keynote by Tracy Alloway** Working Memory: Turning disability to ability.
10:30 – 11:00	**Coffee & Tea**
	Paper session: Assessment
11:00 – 11:30	Do Raven's Colored Progressive Matrices function in the same way in typical and clinical populations? *Marie Laure Joëlle Nuchadee[1], Bruno Facon[1], David Magis[2] & Paul De Boeck[3], [1]University of Lille, [2]University of Liège, [3]University of Amsterdam.*
11:30 – 12:00	Analogical reasoning and working memory in students with intellectual disabilities. *Caroline Bruttin & Fredi Büchel, University of Geneva*.
12:00 – 12:30	Research in intellectual disabilities: Should we match on IQ or on learning capacity? *Marco G.P. Hessels & Mélanie Gassner, University of Geneva*.
12:30 – 14:00	**Lunch**

Thursday June 17: Afternoon programme

14:00 – 15:30	**Poster session**
15:30 – 16:00	**Coffee & Tea**
	Paper session: Memory & Executive Functions 1
16:00 – 16:30	Working memory functions in children with different degrees of intellectual disabilities. *Claudia Mähler & Kirsten Schuchardt, University of Hildesheim*.
16:30 – 17:00	Executive Functions in children with intellectual disabilities. *Henrik Danielsson[1], Lucy Henry[2] & David Messer[3], [1]Swedish Institute for Disability Research & Linköping University, [2]London South Bank University, [3]Open University* .
17:00 – 17:30	Have you seen it before? Collaborative memory for adolescents with intellectual disabilities and their assistants. *Örjan Dahlström & Henrik Danielsson, Swedish Institute for Disability Research & Linköping University*.

18:00 – 19:00	**Guided City Walk**
19:00	**Scientific Committee Meeting**

Friday June 18: Morning programme

8:45 – 9:00	**Registration** (Main Hall, in front of Room 060)
9:00 – 10:00	**Keynote by Ina van Berckelaer-Onnes** Autism: According to the letter.
10:00 – 10:30	**Coffee & Tea**
	Paper session: Autism / Social competences
10:30 – 10:55	Excellent calculation abilities in a child with high functioning autism. *Maria Chiara Passolunghi, S. Pellizzoni & L. Cettolin, University of Trieste.*
10:55 – 11:20	Specifities of language comprehension in autism: Explicable by the account of theory of weak central coherence? *Melanie Eberhardt[1], Christoph Michael Müller[2] & Susanne Nußbeck[1], [1]University of Cologne, [2] University of Fribourg.*
11:20 – 11:45	Brain morphology in autism and fragile x syndrome correlates with social IQ. *Cherine Fahim[1,3], Nagwa Meguid[2], Catherine Brandner[1] & Alan Evans[3], [1]University of Lausanne, [2]National Research Centre Cairo, [3]McGill University.*
11:45 – 12:10	Early family environment and the social competence of adolescent children with disabilities. *Darcy B. Mitchell, Boston College*.
12:10 – 12.35	Atypical visuo-spatial ability and weak working memory in autism: cognitive bias or assessment bias? *Linda Jane van den Berg, Ellahe Chabani & Wilma C.M. Resing, Leiden University.*
12:30 – 14:00	**Lunch**

Friday June 18: Afternoon programme

	Paper session: Intervention
14:00 – 14:30	Working Memory training in children with neuropsychiatric disorders and borderline intellectual disabilities. *Mariët van der Molen, University of Amsterdam.*
14:30 – 15:00	The effects of a metacognitive intervention using games on strategic behavior and cognitive performance of students with intellectual disability. *Christine Hessels-Schlatter, University of Geneva*.
15:00 – 15:30	Dynamic assessment reports and recommendations: opinions of special education teachers. *Tirza Bosma, University of Leiden.*
15:30 – 16:00	**Coffee & Tea**
	Paper session: Memory & Executive Functions 2
16:00 – 16:30	Verbal short-term memory in children with intellectual disabilities. Examining the word length effect. *Sebastian Poloczek[1], Gerhard Büttner[1] & Marcus Hasselhorn[2], [1]Johann Wolfgang Goethe-University, Frankfurt, [2]Deutsches Institut für Internationale Pädagogische Forschung, Frankfurt.*
16:30 – 17:00	Working memory in children with specific language impairment. *Dietmar Grube[1], Kristian Folta[2], Claudia Schlosser[3], Friedrich Linderkamp[3], [1]Hochschule Vechta, [2]University of Hildesheim, [3]University of Oldenburg.*
17:00 – 17:30	Are there domain specific deficits in executive functioning in children and young people with specific language impairment? *Lucy A. Henry[1], David Messer[2], Gilly Nash[1], [1]London South Bank University, [2] Open University.*

19:00 – …	**Social Evening**

Saturday June 19

8:45 – 9:00	**Registration** (Main Hall, in front of Room 060)
9:00 – 10:00	**Keynote by Derek Moore** Social and cognitive development in children with Down syndrome: trying to build wider developmental models.
10:00 – 10:30	**Coffee & Tea**
	Paper session: Down syndrome
10:30 – 11:00	Numerical intelligence training in children with Down syndrome. *Silvia Lanfranchi, Elisa Dal Pont, Federica Avventaggiato & Renzo Vianello, University of Padova.*
11:00 – 11:30	Impact of phonological awareness on reading and writing in Down's syndrome. *Stéphanie Frenkel[1] & Stefano Vicari[1,2], University of Liège, I.R.C.C.S. Ospedale Pediatrico Bambino Gesù Roma.*
11:30 – 12:00	Social stereotyping of children with Trisomy 21: When the positive stereotype at the explicit level turns to be strongly negative at the implicit level. *Claire Enéa-Drapeau, Pascal Huguet, David Gimmig & Michèle Carlier, Aix Marseille University and CNRS.*
12:00 – 12:30	**Synthesis of the 8th ECIDD**
12:30 – 13:00	**Future of the ECIDD**
13:00 – 14:00	**Lunch**

Poster session, Thursday June 17, 14:00 – 15:30

Self-Esteem and Self-Handicapping in Learning Disabilities.
Marianna Alesi, Gaetano Rappo & Annamaria Pepi, Università degli Studi di Palermo.

Executive function in Williams and Down syndromes.
Dan Carney, London South Bank University.

Intra-individual variability in reaction times in processing speed and inhibition among children with attention-deficit/hyperactivity disorder.
C.Chicherio[1], E.Borella[2], A. de Ribaupierre[1] & C.Cornoldi[2]. 1University of Geneva; [2]University of Padova.

Dynamic Assessment instrument to dissociate Gifted Underachiever Children and Children with Autism.
Nikki Elbers, Ellahe Chabani & Wilma C.M. Resing, Leiden University.

Dynamic learning and working memory in adults with autism and intellectual disabilities.
Lucy Henry, Andreas Constandinos & Danielle Dunne, London South Bank University.

Training Quantity-Number-Concept in students with intellectual disabilities.
Jan Kuhl, Daniel Sinner & Marco Ennemoser, University of Giessen.

Explicit and implicit memory among participants with Fragile X syndrome, Williams syndrome, Down syndrome and with typical development.
Hefziba Lifshitz, Elli Vakil, Meital Ihyee, Bar-Ilan University.

Development of a non-verbal technique for patients with intellectual disabilities to investigate eye contact detection.
Erika N. Lorincz, Fabienne Gerber & Giuliana Galli Carminati, Geneva University Hospital.

Visual-Spatial Capacity in Children with Autism: Static test vs. Dynamic Assessment.
Wendy Meurs, Yasmin Vluggen, Ellahe Chabani & Wilma C.M Resing, Leiden University.

