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Abstract

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A COMPARISON AND ANALYSIS OF THE ACADEMIC PROFILES OF ONLY CHILDREN IN THE PEOPLES' REPUBLIC OF CHINA AND THE UNITED STATES

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ABSTRACT

The present study focuses on published materials of the last 15 years, concerning academic achievement of American and Chinese only children. Academic profiles of the only children of the two countries are compared and major causal factors of their academic outcomes are discussed. The topics examine a) family configuration, b) parent-child relationship, c) parent SES, and d) school quality. Results of this investigation indicate that only children in China and the United States enjoy advantages in academic development compared with non-only children, but that various factors impact on academic outcomes in diverse ways. As predicted, some factors such as family size and parents' education, clearly contribute to children's cognitive development. But this relationship is complex; in fact the data indicate that economic factors may substantially explain what initially appears to be a birth order effect.

Chapter I.

INTRODUCTION

This study compared the academic profiles of only children and non-only children in China and in the United States. Rapid demographic changes have contributed to the emergence of major social and economic changes in both the United States and China. One of the most important of these demographic changes involves the clear tendency toward smaller families. In China, the government has mandated a one child policy for all families, except those representatives of very small minority groups. Conversely in the United States recent years have witnessed a higher proportion of parents voluntarily electing to have smaller families. Much research has been conducted to examine the effects of family size on educational productivity, or academic achievement, but to this researcher's knowledge no examination has comprehensively compared and analyzed the learning profiles of only children and non-only children in China and in the United States, within the context of recent demographic changes.

If it is true, as current trends indicate, that both countries will in the future be comprised of a higher proportion of only children, and if only children will therefore constitute a higher proportion of the schooling population and later the work force (and therefore directly affect industrial productivity and economic competition) of these two nations, an important question arises: how do only children and non-only children

perform academically in China and in the United States? Are the achievement profiles of only children and non-only children similar in both countries? Further, what viable explanations can be employed to explain the academic performance of Chinese and American only-children and non-only children? The present study is directed to these questions.

I.1, Overview of the Problem

The impact of ordinal position has been extensively studied, and most recent American research in this area suggests not only that only children enjoy social-economic advantages but that they outperform non-only children in the academic domain (i.e., Falbo and Poston, 1986). However, the major causal factors for the high academic performance of only children remain unclear. Is it possible that different causal factors have more weight than others when children grow and develop in different political and cultural settings?

Intelligence and academic achievement are important human characteristics that are distributed with a certain variability within the population. Moreover, we assume that measures of these characteristics are significant indicators of the productivity level of a population. It is also assumed that intelligence and academic achievement are intercorrelated. But concepts regarding intelligence and the related issues are controversial. This study does not attempt to directly focus on the question of intelligence, although some research and assessment of academic

achievement of only children involves the interpretation of both I.Q. and achievement.

I.2, Significance of the Study

The current investigation is significant because the Chinese population now comprises 1.2 billion people, almost one quarter of the world's population. Of that number, more than three percent are only children. Because of the Chinese Government's one child policy, China now has more only children than any other country in the world. If only children of China enjoy social economic advantages as some research concludes, the only child factor alone will directly increase China's role in future world development. Moreover if the one child policy continues in China, then the policy will eventually change the demographic structure of China and effect the productivity of its population. The changes of such a big country will consequently influence the rest of the world.

Even in developed countries such as the United States, concern about limited resources and overpopulation has led policy makers to examine population trends. One observation is that many American parents are bearing no children or one child. Actually, among the western industrialized countries, there is a shift in the child bearing practices of women such that one-child families have increased in the last several decades, this shift attributed to such factors as the high divorce rate, increased number of women at work, economic recessions, and accessibility of birth

control and abortions.

So, the results of the current study are not only significant to China and the United States, but also to other industrialized countries and developing countries. Deeper and wider research of the only child phenomenon is necessary to determine what is the scientific basis of existing policies and to assess side effects of the one child phenomenon.

