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Relationship between Poverty and Neurocognitive Skills
貧窮和腦神經認知發展的關係

(Project Number: 2017.A3.011.17C)

FINAL REPORT

September 2020

Lingnan University

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Executive Summary

(1). Abstract

Children growing up in poverty may face significant challenges when attempting to move up the social ladder. Empirical studies have shown causal relationships between childhood poverty and negative outcomes of physical and mental health, cognitive ability, poor academic achievement as well as income in adulthood. It is critical to understand what mediate the income effect on children's cognitive achievement in order to explain why and when income matters.

This study aimed to examine the relationship between poverty status and the development of cognitive functions amongst Hong Kong preschool children and to identify the mechanisms underlying the effects of growing up in poverty. This empirical research had two core elements in pursuing the research objectives. First, a neurocognitive assessment was adopted to assess the perceptual, cognitive and language functions of preschool children. Neuropsychology Second Edition (NEPSY-II) and Hong Kong Comprehensive Assessment Scales for Preschool Children (HKCAS-P) were adopted to assess four functional domains, including attention and executive functioning, language (both in Cantonese and English), memory and learning, and visuospatial processing, of preschool children aged 36 to 47 months. Second, structured questionnaire was self-administered by parents to understand their socioeconomic status (SES), parental investment and parental distress.

Overall, regression analyses showed that equalised household income, expenditure on children, parental education (except maternal education on child assessment performance on English language) were not a significant direct linear influence on child assessment performance. The findings showed that household income and child assessment performance are mediated by parental stress. We also observed that household income and child assessment performance on both English and Chinese language are *positively* mediated by parental stress. The findings may be relevant to quality external care the child receives which relieves negative impacts of parental stress on child cognitive development, especially for children from disadvantaged families. There were significant indirect effects of parental investment on child assessment performance, and parental stress and parental investment on child assessment performance, respectively. We also observed that household income and child assessment performance are negatively mediated by parental investment on non-language-related activities. It may be related to the limited parental time spent with their preschool children due to long working hours. Lastly, we argued that family income and household expenditure on child learning-related activities might not be the most decisive mechanism that drives child assessment performance. Parental time investment and quality child-parent interactions have stronger effects than family income on early child cognitive development.

Therefore, we recommend to enhance the accessibility of child care services, which is vital in supporting early childhood development. It is believed that quality child care service can enhance children's readiness for school, which is also a means to ensure equal life chances from the start of their life course and to promote intergenerational mobility regardless of socioeconomic status of their families.

(2). Layman Summary of Policy Implications and Recommendations

Recommendations for policy makers to ensure equal life chances from the start of their life chances from the start of their life course and to promote intergenerational mobility:

- (1). Non-monetary parenting practices are vital to children's cognitive and non-cognitive development. Parents' long working hours limits time involvement in childcare activities and thus **we suggest policy advocacy and implementation on maximum working hours and flexible work-life balance arrangement.**
- (2). Quality parenting time is crucial to children's development. **We suggest equipping parents with the skills needed for creating a stimulating home environment and engaging their children in more structured activities, like reading and mother-child verbal interactions.**
- (3). The shortage of childcare services and the low affordability for low-income families create barriers to the access of quality childcare services. **We suggest increasing the accessibility of childcare service to support the family function of working mothers.**
- (4). Mothers from low-income families who have child caring responsibility but cannot have access to childcare supporting services and fail to return to labour force. **By increasing the accessibility of childcare services, we anticipate, in the long run, to facilitate female participation in the labour force.**

行政摘要

(1). 研究摘要

從貧困中成長的兒童，他們的社會流動階梯往往面對不少挑戰。實證研究顯示兒童貧窮對個人的身心健康、認知能力、學業成績、就業收入等均造成負面因果關係。因此，了解有何其他因素影響收入對兒童認知能力的關係至為重要。

本研究旨在探討香港學前兒童貧困狀況與其認知功能發展之間的關係，並分析對貧困中成長的兒童影響的潛在因素。本實證研究有兩大主要元素：第一，通過神經心理學第二版 (Neuropsychology Second Edition, NEPSY-II) 和香港學前兒童綜合發展評估 (Hong Kong Comprehensive Assessment Scales for Preschool Children, HKCAS-P) 量度工具，評估年齡介乎 36 至 47 個月的學前兒童的注意力和執行、語言 (廣東話和英語)、記憶和學習能力、視覺空間等功能。第二，通過家長問卷的收集，了解不同家庭的社經背景、家庭的資源投放及家長面對的精神壓力狀況。

總括而言，回歸分析結果顯示家庭收入、家庭對子女學習的支出、父母的教育程度 (母親教育程度對學前兒童的英語評估表現例外) 對兒童評估表現沒有明顯的直接線性的影響。分析結果亦顯示家庭收入與兒童評估表現受父母面對的精神壓力所影響。我們亦觀察到父母面對精神壓力對家庭收入、兒童的語言 (廣東話和英語) 評估表現均呈正向關係。結果可能與小朋友獲得優質的幼兒照顧服務有關，因為外在的支援服務有助減輕家長面對的精神壓力對兒童認知發展造成的負面影響 (尤其是弱勢家庭的兒童)。家庭的資源投放對學前兒童評估、家長面對的精神壓力和家庭的資源投放對學前兒童評估表現有顯著的間接影響。同時，我們亦觀察到家庭收入和兒童評估表現受到家長對非語言相關活動的資源投入有負面影響。這可能與家長因長工時影響與年幼子女相處時間有關。最後，我們認為家庭收入與家庭在兒童學習相關的支出並不是對兒童評估表現最決定的因素。家長的時間投放、良好的親子互動較家庭收入對兒童早期認知發展有較大的影響。

因此，我們建議應加強幼兒照顧服務的可及性，這是對兒童早期發展至關重要。我們相信優質的照顧服務為學前兒童的入學打好基礎，亦確保幼童從小擁有平等生活機會的重要手段，不論家庭的社經地位，他們都能有上向流動的機會。

(2). 研究項目對政策影響和政策建議的摘要

為政策制定者對確保幼童從小擁有平等生活及上向流動機會的政策建議：

- (1) 非金錢的親子方式對兒童的認知和非認知發展至為重要。父母的長工時限制了親子活動時間。因此，我們建議最長工時、彈性工作與生活平衡安排的政策倡導和實施。
- (2) 具質素的親子時間對兒童成長至為重要。我們建議為家長提供刺激幼童學習的家庭環境技巧，並讓他們的孩子參與更多有組織性的活動（如閱讀及親子的語言互動）。
- (3) 幼兒照顧服務供應及負擔能力不足，均對低收入家庭獲取幼兒照顧服務造成障礙。我們建議提高幼兒照顧服務的可及性，以支援在職母親的家庭功能。
- (4) 來自低收入家庭的母親，因有親職責任無法獲取幼兒照顧服務，因而未能重返勞工市場。我們期望在提高幼兒照顧服務可及性，長遠而言，可促進女性參與勞工市場。

1. Introduction

1.1 Background

Socioeconomic status and children's cognitive development

Educational attainment is one of the vital determinants of social mobility. Social mobility illustrates movements of individuals within society and in relation to society as a whole between different classes and income levels (Aldridge, 2004; Institute for Public Policy Research, 2008; Nunn et al., 2007). The effects of socioeconomic status (SES) on children's education development have been investigated across disciplines. SES sometimes is measured by household income (Machin and Vignoles, 2004), parental social class (Erikson et al., 2005), or by a composite indicator of income and class (Caro et al., 2009), positive correlation was associated with better educational outcomes. The association between SES and children's education development has also been supported by Gottfried et al. (2003) who found that SES accounted for roughly 20% of childhood IQ. Duncan et al. (1998) drew out similar findings in which SES appeared to create impacts on both intelligence and cognitive achievement. In addition, a meta-analysis by Sirin (2005) found a positive association between SES and academic achievement across all ages.

Children growing up in poverty, however, may face significant challenges when attempting to move up the social ladder. Empirical studies have shown causal relationships between childhood poverty and negative outcomes of physical and mental health, cognitive ability, poor academic achievement as well as income in adulthood (Bradley & Corwyn, 2002; Duncan and Brooks-Gunn, 1997). Upward mobility has also been made more difficult when children were poorly developed in their language and cognition skills (Calvo & Bialystok, 2014). Hence, Bruckauf and Chzhen (2016) pointed out that higher income and social class play a protective role in shielding better educational performance for the next generation and in preventing them from slipping into lower levels.

Family income creates an impact on childhood economic conditions, and particularly so for children who are underprivileged. This results in a significant long-term effect on children's educational attainment. However, Mayer (1997) disagreed with the causality effect of family income on children's outcomes. Researchers raised concerns about the selection bias in same analyses where unmeasured factors such as parental mental health, abilities, and attitudes that may cause parents to have low income as well as impede their children's life chances were omitted. It is, therefore, critical to understand what mediate the income effect on children's cognitive achievement in order to explain why and when income matters.

SES and child's cognitive development: mediation through parental investment

Since the introduction of education reforms in 1990, the intergenerational transmission of education attainment status for children from less educated families has been improved in Hong Kong. A relatively more equal educational opportunity between the rich and the poor has been provided over time, and in particular for children with less educated fathers. As reported by Lam and Liu (2019), in 1991 Hong Kong-born children with university-educated fathers were 7.70 times more likely to attend university than children with primary school-educated fathers. The probability of children with a university-educated father entering to university compared to those with a primary school-educated father dropped to 4.33 times in 2001 and even further to 3.00 in 2011. Although the intergenerational transmission of education attainment status for children from less educated families has been improved, Peng et al., (2019) found that intergenerational earnings mobility remained constant, in particular, for more privileged families in Hong Kong. Vere (2010) revealed that 31% of sons whose fathers were in the top income quintile and 41% of sons whose mothers were in the top income quintile tend to remain in the same quintile as their parent.

The low degree of mobility at the top could be explained and reinforced by the theory of complementarity between the persistence of socioeconomic status and parental investment as proposed by Becker et al. (2018). High-SES families are more likely to invest their time and resources on children's educational activities and engage their children in a variety of cognitively stimulating materials and experiences to promote child's development from an investment perspective (Becker, 1991; Haveman & Wolfe, 1995). Finding on the impacts of SES were also reinforced by Coddington, Mistry and Bailey (2014) who found that maternal education and household income were correlated and were significantly correlated with parental investment. Further empirical studies demonstrated the mediating effect of parental investment on a child's cognitive development. The provision of cognitively stimulating materials (e.g. books and educational toys) and engagement in educationally enriching activities (e.g. reading, visits to museum and library) have consistently been shown to be predictive of children's cognitive and academic functioning (Gershoff et al., 2007; NICHD Early Child Care Research Network, 2005; Shonkoff & Phillips, 2000; Yeung et al., 2002).

Mayer (1997) concluded that there is a potential mediating pathway of income effect through materials and services that parents provide for children. This study, therefore, examined the mediating effect of parental investment on children's cognitive achievement.