Poster session, Thursday June 17, 14:00 – 15:30

Learning how to learn as a process of identity formation: The experiences of six Colombian students.
Maria Oreshkina[1], Jessica Lester[2], Katherine Greenberg[2], [1]University of Scranton, [2]The University of Tennessee.

Intellectual disability: EEG signal randomness measured by approximate entropy.
Julie Palix[1], Fabienne Giuliani[2], Sophie Pernier[2], Elodie Jombart[2], François Grasset[2], Cherine Fahim[1], Catherine Brandner[1], [1]LERB, University of Lausanne, Lausanne, [2]CHUV, Lausanne.

To foster learning opportunities of students with severe learning problems.
Marlous Tiekstra, University of Groningen.

Computer- aided recognition of written words by autistic mute children.
Frédérique Vernay & Jean-Yves Roussey, Provence University, Aix en Provence.

Paper abstracts (in order of presentation)

Paper session: Assessment

Do Raven's Colored Progressive Matrices function in the same way in typical and clinical populations?

Marie Laure Joëlle Nuchadee[1], Bruno Facon[1], David Magis[2] & Paul De Boeck[3]
[1]University of Lille, [2]University of Liège, [3]University of Amsterdam

Thursday, 11:00 – 11:30

The use of standardized tests is very widespread in comparative studies of clinical populations, either as dependent or control variable. Yet, it is not certain that their items really measure the same construct in the groups under study. In the present work, 460 participants with intellectual disability of undifferentiated etiology and 488 typical children were tested using Raven's Coloured Progressive Matrices (RCPM). Data were analyzed using logistic regression modelling, a statistical approach designed to detect differential item functioning or DIF. Results showed that 12 items out of 36 are working differently between the two groups, but only two exhibit some moderate DIF effect. In other words, a large majority of the items have identical discrimination and difficulty levels across the groups of children. It is concluded that RCPM can be used with confidence in studies comparing participants with and without intellectual disability. In addition, it is suggested that methods designed for investigating internal bias of tests in cross-cultural, cross-linguistic or cross-gender comparisons should be much more employed for demonstrating the absence of any systematic measurement error (i.e. differential item functioning) affecting the response to items among clinical populations, particularly in the developmental disabilities field.

Keywords:
Intellectual disability, Raven's Progressive Matrices, differential item functioning, logistic regression

Analogical reasoning and working memory in students with intellectual disabilities

Caroline Bruttin & Fredi Büchel
University of Geneva

Thursday, 11:30 – 12:00

An analogical reasoning computer test was adapted in order to prevent memory overload among students with moderate intellectual disabilities (IQ: 50-55 to 40-45). Participants are presented with a touch screen on which they see the A, B and C terms of the matrix. The test is composed of two versions. The first one is a classic version, which is similar to traditional analogical reasoning tests: Participants see the A, B and C parts of the matrix and have to choose the right picture among several possibilities. The second version is a construction version: Participants have to construct the answer by choosing the different elements composing it. All components are shown on the lower part of the screen, together with incorrect components. The test consists of four levels of difficulty, with two relations in the lowest and five in the highest level. In this kind of tests, the more the relations, the more memory is overloaded, which leads to loose part of the information. Indeed, construction version design allows participants to create external memories and therefore to prevent memory overload, which is not the case in the classic version, because they have to maintain in memory all the relations involved. Results confirm our hypothesis: Compared to children of the same mental age, students with moderate intellectual disabilities solved, in the construction version, items as well as the mental age (MA) control children, thanks to the external memories

Keywords:
Analogical reasoning, intellectual disabilities

Research in intellectual disabilities: Should we match on IQ or on learning capacity?

Marco G.P. Hessels & Mélanie Gassner
University of Geneva

Thursday, 12:00 – 12:30

Research into intellectual and developmental disabilities is generally based on the methodology of comparing the performances of matched groups of participants: the performances on specific cognitive tasks of a group of individuals with intellectual disabilities (ID) are compared to those of children with the same mental age (MA). An equivalent mental age, as determined with an intelligence test, implies that the participants in both groups show the same level of cognitive functioning. When performance differences in specific cognitive functions are found between the two groups, it is concluded that these must be caused by specific deficits in persons with ID. However, research has shown that intelligence tests do not provide reliable and valid measures of the level of cognitive functioning of persons with ID. Therefore, we propose to estimate the level of cognitive functioning in terms of "the capacity to learn", using a learning (potential) test instead of a traditional intelligence test. Our hypothesis was that research that uses one or the other type of test for matching would lead to different conclusions. Therefore, students with mild intellectual disabilities (mean age 17;0) were matched with two groups of typically developing children in primary school. The first group was matched on MA, the second on learning capacity. In all three groups four measures of working memory were administered, both verbal and spatial, with either low or high cognitive demand. The results show that matching on mental age leads to what is generally reported in the research literature, namely that the ID groups show lower scores on WM tasks, despite a same mental age. However, when the groups were matched on learning capacity, no significant differences were found (or a tendency was reversed). The implication is that the validity of research outcomes based on mental age matching is seriously questioned.

Keywords:
Intellectual disability, mental age, matching, learning test, working memory

Paper session: Memory & Executive Functions 1

Working memory functions in children with different degrees of intellectual disabilities

Claudia Mähler & Kirsten Schuchardt
University of Hildesheim

Thursday, 16:00 – 16:30

In recent years, there has been increased research interest in the functioning of working memory in people with intellectual disabilities. Although studies have repeatedly found these individuals to have weak working memory skills, few investigations have distinguished between different degrees of intellectual disability. This study aims to help close this research gap and, in so doing, to examine whether the deficits observed reflect a developmental lag or a qualitative deviation from normal development. In a 5-group design, the working memory performance of a group of 15-year-olds with mild intellectual disability (IQ 50-69) was compared with that of two groups of children (aged 10 and 15 years) with borderline intellectual disability (IQ 70-84) and with that of two groups of children with average intellectual abilities (IQ 90-115) matched for mental and chronological age (aged 7 and 15 years). All children were administered a comprehensive battery of tests assessing the central executive, the visual-spatial sketchpad, and the phonological loop. The results showed deficits in all three components of working memory, and revealed that these deficits increased with the degree of intellectual disability. The findings indicate that, relative to their mental age peers, children with learning difficulties show structural abnormalities in the phonological store of the phonological loop, but developmental lags in the other two subsystems. Similar patterns of results emerged for both subgroups of children with intellectual disability, indicating that problems with phonological information processing seem to be one of the causes of cognitive impairment in individuals with intellectual disability.

Keywords:
Working memory, intellectual disability

Executive Functions in children with intellectual disabilities

Henrik Danielsson[1], Lucy Henry[2] & David Messer[3]
[1]Swedish Institute for Disability Research & Linköping University, [2]London South Bank University, [3]Open University

Thursday, 16:30 – 17:00

Executive functions have been assessed in children with intellectual disabilities (ID) in relatively few previous studies. Most have reported that children with ID perform on a par with mental age-matched controls, but there is at least one report of even greater impairment. However, no previous research has used a broad range of executive measures, systematically varying in terms of verbal and visuospatial demands. In the present study, tests of 5 different sub components of executive functions were included: updating, shifting, fluency, problem solving and inhibition. Each component was assessed with one verbal and one nonverbal test. Preliminary results from 17 children with ID, mental age- (MA) and chronological age-matched (CA) comparison groups revealed different levels of impairment on different tests. The performance for the ID group ranged from CA-appropriate, to below MA level. These results emphasize the importance of using a wide range of tests of executive function to better understand the extent of the difficulties in children with ID.