2. Brief Review of the field

Although the present study focuses on academic achievement issues, a review of the literature must also consider non-achievement but related issues. To some extent this broader examination of the field is necessary since achievement does not function independently. Human beings grow and develop holistically and academic profiles are significantly influenced by physical, emotional, social cultural, and cognitive factors.

What we presently know about only children and non-only children is heavily dependent on studies conducted in the United States. As the science of psychology developed, American investigators compared only children and non-only children along a more extensive variety of domains. In general, these studies failed to support the earlier negative image of only children. The positive effects of only children were reported by Lentz (1927), who concluded that only children were more intelligent, and some others reported that only children had fewer behavior

problems in school (Blatz & Bott, 1927) than non-only children. The major faults of only children were that teachers regarded them as more aggressive and conceited than non-only children (Fenton, 1928; Goodenough & Leahy, 1927).

But some early research results provided a less positive profile of only children. The earliest such study was conducted by the American researcher Bohanon (1898). Two thirds of only children in Bohanon's research sample exhibited what he called "Disadvantageous peculiarities" especially an inability to interact with peers. On the basis of these findings, Bohanon's teacher G. Stanley Hall concluded that "being an only child is a disease in itself". It was a frightening conclusion. Consequently, many people accepted the negative image of only children well into the twentieth century. The popular view of the only child was so negative that Solomon, Chare, and Westoff (1956) reported that among Indiana couples interviewed as part of the Indianapolis Fertility Study in 1941, the second most common reason for having a second child was to prevent their first from being an only child. This negative view was separately reported by Gallup polls of 1950 and 1972; in both cases, U.S. national samples indicated that approximately 78% of white Americans thought that only children were disadvantaged (Blake, 1974).

Thus, throughout most of this century both professional and lay opinion has tended to view only children as disadvantaged by the absence of siblings. Results of early studies disconfirming the negative only child stereotype were largely ignored. During

the postwar baby boom years, prejudice against only borns was manifested both by professionals, who ceased studying them, and by the general public, who avoided having them (Taffel, 1977). However, the country's mood shifted in the mid 1970s when, as a result of many social changes, women increasingly began childbearing later and had fewer or no children (Taffel, 1977). At the same time, the research community once again began to study only children, focusing on such outcomes as personality and cognitive development, mental health, and social adjustment.

In the past decades, Western researchers, especially American researchers, drew upon studies which reported apparent advantages of only children in the achievement and intellectual domains, and sought to explain these apparent advantages by focusing on two central variebles. First, only children in the United States are more likely than those with siblings to have parents with greater educational achievements (Blake, 1981). Thus the advantaged academic outcomes of only children may well reflect the values and abilities of their parents. Second, because the academic achievements of only children have been found to resemble those of first-borns, Falbo and Polit (1966) focused attention on those aspects of the parent-child relationship that would appear to best promote the development of academic abilities. These researchers attributed advantages of only children to enhanced opportunities for parental attention and care.

Chinese only children, however, have only been put in the

light of public focus in the most recent two decades. In China, social and cultural factors are very different than those which prevail in the United States and this may affect the learning profiles of only children and non-only children. In Chinese urban areas, almost all families formed since 1979 are one-child families, irrespective of the parents' characteristics and status (Falbo, 1989). In urban China today, newlyweds know, even before their first child is conceived, that their first child will probably be their only child. Such knowledge may lead some parents to overindulge or overprotect an only child, thereby possibly harming his or her normal personality and academic development. Indeed, a survey of Tainjin families (Bian, 1987) indicated that parents of only children reported devoting more of their time and income to their single children than they thought they should.

However, in China, not much was done with respect to studying the learning levels of only children and non-only children until 1979, when the Government initiated the one-child policy because of historical and political reasons. China is an overly populated developing country; therefore, the Chinese Government and many educated Chinese people in China concluded that the quality of life within China would not improve unless population growth was strictly controlled. Therefore, the one-child policy was initiated in 1979.