SES and child's cognitive development: mediation through parental stress

Apart from illustrating the income effect on a child's developmental outcomes from an investment perspective, it can also be explained through a family stress model (Conger & Elder, 1994; Elder & Caspi, 1988). The family stress model emphasizes that low household income is significantly associated

with children's development. Gershoff et al. (2007) pointed out material hardship was a leading factor to the negative association between family income and parental stress. Given that Hong Kong has one of the highest income inequality ratios on Earth (with a current Gini Index of 53.9 in 2016), plus high property prices, an entirely private early education system (in which schools offering Cantonese-English bilingual education charge higher school fees) and long working hours, the home effects on children's neurocognitive outcomes may be more pronounced in early childhood than in late childhood in Hong Kong (Han, 2005; Han & Fox, 2011). Low income families may experience economic strains such as limited access to basic necessities and also difficulty in making bill payments. Unstable work and income loss in low income families result in economic hardship. Parents with low incomes may also not be able to engage in cognitively stimulating activities with their child as they may have to resume work shortly after giving birth of their child. Parents may have a greater probability of experiencing psychological problems too. In turn, parents' nonmonetary capacities, such as their emotional well-being and interactions with their children, are considered to be related to children's developmental outcomes. This is further explained by Conger et al. (1994) in which the family stress model specifies the impacts between economic strain and economic hardship on parental distress as well as less supportive parenting practices which ultimately contributes to a negative effect on the developmental outcomes of their children.

1.2 Objectives of the Study¹

The overall objective of the proposed study aimed to examine the relationship between poverty status and the development of major perceptual, cognitive and language functions represented in five neurocognitive systems amongst Hong Kong preschoolers and to identify the mechanisms underlying the effects of growing up in poverty.

The specific objectives of the proposed study were:

- (1) To examine the longitudinal relationship between living in poverty and the functioning of the five neurocognitive systems that are involved in major perceptual, cognitive and language functions, including visual/spatial, language and executive functioning abilities. These functions were assessed through behavioural tasks administered to Hong Kong preschoolers, aged four, at two points in time with an approximate 12-month interval in-between. We use a 12-month interval because we plan to apply for further funding to trace the children every year for the next five years. The neurocognitive systems included the occipitotemporal/visual cognitive system, the

¹ Pre- and post-assessments were interrupted / no longer feasible by class suspensions in academic year 2019/20 due to the Hong Kong Protests and COVID-19 pandemic. This final report is based on a cross-sectional study.

parietal/spatial cognition system, the medial temporal/memory system, the left perisylvian/language system, and the prefrontal/executive system;

- (2) To investigate the mediating role of parental investment and parental stress in the link between poverty and the major perceptual, language and cognitive functions.

2. Research Methodology

2.1 Study Design

This empirical research had two core elements in pursuing the research objectives. First, a neurocognitive assessment was adopted to assess the perceptual, cognitive and language functions of preschool children. Neuropsychology Second Edition (NEPSY-II) and Hong Kong Comprehensive Assessment Scales for Preschool Children (HKCAS-P) were adopted to assess four functional domains, including attention and executive functioning, language (both in Cantonese and English), memory and learning, and visuospatial processing, of preschool children. Second, questionnaire was self-administered by parents to understand their socioeconomic status (SES), parental investment and parental distress.

Upon the completion of questionnaire by the parents, the selected preschool children undertook a neurocognitive assessment. Since the ultimate aim of this research was to make suggestions on child/family policy, the neuropsychological assessment therefore focused on identifying the strengths and weaknesses of children's cognitive performance. These results can serve as indicators of the development of cognitive functions and facilitate comparison with other variables. NEPSY-II² and HKCAS-P³ were adopted to measure four cognitive functions, including the visual and spatial cognition, memory, language (both in Cantonese Chinese and English) and executive systems of preschool children. The permission to administer the measures was obtained from the Psychological Corporation and the Child Assessment Service (CAS), Department of Health of the Government of the Hong Kong Special Administrative Region.

2.1.1 Neuropsychological Assessment for Preschool children

One of our important goals was to examine within Hong Kong the patterns of the relationship between poverty and the neurocognitive systems involved in major cognitive, language and perceptual functions. Eight subtests were extracted and adopted. They included *Geometric Puzzles*, *Block Construction*, *Memory for Designs*, *Body Part Naming and Body Part Identification*, and *Statue* in NEPSY-II as well as *Cantonese receptive vocabulary* and *Cantonese expressive vocabulary* in HKCAS-P.

² NEPSY-II is a comprehensive instrument designed to assess neuropsychological development of children aged between 3 and 16 (Korkman et al., 2007a). The subtests are divided across six functional domains, including (i) Attention and Executive Functioning, (ii) Language, (iii) Memory and Learning, (iv) Sensorimotor, (v) Social Perception, and (vi) Visuospatial Processing, together they provide an overview of a child's neuropsychological status as well as, in particular, an understanding of underlying cognitive skills that facilitate the academic and social development of a child (Korkman et al., 2007b).

³ HKCAS-P applies a multidimensional approach to assess the early learning development of Chinese children in Hong Kong aged between 3 years 4 months and 6 years 3 months (Department of Health, 2014). Various scales were developed, including Cognition, Language, Social Cognition, Visual Perception, Fine Motor, Gross Motor, and Early Literacy and Numeracy.

A list of subtests of neuropsychological assessment of preschool children was summarised in **Table 2.1**.

By measuring parental investment and evaluating the level of parenting stress through questionnaires, the mediating roles of parental investment and parenting stress in the link between poverty and a child's neurocognitive development could also be investigated.

Table 2.1 Neuropsychological Assessment for Preschool Children

| Functional Domain | Subtest | Description | Estimated Time (min) |
|--|---|--|----------------------|
| (1). Language | (i). Body Part Naming ¹ (ii). Body Part Identification ¹ | To assess confrontation naming and name recognition, basic components of expressive and receptive language. | 5 |
| | (iii). Cantonese Receptive Vocabulary ² | To match the picture and target word for assessing receptive vocabulary. | 10 |
| | (iv). Cantonese Expressive Vocabulary ² | To assess expressive vocabulary by telling the object from pictures. | |
| (2). Visuospatial Processing | (v). Block Construction ¹ | To assess the visuospatial and visuomotor ability to reproduce three-dimensional constructions from models or from two-dimensional drawings. | 12-15 |
| | (vi). Geometric Puzzles ¹ | To assess mental rotation, visuospatial analysis, and attention to detail. | |
| (3). Memory and Learning | (vii). Memory for Designs ¹ | To assess spatial memory for novel visual material. | 10 |
| (4). Attention and Executive Functioning | (viii) Statue ¹ | To assess motor persistence and inhibition. | 3 |

Notes:

¹. Neuropsychological Second Edition (NEPSY-II).

². Hong Kong Comprehensive Assessment Scales for Preschool Children (HKCAS-P).

(1). Visuospatial Processing

The cognitive skill of visuospatial processing facilitates children to distinguish between objects, synthesize elements into a meaningful whole, and to represent objects mentally (Korkman et al., 2007b). Visuospatial processing also enables people to identify the orientation, location, directionality and relationships of objects as well as to reproduce two- and three-dimensional objects.

In this study, two aspects of visuospatial ability – motor production in Block Construction and nonmotor aspect from Geometric Puzzles – are assessed (Korkman et al., 2007b).

Block Construction

In Block Construction, a child is asked to reproduce the shapes using blocks following the three-dimensional constructions and two-dimensional drawings within the time limit. This aims to assess children's visuospatial and visuomotor ability for reproduction (Korkman et al., 2007a; Korkman et al., 2007b). The performance on Block Construction can be reflected on the Block Construction Total Score and the Block Construction Scaled Score. Children may be relatively poor in visuoconstructional skills and find difficult to visualize three-dimensional spatial relations from a two-dimensional picture (Korkman et al., 2007b). Some children who are slow in completing Block Construction may be poorly developed in motor coordination or take a vigilant approach to complete the task (Korkman et al., 2007b).

Geometric Puzzles

In Geometric Puzzles, the child is required to analyse and compare several shapes of geometric figures within the grid and match two of the shapes outside the grid within a time period. It is designed to assess nonmotor aspects of visuospatial perception, including mental rotation, visuospatial analysis, and attention to detail (Korkman et al., 2007a & 2007b). Geometric Puzzles is composed of Geometric Puzzles Total Score and Geometric Puzzles Percentile Rank. A child who results in a low Geometric Puzzles Total Score may imply s/he encounters difficulty with visual-spatial analysis, such as mental rotation (Korkman et al., 2007b).

(2). Memory and Learning

Memory problems is found to be the secondary deficit in children in the domains of Attention and Executive Functioning, Language, and Visuospatial Processing (Korkman et al., 2007b). In this study, yet, only the ability of nonverbal memory and learning was assessed.

Memory for Designs

Memory for Designs is designed to assess spatial recall, visual content recognition, and overall visuospatial memory for spatial locations and visual detail of children aged 3 to 16 (Korkman et al., 2007a & 2007b). The child is presented an increasing number of designs in a 4 x 4 grid over four trials. In each trial, the child has to recall the designs as well as their location and place the cards in the grid under an immediate condition. A Memory for Designs Total Score, with a total score of 30, is derived from MD Content Score and MD Spatial Score. Children with a low Memory for Designs Total Score is suggested to be cognitively poor in visuospatial memory and find difficult to remember and recall the detail and location of visual stimuli details in two-dimensional space (Korkman et al., 2007b). MD

Content vs. Spatial Contrast Scaled Score can then be converted to compare the MD Content Score against the MD Spatial Score. Children who has a low MD Content vs. Spatial Contrast Scaled Score may find difficult with immediate spatial memory recall relative to visual details (Korkman et al., 2007b). In contrast, children with high MD Content vs. Spatial Contrast Scaled Score may be cognitively poor in immediate recall of visual details relative to spatial memory (Korkman et al., 2007b).

(3). Language

Although the language domain constitutes a wide range of subtests assessing preschool children's linguistic capacities in speech and language, reading, spelling, and writing (Korkman et al., 2007b), only subtests measuring the expressive and receptive of Cantonese Chinese and English language were adopted for the purpose of this study.

Cantonese receptive vocabulary

A total of 14 items were entailed measuring the receptive Chinese vocabulary. Each item constitutes a target and three foils, in which one of them contains shared speech sounds with the target, one presents the meaning of it, and one is extraneous. The child is shown with pictures and required to point to the right picture in response to the target word. Children with a higher score indicates better performance.

Cantonese expressive vocabulary

The expressive Chinese vocabulary is measured by 11 items of eliciting nouns, verbs and adjectives. The child is asked to name the object (for any nouns), describe the behaviour (for any verbs), and illustrate the object (for any adjectives). Children with a higher score indicates better performance.

Body Part Naming and Body Part Identification

The Body Part Naming and Body Part Identification is designed to identify language delays among children aged between three and four. It does this by assessing their confrontation naming and name recognition as well as the basic components of expressive and receptive language (Korkman et al., 2007a; Korkman et al., 2007b; Kemp and Korkman, 2010). The Body Part Naming assesses the capacity of a child to name the body parts in response to a visual stimulus. It consists of 11 items measuring the naming ability, which is considered to be a core element of expressive language. Two points is given with an accumulative total of 22; while no points are given to any incorrect answers. Children who subject to a low Body Part Naming Total Score may suggest s/he may be poor in expressive language, weak in motor control of speech reproduction, and encounter difficulty in word finding (in particular to body parts) (Korkman et al., 2007b).

The receptive vocabulary and name recognition are assessed in the subtest of Body Part Identification. The child is instructed to point to corresponding parts of the body on a figure. Similar to the Body Part Naming, it constitutes 11 items with a maximum score of 11. Children may be poorly developed in their semantic knowledge (either general or specific to body parts) if a low Body Part Identification Total Score is given (Korkman et al., 2007b). The performance of Body Part Naming and Body Part Identification can be compared and formed into a BPN vs. BPI Contrast Scaled Score. A low Contrast Scaled Score reflects poor expressive language or naming skills of a child (Korkman et al., 2007b).

