Proceedings of the 4th International Conference on Educational Innovation and Philosophical Inquiries
DOI: 10.54254/2753-7048/19/20231420

The Effect of Siblings on the Academic Self-efficacy and Self-educational Expectations of University Students

Huaiyi Jiao[1,a,*]

[1]*Department of Psychology, Lingnan University, Hong Kong, 999077, China*
a. huaiyijiao@ln.hk
**corresponding author*

Abstract: With the introduction of China's one-child policy in the 1970s, much research was done to study only children on their well-being, personality, and academic achievement. However, few studies have focused on how they differ from non-only children regarding academic self-efficacy and self-educational expectations and the results have not come to an agreement. Thus, this study targeted the undergraduates in mainland China and those who come from the mainland but studying in Hong Kong. An online questionnaire was published and a total of 140 valid responses were collected. MANOVAs and multiple linear regression models were established in order to investigate the effect of singleton status, birth order, and gender of siblings on university students' academic self-efficacy and self-educational expectations. The results showed that the singleton status, birth order, and gender of siblings had no significant influence on both academic self-efficacy and self-educational expectations, and a significant interaction between birth order and gender of siblings on the score of academic self-efficacy. This study adds to the recent status of the academic self-efficacy and self-educational expectations among undergraduates studying in Mainland and Hong Kong, only children and non-only children. However, due to insufficient sample size, gender and current years of study of students were not included in the comparison, which needs to be further investigated.

Keywords: siblings, only children, birth order, academic self-efficacy, self-educational expectation

1. Introduction

1.1. One-child Policy Background

The only-child policy in China which started in the late 1970s and ended in 2016 is a unique population policy in the world. During this period, families other than ethnic minorities and those in rural areas were restricted to having only one child, resulting in a large number of college students who are now the only child. By the end of 2015, China's one-child population has risen to 224.6 million, accounting for 43 percent of all births during the same period [1]. Since the policy began, an increased tendency of research on only children regarding their well-being, personality, academic performance, and the differences between them and non-only children has been shown.

DOI: 10.54254/2753-7048/19/20231420

1.2. Comparison Between Only Children and Non-only Children

There is a stereotype that only children are the little emperor in their home, being spoiled by their parents and grandparents. An early study showed that parents tended to fulfill the demands and expectations of the only child, resulting in self-centered, dependent, and capricious traits [2]. In Fan and Yu's research on the mental health of only children, they concluded that the one-child group tended to have a higher possibility to suffer from psychological diseases such as depression, anxiety disorder, as well as personality disorders, and was more prone to maladjustment, compared to non-only children [2].

When it comes to academic achievement, one study found that only children tend to outperform children with siblings, which is related to the resource dilution hypothesis that family resources, including parental attention, interaction, and education, are divided in multi-child families [3]. As a result, only children tend to have access to more financial and interpersonal resources than other children, thereby helping them to feel safer and more confident.

On the contrary, Guo's finding showed that having siblings is good for kids on their academic performance [4]. The different conclusions may be due to the different groups of students and the time studied, as an individual's academic performance varies with different cultural backgrounds and social environments in a specific period [2].

2. The Definition of Academic Self-efficacy and Self-educational Expectations

As hot topics in educational psychology, there is a lot of research on self-efficacy and self-expectation both at home and abroad. Self-efficacy, according to Bandura, is the belief that one is capable to implement a specific task or reach a specific achievement [5]. Academic self-efficacy further refers to individuals' belief in their ability to complete academic tasks or to meet goals, which plays an important role in students' performance, motivation, and learning behaviors such as effort, perseverance, and resilience [6].

Educational expectations refer to the expectancy of academic achievement, including short-term expectations such as term grades as well as long-term expectations for final educational attainment, such as a bachelor's or master's degree [7]. The roles of socioeconomic status, parental educational expectations, and parental involvement in students' self-expectations were often discussed. Most previous research has reached a similar conclusion that parents with higher social status, family income, and education level tend to have higher expectations for their children and more involvement in their children's learning activities and life, hence the promotion of the children's self-expectation [8].

2.1. Relation Between Siblings and Academic Self-efficacy and Self-educational Expectations

Besides the factors mentioned above, gender, ethnicity, grade, urban and rural household registration, and singleton status were also included as variables in studies about academic self-efficacy and self-educational expectation, and significant differences were shown in gender and singleton status particularly in some of the research [7]. In recent five years, nevertheless, there has been little study of the relationship between siblings and their academic self-efficacy and expectations in China. Chen and Luo proposed that college graduates without siblings had a lower score in self-esteem and self-efficacy than those with siblings [9]. However, Pan's study revealed a higher academic self-efficacy for only children in a vocational technical college [10].