Soon after implementation of the only-child policy, critics in the West and China complained that this policy would ruin the

character of the Chinese people. They argued that only children were like the sun around which rotated by their parents and grandparents (e.g., Wu, 1986). Such a configuration was thought to spoil the child. In response, many Chinese conducted studies to determine if this concern was justified and if so what could be done to improve the children's character. One extensive review reveals that, like the Western literature, research findings concerning only children are mixed (Feng, 1990). Another factor deserves attention: if the government promotes the one child policy, researchers enjoy advantages if they report benefits of having only children. Consequently, as the Chinese government has developed a number of programs to encourage and promote only child families, it has become increasingly difficult to conduct objective inquiry in China concerning the development of only children.

4. Factors and Popular Explanations

Although the literature reports many psychological and interpersonal explanations for only children's academic outcomes, the most common of these can be synthesized into three basic explanatory mechanisms. Each mechanism has been used to explain results across a broad range of developmental outcomes.

(a) Family Configuration: (including family size and birth order). Pervading many studies is the notion that if siblings provide critical learning experiences for each other, then the absence of siblings means that these lessons are not learned.

This is consistent with some popular views of only children. This mechanism portrays the only child as disadvantaged. The deprivation mechanism has been used to explain IQ discontinuities of only children in terms of their lack of siblings to tutor. (Zajonc & Markus, 1975).

(b) Parent-child Relationship. (including parent anxiety, parents' attention and expectations). This mechanism has been characterized as influenced by higher parental anxiety levels (Schachter, 1959), because parents know little about childrearing (Waddell & Ball, 1980). Consequently they are more anxious, which makes them more responsive to and unrealistic about their children's behavior. Such anxious behavior has been portrayed as causing greater affiliativeness in only and firstborns (Schachter, 1959), achievement motivation, and internality (Falbo, 1984).

(c) Parents' SES. (including parents' education, family economic resources) Some studies' found that the relationship between family size and mental test performance of children is better explained as a function of economic (SES) rather than family size difference (Kunz & Peterson, 1973).

6. Statement of the Problem

Despite significant demographic changes in the United States and in China, no specific and comprehensive effort has been made to compare the achievement profiles of only children and non-only children in the two countries. Nonetheless, the tendency for the

populations within both countries to have larger proportions of only children, coupled with the relationship between educational productivity and industrial productivity, underscores the importance of an improved understanding of the learning levels of only children and non-only children in China and in the United States. Further, if learning levels of only children and non-only children do differ, it is important to understand why this is the case since such an understanding can contribute to the development of educational, social and economic policies.

Therefore, the main purpose of this study is to explore selected literature of the two countries which investigated the academic achievement of the only and non-only children and factors which appear to contribute to such differences. This study therefore focuses the following three questions:

1. Are the academic profiles of the Chinese only children and the only children of the United States essentially the same?

2. Do academic profiles of only children of the United States and China differ from the academic profiles of non-only children of the two countries, and if so, in what respects?

3. What social, cultural and other causal factors explain the academic profile of the only children in China and the United States?

7. Limitations of the Study

Available research information requires primary reliance on literature concerning American studies; investigations into the

learning levels of Chinese only children and non-only children is limited to post 1979 investigations. Chinese studies of this topic started well after the only children policy and are consequently limited, not only with respect to numbers, but also with respect of methodology and technology of research.

Other limitations would be that Chinese researchers encounter with difficulties in conducting objective scientific inquiry when since the Government has enforced the only child policy and would not welcome adverse research reports. Still an other limitation is that scientists of the two countries employed different instruments and drew upon different statistics (such as multiple t tests vs. multivariate analyses).

8. Definition of the Terms

ACADEMIC PROFILE - Standardized achievement test scores which reveal students' competencies in various academic domains.

BIRTH ORDER - Sequence in which births occur in a family unit (ie. first born, second born, last). Relative rank in terms of age of the siblings within a family.

CONFLUENCE MODEL - mathematical and psychological explanation of a child's intelligence as determined by the intellect of the family as a whole.