(4). Attention and Executive Functioning Domain

Motor persistence is one of the major cognitive skills being assessed under the domain of attention and executive functioning (Korkman et al., 2007b). Capacities to inhibit impulsive responding, transforming concepts into action as well as the ability to initiate and self-monitor behaviour are also evaluated in this domain (Korkman et al., 2007b).

Statue

Statue assesses motor persistence and inhibition of children aged three to six (Korkman et al., 2007a & 2007b; Kemp and Korkman, 2010). A child is asked to uphold his/her body position for a 75-second period despite sound distractors at the designated time during the assessment. A Statue Total Score of 30 is given if no errors occur. Inhibitory errors, including body movement, eyes opening and vocalisation, will be recorded for every five seconds. A low Statue Total Score may imply a child is cognitively weak in motor persistence and could suggest an indication of hyperactivity (Korkman et al., 2007b). In other words, children who frequently experience Body Movement and Vocalization errors are anticipated difficulty to inhibit inappropriate behaviour at home or in the classroom (Korkman et al., 2007b).

The subtests extracted from NEPSY-II were translated in Chinese and piloted with preschool children. The assessment took an approximate of 40 to 45 minutes for each preschool child. It was assessed individually at the selected preschool. The school provided proper space during the assessment period.

2.1.2 Parent Questionnaire

Apart from examining the relationship between socioeconomic status and the neurocognitive systems of preschool children, we aimed to study the potential mechanisms underlying the relationship between growing up poor and neuropsychological development. Specifically, we aimed to simultaneously focus on parental investment and parental stress as being two important sources that mediate the link between the SES gradients and neurocognitive development of Hong Kong preschool

children. These three core elements, including parental socioeconomic status (SES), parental investment and parental distress, were incorporated into the structured questionnaire. For details, please refer to 'Parent Questionnaire' in **Appendix 1**.

(1). Socioeconomic Status (SES)

Socioeconomic status (SES) is usually measured by parent educational attainment, occupation, income level (McLoyd, 1998). Using multiple measures of poverty to study the relationship between poverty and neurocognitive outcomes integrate the best research practices from the disciplines of social policy and neuropsychology. In this study, we adopted different approaches to measuring poverty⁴. First, poor families were defined as those household incomes fall below half the median income in Hong Kong. It is widely used in Hong Kong and many other countries. Data on household income collected from the parents of the children were adjusted by dividing household income by the square root of household size (Garfinkel et al., 2006; OECD, 2013). Second, the official poverty line with a threshold value of 50% of median pre-intervention monthly income for households of different sizes set by the Commission on Poverty in 2013. Third, the same equivalence scale for the income-based poverty threshold was applied to the expenditure-based poverty line. Parents or guardians were asked about their monthly household expenditures (including food and transport, housing and utilities, miscellaneous goods and services, clothing, footwear and durable goods) were assessed by asking parents or guardians (Census and Statistics Department, 2016, Table 6). Fourth, poor households were defined as whose family members or friends in receipt of any means-tested in-cash support from government (e.g. Comprehensive Social Security Assistance Scheme, The School Textbook Assistance (TA) Scheme). Finally, a measure of socioeconomic status (SES) accounts for parental education and occupation was adopted. The International Standard Classification of Occupation 2008 (ISCO-08) skill levels of the International Labour Organization was adopted (ILO, 2012). Parental occupation was grouped into four categories: Skill Level 3 or 4: managers and administrators/professionals/associate professionals, Skill Level 2: clerical support workers/service and sales workers/craft and related workers/plant and machine operators and assemblers, and Skill Level 1: elementary occupations/others).

(2). Parental Investment

Parental investment refers to parents' ability to invest in their children and provide a stimulating learning environment. Studies have shown that parental investment mediates between differences in family SES and educational outcomes (e.g., Henry et al., 2011). However, SES contains a mixture of family attributes, including parents' education levels, social networks and other forms of cultural capital that individually contributes to parents' investment in the education of their children and the

⁴ Given the small sample size, this study could not create a valid and reliable material deprivation index.

children's educational outcomes. By relating parental investment to family income, this study was able to gauge the relationship between child poverty and educational outcomes more specifically. In this study, we aimed to assess a cluster of related items that may enrich the educational experience of young children including extracurricular activities, home learning materials and school-related investments (Kaushal et al., 2011). We also examined the amount of time parents spend with their children, including reading activities (Ip et al., 2016; Manolitsis et al., 2013), home learning activities (e.g. teaching children to do simple calculation) (Manolitsis et al., 2013; Skwarchuk et al., 2014), and parent-child interactive activities (e.g. playing board games) (Huntsinger et al. 2016; Skwarchuk et al., 2014) as these variables have significant impacts on children's learning outcomes (Bonke & Esping-Andersen, 2011).

Parental investment was measured in three ways: the amount of time spent in parent-child interactions, the amount of cognitively stimulating materials and activities and the amount of financial resources spent on the child. The amount of time spent on parent-child interaction refers to the time parents have spent on childcare and the activities the parents and their children have engaged in together (e.g. reading, learning and parent-child interactive activities). Reading a book together, visiting a museum or visiting a playground or park are examples of the cognitively stimulating activities (Caldwell & Bradley, 1984; Ip et al., 2016; Manolitsis, et al., 2013). Financial resources include the amount of money spent on formal education, including tuition and school-related expenses, extracurricular activities and expenditures on enrichment items (e.g., books, magazines, computers and sports equipment).

(3). Parent Stress

Economic hardship raises parental stress, which has a negative impact on the quality of parenting and educational outcomes (Yeung, et al., 2002). Parental stress has been associated negatively with child development (Evans & English, 2002). To understand the mechanisms underlying the relationship between SES and neurocognitive outcomes in Hong Kong, it was important to examine the joint influence of parental investment and parental stress using primary data in this study. We aimed to generate data that have strong policy implications in terms of identifying intervention strategies to help underprivileged children attain a level playing field with other children and to sever the tie between low income and children's poor education outcomes, thereby promoting intergenerational mobility.

Parental stress was measured by the 12 items from the Parental Distress (PD) subscale of the Chinese version of the Parenting Stress Index, 4th Edition Short Form (PSI-4-SF). The Parenting Stress consists of three subscales: parental distress (PD), parent-child dysfunctional interaction (PCDI) and difficult

child (DC), respectively. The permission to administer the measure was obtained from the Psychological Assessment Resources (PAR) (www.parinc.com).

The PD subscale measures an impaired sense of parental competence and depression (Tam et al., 1994). The 12 items from the PD include: 'I often have the feeling that I cannot handle things very well', 'I find myself giving up more of my life to meet my children's needs than I ever expected', 'I feel trapped by my responsibilities as a parent', 'Since having this child, I have been unable to do new and different things', 'Since having a child, I feel that I am almost never able to do things that I like to do', 'I am unhappy with the last purchase of clothing I made for myself', 'There are quite a few things that bother me about my life', 'Having a child has caused more problems than I expected in my relationship with my spouse / parenting partner', 'I feel alone and without friends', 'When I go to a party, I usually expect not to enjoy myself', 'I am not as interested in people as I used to be', and 'I don't enjoy things as I used to' (*Reversed score* - 1 = Strongly disagree to 5 = Strongly agree). Parents with higher scores indicate higher parenting stress.

2.2 Study Sample

Having considered this study with a sample of 180 preschool children⁵, the project team recruited child participants aged 36 to 47 months from different SES segments. School selection was approximately based on child poverty rate (post-intervention recurrent cash) by District Council district (Government of the Hong Kong Special Administration Region, 2018, Tables A.3.8 - A.3.10) and annual tuition fees⁶. The project team sent invitations to school principals with consent forms to the parents seeking their permission for their children to participate in the study. In terms of exclusion criteria, we followed those used in previous studies (e.g., Noble et al., 2005) and conduct initial screenings to exclude children: (1) with a very low birth-weight (<1,500 grams); (2) whose mothers reported alcohol or drug use during pregnancy; and (3) who have a history of head injury, Attention deficit hyperactivity disorder (ADHD), learning disabilities, developmental delay or other neurological or psychiatric problems.

The structured questionnaire was piloted with parents whose children aged 36 to 47 months, followed by the pilot of child neurocognitive assessment with preschool children in academic year 2018/2019. The self-administered parent questionnaire and child assessment were undertaken in academic year 2019/2020. The project team has successfully recruited 222 preschool children from nine kindergartens located in different districts of Hong Kong. Parents were invited to complete a

⁵ The number of child participants was changed from 240 to 180 because of the proposed budget cut. The budget plan and the total number of preschool children were revised accordingly.

⁶ Annual tuition fees classified as three specific ranges from (i) less than HK\$6,000; (ii) between HK\$6,000 and HK\$11,999; and (iii) between HK\$12,000 and HK\$17,999.

structured questionnaire followed by the arrangement of their child neurocognitive assessment. A total of 55 cases were excluded for further analyses either because parents only completed questionnaire but refused to participate in or withdrew from child neurocognitive assessment. Some child participants aged below 36 months or above 48 months were also excluded. Eventually, there were 167 preschool children (aged 36 to 47 months) who have completed neurocognitive assessment with their parent questionnaire used for further analyses (see **Table 2.3**). Despite having a small sample of this exploratory study, data derived from different SES background of the participants could still give us insights into the mediating role of parental investment and parental stress in the link between poverty and the major perceptual, cognitive and language functions amongst Hong Kong preschool children.

2.3 Generation of Key Research Variables

(1). Predictors

Parental Socioeconomic Status

There are several variables regarding parental socioeconomic status, including parental highest educational level (1 = Primary or below, 2 = Secondary, 3 = Sub-degree/Diploma/Certificate and 4 = degree or above), and the equivalised household income using an equivalence scale which divides household income by the square root of household size (OECD, 2013).

Since different variables were measured using different scales, all continuous variables were standardised (i.e. mean = 0, standard deviation = 1) before they were used in the following analyses.

Expenditure on Children

We created the mean of expenditure on children by averaging five items (**EXP_CHI**): ‘Language classes’, ‘Interest classes’, ‘Cultural and recreational activities’, ‘Story books’, and ‘Toys’ (ChdExp5 to 9).

(2). Mediators

Parental Investment on Language vs. Non-Language-Related Activities

We created the composite scores for two types of parental investment by averaging items on language-related and non-language-related activities, respectively. The former included four parental investment items on language-related activities (PAInvstAct1 to 4) (**PI_VER**): ‘Reading a book’, ‘Telling a story’, ‘Teaching child Chinese characters’ and ‘Teaching child the English alphabet’ using a 6-point scale with 1 = ‘Never’ and 6 = ‘Every day’ (Crobach’s Alpha = .86). The latter covered eight parental investment items on non-language-related activities (PAInvstAct5 to 10) (**PI_NVER**): ‘Teaching child to do simple calculation’, ‘Playing board games’, ‘Listening to music’, ‘Watching online movie/playing

online games, 'Having meals together', 'Going out with child' using a 6-point scale with 1 = 'Never' and 6 = 'Every day', and 'Visiting Museum, and 'Watching play, dance and music performance' using a 6-point scale with 1 = 'Never' and 6 = 'more than 12 times per year' (Crobach's Alpha = .63).