As for self-educational expectations, students in one-child families had a higher level of self-expectations than those in multi-child families [11]. It might be because parents tend to have higher educational expectations for their only child, so correspondingly the child tend to have higher self-educational expectations, between which two the interaction results in better school performance [7]. On one hand, referring to the compensation mechanism, parents may try their best to provide a better

DOI: 10.54254/2753-7048/19/20231420

environment and education for their only child to make up for the absence of siblings [7]. Together with the resource dilution model, the only child may have higher accessibility to good educational resources. On the other hand, under the Pygmalion effect, high expectations from parents can lead to improved performance of children [7].

2.2. The Role of Gender of Siblings and Birth Order

Sex and birth order have also been discussed as control variables in studies regarding self-efficacy and self-educational expectation. Girls benefit more from being an only child, but when it comes to multi-child families, they tend to be disadvantaged by having younger brothers, which suggests that son preference still exists in some Chinese families [12]. Thus, the gender of siblings can be a factor contributing to academic achievements.

Additionally, in a group of siblings, the eldest and youngest ones may have higher levels of academic self-efficacy. Chinese respondents showed a strong preference for the eldest and youngest children, affecting the educational attainment of children with different birth orders [13].

2.3. Research Questions

Recent Chinese research mostly focused on the mediating effects of students' self-efficacy and self-educational expectation, or their correlation with academic performance as well as well-being, while rarely analyzing the role of siblings separately and the results were relatively inconsistent. Thus, this study will investigate the effect of singleton status (i.e., only child or non-only child) on university students' academic self-efficacy and self-educational expectation, while adding gender and birth order into the control variables, with the hypothesis that singleton status, birth order, and gender have a significant effect on university students' academic self-efficacy, but they have no significant effect on students' educational expectations as the subjects in this study are all oversea undergraduate students from mainland China, most of whom tend to have higher socioeconomic backgrounds and higher parental educational expectations. As self-expectation is significantly related to parents' expectations, the students' self-education expectations may also be high. There is less sexual discrimination or son preference in such families, so the degree of effect of siblings on students will be diminished. A questionnaire was distributed online to recruit participants from both Hong Kong and mainland China, and an ANOVA test was conducted to analyze the data collected.

3. Methodology

3.1. Sample

Convenience sampling was adopted. A total of 164 questionnaires were collected online, 140 of which were valid, including 69 undergraduate students who came from mainland China studying in Hong Kong and 71 mainland undergraduates. 30 respondents are male and 110 are female.

3.2. Design

A cross-sectional survey design was used in this study with two dependent variables, academic self-efficacy and self-educational expectation, and three main independent variables, singleton status, birth order, and gender of their siblings (see Table 1). Other control variables are the major, place of study, year of study, and parental education level of the students. The survey was distributed online, and all questions were presented in Mandarin. Before answering the questions, the respondents were asked to read the section on informed consent and introduction and click on 'Agree' to proceed to the portion of the questionnaire. The participants were first asked to respond to a number of demographic questions (e.g., age, gender, year of study, parental education level, singleton status, birth order,

DOI: 10.54254/2753-7048/19/20231420

gender of siblings, etc.). The next part was two scales measuring students' academic self-efficacy and self-educational expectations.

Table 1: Key variables.

	Variables	Description
Dependent variables	Academic self-efficacy (ASE)	The score of Academic Self-Efficacy Scale.
	Self-educational expectation (SEE)	Self-educational expectation score.
Explanatory variable	Singleton status	Only child, non-only child.
	Birth order	The middle, the youngest, the eldest.
	Gender of siblings	Brother, sister, brother and sister.
Control variables	Major	
	Gender	Male, female.
	Current year of study	Freshman, sophomore, junior, senior.
	Place of study	Hong Kong, mainland China.
	Parental education level (PEL)	Low: Both parents have high school/vocational school education or below, medium: one parent has high school/vocational school education or below, one parent has college education or above, high: both parents have college education or above.

The entire survey process was anonymous and conducted online to ensure that the privacy and personal information of participants was properly protected.

3.3. Materials

3.3.1. Academic Self-efficacy

The study will adopt Liang's Academic Self-Efficacy Scale [14]. This scale is compiled from Pintrich and DeGroot Academic Self-Efficacy Questionnaire (1990), including two dimensions, self-efficacy of learning ability and self-efficacy of learning behaviors. Self-efficacy of learning ability refers to a person's judgment and confidence in their ability to succeed in school and achieve good marks. Self-efficacy of learning behavior is the individual's judgment and confidence on his ability to adapt specific learning methods to meet their learning objectives. For each dimension, there are 11 questions. 22 questions are set in total, rated on a five-point Likert scale ranging from 1 "completely disagree" to 5 "completely agree". Higher scores represent higher efficacy.

