

The Long-term Effect of Cantonese Usage under the Dominance of Mandarin on Academic Performance

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Abstract: Researches on the effect of bilingualism/diglossia on academic performance conclude disparately yet converge on the children of early school age. This research aims to figure out the longer-term influence of Cantonese usage on academic performance by conducting a large sample survey and the Chinese reading literacy assessment of PISA 2018 on 100 young citizens aged 18 to 25 in Guangdong province. In addition to reconfirming the vastness of Cantonese-Mandarin bilinguals in Guangdong province, China, The Language History Questionnaire 3 detected a categorically strong dominance of Mandarin in the Cantonese districts of Guangdong. Nevertheless, it is still not suggested that the Guangdong parents preclude Cantonese from family language planning out of worry about the children's academic performance, drawing on the result that no negative effect of Cantonese usage was found in the correlation test.

Keywords: Bilingualism, Cantonese, Mandarin, Reading literacy, Family language policy

1. Introduction

Due to the vigorous promotion of Mandarin, the standard dialect of the Chinese language, many regional dialects are undergoing a recession in China, and Cantonese is no exception. However, it is habitually considered a relatively dominant regional dialect. The shift of the prestige of Cantonese in the public context, the rise of the number of diglossia families, and the language contact enlarged by the massive use of the internet are considered the main factors that account for the decline of Cantonese use [1][2]. Intergenerational variations of the usage of Cantonese within local families have been reported by Shan and Du [1], indicating a tendency to preclude Cantonese usage in front of their children. It is increasingly common to see parents yielding to children's language habits forged by schools and society where Mandarin holds the leadership.

At the same time, the establishment and maintenance of the Guangdong-Hong Kong-Macao Greater Bay Area (GBA) call for a more diverse and open language environment in Guangzhou, the capital of Guangdong province. The subduction of Cantonese seems to misfit the future trend of the development of GBA [3].

Against this backdrop, the current study aims to evaluate whether there are enough reasons for Guangdong parents to intentionally exclude the local dialect, Cantonese, from family language planning [4], especially from the perspective of the parents' greatest concern, academic performance.

2. Literature Review

Research that alleges the negative effect of bilingualism/diglossia [5][6][7][8] partly accounts for the worry of the domestic use of dialects. Han [5] reported a significantly lower reading and math score of the Non-English-Dominant bilinguals by fifth grade compared to English monolingual children in a large-scale analysis. A longitudinal study in the Southern US by Terry et al. [6] also proved a similar effect of non-mainstream American English dialect on the academic performance of the second graders. However, they emphasized the critical effect of the awareness of language switching on reading ability. It should be noticed that the above studies both took socioeconomic factors into significant consideration, while Chen et al. [7] claim that dialect experience itself negatively affects Mandarin phonological awareness of lower-grade primary school students. Mickan et al. [8], on the other hand, concluded from an experiment of retrieval-induced forgetting that language competition is one of the incentives for language attrition.

On the other hand, some recent evidence from cognitive studies is more reassuring. Liu and Zhu [9] demonstrate the positive effect of diglossia on both high- and low-level cognition. DeMeurisse and Kaan [10] provide cognitive evidence from the Partial Repetition Cost experiment, highlighting the facilitative function of bilingual experience on attentional disengagement.

When it comes to behavioral research, most of the attention has been paid to the effect of bilingualism on young students, while longer-term influence is less discussed. To thoroughly evaluate the necessity of Cantonese in family language polity and give practical suggestions, the current study aims at young adults and focuses on the following two questions:

RQ1 Does domestic usage of Cantonese have a long-term effect on academic performance?

RQ2 Do people who use more Cantonese show worse Chinese reading literacy?

Based on the current language situation in Guangdong, this research is expecting the phenomena below:

H1 A High proportion of Mandarin usage in both public and private domains may be observed.

H2 If domestic Cantonese usage makes a difference in academic performance and Chinese reading literacy, one should expect a significantly lower score in the Chinese literacy proficiency test along with the increasing frequency of Cantonese usage.

3. Method

3.1. Participants

Using the online data platform Credamo, the current study intends to conduct research on 100 Guangdong citizens between 18 and 25 who were born and studied in Guangdong province. After the initial screen, 6 participants who failed to answer the trick questions or provided confused answers were rejected. The basic information of the 94 samples contained in the analysis is shown in Table 1. The study includes young people who have finished compulsory high school education in the Cantonese region of Guangdong province, whose mother language is Mandarin, Cantonese, or both.

Table 1: Basic Information of the Participants.