From a face validity perspective, PAInvstAct1 to 4 are concerned about parents' investment on language-related activities, whereas all others are about non-language-related activities. Admittedly, a better approach is to apply the confirmatory factor analysis (CFA) to examine the appropriateness of adding up these items. However, CFA usually requires a large ratio (e.g. 20:1) between the number of observations and estimated parameters (Kline, 2016; Zhang et al., 2020). Due to the small sample size of this study, we cannot perform the CFA. This issue should be addressed further when larger samples become available.

Parental Distress

Parental stress was measured by the 12-item from the Parental Distress (PD) subscale of the Chinese version of the Parenting Stress Index, 4th Edition Short Form (PSI-4-SF), which measures an impaired sense of parental competence and depression (Tam et al., 1994). Z-score of parenting distress (PD) was created (Crobach's Alpha = .89) (please see the details of how the variable PD was created in **Section 2.2.2 (3)**).

(3). Outcomes

Child Assessment

We also calculated mean scores of five types of child assessments, including: English language (Body Part Naming (BPN) Total Score, Body Part Identification (BPI) Total Score) (**CA_ENG**); Chinese language (Receptive vocabulary (Cantonese) and Expressive vocabulary (Cantonese)) (**CA_CHI**), visuospatial processing (Block Construction (BC) Total Score, Geometric Puzzles (GP) Total Score) (**CA_VP**), memory and learning (Memory for Design (MD) Total Score) (**CA_ML**), as well as attention and executive functioning (Statue (ST) Total Score) (**CA_AEF**).

A list of predictors, mediators and outcome variables is summarised in **Table 2.2**.

Table 2.2 Predictors, Mediators and Outcome Variables and Items

| Variables | Items | Values |
|-------------------|--|---|
| Predictors | | |
| MEDU | Maternal education | 1 = Primary or below to 4 = degree or above |
| FEDU | Paternal education | |
| EQhhdInc | Equivalised household income | An equivalence scale was used. |
| EXP_CHI | Expenditure on children | |
| ChdExp5 | During the last month, how much do you spend on average in the following items - Language classes | Expenses on average (HKD) |
| ChdExp6 | During the last month, how much do you spend on average in the following items - Interest classes | |
| ChdExp7 | During the last month, how much do you spend on average in the following items - Cultural and recreational activities | |
| ChdExp8 | During the last month, how much do you spend on average in the following items - Story books | |
| ChdExp9 | During the last month, how much do you spend on average in the following items – Toys | |
| Mediators | | |
| PI_VER | Parental investment (language-related activities) | |
| PAInvstAct1 | During the last month, how often do you done the following activities with your child - Reading a book | 1 = Never to 6 = Every day (Crobach's Alpha = .86) |
| PAInvstAct2 | During the last month, how often do you do the following activities with your child - Telling a story | |
| PAInvstAct3 | During the last month, how often do you do the following activities with your child - Teaching child Chinese characters | |
| PAInvstAct4 | During the last month, how often do you do the following activities with your child - Teaching child the English alphabet | |
| PI_NVER | Parental investment (non-language-related activities) | |
| PAInvstAct5 | During the last month, how often do you do the following activities with your child - Teaching child to do simple calculation | 1 = Never to 6 = Every day (Crobach's Alpha = .63) |
| PAInvstAct6 | During the last month, how often do you do the following activities with your child - Playing board games | |
| PAInvstAct7 | During the last month, how often do you do the following activities with your child - Listening to music | |
| PAInvstAct8 | During the last month, how often do you do the following activities with your child - Watching online movie / playing online games | |
| PAInvstAct9 | During the last month, how often do you do the following activities with your child - Having meals together | |
| PAInvstAct10 | During the last month, how often did you do the following activities with your child - Going out with child | |

Table 2.2 (Continued)

| Variables | Items | Values |
|------------------|--|---|
| PAInvstVisit1 | In the past 12 months, how often do you do the following activities with your child - Visiting Museum | 1 = Never to 6 = more than 12 times per year |
| PAInvstVisit2 | In the past 12 months, how often do you do the following activities with your child - Watching play, dance and music performance | |
| PAR_STR | Parental distress | |
| PD1 | I often have the feeling that I cannot handle things very well | 1 = Strongly disagree to 5 = Strongly agree <i>(Reversed score from 12 to 60)</i> (Crobach's Alpha = .89) |
| PD2 | I find myself giving up more of my life to meet my children's needs than I ever expected | |
| PD3 | I feel trapped by my responsibilities as a parent | |
| PD4 | Since having this child, I have been unable to do new and different things | |
| PD5 | Since having a child, I feel that I am almost never able to do things that I like to do | |
| PD6 | I am unhappy with the last purchase of clothing I made for myself | |
| PD7 | There are quite a few things that bother me about my life | |
| PD8 | Having a child has caused more problems than I expected in my relationship with my spouse / parenting partner | |
| PD9 | I feel alone and without friends | |
| PD10 | When I go to a party, I usually expect not to enjoy myself | |
| PD11 | I am not as interested in people as I used to be | |
| PD12 | I don't enjoy things as I used to | |
| Outcomes | | |
| CA_ENG | Child assessment performance: language (English) | |
| BPNTotalScore | NEPSY-II: Body Part Naming (BPN) Total Score (Max = 22) | Max = 33 |
| BPITotalScore | NEPSY-II: Body Part Identification (BPI) Total Score (Max = 11) | |
| CA_CHI | Child assessment performance: language (Cantonese) | |
| ChinRecVoc | HKCAS-P: Receptive vocabulary (Cantonese) (Max = 14) | Max = 25 |
| ChinExpVoc | HKCAS-P: Expressive vocabulary (Cantonese) (Max = 11) | |
| CA_VP | Child assessment performance: visuospatial processing | |
| BCTotalScore | NEPSY-II: Block Construction (BC) Total Score (Max = 28) | Max = 52 |
| GPTotalScore | NEPSY-II: Geometric Puzzles (GP) Total Score (Max = 24) | |
| CA_ML | Child assessment performance: memory and learning | |
| MDTotalScore | NEPSY-II: Memory for Design (MD) Total Score (Max = 100) | Max = 100 |
| CA_AEF | Child assessment performance: attention and executive functioning | |
| STTotalScore | NEPSY-II: Statue (ST) Total Score (Max = 30) | Max 30 |

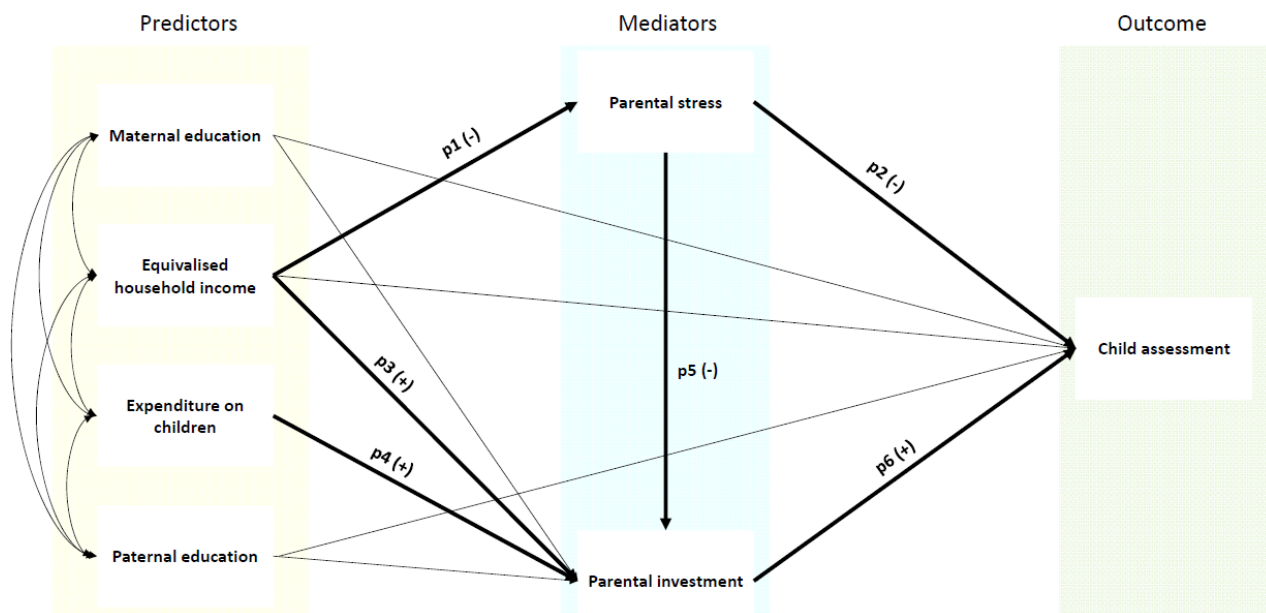
2.4 Analytical Framework

We firstly checked the descriptive statistics of the key research variables followed by conducting regression analysis. We are particularly interested in investigating four major mediation paths, including:

- **Path I:** The relation between household income and child assessment performance mediated by parental stress (i.e. **P1** → **P2**);
- **Path II:** The relation between household income and child assessment performance mediated by parental investment (i.e. **P3** → **P6**);
- **Path III:** The relation between household income and child assessment performance mediated by both parental stress and investment (i.e. **P1** → **P5** → **P6**); and
- **Part IV:** The relation between expenditure on children and child assessment performance mediated by parental investment (i.e. **P4** → **P6**).

Other paths in the series of path analysis models include the direct effects of parental education on parental investment and child assessment performance as well as household income on child assessment performance, respectively. **Figure 2.1** illustrates the overall conceptual framework of the mediation analysis.⁷

Figure 2.1 Conceptual Diagram of Mediation Analysis



⁷ Given the small sample size and the required ratio between the number of variables and parameters to be estimated, the path analysis models did not specify parental education as dummy variables. This limitation should be addressed when larger samples become available.

2.5 Data Imputation

The analysis was conducted using AMOS Version 25 (Arbuckle, 2014) with the bootstrap estimation (bootstrap samples = 2000). AMOS firstly imputed missing data using Bayesian imputation. For all the variables, the percentages of missingness were below 5% (see **Table 3.2**), except attention and executive functioning (CA_AEF) which had about 13% of missingness. In addition, the Little's MCAR test in SPSS (Version 25) indicated that the missingness was not completely at random (chi-square = 77.1, $df = 51$, $p = .011$). Therefore, data imputation might introduce bias. Nevertheless, data imputation enables the application of the bootstrap technique with a random sample of 2000. Given the relatively small sample size of this study, we decided to impute the missing data. The completely imputed data were then used for the mediation/path analyses.

3. Research Results/Findings

3.1 Sociodemographic Profiles of the Study

In total, 167 preschool children and their parents completed the child assessment and self-administered questionnaire, respectively. Among the children, 74 (44.3%) were boys; 93 (55.7%) were girls. Preschool children's average age was 41.36 months (SD = 3.299). 7.2% of families (N = 12) were in receipt of means-tested in-cash support. There was a marked contrast between maternal and paternal occupation. About 50% of mothers (N=78) are home-makers and nearly one-fifth (N = 30) are in managerial and professional positions. Preschool children living in poor families from various income poverty measures were ranged from 18% to 25.1% (**Table 3.1**).

3.2 Descriptive Statistics

Table 3.2 reports the descriptive statistics and correlation coefficients of variables. Household income was significantly and positively associated with expenditure on children, parental investment on language-related activities and child assessment performance except visuospatial processing and attention and executive functioning but negatively related to parental distress. Parental distress was significantly and negatively associated with parental investment (language and non-language-related activities) and child assessment performance on memory and learning.