Keywords:
Executive functions, Verbal and nonverbal

Have you seen it before? Collaborative memory for adolescents with intellectual disabilities and their assistants

Örjan Dahlström & Henrik Danielsson
Swedish Institute for Disability Research & Linköping University

Thursday, 17:00 – 17:30

Persons with intellectual disabilities often have to rely on an assistant to help them remember. Little is known about how this affects the memory ability and how much the assistant influence what is remembered. The aim of this study was to investigate collaborative memory for adolescents with intellectual disabilities when they collaborate with an assistant and also to investigate differences in collaborative memory between settings with similar and settings with different individual performances within the pair. A preliminary analysis is made for 9 adolescents from 2nd to 4th grade in upper secondary education and 9 assistants. Adolescents and assistants were divided into dyads and were individually presented with 56 black-and-white line drawings of common objects including 40 target pictures (20 pictures were in common, 10 pictures each were unique, and the rest was distracters). Recognition was then made from a new list of 50 pictures (the 40 targets and 10 new distracter), first individually and thereafter collaboratively. This procedure was performed twice with different sets of pictures with the same encoding time (2 seconds) once and with a shorter encoding time for the assistants (0.3 seconds). Adolescents' recognitions in non-manipulated and manipulated settings remained the same (M=15.9 and M=16.0) while the assistants' recognitions declined (M=24.3 and M=13.6). Adolescents' as well as assistants' memory performances were improved by collaboration. Collaborative recognition was lower in the manipulated setting. The relative inhibition in collaborative recognition was 6% for the non-manipulated setting and 16% for the manipulated setting. This indicates that the collaborative recognition was more affected when the potential of the assistant was reduced. Collaborative inhibition was shown to be present in a collaborative recognition task and suggests that adolescents and assistants invest more time to build up the relations to improve the performances of memory in the settings in upper secondary education (special schools for adolescents with intellectual disabilities).

Keywords:
Memory, Collaborative memory, Assistant Teacher

Paper session: Autism / Social competences

Excellent calculation abilities in a child with high functioning autism

Maria Chiara Passolunghi, S. Pellizzoni & L. Cettolin
University of Trieste

Friday, 10:30 – 10:55

Children with autism often demonstrate superior abilities in mathematics. In this investigation, we sought to determine the basis on this advantage in a case study of a boy (132 months) (M.N.) with High Functioning Autism whose cognitive processes and arithmetic abilities were compared to the abilities of a group of children matched for intelligence level. Working memory in terms of the phonological loop and the visuo–spatial sketchpad (Baddeley, 1986, 1996) was assessed by an extensive test battery. Additionally, we assessed verbal and visual recall in long-term memory. Mathematical ability was evaluated by two standardized written and oral calculation batteries. According to our hypothesis, a good working memory ability represents a core skill for the good calculation performance of children with High Functioning Autism. In particular, we hypothesized that the visuo-spatial component and an appropriate use of spatial strategies can play a critical role. In agreement with these hypotheses, M.N. significantly overcame the performance of the control group in all the visuo-spatial working memory tasks, and in mental and written addition and subtraction tasks. However, his performance was poor on multiplication and division and no greater than that the control group on verbal working memory tasks and in verbal and visual long-term memory tasks. These results, together with behavioral observations and an interview focused on calculation strategies, provide evidence that efficient visuo-spatial working memory processes underpinned NM.'s ability in addition and subtraction tasks. Furthermore, the present study supported the hypothesis that the visuo-spatial component of working memory plays a central role in addition and subtraction, whereas multiplication and division – processes that are more dependent on verbal ability – can mainly involve the phonological loop.

Keywords:
Working memory, short-term memory, mathematics, calculation, autism

Specifities of language comprehension in autism: Explicable by the account of theory of weak central coherence?

Melanie Eberhardt[1], Christoph Michael Müller[2] & Susanne Nußbeck[1]
[1]University of Cologne, [2] University of Fribourg

Friday, 10:55 – 11:20

In the past decades speech and language processing in people with autism was examined in numerous studies. Interestingly, compared to language production little attention has been directed to the processes of language comprehension. Often empirical results on this topic are interpreted solely within a framework of social cognition. However, results could also be explained by a detail-oriented processing-style proposed by the theory of weak central coherence (Happé & Frith 2006). In this theoretical account a spontaneous bias towards details in people with autism is postulated. Although the theory has been mostly studied with a focus on visual perception, it might also provide explanations for the specificities of language processing in autism. In order to examine the model's explanatory power in the verbal-semantic domain, in this review, pivotal findings on speech and language comprehension in autism were arranged along a linguistic model (Bishop 1999) and compared to the assumption of the theory of weak central coherence. The results show that a detail-focused processing style can provide significant explanations for the specific language comprehension abilities in autism. Open questions, directions for further research and implications for a better understanding of persons with autism are outlined.

Keywords:
Autism, language comprehension, information-processing, weak central coherence

Brain morphology in autism and fragile x syndrome correlates with social IQ

Cherine Fahim[1,3], Nagwa Meguid[2], Catherine Brandner[1] & Alan Evans[3]
[1]University of Lausanne, [2]National Research Centre Cairo, [3]McGill University

Friday, 11:20 – 11:45

Fragile x syndrome shares most of the behavioral phenotypic similarities with autism. How are these similarities reflected in brain morphology? Ten children with autism and seven with fragile x underwent morphological (T1) 1.5T magnetic resonance imaging. We found no significant difference in total brain volumes, regional volumes, gyrification index, sulcul depth and cerebral cortical thickness. However, children with autism showed significant decrease in the medial prefrontal bilaterally and the left anterior cingulate cortices. Regression analysis revealed positive correlation between the medial prefrontal cortical thickness and social IQ. We suggest that the difference between the two groups in the medial prefrontal and anterior cingulate cortices thickness may entail an altered social cognitive style. Functional magnetic resonance imaging studies directly differentiating between social indifference (autism) and social avoidance (fragile x) are needed in order.

Keywords
Autism, fragile x syndrome, magnetic resonance imaging, cerebral cortical thickness

Early family environment and the social competence of adolescent children with disabilities

Darcy B. Mitchell, Boston College

Friday, 11:45 – 12:10

Abstract: The social competence displayed by adolescents is widely understood to be important for adolescents, both typically developing and those with developmental disabilities (DD) (Hauser-Cram, Krauss, & Kersh, 2009). This study focused on the feelings of social competence of 74 15-year-old adolescents with developmental disabilities and the characteristics of children and families that predict these. Hierarchical regression analyses indicated that the socioeconomic status of the family and the behavior problems of the children at age 3 were not predictive of adolescent social competence. Adolescent functioning, characterized by cognitive and adaptive skills, and adolescent behavior problems were found to be related to social competence, but these relations lost significance when family climate was considered. Consistent with developmental systems models, family climate added significant unique variance to adolescents' feelings of social competence. Programs should continue to help adolescents to improve their cognitive and adaptive skills and to minimize their problem behaviors. These findings, however, also suggest that the early childhood years are important to the feelings that adolescents have about their social functioning many years later. Programs that work with young children should consider the family context and support family functioning during these formative years.

Keywords:
Developmental disabilities, adolescents, family climate, social competence

Atypical visuo-spatial ability and weak working memory in autism: cognitive bias or assessment bias?