3.3.2. Self-educational Expectation

This variable will be measured by the question "What degree do you expect yourself to earn eventually" with choices assigned values from 1 "drop out now", 2 "bachelor's degree", 3 "master's degree", to 4 "Doctor's Degree". Higher scores represent higher self-educational expectations.

3.4. Data Analysis

Multivariate analysis of variance (MANOVA) and multiple linear regression were carried out through SPSS to explore the effects of singleton status, birth order, gender of siblings, and other independent

DOI: 10.54254/2753-7048/19/20231420

variables on academic self-efficacy and self-educational expectations, as well as the correlations between the independent variables and between the two dependent variables. After testing the main effect and interaction effect of the variables, the simple main effect of the interaction item was further examined. Being followed was a post-hoc test to investigate the pairwise differences separately among the groups. In this process, Tukey-Kramer test was chosen. The significant differences between each level of the independent variables (e.g., only child and non-only child for singleton status, eldest, middle, and youngest for birth order, and brother, sister, and brother and sister for gender of siblings) were shown.

4. Result

Table 2 presents the descriptive statistics of the variables studied. Findings from MANOVAs showed no significant main effect of singleton status, birth order, and gender of siblings on both academic self-efficacy and self-educational expectation. There is a significant interaction effect between birth order and gender of siblings on the score of academic self-efficacy ($F(2) = 5.042$, $p < 0.05$, $\eta 2 = 0.245$), which means the effect of having elder brothers, elder sisters, younger brothers, or younger sisters on students' academic self-efficacy is different. However, the further simple effect analysis showed no significant results for the two variables. The possible reason might be the limited sample size.

Table 2: Participant characteristics.

		N	Mean of ASE	Mean of SEE
Total		140		
Gender	Male	30	70.3667	3.03
	Female	110	70.0545	2.92
Current year of study	Freshman	55	73.5273	2.89
	Sophomore	36	68.3611	2.72
	Junior	40	71.8	3.07
	Senior	9	73.3333	3.56
Place of study	Hong Kong	69	73.7391	3.1
	Mainland China	71	69.7042	2.79
PEL	Low	71	69.4366	2.83
	Medium	11	71.4545	2.82
	High	58	74.5	3.1
Singleton status	Only child	69	73.6765	3.04
	Non-only child	72	69.8194	2.85
Birth order	Youngest	15	67.9333	2.8
	Middle	12	67.25	3.08
	Eldest	46	71.0435	2.78
Gender of siblings	Brother	33	70.9091	2.76
	Sister	22	70.5	2.86
	Brother and sister	18	66.8333	2.94

The correlations between the variables studied are shown in Table 3. Academic self-efficacy showed a significant correlation with the place of study ($r=-0.145$, $p<0.05$) and parental educational level ($r=0.174$, $p<0.05$). Self-educational expectation correlated with singleton status significantly and positively ($r=0.148$, $p<0.05$). Parental educational level ($r=0.195$, $p<0.05$), and was negatively related to place of study ($r=-0.236$, $p<0.01$). Place of study, singleton status, and parental educational

DOI: 10.54254/2753-7048/19/20231420

level all showed a correlation with each other. The regression coefficients of parental educational level (B=-0.227, p<0.05) and place of study (B=-0.313, p<0.01) were statistically significant, which indicated the educational-self expectation of students with high parental educational level was 0.227 higher than those with low parental educational level. The result of multiple linear regression analysis was interpreted as indicating that the educational-self expectation of students studying in Hong Kong was 0.313 higher than that of students studying in mainland China when other variables remained unchanged (B=0.313, p<0,01).

Table 3: Pearson correlations between variables.

	1	2	3	4	5	6	7
1. ASE	--	0.062	-0.145*	-0.139	0.174*	-0.097	-0.102
2. SEE	0.062	--	-0.236**	0.148*	0.195*	0.047	0.112
3. Place of study	-0.145*	-0.236**	--	0.3**	-0.44***	-0.022	-0.041
4. Singleton status	-0.139	-0.148*	0.3**	--	-0.498***	--	--
5. PEL	-0.174*	0.195*	-0.44***	-0.498***	--	-0.243*	-0.009
6. Birth order	-0.097	0.047	-0.022	--	-0.243*	--	0.013
7. Gender of siblings	-0.102	0.112	-0.041	--	-0.009	0.013	--

Note: *p < 0.05, **p < 0.01, ***p < 0.001

5. Discussion

This study did not find significant effects of singleton status, birth order, and gender of siblings on academic self-efficacy and educational expectation, which may be offset by other unmeasured factors (e.g., personality, motivation, learning experience). The possible explanation might be that China's education system generally focuses on academic achievement and competitiveness, and both only children and non-only children experience similar academic pressures and exam competition. They have similar access to educational systems and educational resources, which may lead to similar performance in their academic self-efficacy. Also, the effects of single status, birth order, and gender of siblings on academic self-efficacy and self-education expectations may vary across cultures and backgrounds, resulting in different results from previous studies. The family recourses may not be diverse between children with different birth orders, indicating that preference toward eldest or younger children was rare in this study's sample.