Significant differences were found in z-scores of parental distress sub-scales with various sociodemographic variables. The mean and confidence interval scores were summarised in **Table 3.3**. There was a fairly consistent pattern showing parents with lower educational attainment, families in receipt of means-tested in-cash support and families with lower household income reported higher parental stress. The findings were consistent with a recent study of the parenting practices in Hong Kong (Family Health Services, Department of Health, 2018).

3.3 Regression Analysis

Regression analyses were performed to examine the relative effects of socioeconomic status on child assessment performance (**Table 3.4**). Overall, equalised household income, expenditure on children, parental education (except maternal education on child assessment performance on English language) were not a significant direct linear influence on child assessment performance. Parental SES overall only explained 1.3% to 9.9% of the variance in five different types of child assessment (i.e. $R^2 = .013$ to $.099$). Despite that SES seemed to not have a direct impact on child performance, according to previous literature (e.g. Gershoff et al. 2007; Han & Fox, 2011), SES still played roles in parenting behaviours. Therefore, the next section will focus on examining whether family SES still takes effects on child performance via possible mediators, i.e. parental distress and investment.

3.4 Mediation Analysis

(1) Overall Model Fitness

We have two types of parental investment (language-related vs. non-language-related activities) and five child assessments. Therefore, in total, 10 mediation models were examined using path analysis, which is a specific form of the structural equation modelling (SEM). The first step is to investigate the model fitness, that is, whether the data can match the proposed conceptual models. A set of model fitness index are applied, including the root mean square error of approximation (RMSEA) and its 95% confidence intervals (95% CIs), the comparative fit index (CFI), the Tucker-Lewis Index (TLI) and the chi-square. As shown in **Table 3.5**, the overall fitness of all the models was acceptable (i.e., $RMSEA < .10$, $CFI > .90$ and $TLI > .90$; Hu and Bentler 1998).

(2) Mediation Effects

Recall that we are interested in investigating four major mediation paths, including: **Path I**: the relation between household income and child assessment performance mediated by parental distress (i.e. $P1 \rightarrow P2$); **Path II**: the relation between household income and child assessment performance mediated by parental investment (i.e. $P3 \rightarrow P6$); **Part III**: the relation between household income and child assessment performance mediated by both parental distress and investment (i.e. $P1 \rightarrow P5 \rightarrow P6$); and **Part IV**: the relation between expenditure on children and child assessment performance mediated by parental investment (i.e. $P4 \rightarrow P6$).⁸

As shown in **Table 3.6**, the most robust path I ($P1 \rightarrow P2$) is that household income and child assessment performance are mediated by parental distress, which demonstrate significant indirect effects in all models except Models 5 and 10. We also observed that household income and child assessment performance on both English and Chinese language are *positively* mediated by parental distress (i.e. Path I: Models 1 to 2 and 6 to 7). The findings may be relevant to quality external care the child receives which relieves negative impacts of parental stress on child cognitive development, especially for children from disadvantaged families (Esping-Andersen, 2009; Waldfogel, 2004).

The least robust path IV ($P4 \rightarrow P6$) is that expenditure on children and child assessment performance are mediated by parental investment, which only demonstrates significant indirect effects in Models 9 and 10. It indicates that parental time investment on language and non-language-related activities

⁸ Concrete details of each model's parameters, diagrams and other information are over 10 pages generated by the AMOS software and are available upon request.

seemingly had stronger indirect effects on child assessment performance than the 'money' effect (i.e. expenditure on children) (Esping-Andersen, 2009; Yoshikawa et al., 2013).

This argument was supported by the research results. We found that there were significant indirect effects of parental investment (i.e. path II: P3 → P6), and parental distress and parental investment (i.e. path III: P1 → P5 → P6) in Models 1 to 4 and 9 and 10. We also observed that household income and child assessment performance are *negatively* mediated by parental investment on non-language-related activities (Path II: Models 6 to 10). It may be related to better-off parents who are fully occupied with their paid work and have limited time spent with their preschool children on non-language-related activities (Cordero-Coma and Esping-Andersen, 2018; Liu and Xie, 2015).

Table 3.1 Characteristics of the Sample by Age (Months)

| | 36-41 months | 42-47 months | Total |
|--|---------------------|---------------------|-----------------------------|
| Valid N (%) or Mean (SD) | 89 (53.3%) | 78 (46.7%) | 167 41.36 (3.299) |
| Gender | | | 167 |
| Boy | 42.7% | 46.2% | 44.3% |
| Girl | 57.3% | 53.8% | 55.7% |
| Whether families in receipt of means-tested in-cash support | | | 167 |
| No | 92.1% | 93.6% | 92.8% |
| Yes | 7.9% | 6.4% | 7.2% |
| Maternal occupation¹ | | | 159 |
| Skill levels 3 or 4: Managers and administrators / Professionals / Associate professionals | 19.8% | 17.8% | 18.9% |
| Skill level 2: Clerical support workers / Service and sales workers / Craft and related workers / Plant and machine operators and assemblers | 27.9% | 35.6% | 31.4% |
| Skill level 1: Elementary occupations / Others | 1.2% | 0.0% | 0.6% |
| Home-makers | 51.2% | 46.6% | 49.1% |
| Paternal occupation¹ | | | 150 |
| Skill levels 3 or 4: Managers and administrators / Professionals / Associate professionals | 47.6% | 48.5% | 48.0% |
| Skill level 2: Clerical support workers / Service and sales workers / Craft and related workers / Plant and machine operators and assemblers | 46.3% | 45.6% | 46.0% |
| Skill level 1: Elementary occupations / Others | 6.1% | 5.9% | 6.0% |
| Maternal education | | | 163 |
| Secondary | 47.2% | 48.6% | 47.9% |
| Sub-degree/Diploma/Certificate | 19.1% | 21.6% | 20.2% |
| Degree or above | 33.7% | 29.7% | 31.9% |
| Paternal education | | | 159 |
| Secondary | 48.3% | 54.2% | 50.9% |
| Sub-degree/Diploma/Certificate | 19.5% | 13.9% | 17.0% |
| Degree or above | 32.2% | 31.9% | 32.1% |
| Relative poor | | | 167 |
| Not poor | 82.0% | 82.1% | 82.0% |
| Poor | 18.0% | 17.9% | 18.0% |
| Official HK poverty line | | | 167 |
| Not poor | 76.4% | 73.1% | 74.9% |
| Poor | 23.6% | 26.9% | 25.1% |
| Equivalent household income | | | 167 |
| 1st quintile (lowest) | 21.3% | 24.4% | 22.8% |
| 2nd quintile | 18.0% | 17.9% | 18.0% |
| 3rd quintile | 16.9% | 21.8% | 19.2% |
| 4th quintile | 22.5% | 20.5% | 21.6% |
| 5th quintile (highest) | 21.3% | 15.4% | 18.6% |
| Expenditure-based poverty threshold | | | 167 |
| Not poor | 93.3% | 89.7% | 91.6% |
| Poor | 6.7% | 10.3% | 8.4% |

Notes:

¹ The ILO International Standard Classification of Occupation 2008 (ISCO-08) skill levels was adopted.

Table 3.2 Descriptive Statistics and Correlations Coefficients of Key Variables (Total N = 167)

| Variable | Type | Valid N | Min | Max | Mean | SD | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | |
|----------------------------------|--|-------------|-----|------|----------|----------|----------|----------------|------|----------------|----------------|---------------|------|---------------|---------------|--------------|
| Parental SES | | | | | | | | | | | | | | | | |
| 1 | Maternal education (MEDU) | categorical | 163 | 2 | 4 | 2.8 | 0.9 | | | | | | | | | |
| 2 | Paternal education (FEDU) | categorical | 159 | 2 | 4 | 2.8 | 0.9 | | | | | | | | | |
| 3 | Equivalentised household income (EQhhdInc) | continuous | 167 | 0.00 | 60621.78 | 19838.60 | 12907.96 | | | | | | | | | |
| 4 | Expenditure on children (EXP_CHI) | continuous | 166 | 0.00 | 3000.00 | 410.90 | 526.04 | .212** | | | | | | | | |
| Parental investment on... | | | | | | | | | | | | | | | | |
| 5 | ...language-related activities (PI_VER) | continuous | 167 | 1.00 | 6.00 | 3.79 | 1.18 | .346** | 0.08 | | | | | | | |
| 6 | ...non-language-related activities (PI_NVER) | continuous | 167 | 1.38 | 5.00 | 3.14 | 0.65 | 0.03 | 0.11 | .544** | | | | | | |
| Parental distress | | | | | | | | | | | | | | | | |
| 7 | Parental distress (PAR_STR) | continuous | 167 | 12.0 | 53.0 | 31.0 | 8.1 | -.263** | 0.01 | -.263** | -.210** | | | | | |
| Child assessment | | | | | | | | | | | | | | | | |
| 8 | Language-English (CA_ENG) | continuous | 158 | 0.00 | 11.00 | 2.37 | 2.22 | .265** | 0.06 | 0.15 | 0.03 | -0.01 | | | | |
| 9 | Language-Cantonese (CA_CHI) | continuous | 167 | 0.50 | 9.50 | 5.12 | 2.05 | .173* | 0.10 | .256** | 0.01 | 0.02 | 0.13 | | | |
| 10 | Visuospatial processing (CA_VP) | continuous | 167 | 1.00 | 13.50 | 8.07 | 2.28 | 0.02 | 0.04 | -0.03 | 0.03 | -0.11 | 0.13 | .290** | | |
| 11 | Memory and learning (CA_ML) | continuous | 163 | 9.00 | 84.00 | 38.48 | 12.96 | .199* | 0.10 | .156* | 0.13 | -.181* | 0.16 | .195* | .367** | |
| 12 | Attention & executive functioning (CA_AEF) | continuous | 145 | 0.00 | 30.00 | 22.22 | 7.35 | 0.09 | 0.03 | 0.05 | 0.14 | 0.00 | 0.07 | 0.11 | .232** | .187* |

Notes:

¹Continuous variables were standardised before correlational analysis.

² ** significant at the 0.01 level (2-tailed); * significant at the 0.05 level (2-tailed).

³ Only the correlations coefficients of continuous variables were displayed.

Table 3.3 Z-score Parental Distress (PD) by Parental Socioeconomic Status

| | N | Mean | 95% Confidence Interval for Mean | | Sig. |
|--|-----|-------|----------------------------------|-------------|--------------|
| | | | Lower Bound | Upper Bound | |
| Maternal education | | | | | 0.001 |
| Secondary | 78 | 0.28 | 0.04 | 0.51 | |
| Sub-degree/Diploma/Certificate | 33 | -0.26 | -0.59 | 0.06 | |
| Degree or above | 52 | -0.30 | -0.53 | -0.06 | |
| Paternal education | | | | | 0.006 |
| Secondary | 81 | 0.19 | -0.04 | 0.43 | |
| Sub-degree/Diploma/Certificate | 27 | -0.02 | -0.43 | 0.39 | |
| Degree or above | 51 | -0.37 | -0.59 | -0.15 | |
| Whether families in receipt of means-tested in-cash support | | | | | 0.002 |
| No | 155 | -0.07 | -0.22 | 0.09 | |
| Yes | 12 | 0.84 | 0.23 | 1.46 | |
| Relative poor | | | | | 0.012 |
| Not poor | 137 | -0.09 | -0.25 | 0.07 | |
| Poor | 30 | 0.41 | -0.02 | 0.85 | |
| Official HK poverty line | | | | | 0.025 |
| Not poor | 125 | -0.10 | -0.27 | 0.07 | |
| Poor | 42 | 0.30 | -0.05 | 0.64 | |
| Equalised household income | | | | | 0.009 |
| 1st quintile (lowest) | 38 | 0.33 | -0.04 | 0.70 | |
| 2nd quintile | 30 | 0.02 | -0.38 | 0.41 | |
| 3rd quintile | 32 | 0.20 | -0.10 | 0.50 | |
| 4th quintile | 36 | -0.13 | -0.44 | 0.18 | |
| 5th quintile | 31 | -0.48 | -0.79 | -0.18 | |
| Expenditure-based poverty threshold | | | | | 0.793 |
| Not poor | 153 | 0.01 | -0.15 | 0.16 | |
| Poor | 14 | -0.07 | -0.81 | 0.68 | |

Notes:

1. ** $p < .001$; * $p < .01$ (2-tailed).

