INTRODUCTION

- Importance of early development
- Early intervention for at risk children
  - Research on factors associated with child development
  - Assessment of effectiveness of early intervention programs
  - Early identification of at risk children
- Reliable and valid assessment tools on child development
AVAILABLE TOOLS IN HONG KONG

- Tools for assessment of cognitive skills
  - Tools with no local norms
    - Wechsler Preschool and Primary Scale of Intelligence (WPPSI)
    - Stanford-Binet Intelligence Scale (5th ed.)
    - Merrill-Palmer-Revised Scales of Development
    - Bayley Scales of Infant and Toddler Development (3rd ed.)
    - Griffiths Mental Developmental Scales-Revised
  - Tools with local norms
    - Wechsler Intelligence Scale for Children (Hong Kong) – IV (age 6 years or above)
AVAILABLE TOOLS IN HONG KONG

- Tools for assessment of language development
  - Reynell Developmental Language Scales
  - The Hong Kong Cantonese Receptive Vocabulary Test
  - The Hong Kong Cantonese Oral Language Assessment Scale (HKCOLAS)
  - The Cantonese Language Deficiency Early Identification Test for Pre-primary Children (CEIT)

- Tools for assessment of social development
  - Mainly based on parent or caregiver report
AVAILABLE TOOLS IN HONG KONG

• Limitations of existing assessment tools for preschool children in Hong Kong
  • No local norms
  • Lengthy administration time by specialists (e.g. psychologists, speech therapists)
  • Assessment of social development mainly based on parent or caregiver reports
  • No tools for assessment of motivation or learning behavior
THE PRESCHOOL DEVELOPMENTAL ASSESSMENT SCALE (PDAS)

CHILD ASSESSMENT SERVICE, DEPARTMENT OF HEALTH
CYNTHIA LEUNG, ROSE MAK, ANITA WONG
THE PRESCHOOL DEVELOPMENTAL ASSESSMENT SCALE (PDAS)

- Target age group – 3 years 4 months to 6 years 3 months
- Content
  - Cognitive
  - Language
  - Social
  - Literacy and numeracy
  - Fine motor
  - Gross motor
  - Visual perceptual
- Developed by a multi-disciplinary team including pediatricians, psychologists, speech therapists, physiotherapists and occupational therapists
THE PRESCHOOL DEVELOPMENTAL ASSESSMENT SCALE (PDAS)

- Development
  - Pilot
  - Validation
  - Norming – in progress
THE PRESCHOOL DEVELOPMENTAL ASSESSMENT SCALE (PDAS)

- Pilot study
  - Participants \((N = 324)\)
    - 3 age groups
    - 240 preschool children recruited from 4 districts in Hong Kong
      - 40 boys and 40 girls from each age group
      - Preschools randomly selected from the Education Bureau preschool list
      - Children randomly selected from the class register
THE PRESCHOOL DEVELOPMENTAL ASSESSMENT SCALE (PDAS)

- 48 children attending integrated programs in the 4 districts (IP)
  - 8 boys and 8 girls in each age group
  - Preschools randomly selected from the Social Welfare Department preschool list
  - Children randomly selected from the class register
- 36 children receiving services at Child Assessment Centres (CAS)
  - 6 boys and 6 girls from each age group
  - Randomly selected among clients attending service during the study period
THE PRESCHOOL DEVELOPMENTAL ASSESSMENT SCALE (PDAS)

- Methodology
  - Unidimensionality and item difficulty – Rasch analysis
- Criterion validity
  - Developmental changes
  - Differentiation of children with developmental disabilities from children with typical development
- Reliability – KR-20
THE PRESCHOOL DEVELOPMENTAL ASSESSMENT SCALE (PDAS)

• Validation study
  • Participants ($N = 378$)
    • 324 children recruited from 18 districts of Hong Kong
    • 18 children (9 boys and 9 girls) from each district (3 preschools)
    • 54 boys and 54 girls from each age group
    • Preschools randomly selected from the Education Bureau preschool list
    • Children randomly selected from the class register
  • 54 children receiving services at Child Assessment Centres (CAS)
    • 18 children (9 boys and 9 girls) from each age group
    • Randomly selected among clients attending service during study period
THE PRESCHOOL DEVELOPMENTAL ASSESSMENT SCALE (PDAS)

• Methodology
  • Unidimensionality and item difficulty – Rasch analysis
  • Convergent validity
    • Correlation with existing tests
  • Criterion validity
    • Developmental changes
    • Differentiation of children with developmental disabilities from children with typical development
• Reliability
  • Internal consistency – KR-20
  • Test retest reliability (8 weeks) – intra-class correlation
THE COGNITIVE SCALE

• Pilot study
  • Reference sources
    • The Early Learning and Development Benchmarks
    • The Early Development Instrument (EDI)
    • Preschool Curriculum Guide
  • Initial item pool – 87 items on colour, shape, quantity, matching, categorization, sequence, inductive/deductive reasoning, difference, body parts, picture recognition, comprehension and picture story
THE COGNITIVE SCALE