EDUCATIONAL ACHIEVEMENT - Educational outcomes of the major subjects

EDUCATIONAL ENCOURAGEMENT - how much the individuals were encouraged by parents and teachers to continue their education

EDUCATIONAL ENVIRONMENT - School and home educational resources

FAMILY SIZE - Total number of children in a family.

ONLY CHILDREN - The single child within a family.

SCHOOL QUALITY - minimum facilities, school resources, and teacher qualifications.

SES - Socioeconomic status.

SIBSHIP - children in a family

SMALL FAMILY - Family with two children or less.

LARGE FAMILY - family with three or more children.

9. Procedures of Obtaining Literature

Only since 1979 have Chinese studies been conducted concerning only children; therefore the major way to obtain research literature regarding Chinese only children and non-only children involved examination of recent and relevant papers and articles, as they have been organized by the Information Center of the People's University of China. This Center provides access to all major research as conducted after the cultural revolution. One of the writer's colleagues helped review all research documents filed by the Center on this topic. It is surprising to find that despite the importance of only children to the development of schooling policies in China, only 20 papers examined the general developmental issues of only children and non-only children. Further, if concern is directed only to the academic achievement of only children, the Center contains only five studies. This is extremely limited research for a question

as important as only children policies as they presently exist in China. Moreover, a review of CD ROM, drawing on ERIC files, identified only four studies generally available to American researchers, which discussed the achievement profiles of Chinese only children and non-only children.

In contrast to limited relevant Chinese research, extensive investigations have been conducted in the United States concerning only children and non-only children. An ERIC search, again employing the CD ROM, identified 244 research papers related to the field during 1966-1981 period under the descriptor "birth order", and 134 papers from 1982-1993; forty-four of these studies dealt with academic achievement of only children.

Chapter II.

REVIEW OF THE LITERATURE

This review of literature focuses on the academic outcomes of only children of America and China, and reasons advanced for these academic outcomes.

II.1. The Academic Outcomes of the Only Children

a) America

Achievement of only children is an area that has received much research attention in the United States. There is substantial evidence that, in many respects, only children are high achievers. Disproportionate numbers of first and only borns have been found among eminent men (Ellis, 1904), faces on the covers of Time (Toman & Toman, 1970) and psychologists (Roe, 1953). Further more, several birth order studies of achievement have found that both first and only borns performed better academically than others (Guilford & Worcester, 1930; Jones, 1954; Lees & Steward, 1957; Oberlander & Jenkins, 1967; Skoubolt, Moore & Wellman, 1973). More recent studies have made comparisons on the basis of family size and found only borns to compare favorably to people from larger families. For example, Blake (1981) found that only born men attain higher levels of education and occupational prestige than men from larger families, especially those with four or more children. Claudy et

al (1979) also found evidence that only children were more academically oriented in high school and later, as adults, only children obtained more education than individuals from two-child families.

In 1986, T. Falbo and D. Polit made a quantitative review of the only child literature based on 115 studies from six meta-analyses of the research literature on the only child. The results are summarized on Table 1.

Table 1

Mean Effect Size for Achievement Outcomes of US Children: Only Children Compared with Others

Outcome		Effect size	
Only children Compared to:	No. of Studies	M	SD
All non-only borns	43	.17**	.25
Small families	20	-.07	.17
Medium families	22	.11*	.21
Large families	20	.44**	.56
First borns	21	.06	.17
Later borns	23	.20**	.25

Note. * p<.05, two-tailed. ** p<.01, two tailed

The numbers of studies contributing to the effect size vary

because most studies did not compare only borns to all family sizes and birth orders. A positive effect size means that only borns surpassed non-only borns. A negative effect size means that non-only borns surpassed only borns. (Small family: 2 children or less; large family: 3 and more children).

Table 1 shows that only children generally obtain higher achievement scorse than non-onlies. Only borns surpassed all other groups except the small families. One confounding problem within this meta-analyses could be that the first-born and the last-born could not be identified on the bases of family size.