Table 3.4 Regression Analysis of Unstandardized Coefficients with 95% Confidence Intervals in Brackets

| Predictors | Child assessment | | | | |
|---|-------------------------------|------------------------|-------------------------|------------------------|-------------------------------------|
| | English language | Chinese language | Visuospatial processing | Memory and learning | Attention and executive functioning |
| Equivalised household income | .204 (-.014, .422) | .030 (-.187, .246) | -.063 (-.285, .159) | .121 (-.094, .336) | .095 (-.139, .328) |
| Expenditure on children | .000 (-.160, .161) | .086 (-.076, .247) | .053 (-.112, .218) | .075 (-.085, .236) | .009 (-.167, .184) |
| Maternal education: Secondary (Ref.) | | | | | |
| Sub-degree /Diploma /Certificate | .196 (-.284, .675) | -.180 (-.667, .306) | -.115 (-.613, .384) | -.319 (-.803, .166) | -.166 (-.672, .341) |
| Degree or above | .530* (.033, 1.026) | -.027 (-.526, .472) | -.011 (-.521, .500) | .024 (-.469, .517) | .503 (-.004, 1.010) |
| Paternal education: Secondary (Ref.) | | | | | |
| Sub-degree /Diploma /Certificate | -.174 (-.681, .334) | .463 (-.045, .970) | .073 (-.447, .593) | .072 (-.433, .576) | -.138 (-.659, .383) |
| Degree or above | -.294 (-.791, .202) | .418 (-.082, .918) | .293 (-.219, .805) | .215 (-.281, .710) | -.586* (-1.098, -.074) |
| Model summary | | | | | |
| R | .314 | .239 | .115 | .255 | .293 |
| R square | .099 | .057 | .013 | .065 | .086 |
| Adjusted R square | .061 | .019 | -.026 | .027 | .043 |
| F-change (df1, df2) | 2.59 (6, 142) | 1.51 (6, 150) | .335 (6, 150) | 1.965 (6, 146) | 2.023 (6, 129) |
| Sig. F change | .021* | .178 | .917 | .126 | .067 |

Notes:

¹ Total $N = 167$. * indicated $p < .05$; (Ref.) indicated the reference or baseline group in each categorical variable; df = degrees of freedom.

² Due to the fact that none of the parents' educational level was primary school or below, the reference group became secondary school.

Table 3.5 Overall Fitness of the Models

| Models | Predictors | Mediators | Outcome | Chi-square | RMSEA (95% CIs) | CFI | TLI |
|--------|--|---|-------------------------------------|------------|-------------------|------|------|
| M1 | Maternal education Paternal education Household income Expenditure on child | Parental stress + Parental investment (language-related activities) | English language | 52.694 | .085 (.066; .107) | .981 | .901 |
| M2 | | | Chinese language | 61.534 | .093 (.073; .114) | .978 | .883 |
| M3 | | | Visuospatial processing | 53.164 | .086 (.066; .107) | .980 | .893 |
| M4 | | | Memory and learning | 51.200 | .084 (.064; .105) | .981 | .900 |
| M5 | | | Attention and executive functioning | 49.231 | .082 (.063; .104) | .982 | .904 |
| M6 | | Parental stress + Parental investment (non-language- related activities) | English language | 48.255 | .081 (.062; .103) | .981 | .902 |
| M7 | | | Chinese language | 60.842 | .092 (.073; .113) | .975 | .871 |
| M8 | | | Visuospatial processing | 47.771 | .081 (.061; .102) | .980 | .896 |
| M9 | | | Memory and learning | 53.349 | .086 (.066; .107) | .979 | .888 |
| M10 | | | Attention and executive functioning | 46.494 | .080 (.060; .101) | .982 | .904 |

Table 3.6 Indirect Effects Household Income and Expenditure on Children through Parental Stress and Parental Investment

| Models | Predictors | Mediators | Outcome | Path I: | Path II: | Path III: | Path IV: |
|--------|--|---|--|--------------------------|--------------------------|---------------------------------------|--------------------------|
| | | | | P1 → P2 INC → PS → CA | P3 → P6 INC → PI → CA | P1 → P5 → P6 INC → PS → PI → CA | P4 → P6 EoC → PI → CA |
| M1 | Maternal education Paternal education | Parental stress + Parental investment (language-related activities) | English language | -.024** | .010* | .003* | .002 |
| M2 | | | Chinese language | -.032** | .032** | .009** | .008 |
| M3 | | | Visuospatial processing | .032** | -.012** | -.003** | -.003 |
| M4 | | | Memory and learning | .030** | .011* | .003* | .003 |
| M5 | | | Attention and executive functioning | -.005 | .007 | .002 | .002 |
| M6 | Household income Expenditure on child | Parental stress + Parental investment (non-language- related activities) | English language | -.022** | -.005 | .001 | .003 |
| M7 | | | Chinese language | -.023** | -.002 | .001 | .001 |
| M8 | | | Visuospatial processing | .028** | -.001 | .000 | .000 |
| M9 | | | Memory and learning | .029** | -.017** | .005** | .012** |
| M10 | | | Attention and executive functioning | -.009 | -.026** | .008** | .018** |

Notes:

^{1.} **INC** = equivalised household income; **EoC** = Expenditure on children; **PS** = Parental stress; **PI** = Parental investment; **CA** = Child assessment.

^{2.} ** $p < .001$; * $p < .01$

4. Policy Implications and Recommendations

This study examined the relationship between poverty status and the functioning of different neurocognitive systems, including the language, visuospatial, memory and executive functioning abilities of Hong Kong preschool children. The study also investigated the mediating role of parental investment and parental distress in the link between poverty and the major perceptual, cognitive and language functions amongst Hong Kong preschool children.

The previous sections have showed that various ‘family effects’ (i.e. the ‘money’ effect, the ‘time investment’ effect, and the ‘learning culture’ effect) are key determinants of child outcomes (Esping-Andersen, 2009). We found that parental socioeconomic status, particularly household income and expenditure on children, was not significant influences on child assessment performance. We argued that family income and household expenditure on child learning-related activities might not be the most decisive mechanism that drives child assessment performance. Parental time investment and quality child-parent interactions (or parental stimulation) have stronger effects than family income on early child cognitive development (Bruckauf et al., 2016; Esping-Andersen, 2009; Heckman and Mosso, 2014).

More importantly, we found that parental distress explained, rather than merely influenced, the relationship between parental SES and child assessment performance amongst Hong Kong preschool children.

Quality parenting and family-friendly policies

We also found that high household income may not correlate positively to parental time investment on child development. It is assumed that being employed reduces parental involvement on childcare. In Hong Kong, more than one third of the labour forces engages in work for more than 50 hours per week (Census and Statistics Department, 2002b). This results in limited time involvement in childcare activities and affects children’s long-term development. As Mayer (1997) suggests non-monetary parenting practices are vital to children’s cognitive and non-cognitive skills development, it is important therefore for parents to balance their time between work and involvement in childcare activities. Policy advocacy and implementation on maximum working hours and flexible work life balance arrangement would allow working parents to be more involved in childcare activities.

Although the time dedicated to childcare activities is crucial, various studies have emphasized the importance of both the quantity and quality of parenting time (Fiorini & Keane, 2014; Hsin & Felfe, 2014). Previous empirical evidence has shown the mediation effect of parenting quality between family’s SES and children’s cognitive development from a development psychology perspective (Liner et al., 2002; Lugo-Gil & Tamis-LeMonda, 2008). In order to facilitate active parenting, it is essential to

equip parents with the skills needed for creating a stimulating home environment and for engaging their children in more structured activities, like reading and mother-child verbal interactions.

Female labour force participation rate and accessibility to childcare services

Parental stress may have an impact on the resources, including monetary and non-monetary materials, invested on children. It is assumed that low income families may be subjected to higher parental stress due to financial constraints. Yet, mothers from low-income families who have child caring responsibility but cannot have access to affordable or available supporting services cannot return to labour force to help relieve their family burden. Regarding the female labour force participation rate by marital status, 70.1% and 49.3% were unmarried and married respectively in 2019 (Census and Statistics Department, 2020b). This reflects that some married women may temporarily or permanently quit from the labour force.

To increase the participation rate of female labour force, it is believed that a system of enlarged childcare services may be beneficial, in particular for low-income parents who may need to return to labour force to earn a living. However, the availability of childcare services may constrain the opportunity for parents to return to the labour force. According to Yip (2019), the overall availability of Child Care Centres (CCCs) for children aged under 2 was 1:61, and aided place was 1:114 in 2016. The availability of CCCs turns better for children aged between 2 and 3, where the overall availability was 1:2, and for each 9 children there is one aided place. A recent study conducted by Oxfam Hong Kong (2018) also showed similar findings with only one in 148 children aged under 2 able to get access to aided CCCs. These studies also revealed that aided CCCs were lacking for children aged under 2.

The affordability of CCCs is another concern to parents. It was found that parents spent 21.4% and 46.3% of their household income on aided and non-aided standalone CCCs respectively, and 15.7% and 28.1% on aided and non-aided CCCs attached to KGs respectively (Yip, 2019). However, a great contrast in the expenditure on childcare services was seen between lower and higher affordability households. Families with lower affordability may spend more than half of their income while families with higher affordability may only spend less than 10% of their income on childcare services. The shortage of childcare services in addition to the low affordability for low-income families create barriers to the access of childcare services. Along this vein, it is crucial to increase the accessibility of childcare service to support the family function of working mothers and, in long run, to facilitate female participation in the labour force (Economist Intelligence Unit, 2012).

5. Details of the Public Dissemination Held

The findings of this project will be disseminated to the wider public in a variety of ways. It is planned to prepare a policy brief and draft newspaper article. These shorter pieces will be available via the website of the Institute of Policy Studies, Lingnan University (<https://www.ln.edu.hk/ips/policy.html>). In addition, the findings of this project will be presented at the 2020 Annual Meeting of the Research Committee on Poverty, Social Welfare and Social Policy RC19 of the International Sociological Association (ISA) between 3rd and 4th December 2020 (see **Annex I**).