Linda Jane van den Berg, Ellahe Chabani & Wilma C.M. Resing
Leiden University

Friday, 12:10 – 12:35

Research often stated that individuals with autism perform poorly on working memory tasks as compared to normally developed individuals. This study attempts to answer the question if these atypical visuo-spatial abilities and weak working memory are due to a real cognitive bias or due to an assessment bias. Standard memory tests are most often executed in a test situation in which children are explicitly asked to remember things. Test situations like this ask a lot of control of a child, something children with autism cannot handle. Nakahachi et al. (2006) stated that superficial working memory dysfunction in children with autism could be attributed to different task characteristics such as verbal factors, perseveration and complexity. Consequently results of standard memory tests cannot be seen as correct. We propose a dynamic testing procedure, a pretest followed by several training sessions and a post test, to give more accurate results and more insight in cognitive processes. We assessed 75 children with autism with a newly developed visual spatial dynamic assessment along with a battery of different memory tests. In between a pre- and posttest two training sessions will be given. The test material is presented as a game and measures long term memory asking the children if they can distinguish between test material they have seen before and material they have not seen before. When the children first see the training material we do not explicitly instruct to remember the material. For the short term memory component we will look at how many times the child has to see a solution card as a hint during training before he is able to solve the puzzle. The dynamic procedure will give us the opportunity to see if working memory can be trained. If children need less hints to solve a puzzle during the training sessions working memory has improved with training in a short time. The goal of this study is to analyze the correlation between visuo-spatial capacity and working memory and analyze the differences between low and high functioning children with autism based on the total score, on short term memory and on long term memory. The results of this study (which is under way, results will be presented at the conference) can prove that actual working memory in children with autism is not as low as standard tests measure and can be trained.

Keywords
Autism, working memory, visual capacity, dynamic assessment

Paper session: Intervention

Working Memory training in children with neuropsychiatric disorders and borderline intellectual disabilities

Mariët van der Molen
University of Amsterdam

Friday, 14:00 – 14:30

Children with borderline intellectual disabilities show weaknesses in executive functioning like working memory, inhibition and flexibility. Furthermore, this group of children show more often neuropsychiatric disorders than typically developing children. In this study a promising neurocognitive training packed in a game, coined Braingame Brian© (Prins et al., in press), was investigated in a randomized controlled trial. The objectives were to investigate the efficacy of Braingame Brian© in reducing behavioral symptoms and to investigate whether this training improves neurocognitive functioning and academic achievements in this group of children. Children had an IQ score between 70 and 85 and were aged between 9 and 13 years. They were all diagnosed with ADHD and/or PDD. The training is given in 25 sessions of 45 minutes each, during a 6-week period. In each session, the children has to make three tasks; working memory, shifting and inhibition. The difficulty of each task adapts to the participants´ level. Between the three tasks, the child walks around in a virtual world. Finishing each task changes the virtual world, it becomes nicer. Outcome measures were tasks tapping, amongst others, working memory, fluid intelligence, inhibition, flexibility, arithmetic and reading. The first results will be presented and it will be discussed if this sort of cognitive interventions offers promising vista for future research and implementation in the field.

Keywords:
Neuro-cognitive training, Game training, Borderline intellectual disabilities

The effects of a metacognitive intervention using games on strategic behavior and cognitive performance of students with intellectual disability

Christine Hessels-Schlatter
University of Geneva

Friday, 14:30 – 15:00

A metacognitive intervention based on games and involving two adolescents with moderate to severe intellectual disability (MSID) will be presented. It is argued that games represent valuable tools for metacognitive interventions. Games allow addressing various cognitive and metacognitive processes, as well as motivational aspects. They are stimulating and help students engage in active, effortful and strategic behavior. Two case studies with adolescents with MSID were undertaken. The intervention consisted of 19 sessions and included several observation and visual comparison, induction, and construction games. Different cognitive and metacognitive processes as well as cognitive strategies were targeted during the intervention. The intra-individual training and maintenance effects were estimated with a pretest – intervention – posttest 1 – posttest 2 – design. Several cognitive and school-related tasks were used, as well as an observational checklist to evaluate the cognitive and metacognitive processes and strategies. The teachers also filled in a questionnaire to estimate the transfer of the trained strategies to the classroom context. The participants improved their strategic behavior and performance on several tasks. Moreover, these tasks were not directly trained and thus required near to very far transfer. One participant even transferred several of the trained strategies to the school context. The gains were maintained after eight weeks. The participants did not profit from the intervention in the same way, which is attributed to their respective learning capacity as assessed with the Analogical Reasoning Learning Test and to motivational factors. These effects of this short intervention are very promising when considering the participants' low level of cognitive functioning. For people with MSID, interventions should be run over a long-term period and ideally start at an early age. The relevance of games as tools for cognitive education is clearly illustrated. They underline the potentiality of enhancing general reasoning ability through training of the underlying cognitive processes. Although these results cannot be generalized, the provided procedural data and how they varied with the participants' performance can bring further insight for developing effective interventions.

Keywords:
Games, metacognition, intervention, intellectual disability

Dynamic assessment reports and recommendations: opinions of special education teachers

Tirza Bosma
University of Leiden

Friday, 15:00 – 15:30

In our study we focused on the applicability of a dynamic test as part of needs based assessment and for special educational practices. We studied the effect of static compared to dynamic reports and recommendations in the practice of special education teachers regarding their severe learning disabled students during a controlled diagnostic process. We expected teachers to value the provided reports and recommendations especially those based on the dynamic test. Thirty six Dutch children (mean age 11;6) identified as severe learning disabled and their special education teachers (N=15) took part in this study. School records including recent IQ scores (Mean IQ=55) were obtained. Teachers filled in a questionnaire regarding information needed for instructional planning and an intake form for each participating child. To the children in the experimental condition the dynamic assessment (CCPAM) was conducted, with a newly developed intervention phase based on a graduated prompt approach. To control group children the pre and posttest were administered. Afterwards, teachers were given recommendations based on either static or dynamic assessment. Through a questionnaire teachers were asked to evaluate each report, including recommendations. During the conference the value of dynamic testing in special education and the value of the recommendations for teachers' practices will be presented and discussed.

Keyword:
Needs based assessment, dynamic assessment, educational practice

Paper session: Memory & Executive Functions 2

Verbal short-term memory in children with intellectual disabilities. Examining the word length effect

Sebastian Poloczek[1], Gerhard Büttner[1] & Marcus Hasselhorn[2]
[1]Johann Wolfgang Goethe-University, Frankfurt, [2]Deutsches Institut für Internationale Pädagogische Forschung, Frankfurt

Friday, 16:00 – 16:30

To address the special educational needs of children with low intelligence, it is crucial to increase the understanding of their memory functions and limitations. To test whether the short-term memory functions of children with intellectual disability (ID) are in line with their general cognitive development, their performance on memory tasks can be compared to a group of younger children matched for mental age (MA). Examining the verbal short term memory (verbal STM) of 10 year old students with mild or borderline ID (IQ 50-84) Hasselhorn and Mähler (e.g., 2007) found that their capacity of the phonological store was impaired in comparison to peers of the same age but was in line with their MA. However, while a word length effect was present in all MA control group samples of their studies, no word length effect could be observed in any sample of 10 year olds with ID. This was interpreted as a possible evidence for a structural difference in the memory development impeding the automatic activation of the subvocal rehearsal which has the role to refresh decaying memory traces in the phonological store. However, these studies are not conclusive, because when testing phonological STM with verbal serial recall a word length effect can result from longer output times for long words and need not to be indicative of subvocal rehearsal. Therefore the word length effect was examined with 3 different output formats (verbal serial recall, non-verbal serial recall, and non-verbal probed recall). The sample consists of 56 children with mild or borderline ID and a control group of children matched on MA, sex and language background. A significant word length effect was found in the low IQ- and in the control-group. However, the word length effect was qualified by a significant interaction with the answering format. It is present in the verbal and non-verbal serial recall condition, but not in the probed recall condition. Our results do not support the idea that the verbal short-term memory of children with ID is characterised by a special problem with the subvocal rehearsal process.