John T. Doby, et al conducted a very complicated research project in 1980 which investigated the development of only children basid on a mass scale of data from the Health Examination Survey (HES). In this study data were secured from a very large sample collected by the National Center for Health Statistics (NCHS). The sample drawn from the database was representative of the nation. Reading and arithmetic sub-tests of the Wide Range Achievement Test were used to study children's achievement performance. Data analysis permitted three important data base comparisons. First in the cross-sectional data, all children who were only children, firstborn children etc. were contrasted with later born children; second, within family comparisons among siblings and finally longitudinal comparisons of differences over times could also be made from appropriate subsamples of the original sample.

The results indicated that only children scored among the highest on both intelligence and achievement tests. The researchers concluded that being reared as an only child actually provided a slight developmental advantage over those raised with other siblings.

b) China

In China, empirical research of ordinal position and academic achievement only began in 1979, and the issue has drawn the attention of many Chinese investigators only recently. Although some Chinese research produced conflicting results, most of the Chinese investigations suggest that only children outperform non-only children in academic achievement (e.g., Falbo et al,. 1989, Poston and Falbo, 1990, Poston & Yu, 1986; Xiao & Zhang, 1985; Yank, Kao, & Wang, 1980). For example, research conducted to investigate knowledge acquisition and cognitive ability development on 60 selected samples in Shanghai reported that as to knowledge acquisition (including natural and social knowledge), results were as follows: the onlies, $\bar{X}1 = 18.1$ while the non-onlies, $\bar{X}2 = 15.8$, $t = 3.74$, $P > 0.001$; and as to cognitive ability, onlies, $\bar{X}1 = 33.6$ while the non-onlies, $\bar{X}2 = 29.09$, $t = 2.97$, $P < 0.01$. Both results were very significant (Shanghai Institute of Early Childhood Education, 1981). Moreover, D. Y. Shong compared IQ test results and the reading and math exam results of 400 Beijing fifth grade only borns and non-onlies. Results revealed that onlies surpassed

non-onlies in all three tests and exams (Shong, 1989). This finding is consistent with the Western reports of academic advantages among only children (Falbo & Polit, 1986).

No meta-analysis has been done in the achievement of only children in China, but several outstanding recent studies on this field in China could be used for comparison. Falbo et al (1989, 1990 and 1993) conducted a series of studies in this area. These studies are exemplary because of their scientific designs, large samples and detailed description of findings. Moreover, the researchers were acquainted with rural and urban areas of China. One study was conducted in the regions of Beijing Municipality and second was conducted around Changchun, the capital of Jilin province, in northeastern China; the third was conducted in four selected Chinese provinces.

The Falbo studies involved a sample of 1465 school children; of these, 72% were from urban schools and 28% were from rural schools. Figures 1 and 2 present mean scores for only children with siblings by birth order, on the two achievement outcomes of mathematics and Chinese language, Figures 1 and 2 show that only children uniformly performed better than all categories of non-only children on standardized mathematics examinations (Fig.1), and on standardized Chinese language examinations (Fig. 2). The finding that onlies perform better than non-onlies who are not firstborns is consistent with Western results, but the finding that onlies perform better on these achievement tests than other firstborns is not consistent with Western studies (Falbo, 1986).

Figures of Comparison of
Mathematics and Chinese Language Ability of
Only and Non-only Chinese Children