6. Conclusion

Socioeconomic status of family is not the sole determinant of children's cognitive development and future achievement (Mayer, 1997). Yoshikawa et al.'s study (2013) revealed that parents' psychological well-being, parenting behaviours and parents' economic security influence child development. This study also supported that parental investment and parental stress created mediation effects between SES and child cognitive development. Higher income families can certainly invest more on their children monetarily. However, attention needs to be paid to the quality of time of parental involvement as well as long working hours for both higher and lower income families. In the meantime, parental stress is greatly influenced by household income. The advocacy of greater accessibility of childcare services is, therefore, vital to support early childhood development. It is believed that quality childcare services can enhance children's readiness for school, in particular for children from underprivileged families (Economist Intelligence Unit, 2012). This is also a means to ensure more equal life chances for children and to promote intergenerational mobility regardless of SES of their families.

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Appendix 1: Parent Questionnaire (in Chinese)

填入數據後即成機密文件
只有獲授權人士可閱讀本文件內容

研究項目職員填寫

學校名稱：_____

回收問卷日期 (YYYY.MM)：_____

家長問卷編號：_____



「學前兒童綜合發展：家庭經濟條件、家長資源投放及親職壓力之關係」 家長問卷調查

你好，嶺南大學研究生院聯同香港教育大學亞洲及政策研究學系、特殊教育與輔導學系及香港保護兒童會的研究團隊，現正進行一項名為「學前兒童綜合發展：家庭經濟條件、家長資源投放及親職壓力之關係」的研究項目。研究團隊成員來自公共政策、教育心理學、幼兒教育等不同的專業界別，冀透過整理及分析家庭因素對兒童成長及學習能力的影響的數據資料，有助社會各持分者制訂相關促進學校與家長溝通和協作，加強父母的育兒質素及情緒支援的政策建議，從而提升學前兒童的學習興趣及能力。

此為家長問卷，主要收集敝子女的學習模式、親子時間運用及家庭資源投放等數據。煩請閣下利用 15 分鐘自行填寫問卷。

問卷只供幼兒的父或母填寫，閣下於是次問卷調查所提供的一切資料將會絕對保密，多謝合作！

如有垂詢，請致電 xxxx-xxxx 或電郵至 xxxxxxxxx 與劉嘉慧博士聯絡。

第一部分：學生及家長資料

Q1. 學生資料： 姓名：

性別： (1). 女 (2). 男
 出生日期：_____年 _____月 _____日

****此欄資料將用作「學前兒童綜合發展評估」之用****

Q2. 你是孩子的： (1). 父親 (2). 母親 (3). 同住的監護人

Q3. 你的孩子在以下情況最常用作溝通的語言。

| | 廣東話 | 普通話 | 英文 | 其他 |
|--------------------------|-------------------------------|-------------------------------|-------------------------------|---|
| 1) 當他/她在家的時候 | (1). <input type="checkbox"/> | (2). <input type="checkbox"/> | (3). <input type="checkbox"/> | (4). <input type="checkbox"/> (請註明：_____) |
| 2) 當他/她在學校上課的時候 (不包括外語堂) | (1). <input type="checkbox"/> | (2). <input type="checkbox"/> | (3). <input type="checkbox"/> | (4). <input type="checkbox"/> (請註明：_____) |
| 3) 當他/她和朋友一起的時候 | (1). <input type="checkbox"/> | (2). <input type="checkbox"/> | (3). <input type="checkbox"/> | (4). <input type="checkbox"/> (請註明：_____) |

Q4. 你的婚姻狀況： (1). 從未結婚 (2). 已婚 (3). 同居 (4). 喪偶 (5). 離婚 (6). 分居

| | 你 (受訪者) | 你的配偶/伴侶 (如適用) |
|-------------------|--|---|
| Q5. 教育程度 | (1). <input type="checkbox"/> 小學或以下 (2). <input type="checkbox"/> 初中 (3). <input type="checkbox"/> 高中 (4). <input type="checkbox"/> 文憑/證書課程 (5). <input type="checkbox"/> 副學位課程 (6). <input type="checkbox"/> 學位課程 (7). <input type="checkbox"/> 碩士學位課程或以上 | (1). <input type="checkbox"/> 小學或以下 (2). <input type="checkbox"/> 初中 (3). <input type="checkbox"/> 高中 (4). <input type="checkbox"/> 文憑/證書課程 (5). <input type="checkbox"/> 副學位課程 (6). <input type="checkbox"/> 學位課程 (7). <input type="checkbox"/> 碩士學位課程或以上 |
| Q6. 經濟活動狀況 | (1). <input type="checkbox"/> 僱主: 最少僱用 1 名員工 (2). <input type="checkbox"/> 僱員 (3). <input type="checkbox"/> 自僱 (4). <input type="checkbox"/> 學生 (5). <input type="checkbox"/> 料理家務者 (6). <input type="checkbox"/> 退休人士 (7). <input type="checkbox"/> 失業 (8). <input type="checkbox"/> 其他 (請註明：_____) | (1). <input type="checkbox"/> 僱主: 最少僱用 1 名員工 (2). <input type="checkbox"/> 僱員 (3). <input type="checkbox"/> 自僱 (4). <input type="checkbox"/> 學生 (5). <input type="checkbox"/> 料理家務者 (6). <input type="checkbox"/> 退休人士 (7). <input type="checkbox"/> 失業 (8). <input type="checkbox"/> 其他 (請註明：_____) |
| Q7. 職位 | [只限僱主、僱員、自僱人士作答] (1). <input type="checkbox"/> 經理及行政級人員 (如公、私營機構經理、行政管理人員) (2). <input type="checkbox"/> 專業人員 (如醫生、律師；統計師；社工；大學及專上學院校長及教職員；中學校長及教師等) (3). <input type="checkbox"/> 輔助專業人員 (如護士；保健輔助專業人員；紀律部隊主任級以上的人員；小學及幼稚園/幼兒園校長及教師等) (4). <input type="checkbox"/> 文書支援人員 (如秘書；文員；銀行櫃位員等) (5). <input type="checkbox"/> 服務工作及商店銷售人員 (如機艙服務員；廚師及侍應生；褸姆；理髮師；紀律部隊員佐級人員；推銷員等) (6). <input type="checkbox"/> 漁農業熟練工人 (7). <input type="checkbox"/> 工藝及有關人員 (如建造業工人；機械及電子技工；麵包師傅等) (8). <input type="checkbox"/> 機台及機器操作及裝配員 (如印刷機操作員；司機等) (9). <input type="checkbox"/> 非技術工人 (如小販；家務助理及清潔工人；速遞員；保安等) (10). <input type="checkbox"/> 其他 (請註明：_____) | (1). <input type="checkbox"/> 經理及行政級人員 (2). <input type="checkbox"/> 專業人員 (3). <input type="checkbox"/> 輔助專業人員 (4). <input type="checkbox"/> 文書支援人員 (5). <input type="checkbox"/> 服務工作及商店銷售人員 (6). <input type="checkbox"/> 漁農業熟練工人 (7). <input type="checkbox"/> 工藝及有關人員 (8). <input type="checkbox"/> 機台及機器操作及裝配員 (9). <input type="checkbox"/> 非技術工人 (10). <input type="checkbox"/> 其他 (請註明：_____) |

第二部分：住戶資料

Q8. 請告知你家裡共住了多少人 (包括所有家庭成員及家庭傭工)? _____ (位)

Q9. 請告知所有與你同住的人 (可選擇多項):

- (1). 配偶/伴侶 (2). 兒子/女兒 (3). 爸爸/媽媽 (4). 配偶的爸爸/媽媽
(5). 兄弟/姐妹 (6). 家庭傭工 (7). 其他 (請註明: _____)

Q10. 你的家庭有多少個年齡介乎 0-17 歲的孩子? _____ (位)

Q11. 你的居所是自置還是租住?

- (1). 自置: 有按揭供款或借貸還款 (2). 自置: 沒有按揭供款或借貸還款 (3). 租住
(4). 僱主提供 (5). 免租

Q12. 你的居所類型是?

- (1). 公屋 (2). 資助自置居所房屋 (3). 私人樓宇 (整個單位)
(4). 私人樓宇 (套房/劏房/板間房) (5). 其他 (請註明: _____)

Q13. 在過去 12 個月, 你及你的家人有沒有因為缺乏金錢而逾期未能繳交以下服務的賬單? (可選擇多項)

- (1). 按揭/房租/物業管理費/差餉及地租 (2). 家用設施賬單(如電費、煤氣費、水費及電話費)
(3). 薪俸稅及個人入息課稅 (4). 醫療賬單
(5). 教育賬單(如學費) (6). 信用卡還款
(7). 其他借貸/賬單 (8). 沒有任何逾期未能繳交賬單

Q14. 請問你及你家人的收入來源? (可選擇多項)

- (1). 收入來自受僱或自僱工作 (2). 存款利息及股息等
(3). 其他收入來源 (如租金) (4). 從其他親戚獲得定時的現金資助
(5). 退休金 (如公務員退休金計劃) (6). 須資產審查的經濟援助 (如綜援、學校書簿津貼計劃)

Q15. 請問以下哪一項收入組別 (在扣除薪俸稅及個人入息課稅、強積金等之前) 代表你的每月整體住戶總收入?

- (1). 沒有收入 (2). \$1 – 999 (3). \$1,000 – 1,999
(4). \$2,000 – 2,999 (5). \$3,000 – 3,999 (6). \$4,000 – 5,999
(7). \$6,000 – 7,999 (8). \$8,000 – 9,999 (9). \$10,000 – 14,999
(10). \$15,000 – 19,999 (11). \$20,000 – 24,999 (12). \$25,000 – 29,999
(13). \$30,000 – 34,999 (14). \$35,000 – 39,999 (15). \$40,000 – 44,999
(16). \$45,000 – 49,999 (17). \$50,000 – 59,999 (18). \$60,000 – 79,999
(19). \$80,000 – 99,999 (20). \$100,000 或以上

Q16. 參考住戶開支的五大類別 (包括: (1) 食品交通、(2) 住屋及相關雜費、(3) 雜項物品及服務、(4) 醫療服務 及 (5) 衣履、煙酒及耐用物品) , 以下哪一項開支組別代表你的每月整體住戶總開支?