Keywords:
Phonological Short Term Memory, Intellectual Disabilities, Word Length Effect

Working memory in children with specific language impairment

Dietmar Grube[1], Kristian Folta[2], Claudia Schlosser[3] & Friedrich Linderkamp[3]
[1]Hochschule Vechta, [2]University of Hildesheim, [3]University of Oldenburg

Friday, 16:30 – 17:00

Although specific language disorder (SLI) is quite frequently diagnosed the causes of the disorder are still under debate. Recently there is growing evidence supporting the view that phonological working memory is an important determinant of this disorder.
The present study was designed to explore working memory in children with specific language impairment from the view of Baddeley's working memory model. Subjects with with SLI were recruited from German special schools for language difficulties and control subjects from regular elementary schools. SLI group children had to show average intelligence and scores below average regarding two subscales of the Heidelberger Sprachentwicklungstest (HSET; Grimm & Schöler, 1991). The subtests (IS, SB) require the immediate imitation of spoken sentences and the construction of sentences from few given words. Children with SLI and control children (with average language scores) were matched by age and by nonverbal intelligence assessed by a German version of the Columbia Mental Maturity Scale (CMM1-3; Schuck, Eggert & Raatz).cNineteen children with SLI (mean age 7 years, 4 months; SD = 4 months) and 18 control children (mean age 7 years, 3 months; SD = 8 months) meeting the criteria given above performed the tasks of a German working memory test battery (AGTB; Hasselhorn et al., in prep.). The tasks assess the traditional subcomponents of Baddeley's working memory model: central executive, visuo-spatial sketchpad and phonological loop. Subjects of the SLI group showed reduced scores regarding the tasks assessing central executive and phonological loop functioning, respectively. No differences were found regarding visuo-spatial tasks. Results are interpreted in terms of phonological working memory deficits in children with SLI that also produce reduced scores in central executive tasks requiring processing of verbal information as used within the present study.

Keywords:
Working memory, specific language impairment, phonological loop

Are there domain specific deficits in executive functioning in children and young people with specific language impairment?

Lucy A. Henry[1], David Messer[2] & Gilly Nash[1]
[1]London South Bank University, [2] Open University

Friday, 17:00 – 17:30

Specific Language Impairment (SLI) is a common developmental disorder where language proficiency does not match an individual's other abilities. SLI appears to have significant negative consequences for concurrent and future functioning. Our research has been concerned with the relations between executive functioning (EF) and SLI, with a particular interest in whether children with SLI have impairments on both verbal and non-verbal measures of EF, i.e. a domain general or a domain specific cognitive impairment. Forty children and young people with SLI, 10-14-years of age, were recruited and included in the sample, based on impaired performance on at least three out of four subtests administered from the CELF-4 (Semel, Wiig, & Secord, 2006), together with average non-verbal IQ (BAS-II matrices). The average language delay for the children and young people in this sample was four years (i.e. mean chronological age 11.5 years, mean language age 7.5 years). The children and young people were assessed using a range of EF measures, many from a standardised test battery (Delis-Kaplan Executive Function System). We included measures of executive-loaded working memory, switching, inhibition, planning and fluency; and in each case, there were pairs of matched verbal and nonverbal tasks. The performance of children with SLI was compared with the performance of the same number of participants matched for chronological age (CA) and language age (LA). All analyses controlled for non-verbal IQ. The children and young people with SLI showed significant deficits relative to CA controls on four of the five areas of executive functioning: executive-loaded working memory; fluency; planning; and inhibition. These deficits were found for both verbal and nonverbal measures in each case, but the severity of the deficits did not exceed language age. There was no evidence that children and young people with SLI had difficulties with switching, either in the verbal or nonverbal domain. Children and young people with SLI showed EF impairments on non-verbal *and* verbal assessments, suggesting that they have broad, domain general deficits in this area, as opposed to language-related, domain specific weaknesses.

Keywords:
Specific language impairment, executive functioning, cognitive impairment

Paper session: Down syndrome

Numerical intelligence training in children with Down syndrome

Silvia Lanfranchi, Elisa Dal Pont, Federica Avventaggiato & Renzo Vianello
University of Padova

Saturday, 10:30 – 11:00

The present study aims to explore the extent to which training numerical intelligence facilitates learning of basic mathematical concepts and skills in children with Down Syndrome (DS). The training program was specifically built for children with DS considering strengths and weaknesses of their cognitive profile. One group of children with DS and two groups of typically developing (TD) children, matched on their level of numerical intelligence, took part to the study. All children were tested before and after training sessions on numerical intelligence and logical thinking. The group of DS children and one group of TD children (TD1) were trained on numerical intelligence. No training was administered to the third group of TD children that served as control group (TD2). Both DS and TD1 group after the training improved their performances in Numerical intelligence test. Moreover also their performances on logical thinking improved showing a generalization of learning to this area. Only a minimal improvement in math and in logical thinking was seen in TD2 group confirming the effectiveness of the training.

Keywords:
Down syndrome, numerical intelligence, logical thinking

Impact of phonological awareness on reading and writing in Down's syndrome

Stéphanie Frenkel[1] *& Stefano Vicari*[1,2]
University of Liège, I.R.C.C.S. Ospedale Pediatrico Bambino Gesù Roma

Saturday, 11:00 – 11:30

Children from a majority of European countries become accurate and fluent in foundation level reading before the end of the first school year. Excepted for French, Portuguese, Danish and more particularly, English. Differences of age of starting and letter knowledge don't seem to be responsible. What seems to be responsible are fundamental linguistic differences in syllabic complexity (which affect decoding) and fundamental linguistic differences in orthographic depth (which affect both word reading and non word reading), (Seymour, Aro & Erskine, 2003). Concerning time needed to establish foundation literacy, it is higher for French than for Italian language. It seems to be due to French language characteristics. People with Down's syndrome can help us to best understand reading mechanisms and to confirm the role of orthography in mastering reading (more transparent orthographies master earlier than others). Indeed, they are impaired in working memory and phonological awareness but they succeed to learn to read. The aim of the present study is to explore the effect of two different languages on the working memory and linguistic development in children with Down's syndrome. The comparison of two different linguistic samples of DS participants (French speakers and Italian speakers) may contribute to better understand the role played by different languages on the development of verbal working memory and phonological awareness. This paper will present our first results.

Keywords:
Down syndrome, working memory, linguistic development, phonological awareness, cross cultural research

Social stereotyping of children with Trisomy 21: When the positive stereotype at the explicit level turns to be strongly negative at the implicit level

Claire Enéa-Drapeau, Pascal Huguet, David Gimmig & Michèle Carlier
Aix Marseille University and CNRS

Saturday, 11:30 – 12:00

Trisomy 21 (T21) is the most frequent genetic disease associated with a cognitive deficit. Although there is evidence that persons with T21 are stigmatized, little attention has been paid to this issue. Here, we offer first evidence that children with T21 are the target of a negative stereotype that is especially visible at the implicit level (when measuring implicit attitudes rather than explicit judgments of T21 persons). In Study 1, participants were asked to rate people with T21 on both negative and positive traits on 6-point scales. As expected given the explicit nature of this task, positive traits (e.g., kind, joyful) proved to be more accepted than negative traits (e.g., nasty, stupid). A Principal Component Analysis (PCA) actually provided a 5-factor model, with the two first factors based on positive social (factor 1) and personality (factor 2) traits, respectively (the three remaining factors were made of negative personality traits, negative cognitive traits, and negative physical traits). Women as well as participants knowing T21 persons were more positive than men and participants who did not know such persons. In Study 2, participants estimated whether each of 26 children faces (photos) was typical of T21 and –independently– whether each of them could be associated with a series of positively and negatively valenced traits. As expected, the more participants perceived the faces as typical of T21, the more they rated them as “mentally retarded” and the less “intelligent”. Finally, Study 3 based on the Implicit Association Test (IAT Greenwald, McGhee, & Schwartz, 1998) revealed strong negative automatic associations between the T21 faces and negative traits, the IAT effect being even larger than that typically found in the literature on implicit stereotyping. Taken together, these findings can be taken as evidence that persons facing T21 are the target of a negative stereotype that may be hardly detectable at the explicit level but exist at the implicit level. Whether implicit stereotyping can be found among professionals dealing with mental deficiency merits special attention in future research. Another important issue is whether implicit stereotyping impairs the psychological development of the stigmatized persons, a vicious circle that would reinforce the negative stereotype itself.