Items	Categories	N	Percent (%)
Age (n=94)	18	5	5.32
	19	8	8.51
	20	13	13.83
	21	12	12.77
	22	19	20.21

Table 1: (continued).

		23	12	12.77
		24	13	13.83
		25	12	12.77
Mother (n=94)	Language	Mandarin	8	8.51
		Cantonese	33	35.11
		Mandarin and Cantonese	53	56.38

3.2. Variables and Measures

3.2.1. Language Type

The language type of the subjects is decided by the background module of LHQ3 (Language History Questionnaire 3) [11]. The subjects report their starting ages of acquisition and period of usage of the listening and speaking skills of Mandarin and Cantonese. The judgement is assisted by the result of the usage module of LHQ3.

This study defines the demarcation of the monolingual and bilingual by the language acquisition before 8 years old. The subjects who mastered listening and speaking skills in both Cantonese and Mandarin before 8 years old are categorized as Cantonese and Mandarin bilinguals (BiCM). The ones who acquired only Cantonese or Mandarin before 8 are Cantonese monolinguals (MC) and Mandarin monolinguals (MM).

3.2.2. Academic Performance

Academic performance refers to the academic achievement one attains before postsecondary education. The study measures the academic performance of the participants by the score of the PISA reading literacy assessment.

The notion of Chinese Literacy is increasingly discussed under the continuing wave of comprehensive quality education reform. Chinese Reading Literacy signifies the ability to understand, use, evaluate, reflect on, and engage with Chinese texts in order to achieve one's goal, develop one's knowledge and potential, and participate in society [12]. In this research, this ability is measured by the score of the Chinese (simplified) version of the 2018 Programme for International Student Assessment (PISA) reading literacy test, a global reading literacy examination conducted by the Organization for Economic Co-operation and Development (OECD) with well-acknowledged variability and validity. It is effective and, at the same time, easy to operate thanks to the small volume design. The item of the assessment can be divided into five difficulty levels (1a;1b; 2;3;4;5) and six cognitive processes (represent literal meaning, integrate and generate inferences; reflect on content and form; assess quality and credibility; integrate and generate inferences across multiple sources; access and retrieve information within a text; detect and handle conflict), which allows the current research to specify the performance of the participants.

3.2.3. Language Usage

Language usage shows the habits of the participants using Cantonese and Mandarin in daily life. The frequency of using Cantonese and Mandarin in variegated domains, including public (at school, with other people in the society) and private (at home, with friends), and the frequency of mixing the two languages are assessed by the score of a 7-point Likert scale revised from the items of the usage module of LHQ3 (LHQ3-U). The original items require participants to recall and estimate the hours of using each language in various domains and activities, which may cause confusion and degrade the accuracy.

3.2.4. Language Proficiency

Language proficiency may also play a part in academic performance and Chinese reading literacy. LHQ3 - Module of Proficiency (LHQ3-P) will be conducted to determine the students' proficiency in Cantonese and Mandarin. Considering the potential influence of the ability of language switching [7], three new items are designed to measure the subjects' self-assessment of their ability to translate between Cantonese and Mandarin, to switch language according to the interlocutors and choose language under different contexts (formal and informal).

3.3. Procedures

The current research first investigates Cantonese and Mandarin usage in Guangdong province by issuing a questionnaire revised from the LHQ3 [11]. The revisions are made to adapt to the target languages, Cantonese and Mandarin, as well as to improve the accessibility of the questions. The sample range is confined within Guangdong province to improve the adaptability of the subjects. The module of language background, language proficiency, language usage, and language dominance of LHQ3 will be applied to conduct the investigation. Disqualified participants are either automatically rejected by 3 trick questions or detected by the incongruent answer to similar questions.

After the screening, eligible participants are asked to report their scores in Chinese, Math, and English up to their own will. Then, they are presented with three sets of PISA reading literacy, *Chicken Forum*, *Rapa Nui*, and *Cow's Milk*, with 7 items in each set.

The questionnaire and the reading literacy test are issued on the one-stop smart research platform Credamo. Credamo supports random distribution with accurate delivery to targeted respondents by region. The current questionnaire and assessment are delivered to the respondents with Guangdong IP. The respondents who are staying in Guangdong for random reasons are sorted out by places of birth and current residence. The data collected is then analyzed on SPSS Online.

4. Result

4.1. Language Usage

As shown in Table 2, Cantonese and Mandarin Bilinguals lead by a solid majority (80.85%) among young people in Guangdong even though there are still 35.11% of participants who have only Cantonese as their mother language.

Table 2: Language Type of the Participants.