Fig. 1. - Mathematics ability

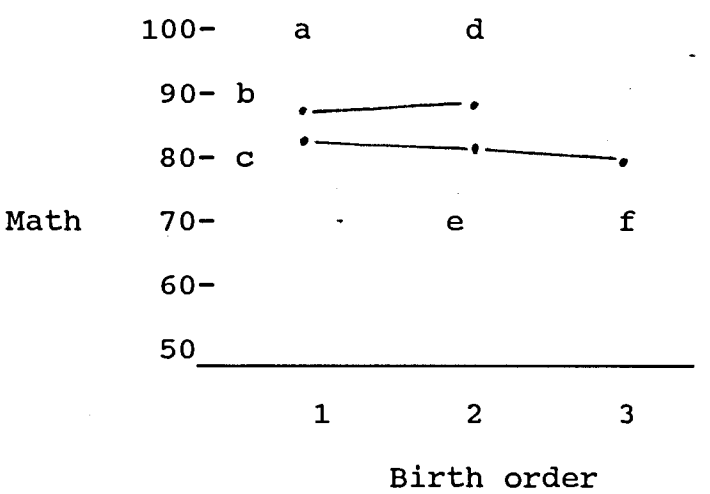
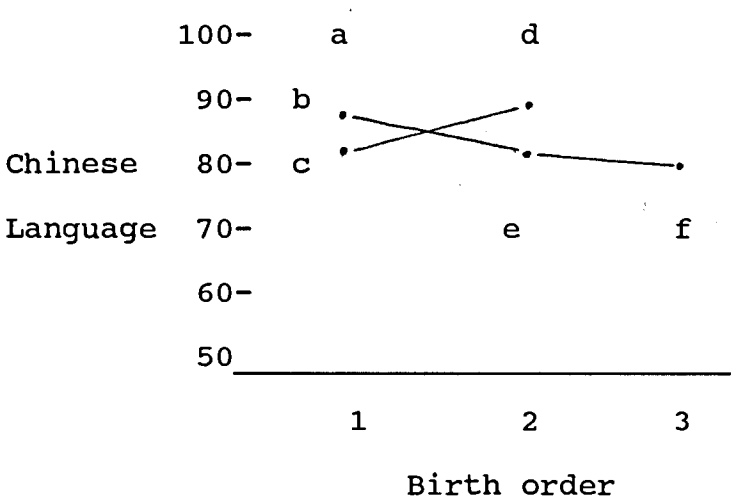


Fig. 2. - Chinese language ability



Note. a - only child, b-firstborn of small family c-firstborn of large family, d-secondborn of small family e-secondborn of large family, f-thirdborn of large family.

Table 2 presents the results of regression analyses designed to determine if an only-child effect is found when pertinent background and personal characteristics of the children are controlled (Falbo et al, 1989). In these equations, the researchers regressed each of the six outcomes variables, one at a time, on the following six independent variables: (1) a combined measure representing the educational attainments of both parents; (2) only/non-only child status; (3) gender of child; (4) a combined measure indicating how often the parents help the child in homework; (5) a combined measure indicating the level of expectations of both the mother and father about the child's future occupation; and (6) whether a child attended nursery school or was cared for by relatives before entering elementary school.

In these analyses, children were subdivided by region of residence and grade. Separate sets of regression equations were estimated for each of the four subgroups (two regions by two groups). Analyses of these data indicated that urban and rural children attained extremely different achievement outcomes. Accordingly, they estimated the regression equation separately in each of the four groups.

Table 2

Unstandardized Regression Coefficients for Chinese Children: Children Achievement Outcome by Residence and Grade

Residence And Grade	Math	Verb
Urban:		
First graders:		
OC vs. NOC (N = 530)...	1.65**	1.08*
OC vs. FB (N = 373)....	1.76	.26
Fifth graders:		
OC vs. NOC (N = 451)...	3.59*	.99
OC vs. FB (N = 187)....	3.92	-.63
Rural:		
First graders:		
OC vs. NOC (N = 212)...	-2.38	-5.24
OC vs. FB (N = 108)....	-3.02	-6.28
Fifth graders:		
OC vs. NOC (N = 175)...	3.89	4.88
OC vs. FB (N = 65).....	1.40	2.37

Note. * Significant at P < .05 ** Significant at P < .01

OC vs. NOC = only children vs. all non-onlies;

OC vs. FB = only children vs. firstborn nononlies.