Keywords
Trisomy 21, stereotype, social perception

Poster abstracts (in alphabetical order)

Self-Esteem and Self-Handicapping in Learning Disabilities

Marianna Alesi, Gaetano Rappo, Annamaria Pepi
Dipartimento di Psicologia, Università degli Studi di Palermo

Thursday, 14:00 – 15:30

There is a considerable body of evidence in the literature to focus on the cross-domain analysis of cognitive and emotional-motivational factors in learning disabilities. Recent research focuses on the role of self-esteem and self-handicapping strategies in the school domain. In particular self-handicapping indicates the maladaptive strategies employed by adults and children to protect them and maintain a positive self esteem. This study aims to compare the self-esteem and the self-handicapping strategies of children with dyslexia, reading comprehension disabilities, mathematical disabilities and the control group with normal learning level. The participants were 56 children with an average age of 8 years, of which 23 female and 33 male, attending third grade junior school. These pupils were selected by a battery of learning tests that included the Non-Verbal Intelligence Test (Hammill, Pearson, & Wiederholt, 1998), the Text Comprehension and Decoding Test (Cornoldi, Colpo, & Gruppo, 1986), the Dyslexic and Dysgraphic Evaluation Test (Sartori, Job, & Tressoldi, 1995) and the AC-MT Test (Cornoldi C., Lucangeli D. and Bellina M., 2002). On the basis of the results students were subdivided into four groups of 14 subjects: group 1 characterised by normal intelligence, normal reading comprehension, decoding reading disabilities and normal mathematical skills (dyslexia); group 2 characterised by normal intelligence, comprehension disabilities, normal decoding reading and normal mathematical skills; group 3 characterised by normal intelligence, normal reading comprehension, normal decoding reading and mathematical disabilities; group 4 characterised by normal learning. These children were given the School Self-Esteem selected by the TMA (Bruce A. Bracken, 1992) and the Self-Handicapping Scale for Children (Waschbusch, Craig, Pelham e King, 200 Waschbusch, Craig, Pelham e King, 2007). On the whole, the results demonstrate that our children with dyslexia, reading comprehension disabilities and mathematical disabilities show lower self-esteem levels and employ more self-handicapping strategies than children with normal learning.

Keywords
Motivation; Self-Esteem; Self-Handicapping; Learning

Executive function in Williams and Down syndromes

Dan Carney
London South Bank University

Thursday, 14:00 – 15:30

The genetic disorders Williams and Down syndromes (WS/DS) are characterised by roughly opposing cognitive ability profiles. Individuals with Williams syndrome frequently display a relative sparing of verbal skills alongside marked deficits in non-verbal areas, while Down syndrome individuals have been shown to exhibit difficulty in the domain of expressive language, in the face of non-verbal deficits which are less severe. Little is known, however, about how this ability split may affect, or feed into, executive skills i.e. performance upon tasks which require monitoring, planning, updating and organising responses, as opposed to "simple" recall. Most studies examining executive skills in these populations, whilst undoubtedly instructive, do not take the outlined relative opposing deficits into account. The data which will be presented comprises part of a larger doctoral research project. Children and adolescents with WS and DS are being given analogous task pairs within four executive skill domains, namely executive-loaded working memory, response inhibition, fluency and switching/set-shifting. Task pairs within each domain incorporate both a verbal and a non-verbal task, designed to be as equivalent as possible. WS and DS performance upon this task battery will be compared with both that of both typically developing (TD) and intellectually disabled (ID) control groups matched for overall cognitive ability, in order to establish whether observed between-group differences within task domains can help to elucidate a finer-grained picture of any executive difficulties which may exist in WS and DS populations, taking task modality into account. Such an approach should indicate the nature of day-to-day tasks tapping requiring executive resources, which WS and/or DS children may find difficult. The data should also be useful in the planning of appropriate remediational strategies. The current poster will present a preliminary data analysis and options for further research.

Keywords
Williams syndrome, Down syndrome, executive function

Intra-individual variability in reaction times in processing speed and inhibition among children with attention-deficit/hyperactivity disorder

C.Chicherio[1], E.Borella[2], A. de Ribaupierre[1,3], & C.Cornoldi[2]
[1]Faculty of Psychology and Educational Sciences, University of Geneva;
[2]Department of General Psychology, University of Padova; [3]Interfacultary Center of Gerontology, University of Geneva

Thursday, 14:00 – 15:30

Attention-deficit/hyperactivity disorder (ADHD) is a neuropsychiatric disorder associated with deficits in executive functions and inhibitory control. Recent studies further evidenced higher intra-individual trial-to-trial variability (iiV) in reactions times (RT) in children with ADHD compared to controls. However, iiV has been mainly examined in continuous performance test, go/no-go task, stop signal and reaction times tasks. The present study aimed to examine the patterns of iiV in RTs among ADHD, by means of both the Stroop-Color interference task and a simple RT task. Twenty-seven children with ADHD combined-type cases and 27 age- and gender-matched typically developing children from 8 to 12 years of age were included. Individual mean, standard deviation (ISD) and coefficient of variation (ICV) as well as ex-Gaussian parameters (mu, sigma, tau) from individual RT distributions were considered for analyses. Results demonstrated that ADHD reacted, on average, D children. Our data highlight the influence of baseline performance in interpreting inhibitory deficits. This suggests that differences in the Stroop task are not as large as previously shown and should not be attributed to a single deficit in response inhibition exclusively. Larger iiV in RTs can be attributed to a deficient allocation of effort in ADHD, in accordance with the cognitive energetic state regulation deficit model.

Keywords
ADHD, intra-individual variablity, Stroop-interference, individual RT distribution

Dynamic Assessment instrument to dissociate Gifted Underachiever Children & Children with Autism

Elbers, N., Chabani, E.,& Resing, W.C.M.
Leiden University

Thursday, 14:00 – 15:30

A group of children referred as gifted underachievers can be distinguished among children with learning disabilities. These gifted underachiever children demonstrate a substantial discrepancy between their potential measured with standardized test and performance in class assessments. For example, some might excel in solving visual spatial or logic problems and yet are poor spellers; others may be able to read and write far above average level and have trouble with mathematics. They may act out in class or display as well disabilities in communication, social interaction and behavior, focus on a task or on their own thoughts which are similar to symptoms of hyperactivity, autism-spectrum conditions, and other psychological disorders. However, these children are often struggling at school because their intelligence/capacity is not recognized and neither are their strengths (e.g in visual spatial processing) or weaknesses, (e.g. in auditory sequential processing). Generally gifted underachiever children are evaluated and are often classified by the use of standard IQ tests. But in this study we used the same visual spatial dynamic assessment approach (a test-intervention-test approach) as in our previous study within typically developed children. The main goal of this experiment was; a) to differentiate the cognitive capacity and strategy used among children with autism and gifted underachiever; b) to compare the visual spatial reasoning capacity of these two groups with results of typically developed children; c) to identify underlying factors such as inefficient executive functioning, and weak central coherence within these two group and c) to identify major effective component of the training program. In this study, eighty children (age 7-10) identified as either gifted or having mild or average autistic symptoms were recruited from primary schools in Zuid-Holland, the Netherlands. This dynamic assessment was a randomized blocking control group design that included a pre-test, two training sessions and a post-test. The experiment ran from January to April 2010, the results will be presented at the conference.