• Rasch analysis
  • Infit and outfit mean squares of 42 items outside the recommended range (0.70 to 1.30)
  • Revised version with 40 items

Leung, Mak, Lau, Cheung & Lam (2010)
THE COGNITIVE SCALE

- Reliability (KR-20) - .93
- Validity
  - Significant difference between the three age groups
  - Significant difference between the preschool group and CAS/IP group
THE COGNITIVE SCALE

- Validation study - 40-item version with items ordered according to item difficulty (colour, shape, quantity, matching, categorization, sequence, difference, body parts, comprehension/picture story)
  - Rasch analysis
    - Infit mean square statistics of all items within the recommended range of 0.70 to 1.30
  - Reliability
    - KR-20 - .93
    - Test-retest reliability (intra-class correlation) - .81 (8 weeks)
• Convergent validity
  • WPPSI-R short form Full Scale IQ calculation using LoBello (1991) formula
  • Correlation between the FSIQ from the full form and the LoBello FSIQ: .96, .92 and .94
  • Moderate correlation (r ≥ .56) with WPPSI-R
THE COGNITIVE SCALE

• Criterion validity
  • Significant differences between the three age groups
  • Significant differences between CAS group and preschool group
THE LANGUAGE SCALE

- Pilot study
  - Initial item pool – 158 items on receptive vocabulary, expressive vocabulary, receptive grammar, expressive grammar, narrative comprehension, narrative production
- Rasch analysis
  - Infit and outfit mean squares of 31 items outside the recommended range (0.70 to 1.30)
  - Revised version with 106 items

Wong, Leung, Siu, Lam & Chan (2011)
THE LANGUAGE SCALE

• Reliability (KR-20) - .95

• Validity
  • Significant difference between the three age groups
  • Significant difference between the preschool group and CAS/IP group
THE LANGUAGE SCALE

• Validation study - 66 items (receptive vocabulary, expressive vocabulary, receptive grammar, expressive grammar, narrative comprehension, and narrative production)
  • Rasch analysis
    • Infit mean square statistics of all items within the recommended range of 0.70 to 1.30
  • Reliability
    • KR-20 - .93
    • Test-retest reliability (intra-class correlation) - .91 (8 weeks)

Wong, Leung, Siu & Lam (2012)
THE LANGUAGE SCALE

• Convergent validity
  • Correlation with Reynell Developmental Language Scale (3:4 to 5:3) – $r \geq .39$
  • Correlation with The Hong Kong Cantonese Oral Language Scales (5:4 to 6:3) – $r \geq .35$
THE LANGUAGE SCALE

- Criterion validity
  - Significant differences between the three age groups
  - Significant differences between CAS group and preschool group
THE SOCIAL SCALE

- Pilot study
  - Initial item pool – 30 items on social relationships, understanding of social norms and rules, empathy and perspective taking
- Rasch analysis
  - Infit and outfit mean squares of 6 items outside the recommended range (0.70 to 1.30)
  - Revised version with 29 items

Leung, Cheung, Lau & Lam (2011)
THE SOCIAL SCALE

- Reliability (KR-20) - .86
- Validity
  - Significant difference between the three age groups
  - Significant difference between the preschool group and CAS/IP group
THE SOCIAL SCALE

• Validation study – 29 items
  • Rasch analysis
    • Infit mean square statistics of all items within the recommended range of 0.70 to 1.30
• Reliability
  • KR-20 - .89
  • Test-retest reliability (intra-class correlation) - .80 (8 weeks)
THE SOCIAL SCALE

- Convergent validity
  - Significant correlation with Adaptive Behavior Assessment System (ABAS) and Comprehension sub-scale of WPPSI-R
THE SOCIAL SCALE

• Criterion validity
  • Significant differences between the three age groups
  • Significant differences between CAS group and preschool group
LIMITATIONS

- Divergent and predictive validity not assessed
- Lack of locally normed instruments for convergent validity
- Short-form used for some tests because of resource limitations
- Inter-rater reliability not assessed
- School response rate
  - Higher proportion of families with income below the population median domestic household income
USAGE OF PDAS

• A comprehensive profile of children's developmental domains
• Identify areas for developmental intervention and follow up of progress
• A quick tool for evaluation of effectiveness of early intervention programs
• A quick tool for research on early child development
ACADEMIC COMPETENCE BEHAVIOUR

CYNTHIA LEUNG, S K LO & SHIRLEY LEUNG (2012)
BACKGROUND

- A set of behavior known to be related to academic and/or cognitive competence
  - Self-regulation
  - Initiative
  - Persistence and task engagement in academic activities
  - Positive moods
BACKGROUND

- Sense of academic competence
  - Taking initiatives
  - Preference for challenges
  - Sociability
  - Coping skills
- The Behavioural Rating Scale of Presented Self-Esteem in Young Children (Fuchs-Beauchamp, 1996)
- Parent and teacher report
METHOD