- (1). 沒有開支 (2). \$1 – 999 (3). \$1,000 – 1,999
(4). \$2,000 – 2,999 (5). \$3,000 – 3,999 (6). \$4,000 – 5,999
(7). \$6,000 – 7,999 (8). \$8,000 – 9,999 (9). \$10,000 – 14,999
(10). \$15,000 – 19,999 (11). \$20,000 – 24,999 (12). \$25,000 – 29,999
(13). \$30,000 – 34,999 (14). \$35,000 – 39,999 (15). \$40,000 – 44,999
(16). \$45,000 – 49,999 (17). \$50,000 – 59,999 (18). \$60,000 – 79,999
(19). \$80,000 – 99,999 (20). \$100,000 或以上

Q17. 請告知你有沒有以下的成年人生活必需品?

| | 有 | 沒有： 因為不需要 | 沒有： 因為不能負擔 | 不適用 |
|------------------------------------|---|--------------|---------------|-----|
| 1) 每日三餐 | 1 | 2 | 3 | 4 |
| 2) 每隔一天有肉或魚 (包括新鮮/冰鮮) 或等同於素食者的菜單份量 | 1 | 2 | 3 | 4 |
| 3) 每天有新鮮的水果或蔬菜 | 1 | 2 | 3 | 4 |
| 4) 每逢節日都可以吃到新鮮/冷藏的家禽 (如農曆新年) | 1 | 2 | 3 | 4 |
| 5) 每年有一至兩件新衫 | 1 | 2 | 3 | 4 |
| 6) 可以有一套體面的衣服 (如見工、慶祝農曆新年時穿著) | 1 | 2 | 3 | 4 |
| 7) 當你患病時，可以看私家醫生 | 1 | 2 | 3 | 4 |
| 8) 當你患病時，可向中醫求診及購買處方的藥物 | 1 | 2 | 3 | 4 |
| 9) 每年一次的定期的牙齒檢查 | 1 | 2 | 3 | 4 |
| 10) 可於需要時支付配眼鏡的費用 | 1 | 2 | 3 | 4 |
| 11) 手提電話/家居電話 | 1 | 2 | 3 | 4 |
| 12) 洗衣機 | 1 | 2 | 3 | 4 |
| 13) 冷氣機 | 1 | 2 | 3 | 4 |
| 14) 家中電腦連結上網服務 | 1 | 2 | 3 | 4 |
| 15) 有足夠金錢更換破舊的傢俱 | 1 | 2 | 3 | 4 |
| 16) 有足夠金錢更換/修理家中損壞的電器 (如雪櫃、洗衣機) | 1 | 2 | 3 | 4 |
| 17) 每個星期有少量金錢可自用 | 1 | 2 | 3 | 4 |

Q18. 請告知你有沒有參與以下的社交及家庭生活項目?

| | 有 | 沒有： 因為不想參與 | 沒有： 因為不能負擔 | 沒有： 因為其他原因 | 不適用 |
|--------------------------------------|---|---------------|---------------|---------------|-----|
| 1) 與朋友或家人慶祝一些特別的日子 (如農曆新年) | 1 | 2 | 3 | 4 | 5 |
| 2) 至少每月一次可與朋友或家人出外用膳 | 1 | 2 | 3 | 4 | 5 |
| 3) 每年一次有一個星期可與朋友或家人離港旅行 | 1 | 2 | 3 | 4 | 5 |
| 4) 至少每月一次可與朋友或家人參與餘暇活動 (如看電影、參與體育活動) | 1 | 2 | 3 | 4 | 5 |
| 5) 親友結婚時能夠支付賀禮 | 1 | 2 | 3 | 4 | 5 |

Q19. 請告知你家中孩子有沒有以下的兒童生活必需品?

| | 有 | 沒有： 因為不需要 | 沒有： 因為不能負擔 | 不適用 |
|-------------------------------|---|--------------|---------------|-----|
| 1) 每日三餐 | 1 | 2 | 3 | 4 |
| 2) 每天至少一餐有新鮮的水果或蔬菜 | 1 | 2 | 3 | 4 |
| 3) 每天至少兩餐有肉、魚或等同於素食者的菜單份量 | 1 | 2 | 3 | 4 |
| 4) 合身的鞋 (如皮鞋及運動鞋) | 1 | 2 | 3 | 4 |
| 5) 能夠購買一些新衣服 | 1 | 2 | 3 | 4 |
| 6) 足夠的禦寒衣服 | 1 | 2 | 3 | 4 |
| 7) 合身的校服 | 1 | 2 | 3 | 4 |
| 8) 有牌子的運動鞋 | 1 | 2 | 3 | 4 |
| 9) 富教育性的遊戲 (如棋類) | 1 | 2 | 3 | 4 |
| 10) 戶外消閒活動的設備 (如球拍或足球) | 1 | 2 | 3 | 4 |
| 11) 10歲或以上的小朋友有自己的手提電話 | 1 | 2 | 3 | 4 |
| 12) 在家中，有適合小朋友年齡閱讀的書籍 (包括習作簿) | 1 | 2 | 3 | 4 |
| 13) 家中有一個適合小朋友溫習或做功課的地方 | 1 | 2 | 3 | 4 |
| 14) 可自用的零用錢 | 1 | 2 | 3 | 4 |

Q20. 請告知你家中孩子有或沒有參與以下的社交及課餘活動項目?

| | 有 | 沒有： 因為不想參與 | 沒有： 因為不能負擔 | 沒有： 因為其他原因 | 不適用 |
|--------------------------------------|---|---------------|---------------|---------------|-----|
| 1) 至少每月一次可與其他小朋友出外用膳 | 1 | 2 | 3 | 4 | 5 |
| 2) 至少一年四次可與家人進行境內一日遊 (如到大嶼山、主題公園) | 1 | 2 | 3 | 4 | 5 |
| 3) 參與一些課外活動 (如運動、音樂) | 1 | 2 | 3 | 4 | 5 |
| 4) 參與課後補習班 | 1 | 2 | 3 | 4 | 5 |

第三部分：家長資源投放及親職壓力

請你仔細閱讀下列問題，將焦點放在參與是次學前綜合發展評估的孩子，選出最能代表你的想法的答案。

Q21. 在過去 1 個月，你有幾經常與孩子一起完成以下的活動?

| | 從來沒有 | 每星期 少於 1 次 | 每星期 1-2 次 | 每星期 3-4 次 | 每星期 5-6 次 | 每天 |
|--------------------|------|---------------|--------------|--------------|--------------|----|
| 1) 閱讀圖書 | 1 | 2 | 3 | 4 | 5 | 6 |
| 2) 跟孩子說故事 | 1 | 2 | 3 | 4 | 5 | 6 |
| 3) 教孩子簡單的中文字詞 | 1 | 2 | 3 | 4 | 5 | 6 |
| 4) 教孩子簡單的英文字詞 | 1 | 2 | 3 | 4 | 5 | 6 |
| 5) 教孩子簡單的數字運算 | 1 | 2 | 3 | 4 | 5 | 6 |
| 6) 玩桌上遊戲 (如 UNO 等) | 1 | 2 | 3 | 4 | 5 | 6 |
| 7) 聽音樂 | 1 | 2 | 3 | 4 | 5 | 6 |
| 8) 看線上影片、玩線上遊戲 | 1 | 2 | 3 | 4 | 5 | 6 |
| 9) 共進主餐 | 1 | 2 | 3 | 4 | 5 | 6 |
| 10) 跟孩子外出 (如到公園遊玩) | 1 | 2 | 3 | 4 | 5 | 6 |

Q22. 在過去 12 個月，你有幾經常與孩子一起完成以下的活動?

| | 從來沒有 | 每年 1-3 次 | 每年 4-6 次 | 每年 7-9 次 | 每年 10-12 次 | 每年 多於 12 次 |
|-------------------------|------|-------------|-------------|-------------|---------------|---------------|
| 1) 參觀博物館 (如香港太空館、香港科學館) | 1 | 2 | 3 | 4 | 5 | 6 |
| 2) 看話劇、舞蹈或音樂表演 | 1 | 2 | 3 | 4 | 5 | 6 |

Q23. 在過去 1 個月，你在孩子身上平均花費多少?

| | |
|-----------------------------|--------------------|
| (1). 幼兒服務 | [註]：如沒有相關開支，請填寫“0” |
| 1) 托兒和褓姆 | \$ _____ |
| (2). 學費 | |
| 1) 學費 | \$ _____ (每學期) |
| 2) 書簿費和雜費 | \$ _____ (每學期) |
| 3) 交通費 (如：校車) | \$ _____ |
| (3). 課外活動 | |
| 1) 語言 (如：英語課程、普通話課程) | \$ _____ |
| 2) 興趣班 (如：鋼琴、戲劇) | \$ _____ |
| (4). 其他課餘活動及相關項目 | |
| 1) 文娛康體活動 (如：到主題公園、兒童遊戲室) | \$ _____ |
| 2) 故事書 | \$ _____ |
| 3) 玩具 | \$ _____ |
| (5). 其他 (請註明: _____) | \$ _____ |

Q24. 仔細地閱讀下列每項陳述，圈選最能代表你的想法的一個答案。

| | 非常同意 | 同意 | 不確定 | 不同意 | 非常不同意 |
|-------------------------------------|------|----|-----|-----|-------|
| 1) 我經常覺得自己無法好好處理事情。 | 1 | 2 | 3 | 4 | 5 |
| 2) 我發覺為了滿足孩子們的需求，我放棄自己的生活比曾經預期的還要多。 | 1 | 2 | 3 | 4 | 5 |
| 3) 我覺得自己受困於做為父母的責任中。 | 1 | 2 | 3 | 4 | 5 |
| 4) 自從有了這個孩子後，我一直無法做新的和不同的事情。 | 1 | 2 | 3 | 4 | 5 |
| 5) 自從有了一個孩子後，我覺得我幾乎永遠無法再做自己喜歡的事情。 | 1 | 2 | 3 | 4 | 5 |
| 6) 我對上一次為自己購買衣服的事而感到不開心。 | 1 | 2 | 3 | 4 | 5 |
| 7) 有幾件事情讓我對自己的人生感到困擾。 | 1 | 2 | 3 | 4 | 5 |
| 8) 有了孩子讓我和配偶/育兒伴侶的關係因而出現的問題比我預期的多。 | 1 | 2 | 3 | 4 | 5 |
| 9) 我感到孤獨，沒有朋友。 | 1 | 2 | 3 | 4 | 5 |
| 10) 當我去參加一個聚會，我通常預期自己不會樂在其中。 | 1 | 2 | 3 | 4 | 5 |
| 11) 我對別人的興趣大不如前。 | 1 | 2 | 3 | 4 | 5 |
| 12) 我不再如過往一樣享受事物。 | 1 | 2 | 3 | 4 | 5 |

~ 完結，謝謝 ~

Annex I: Abstract submitted to the RC19 Organizer

The 2020 Annual Meeting of the Research Committee on Poverty, Social Welfare and Social Policy
RC19 of the International Sociological Association (ISA)

Globalization in Retreat? Welfare States amid Regional

Turbulence National Taiwan University, Taiwan

3rd – 4th December 2020

Title: Childhood poverty and neurocognitive skills of Hong Kong preschool children: The mediating roles of parental investment and parental distress

Maggie K.W. LAU is Research Associate Professor in the School of Graduate Studies and the Centre for Social Policy and Social Change at Lingnan University, Hong Kong (Email: xxxx xxxx)

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Themes: (1) Child poverty, inequality and social mobility; (2) Socioeconomic status (SES), parental investment and parental stress; (3) SES and child cognitive development

Abstract: Empirical studies have shown associations between childhood poverty and negative outcomes of physical and mental health, cognitive ability, poor academic achievement as well as income in adulthood. This paper aims to examine the relationship between poverty status and the development of cognitive functions amongst Hong Kong preschool children and to identify the mechanisms underlying the effects of growing up in poverty. The analysis is based on a cross-sectional study derived from 167 preschool children (aged 36 to 47 months) who have completed neurocognitive assessment with their parent questionnaire. The neurocognitive assessment was adopted to assess the perceptual, cognitive and language functions of preschool children. Neuropsychology Second Edition (NEPSY-II) and Hong Kong Comprehensive Assessment Scales for Preschool Children (HKCAS-P) were adopted to assess four functional domains, including attention and executive functioning, language (both in Cantonese and English), memory and learning, and visuospatial processing, of preschool children aged 36 to 47 months. A structured questionnaire was self-administered by parents to understand their socioeconomic status (SES), parental investment and parental distress. Apart from examining the relationship between socioeconomic status and the neurocognitive systems of preschool children, we aim to study the potential mechanisms underlying the relationship between growing up poor and neurocognitive skills amongst preschool children. Specifically, we aim to simultaneously focus on parental investment and parental distress as being two important sources that mediate the link between the SES gradients and neurocognitive development of Hong Kong preschool children. Implications of these findings for policy and practice, and priorities for future research will be discussed.

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