Keywords
Dynamic Assessment, Gifted Underachievers, Autism

Dynamic learning and working memory in adults with autism and intellectual disabilities

Lucy Henry, Andreas Constandinos & Danielle Dunne
London South Bank University

Thursday, 14:00 – 15:30

This project explored a new type of interactive intelligence test, dynamic learning, comparing it with older, static intelligence tests. We were particularly interested in how effective these tests were for adults with learning disabilities, and whether they predicted working memory capacity more effectively than static intelligence tests. Sixteen adults with autism and intellectual disabilities were administered a static intelligence test (Stanford-Binet) and a dynamic intelligence test (ARLT) with three phases: pre-training, learning and maintenance. They then completed three visual working memory tests (CORSI spatial span test, memory span for patterns, and odd one out test) and two verbal working memory measures (word span and listening span). A control group of typically developing children with the same mental ages as the clinical group were administered the same tests for comparison purposes. Correlations between the measures indicated that the two tests of ability were strongly related in adults with autism and ID, and both tests were also strongly related to all of the working memory assessments. By contrast, IQ was only related to executive-loaded working memory among controls. Independent t-tests found group differences were present for all working memory measures, but the direction of the differences varied by task. Conclusion: Working memory, IQ and learning potential were closely related in adults with autism and intellectual disabilities, suggesting that these measures may all assess cognitive capacity in this population. Adults with ID and autism also showed deficits, compared to typically developing controls of similar mental age on straightforward storage working memory tasks, but not on executive-loaded tasks.

Keywords
Autism, intellectual disabilities, working memory

Training Quantity-Number-Concept in students with intellectual disabilities

Jan Kuhl, Daniel Sinner & Marco Ennemoser
University of Giessen

Thursday, 14:00 – 15:30

Literature reviews and meta-analysis offer evidence for using systematic instruction to teach students with intellectual disabilities in mathematics. Most studies focused on basic skills instruction, computation, and problem solving. A new approach in teaching mathematic skills is to provide the Quantity-Number-Concept (QNC). However, this approach is not audited in people with intellectual disabilities. The objective of this study was to evaluate the effects of a QNC (Quantity-Number-Concept) training based on the developmental model by Krajewski (2008) in students with mild to moderate intellectual disabilities. The model (and the training) assumes three levels of QNC. Level I: basic numerical skills like counting and knowledge of numbers. Level II: linking number words with quantity. Level III: Linking quantity relations with number words. Based on their cognitive and mathematical abilities 25 children with intellectual disabilities (age: 7-13 years) were assigned to one of two experimental conditions. The experimental group (N = 12) received a 12-session QNC training (Krajewski, Nieding, & Schneider, 2007) while the control group (N = 13) received a language skills training by the dialogic reading approach. The posttest findings indicate that the gains in mathematical competence in the experimental group were substantially larger than in the control condition. However, not all QNC levels were concerned by the improvement. Mainly level II of the QNC benefitted from the training. The follow-up-test showed a decline of the achievements in the experimental group. Nevertheless, it could be secured that the training effects were also preserved after 3 months partially.

Keywords
Intellectual disabilities, mathematics, Quantity-Number-Concept, training

Explicit and implicit memory among participants with Fragile X syndrome, Williams syndrome, Down syndrome and with typical development

Hefziba Lifshitz, Elli Vakil, Meital Ihyee
Bar-Ilan University

Thursday, 14:00 – 15:30

Fragile X syndrome (FXS) is the most common familial cause of mental retardation. The cognitive profile indicates strengths in language and comprehendsion, short-term memory (STM) and long-term memory (LTM) for language, but deficit in STM for more abstract concepts, sequences of information, difficulties with visuo-spatial skills and working memory. The neurological profile indicates impairment in the basal ganglia, cortex and cerebellum that are responsible for procedural learning, and in the hippocampus and thalamus that are related to learning ability and declarative memory. This study aimed to examine declarative and procedural memory among participants with FXS and Down syndrome (DS), versus participants with typical development (TD) with the same MA. We hypothesized that FXS individuals will exhibit poorer performance than their peers with DS. The sample included 15 participants with FXS, 20 with DS and 20 TD participants. The declarative tests battery included the Rey-AVLT and complex figure test. The procedural tests battery included a conceptual task: the Tower of Hanoi (TOH) and a perceptual task: the Serial Reaction Time (SRT). TD participants had higher scores than those with FXS and DS in all tests. FXS participants show the lowest in all tests. In the first five trials of the Rey test, DS and PSX participants had the lowest scores. However, both groups exhibited an increase in the number of words recalled from the first to the fifth trial. In the retention phase conducted 20 minutes later FXS participants exhibited a greater decline than the DS group. FXS participants recognized fewer words than the DS group. In the Rey figure test, DS participants scored higher than those with FXS. In the TOH, FSX participants needed more moves to complete the puzzle in the immediate session, half an hour, and a week later. However, both etiologies indicate improvement from session to session. In the SRT, the passing from block 6 to 7- the random block, the RT for solving the task was not increased for FXS participants, indicating poor implicit learning for temporal sequence of events. Our hypothesis was supported: FXS participants have a deficit in verbal and visual declarative memory as well as in procedural memory. The findings support the neuropsychological and cognitive profile of this etiology.

Keywords
Fragile X syndrome, Down Syndrome, Implicit and explicit memory

Development of a non-verbal technique for patients with intellectual disabilities to investigate eye contact detection

Erika N. Lorincz, Fabienne Gerber & Giuliana Galli Carminati
Geneva University Hospital (HUG)

Thursday, 14:00 – 15:30

The goal of this project is to develop methodologies, which allow quantifying capacities of clients with intellectual disabilities (ID), based on objective and non invasive measures of simple operant behaviour using a touch screen and of spontaneous eye movements using an eye tracker. We will focus on the understanding of visual social signals, whose mechanisms are disrupted in individuals with autism spectrum disorders (ASD). In particular, eye gaze direction represents a crucial cue to predict other's behaviour. Eye contact and gaze following represent the first steps in establishing interpersonal communication. Children with ASD, as typicals, can detect a pair of staring eyes amongst averted gaze either presented in isolation or in a front view faces, faster that the reversed. This search asymmetry is lost when eye contact is presented in averted faces. However, the averted faces used were 'artificially' encapsulated in oval shapes, which may have introduced a conflicting directional signal and may have failed to provide necessary directional cues. Because of the lack of information about direct gaze processing in adults with ASD and lower IQ, the first experiment tests whether ASD adults with moderate ID, will detect faster a pair of staring eyes on a photo amongst averted gazes isolated from front view faces, rather than the reversed. The second experiment examines whether eye contact presented in averted faces with real contour could elicit an eye contact asymmetry in ASD individuals. Using a search paradigm, adults with moderate autism, matched IQ Down syndrome and typical participants will be requested to touch the single out target displayed amongst distracters, while eye movements will be recorded. ASD adults, as typical and Down syndrome participants, should display faster manual and visual reaction time to detect direct gaze than averted gaze targets in experiment 1 and in 2, if they combine complex directional visual cues to process gaze direction. This will show whether ASD adults can compute eye contact in a whole face when displayed with incongruent (but not conflicting) directional cues. This pilot study is the first step in investigating social understanding in adults with intellectual disabilities using a fully non verbal method and will offer new avenues to further develop assessment of similar or more severally affected populations.