Table 2 reveals that in the larger sample of school children (i.e., the sample comparing only children with all children with siblings), being an only child among urban first graders is significantly associated with higher performance in both mathematics and verbal (Chinese) achievement. Further, in the larger sample and among urban fifth graders, being an only child is significantly associated with achievement in mathematics. In all cases, only children outperformed their non-onlies. Note that an only child advantage is not found among rural children. Further more, when the comparison is restricted to single children and firstborns, no significant only-child advantages in achievement are found.

Causal factors associated with children's academic outcomes and how those outcomes are influenced by residence and grade are show in Table 3:

Table 3

Listing of Statistically Significant Unstandardized Regression Coefficients: Children's Academic Outcomes by Residence and Grade

Residence and Grade	Achievement Domain	
	Math	Verb
Urban:		
First graders:		
OC vs NOC ...	1,2	1,2,5
OC vs FB	1	1
Fifth graders:		
OC vs NOC ...	1,2,3,5	3,5
OC vs FB	1,3,6	
Rural:		
First graders:		
OC vs NOC ...	1	1
OC vs FB	1	
Fifth graders:		
OC vs NOC ...	1	1,5
OC vs FB		5

Note. Independent variable codes: 1 = parental education; 2 = only/non-only status; 3 = gender; 4 = parents' helps; 5 = parents' expectations; 6 = child-care status. (Falbo & Poston, 1989).

As shown on Table 3, the most consistently significant predictor for academic achievement is parental education. In 12 of the 16 regression equations predicting mathematics or verbal (Chinese) achievement, parental education is a significant predictor. For most of the Chinese children in this sample, scores on mathematics and Chinese-language examinations are positively and significantly associated with the levels of their parents' education (Falbo & Poston, 1989). There are some gender effects for the fifth graders of urban areas, and parental expectations seem to be a very stronger predictor for most of the children. Table 3 also shows that the child-care status has very little effect on overall students' performance, and that parents' education was clearly the strongest single predictor. For fifth graders, parents' expectation was also a significant predictor. Compared to results of different factors affecting children in urban and the rural area as shown in Table 3, many factors found in urban children failed to be detected on the children in rural areas.

Furthermore early child-care status such as nursery school and kindergarten experience have little effect on Chinese children's academic outcome. This is contrary to some studies which suggest that compensatory preschool programs should consider family size when strategies are being designed to meet the learning needs of individual low-SES children (Scott & Seifert, 1974; Scott & Kobes, 1975).

Falbo et al therefore concluded that in terms of academic

achievement, urban only children were found to outperform their later-born peers, even after parental characteristics, gender, and nursery school attendance were controlled. The consistency of this finding with Western results suggests that, at least in urban areas, only children are advantaged in their academic outcomes, and these advantages may not be entirely explained the parents' higher educational attainments.

In an even larger study, Falbo and Poston confirmed most of the 1989 results (Falbo et al, 1993). The study involved four Chinese provinces with a sample of 4,000 school children. In this study, only children outscored others in verbal achievement. In mathematics, there was some variation by region and province, but where differences were found between only children and others, only children were never found to score significantly lower than both first and last borns and they usually scored higher than at least one sibling group.

One exception to higher performance of urban children was found in the Beijing Municipality, where the multi-variate effect for region was $F(4,984) = 13.43$, $P = .0001$. Here the reverse of the general finding was found, with rural children outperforming urban ones in school based verbal tests, $F(1,998) = 31.35$, $P < .0001$, in school-based math tests, $F(1,998) = 3.75$, $P < .05$, and in standard math tests, $F(1,998) = 12.86$, $P < .0002$. (Falbo & Poston, 1993). Falbo et al attributed this discrepancy to emotional factors linked with 1989 Tiananmen Square events

because the data were collected right after that incident. But this hypothesis is certainly debatable; if there were any such effect, rural children would also be affected because they are in such a close surrounding area. One alternative explanation may be that the rural children of the study were more motivated because they would like to leave the poor country-side.