- **Participants**
  - 457 preschool children from all districts of Hong Kong
    - 230 boys (109 4-year-old children and 121 5-year-old children)
    - 227 girls (112 4-year-old children and 115 5-year-old children)
  - 44 children attending integrated programs from all districts of Hong Kong
    - 39 boys (18 4-year-old children and 21 5-year-old children)
    - 5 girls (4 4-year-old and 1 5-year-old child)
METHOD

• **Measures**
  - Direct assessment of children – Cognitive scale of Preschool Developmental Assessment Scale (PDAS)
  - Teacher report – teacher version of Behavior Academic Competence
  - Parent report
    - Parent version of Behavior Academic Competence
    - Strength and Difficulties Questionnaire (SDQ)
    - Demographic information
RESULTS

• Rasch analysis
  • Infit and outfit statistics of one item in the teacher’s version outside the recommended range
• 15-item parent’s and teacher’s version
  • Infit and outfit mean square statistics within the recommended range
• Category functioning
  • Average measures were ordered
  • Step calibrations increased monolithically and the thresholds were more than 1.4 logits apart
RESULTS

• Reliability

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<th></th>
<th>Cronbach’s Alpha</th>
<th>Test-retest reliability</th>
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<tr>
<td>Teacher’s version</td>
<td>.95</td>
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• Convergent validity
  • Positive correlation with SDQ prosocial behavior and PDAS cognitive scale
  • Negative correlation with SDQ problem behavior
  • Criterion validity – differentiation between preschool children and children with developmental disabilities
MASTERY MOTIVATION
LEUNG & LO (2013)
BACKGROUND

- Mastery motivation
  - Effort motivation
  - Task motivation
- Mastery motivation has been found to be associated with intrinsic motivation, academic skills and quality of life
- Inventory of School Motivation (McInerney & Ali, 2006)
  - Effort Motivation – 7 items
  - Task Motivation – 4 items
- Parent and teacher reports
METHOD

- **Participants**
  - 457 preschool children from all districts of Hong Kong
    - 230 boys (109 4-year-old children and 121 5-year-old children)
    - 227 girls (112 4-year-old children and 115 5-year-old children)
  - 44 children attending integrated programs from all districts of Hong Kong
    - 39 boys (18 4-year-old children and 21 5-year-old children)
    - 5 girls (4 4-year-old and 1 5-year-old child)
METHOD

• **Measures**
  - Direct assessment of children – Cognitive scale of Preschool Developmental Assessment Scale (PDAS)
  - Teacher report – teacher version of Effort and Task Motivation
  - Parent report
    - Parent version of Effort and Task Motivation
    - Strength and Difficulties Questionnaire (SDQ)
    - Demographic information
RESULTS

• Rasch analysis
  • Infit mean square statistics of one item in the parent’s version of Effort Motivation outside the recommended range
• Category functioning
  • Average measures were ordered
  • Step calibrations increased monolithically and the thresholds were more than 1.4 logits apart
## RESULTS

### Reliability

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RESULTS

• Convergent validity
  • Positive correlation with SDQ prosocial behavior and PDAS cognitive scale
  • Negative correlation with SDQ problem behavior
• Criterion validity – differentiation between preschool children and children with developmental disabilities
BACKGROUND

- School readiness - interactionists’ view (Pianta, Rimm-Kaufman & Cox, 1999)
- The Gumpel School Readiness Inventory
  - 6 items completed by teachers
  - Measure of academic and social behavior
- Parent and teacher reports
METHOD

• Participants
  • 604 preschool children from all districts of Hong Kong
    • 300 boys (69 3-year-old children, 109 4-year-old children and 122 5-year-old children)
    • 304 girls (71 3-year-old children, 112 4-year-old children and 121 5-year-old children)
  • 49 children attending integrated programs from all districts of Hong Kong
    • 42 boys (19 4-year-old children and 23 5-year-old children)
    • 7 girls (4 4-year-old and 3 5-year-old children)
METHOD

• **Measures**
  - Direct assessment of children – Cognitive scale of Preschool Developmental Assessment Scale (PDAS)
  - Teacher report – teacher version of Gumpel School Readiness Inventory
  - Parent report
    - Parent version of Gumpel School Readiness Inventory
    - Strength and Difficulties Questionnaire (SDQ)
    - Demographic information
RESULTS

• Rasch analysis
  • Infit and outfit mean square statistics within the recommended range
• Category functioning
  • Average measures were ordered
  • Step calibrations increased monolithically and the thresholds were more than 1.4 logits apart
RESULTS

• Reliability

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• Convergent validity
  • Positive correlation with SDQ prosocial behavior and PDAS cognitive scale
  • Negative correlation with SDQ problem behavior
RESULTS

- Criterion validity
  - Differentiation between preschool children and children with developmental disabilities
  - Differentiation between children from different age groups
LIMITATIONS

• A convenience sample
  • Higher proportion of families with income below the population median domestic household income
• More boys in the IP group
• Test retest reliability
• Divergent and predictive validity not assessed
USAGE OF THE SCALES

- As a quick research tool to assess children’s learning and motivation
- As a tool for the evaluation of early intervention program
- Parent and teacher report for triangulation
THANK YOU