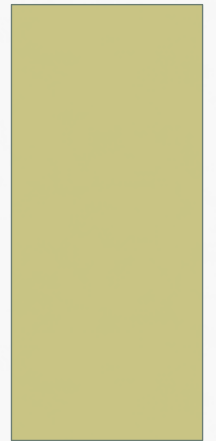


# LOCAL ASSESSMENT TOOLS FOR PRESCHOOL CHILDREN

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# 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 (5<sup>th</sup> ed.)
    - Merrill-Palmer-Revised Scales of Development
    - Bayley Scales of Infant and Toddler Development (3<sup>rd</sup> 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)

# THE COGNITIVE SCALE

- **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 ( $r \geq .56$ ) 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**

# 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**

# 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**

	<b>Cronbach's Alpha</b>	<b>Test-retest reliability</b>
<b>Teacher's version</b>	<b>.95</b>	<b>.72</b>
<b>Parent's version</b>	<b>.89</b>	<b>.63</b>

- **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

	Cronbach's Alpha	Test-retest reliability
Effort Motivation (Teacher)	.92	.61
Effort Motivation (Parent)	.89	.69
Task Motivation (Teacher)	.85	.57
Task Motivation (Parent)	.77	.54

# 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**

# GUMPEL SCHOOL READINESS INVENTORY

DOROTHY HO & CYNTHIA LEUNG

# 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 child)



# 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**

	<b>Cronbach's Alpha</b>	<b>Test-retest reliability</b>
<b>Teacher's version</b>	<b>.81</b>	<b>.73</b>
<b>Parent's version</b>	<b>.70</b>	<b>.75</b>

- **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**