Keywords
Pervasive developmental disorders, intellectual disabilities, eye contact

Visual-Spatial Capacity in Children with Autism: Static test versus Dynamic Assessment

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Leiden University

Thursday, 14:00 – 15:30

Individuals with autism are usually assessed using static intelligence tests which heavily rely on their verbal abilities. Research indicates that individuals with autism are verbally impaired but their visual-spatial abilities are intact and have shown an exceptional capacity on tests that focus on visual-spatial reasoning (e.g. block design test). Nonetheless, the evaluation of cognitive capacity in single session tests like the WISC-IV, might not give a reliable indication of the real cognitive capacity of autistic children. In contrast, dynamic assessments that merge between learning and testing might provide more indications regarding underlying cognitive processes on visual-spatial reasoning tasks. The main focus of this study was; a) to evaluate to what extent the use of dynamic training would increase our understanding of visual-spatial capacity in children with autism in comparison to their overall performances on static tests. b) To identify and evaluate the efficacy of immediate contextualized feedback that could help children in resolving complex visual-spatial tasks. For this study, 80 children diagnosed with mild or average symptoms of autism were recruited by addressing special schools in Zuid-Holland, the Netherlands. The children were divided randomly into two groups: experimental and controls, and were assigned to a dynamic assessment using a visual spatial task. The visual-spatial dynamic assessment (VSDA) used in this experiment was an adapted version of the ancient Chinese tangram puzzle. The design of this experiment was a two-group between-subjects design. Both groups participated in a pre- and post-test to identify the visual spatial abilities of the children. We compared the experimental group, who received two trainings sessions, with the control group who did an alternative task which was unrelated to the test. The experiment was carried out from January to April 2010. Therefore the results will be presented at the conference.

Keywords
Visual-spatial, autism, dynamic assessment

Learning how to learn as a process of identity formation: The experiences of six Colombian students

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Thursday, 14:00 – 15:30

This paper will explore how introducing students identified as 'at-risk' to knowledge about cognition and motivation and facilitating students' use of this knowledge in school and out of school settings improves their academic achievement and social integration. Over a two year time period, we conducted a qualitative study in which we explored the experiences of Colombian children who studied in a classroom using a comprehensive educational approach, Cognitive Enrichment Advantage (CEA). The CEA approach is designed to help students develop personal learning strategies based on explicit knowledge of 12 cognitive processes that provide a foundation for successful cognitive functioning, and eight affective/motivational approaches to learning that help students become more independent and collaborative learners. In this paper, we suggest that students 'at-risk' have the potential to successfully develop adaptive forms of behavior when explicit remediation.

Keywords
identity formation, cognitive and metacognitive processes, mediated learning

Intellectual disability: EEG signal randomness measured by approximate entropy

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Thursday, 14:00 – 15:30

The aim of this study is to compare EEG background activity between patients with intellectual disability (ID) and healthy normal controls (IQ =100) using approximate entropy (ApEn). ApEn is a non-linear method reflecting more randomness, irregularity and less system order. Research findings demonstrated that neurological and psychiatric disorder patients display lower ApEn suggesting a general decrease in brain dynamical complexity. Twenty-nine subjects participate to the study (IQ estimated with WAIS-R), 14 (12 males) with middle or light intellectual disability (IQID=56), and 15 control subjects (IQ controls=110). The EEG was acquired from 64 pin-type scalp electrodes (Active-two system, Biosemi) during resting, awakened and eyes open periods. Additionally, synchronous neural activity was measured in response to flickering checkerboard (SOA of 500ms), as well as simple reaction times (RT) to visual stimulation to estimate mental speed and behavioral efficiency. ApEn method was applied for each person on 35sec of EEG signal of the resting condition, over left, central and right posterior electrode sites (P7, P3, POz, P8, P4). VEP latencies and amplitudes were analyzed for time windows representative of the C1, P1 and N1 components. RTs differed between both groups with longer mean RT for ID than for controls (309ms and 269ms respectively). The significant correlation calculated between RT and IQ indicates that speed of processing tends to decrease as a function of IQ decline. Furthermore, for ID patients only, RT length is highly predicted by ApEn values: For low ApEn, RTs are longer. Peaks latencies of C1 and P1 components are late for ID compared to normal controls. Interestingly, for ID subjects the train of VEP components shows singular regularities, delays between C1 to P1 and P1 to N1 staying stable, but increase for controls (30ms to 50ms). The presence of singularities in spontaneous brain dynamics, parallel to delayed sensorimotor responses and synchronous neural activation in ID, could indicate that impairment in smooth adaptive behavior originate in a decrease of brain states varieties/possibilities. The findings will be discussed in light of neurodevelopmental impairments and abnormal processes of maturation of cerebral functions.

Keywords
Intellectual disability EEG randomness Behavior Visual evoked potentials

To foster learning opportunities of students with severe learning problems

Marlous Tiekstra
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Thursday, 14:00 – 15:30

When a child has difficulties in learning, it needs more help than the rest of its classmates. This aid can only be effective when it is adaptive to the child's capacities. A general aim of this project is to develop a (meta)cognitive and motivational intervention to foster learning opportunities of students with severe learning problems. Due to the lack of effective interventions dealing with 'at-risk' children, there is an urgent need to bridge the gap between diagnosis and intervention. Learning potential tests try to measure the child's potential to adequately respond to quality instruction (due to the interactive part of these tests) and provide information that can be useful for interventions that might follow after the test. Hence, the use of these tests could bridge the gap between diagnosis and intervention. In order to develop an effective intervention, a first phase of this project focuses on exploring adequate responses to instruction and the relationship between traditional or dynamic tests and school achievement. Two planned studies will be carried out among students in Primary Education (grade 3-6) as well as students in first and second year of Secondary Education.

Keywords
Learning difficulties, dynamic assessment, response to instruction, (meta)cognitive intervention

Computer- aided recognition of written words by autistic mute children

Frédérique Vernay & Jean-Yves Roussey
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Thursday, 14:00 – 15:30

A lot of studies demonstrated autists' difficulties to establish a communication with others. These difficulties are linked with specific cognitive abilities. For example perception of relevant information among all those accessible can fail because of perceptual global bias that could lead these children to local processing (Frith, 1989) at the expense of global processing. Mottron and al. (2006), in their model Enhanced Perceptual Functioning (EPF), consider that the focalization on local processing shows an overall superiority of low level perceptual processes, activated by default in autistic children. This research concerns verbal communication by mute autistic children. We suppose that the learning of written words, systematically associated with their oral form, in well defined simplified contexts, should decrease difficulties of autistic children to identify oral language in contrast to ordinary communication situations. In this study, we aimed at extending the findings about association between letters and sounds (Mottron and al., 2006) to the field of characteristics of written language adapted to the abilities of autistic mute children. The purpose is using this written language as support for identification of oral language. The experimentation is based on computer-aided learning of written words. These written words are presented in association with their oral form, in specific simplified learning contexts. In fact, the experiment took place in two step processes that corresponded to a gradual increase in the difficulty of the task: find a written word among other randomly displayed after presentation of the association written word/ picture/ oral form when the target is still (step 1) or not (step 2) on the screen during the search. Results show that a written material, in association with oral form and presented with computer, allowed autistic mute children to be successful in learning written words. But it is important to underline the difficulty of participants to discriminate targets that have visual similarities when the target was not on the screen during research. These findings may open new lines for oral language learning using computer-aided written language as mediation.

Keywords
Autism, cognitive performance, written language, computer-aided learning

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