Items	Categories	N	Percent (%)
Language Type (n=94)	BiCM	76	80.85
	MC	3	3.19
	MM	15	15.96

The LHQ3-U made of 2 items with 15 subitems of a 7-point Likert scale measured the respective mental frequency of using and mixing the two languages with five kinds of interlocutors, which are families, friends, classmates, teachers, and other people in the society such as doctors, waiters, and bus drivers. According to the result of the paired t-test shown in Table 3, the usage of Cantonese and Mandarin varied significantly. The score of Mandarin (5.56/7) significantly surpasses Cantonese (3.68/7) on average, and the advantage of Mandarin is congruent in the facets of friends, classmates, teachers, and other people in society, reaching the summit in the item of teachers. The only occasion

where Cantonese exceeds Mandarin is in families. The participants share a low degree of language mixing frequency (3.48/7).

Table 3: Differences Between Cantonese and Mandarin in Usage (Paired t-test).

Items	Paired (M±SD)		Mean difference (Paired1-Paired2)	t	p
	Cantonese	Mandarin			
Average	3.68±1.23	5.56±1.13	-1.88	-8.652	0.000**
Families	5.77±1.87	3.55±2.21	2.21	5.783	0.000**
Friends	4.14±1.72	5.45±1.70	-1.31	-4.167	0.000**
Classmates	2.79±1.59	6.36±1.12	-3.57	-14.614	0.000**
Teachers	2.26±1.62	6.61±0.93	-4.35	-18.658	0.000**
Others	3.46±1.70	5.82±1.35	-2.36	-8.372	0.000**

* p<0.05, ** p<0.01

4.2. Language Dominance

LHQ3-D has 4 items. The first one inspects the most comfortable language for each language skill (listening, speaking, reading, and writing) in 4 registers, at home (H), at school (Sc), with friends (F), and with other people in the society (O). The participants choose the more comfortable language between Cantonese and Mandarin in each register for each skill, and the percentage of the language used for each register is calculated and concluded in Table 4.

Table 4: The Percentage of Language Dominance by Registers and Skills (%).

Reg	M	C	Sk	M	C	H-Sk	M	C
H	38.56	61.44	L	56.12	43.88	H-L	20.21	79.79
Sc	60.24	39.76	Sp	55.32	44.68	H-Sp	19.15	80.85
F	57.98	42.02	R	71.54	28.46	H-R	42.55	57.45
O	81.12	18.88	W	87.77	12.23	H-W	72.34	27.66
Sc-Sk			F-Sk			O-Sk		
Sc-L	91.49	8.51	F-L	38.3	61.7	O-L	74.47	25.53
Sc-Sp	87.23	12.77	F-Sp	39.36	60.64	O-Sp	75.53	24.47
Sc-R	95.74	4.26	F-R	68.09	31.91	O-R	79.79	20.21
Sc-W	97.87	2.13	F-W	86.17	13.83	O-W	94.68	5.32
Total	67.69	32.31						

Note. Reg = register; M = Mandarin; C = Cantonese; H = home; Sc = school; F = family; O = other people in the society; H-L = listening at home.

Result shows that Mandarin is dominant overall, reconciling with that in the LHQ3-U. In respect of the registers, Mandarin again outstrips Cantonese in the registers of school, friends, and other public occasions. As to language skills, the proportion of Cantonese is larger in listening and speaking, yet Mandarin possesses an absolute advantage in reading and writing. The dominance of Cantonese is restrained within private registers where the participants listen and speak at home and with friends.

Moreover, the result of the second item of LHQ3-D in Table 5 illustrates a similar pattern as above where Mandarin governs the various facets of inner language strongly over Cantonese. The participants are inclined to “speak” in Mandarin even in their minds, except for soliloquizing and expressing emotions, where the two languages share a similar frequency. Cantonese is not showing any advantages in the inner language of the participants. Nevertheless, that does not signify that the

participants identify themselves less strongly with the local culture represented by Cantonese. Statistics manifest that the sense of identity between the Lingnan (the area covering Guangdong and Guangxi province) Culture and the Northern/Collective Culture represented by Mandarin does not diverge as obviously (Table 6).

Table 5: The Effect of Language Proficiency on Usage and Dominance (Pearson Correlation).

		Usage		Dominance (Inner)	
		Cantonese	Mandarin	Cantonese	Mandarin
Proficiency	Cantonese	0.672**	-0.495**	0.620**	-0.430**
	Mandarin	-0.188	0.266**	-0.303**	0.459**

* p<0.05, ** p<0.01

It could be extracted from a further correlation analysis of LHQ3-P with LHQ3-U and LHQ-D that the proficiency of the languages highly affects the inclination of language usage and dominance, which leads to us to believe that the improvement of Mandarin dominance may come from the improvement of the speaker's Mandarin proficiency (Table 5).