Students studying in Hong Kong also showed higher self-educational expectations. This is relatively common for oversea students to pursue a higher diploma as they have invested a huge amount of money in the expensive tuition fee and expect more in return. Likewise, they have more financial support to complete an advanced degree. Also, students with higher parental educational levels showed higher self-educational expectations. Parents' education level is usually included as an indicator of family's socioeconomic status, thus affecting parents' participation in children's education [12]. At the same time, it will also affect parents' educational expectations, which will affect children's expectations of self-education [12].

Additionally, Students who study in Hong Kong have a higher parental educational level, which might be because that parents with a higher educational level have higher financial capacity and are more willing to send their children to study in Hong Kong.

DOI: 10.54254/2753-7048/19/20231420

6. Conclusion

This study investigated the effect of singleton status, birth order, and gender of siblings on students' academic self-efficacy and self-educational expectations by distributing a questionnaire online, with the outcomes of MANOVAs and multiple linear regression analysis that is not significant, which is inconsistent with the hypothesis and previous studies. Possible reasons may be the commonality of educational environment for both the only children and children with siblings, other confounding variables (e.g., personality, motivation, learning experience), different cultural backgrounds, and measuring time. A significant interaction effect of birth order and gender of siblings was shown on academic self-efficacy, nevertheless, no significant results were found in simple effect analysis for the two variables due to the limited sample size.

The effects of the location of school and parental educational level on self-education expectations were statistically significant. Students studying in Hong Kong and those with higher parental educational level revealed higher self-educational expectations because of better financial capacity, higher cost input for studying overseas, and higher parental expectations.

However, this study has some limitations on sample size, particularly the differences in the number of males and females and the number of students from different years of study. Therefore, this study did not make comparison in these variables. What's more, the educational system and teaching methods of universities are different in mainland China and Hong Kong, which may affect the results of students' self-efficacy and educational expectations. Further studies can expand the sample size and take the effect of gender and different years of study into account and explore the influence of different teaching methods in Hong Kong and the Mainland on students' self-efficacy and self-educational expectations.

References

[1] *Li, H. D., Wang, R., Ren, Y. J. (2018). Analysis on the number of only children and family structure since the one-child policy. Statistics and Decision, 13.*

[2] *Fan, L. F., & Yu, G. L. (2019). Research on mental health education of only child. Heilongjiang Higher Education Research, 2(4).*

[3] *Downey, D. B. (2001). Number of siblings and intellectual development: The resource dilution explanation. American Psychologist, 56(6-7), 497–504.*

[4] *Guo, M. (2021). The Impact of Family Size and Siblings on Chinese Students' Academic Performance.*

[5] *Bandura, A., Freeman, W. H., & Lightsey, R. (1997). Self-efficacy: The exercise of control.*

[6] *Van Dinther, M., Dochy, F., & Segers, M. (2011). Factors affecting students' self-efficacy in higher education. Educational research review, 6(2), 95-108.*

[7] *Li, L., Shi, J., Wu, D., & Li, H. (2020). Only child, parental educational expectation, self-expectation and science literacy in Zhuang adolescents in China: A serial mediation model. Children and Youth Services Review, 115, 105084.*

[8] *Gao, M., & Luo, L. (2022). Home-based parental involvement in single-and multiple-child Chinese families: the role of socio-demographic characteristics and parental expectations. European Early Childhood Education Research Journal, 1-17.*

[9] *Chen, L. N., & Luo, L. F. (2019). Interpersonal self-esteem and self-efficacy of only and non-only college graduates. Journal of Clinical Psychosomatic Diseases,25(1), 4.*

[10] *Ren, P. W. (2020). The mediating role of academic self-efficacy between proactive personality and learning adjustment among technical vocational students in Shanxi Province. Modern vocational education.*

[11] *Wei, Y., & Ma, X. (2017). Influencing factors of middle school students' self-education expectations -- An empirical analysis based on ceps. Educational Academic Monthly, 10(10).*

[12] *Liu, Y., & Jiang, Q. (2021). Who benefits from being an only child? A study of parent–child relationship among Chinese junior high school students. Frontiers in Psychology, 11, 608995.*

[13] *Xiong, F., Zang, L., Zhou, L., & Liu, F. (2020). The effect of number of siblings and birth order on educational attainment: Empirical Evidence from Chinese General Social Survey. International Journal of Educational Development, 78, 102270.*

DOI: 10.54254/2753-7048/19/20231420

[14] Liang, Y. S. (2004). Study on the correlation between academic self-efficacy and mental health of college students. Chinese Clinical Rehabilitation, 8(24), 4962-4963.