Table 6: The Significance of the Difference Between Cantonese and Mandarin Dominance (Paired t-Test).

Items	Paired (M±SD)		Mean difference (Cantonese- Mandarin)	t	p
	Cantonese	Mandarin			
Inner Language					
Average	3.64±1.50	5.11±1.48	-1.47	-5.093	0.000**
Thinking	3.56±1.83	5.40±1.65	-1.84	-5.611	0.000**
Soliloquizing	4.15±2.11	4.69±2.18	-0.54	-1.325	0.188
Expressing emotions	4.54±1.87	4.83±1.91	-0.29	-0.806	0.422
Dreaming	3.19±2.17	4.72±2.11	-1.53	-3.937	0.000**
Arithmetic	2.99±1.85	5.65±1.78	-2.66	-7.699	0.000**
Memorizing numbers	3.39±2.18	5.34±1.89	-1.95	-4.888	0.000**
Identity					
Average	4.82±1.23	4.52±1.44	0.31	1.242	0.217
Way of Life	5.53±1.67	4.26±2.10	1.28	3.871	0.000**
Food	5.10±1.83	4.35±1.89	0.74	2.231	0.028*
Music	5.18±1.77	4.61±1.78	0.57	1.884	0.063
Art	4.07±1.87	4.81±1.87	-0.73	-2.157	0.034*
City Landmarks	5.36±1.86	4.33±1.98	1.03	2.973	0.004**
Sport Teams	3.69±2.19	4.76±2.02	-1.06	-2.77	0.007**

* p<0.05, ** p<0.01

4.3. Language Proficiency

Overall, the participants are confident about their language proficiency. Nevertheless, they tend to report higher self-assessment scores in Mandarin rather than Cantonese, especially in Writing. Both bilinguals and monolinguals reported significantly higher proficiency in four Cantonese language skills but not lower proficiency in Mandarin. Additionally, they do not think they have a thick accent

when speaking Mandarin. Both BiCMs and CMs reported more vital ability in language switching (Table 7).

4.4. Academic Performance

A one-way ANOVA test is applied to explore whether mother language, language type, and dominance in private registers (at home and with friends) affect the score of the PISA reading literacy assessment. The analysis found no significant differences in the general score of the PISA reading literacy test among different groups under mother language, language type, and language dominance. To Specify the result, the participants whose mother language is pure Cantonese were found to outperform the other two groups in the PISA test at level 1b (Mean±Std. Deviation=0.96±0.11, F=5.684, p<0.005**). According to the statistics (Table 8), the participants who feel more comfortable listening and speaking Cantonese with their friends beat those who prefer to use Mandarin at level 4. They are also better at assessing quality and credibility, as well as in detecting and handling conflict. On the other hand, participants who prefer to write in Mandarin with their friends scored higher in reflecting on content and form. Other than these, the connection between the PISA scores and the language factors was barely detected.

Table 7: Significance of the Difference among Three Language Types in Language Proficiency (ANOVA).

		Language Type (Mean±Std. Deviation)			F	p
		BiCM (n=76)	CM(n=3)	MM(n=15)		
Cantonese Proficiency	Listening	6.47±0.66	6.67±0.58	5.07±1.67	15.883	0.000**
	Speaking	5.75±1.18	6.67±0.58	3.53±1.73	20.579	0.000**
	Reading	5.39±1.23	6.00±1.00	3.73±1.87	10.149	0.000**
	Writing	4.13±1.58	3.67±2.31	2.40±2.10	6.616	0.002**
	Accent	3.53±1.72	3.33±2.31	3.60±1.72	0.031	0.969
Mandarin Proficiency	Listening	6.75±0.59	6.67±0.58	6.67±0.62	0.143	0.867
	Speaking	6.36±0.90	6.33±0.58	6.47±0.74	0.104	0.901
	Reading	6.39±0.83	5.67±0.58	6.40±0.74	1.162	0.317
	Writing	6.43±0.79	6.67±0.58	6.53±0.52	0.231	0.795
	Accent	3.18±1.77	4.33±3.06	2.47±1.64	1.733	0.183
Language Switching Proficiency	Translation	5.46±0.87	5.67±0.58	4.60±1.24	5.535	0.005**
	Interlocutor	5.68±1.09	6.33±1.15	4.87±0.92	4.495	0.014*
	Context	5.61±1.03	5.33±0.58	4.47±1.36	6.944	0.002**
	Average	4.74±0.64	5.11±0.51	4.17±0.38	6.485	0.002**
Language Proficiency	Learning	4.97±1.19	5.67±1.53	5.00±0.93	0.514	0.6

* p<0.05, ** p<0.01

Furthermore, the result of the correlation test doesn't provide strong evidence of linear correlation of the usage or dominance of Cantonese on reading literacy. Instead, age may be more likely to be one of the factors that affect the scores (Table 9).

Table 8: Variation of the PISA Score Caused by Language Cantonese Dominance in Private Registers (One-Way ANOVA).

PISA Section	Language Dominance in Private Registers (Mean±Std. Deviation)			F	p
	Dominance-F	Mandarin	Cantonese		
L4	Speaking	0.72±0.32(n=37)	0.84±0.24(n=57)	4.047	0.047*
Reflect on content and form	Writing	0.83±0.13(n=81)	0.72±0.12(n=13)	7.904	0.006*
	Listening	0.70±0.31(n=36)	0.85±0.28(n=58)		
Assess quality and credibility	Listening	0.75±0.31(n=36)	0.88±0.24(n=58)	4.889	0.030*
Detect and handle conflict	Speaking	0.74±0.33(n=37)	0.89±0.21(n=57)	7.232	0.009*

* p<0.05 ** p<0.01

Table 9: Correlation Between Cantonese and PISA Score (Correlation Test).

Item	Pearson Correlation						
	RL-General	L 1a	L 1b	L 2	L 3	L 4	L 5
Age	0.311**	0.19	0.322**	0.256*	0.177	0.126	0.253*
Usage (Skills)	0	0.126	0.073	0.047	-0.015	0.05	-0.099
Mixing Languages	-0.108	-0.077	0.028	-0.096	-0.066	-0.078	-0.107
Proficiency (Skills)	-0.021	-0.010	0.016	-0.017	0.016	-0.036	-0.036
Accent (Cantonese)	-0.121	0.085	-0.124	-0.126	-0.12	-0.103	-0.065
Accent (Mandarin)	-0.034	-0.054	-0.012	-0.011	0.088	-0.055	-0.094
New Language	-0.16	-0.195	-0.048	-0.05	-0.261*	-0.012	-0.122
Language Switching	-0.002	-0.054	0.051	0.033	-0.028	-0.029	0
Dominance	0.016	0.037	0.112	0.024	0.039	-0.008	-0.045
Inner Language	0.045	0.101	-0.028	0.029	0.077	0.076	-0.008
Environment	0.057	0.286**	0.057	0.11	0.067	0.023	-0.093

5. Discussion

5.1. Current Situation of Bilingualism in Guangdong

The research above reconfirmed the overwhelming expansion of Mandarin usage in Guangdong province, which reconciles with the prior researches [1][2][13][14]. 85% percent of the sample is

Cantonese and Mandarin bilingual and acquired both Mandarin and Cantonese. The Mandarin proficiency of young people in Guangdong, especially their accent, seems to challenge the stereotype of the insufficient Mandarin ability of Guangdong citizens. Mandarin governs the language usage of young people not only in terms of proficiency but also language dominance. The young people in Guangdong feel more comfortable using Mandarin in most of the registers, including those outside of school, such as talking to friends and social workers. More surprisingly, Mandarin dominates the majority of the participant's inner speech except for talking to themselves and expressing emotion. That being said, the cultural identity of Guangdong stayed strong. The family became the final fortress of Cantonese with a pronounced portion of Cantonese usage, listening and speaking in particular, within families.

5.2. The Effect of Cantonese Usage on Academic Performance

Given the progressively faster and broader usage of Mandarin, should parents be worried and plan early to diminish Cantonese within families to ensure better academic performance? As far as this study shows, no negative effect of Cantonese usage, proficiency, dominance, or language switching on the score of the PISA Chinese reading literacy assessment was derived from the ANOVA test and the correlation test conducted above (Table 8 and Table 9). The deviation of the scores is more related to the age of the participants. For this reason, at least Cantonese usage should not be a pitfall for school subjects that rely highly on Chinese reading literacy, such as Chinese, History, etc.

6. Conclusion

In summary, this research provides evidence of the increasing dominance of Mandarin in Guangdong province, China. However, the study found no significant negative impact of Mandarin on Cantonese language abilities in the participants tested. Therefore, the increasing use of Mandarin does not necessarily indicate a decline in the use of Cantonese within families in this region. While the current evidence is not sufficient to definitively rule out the possibility of Cantonese attrition, it does suggest that the relationship between the two languages is complex and multifaceted and warrants further investigation.

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