10. A Comparison of the Profiles

In summary, according to this selected literature review, only children in China and the U.S. manifested academic advantages; they outperformed non-onlies academically, with the exception of only children in rural areas in China. A comparison of data from Table 1 and Table 2 reveals that the academic profiles of only children of the two countries are very similar. Yet the lack of advantages for only children in the rural areas of China challenges some of the popular explanations of Western researchers. Presumably, rural parents with just one child have more time to spend with their only child than do those with more than ones. Results of the most recent research suggest either that the parents fail to do so or that the children fail to benefit from the rural parents' attention. While rural parents of one child were found to have more years of education than parents with more than one, their educational attainments were still substantially less than those of urban parents with more than one child. Enhanced attention from relatively less educated parents and grandparents may not have an advantage for rural only

children.

One other alternative explanation for the different academic performance of only children in rural and urban area is that the quality of the schools are different. This was not noticed as a major causal factor by Western researchers but is true to the situation of China. Most Chinese urban schools meet the minimum quality requirements while most rural schools do not. This issue is discussed at greater length in the following section which deals with factors associated with school quality.

II.2 Analysis of Causal Factors of Academic Outcomes

When we look at factors affecting the academic outcomes of only children between the two countries, certain differences stand out. The following major factors will be compared to see if they apply to both or either of only children of America and China; a) Family configuration (siblings, tutoring effect; b) deprivation; c)Parent-child Relations (Parents anxiety and expectations); d) parents SES (family income and parents education); and e) school quality.

a) Family Configuration

This explanation examines factors of family size and birth order and how these factors influence students' intellectual ability and academic achievement.

Birth Order: studies of the relationship between birth order

and intellectual and academic outcomes vary as to whether they invoke procedures controlling for the confounding family size variable (i.e., low birth orders can only occur in large families). A series of more methodologically adequate studies has handled this problem by analyzing the effect of birth order within groups that have similar family sizes. General findings from several of these studies are that birth order is associated with declining intellectual performance within each family size. The influence of increasing family size is seen as having an increasingly depressing effect on the score range, with an attendant progressive disadvantage for the youngest in comparison with the oldest in larger families (Belmont & Marolla, 1973; Belmont, Stein, & Wittes, 1976; Eysenck & Cookson, 1970; Zajonc, 1976).

However, more recent studies do not provide unequivocal evidence either for or against the existence of a birth order influence on achievement. The findings of Avanum and Bringle (1980) on a large representative American sample of 6- through 11-year-olds supports the notion that birth order effects are not significant when family size is controlled.

Family Size: The literature is also inconsistent with regard to the relationship between family size and intellectual and academic performance. However, SES differences within family size across studies seem to explain some of the inconsistencies. That SES possibly plays a role in producing any observed family size influence has long been recognized (Page & Grandon, 1979),

i.e., low SES families tend to be larger. In other studies, the impact of family size has been analyzed within homogenized SES groups (Belmont & Marolla, 1973; Douglas & and Simpson, 1964;Kunz & Peterson, 1974). Generally, studies using statistical control techniques have found the correlation between family size and the different measures of the child's intellectual performance to be substantially reduced, but still significant, after SES variance has been removed. In contrast, the use of selected sampling techniques does not show such consistent findings.

Zajonc and Markus (1985) formulated the confluence model in response to studies which showed that family size and birth order were inversely related to intellectual ability. In brief, children pull down the family's intellectual environment for at least a while. For example, if the level of each parent is set at 100 and that of the first child at near zero at birth, the average intellectual level becomes 67. This increases as the child develops. But the birth of a second child, and then of a third, a fourth, and so on, pulls it down again. They state,"to the extent that some portion of the intellectual growth of children is determined by an interaction with the intellectual levels of their parents and siblings, larger families will be associated with lower intellectual levels." The researchers claimed that the most favorable intellectual climate was experienced by children from small families, older children, and distantly spaced children. Although the research indicates that an only-child should score higher than a child with siblings and

the last-born should score lowest in the family, this was not always the case.

To explain why these two groups deviated from the linear decline in ability tests, Zajonc and Markus added another factor to the confluence model: the tutoring explanation. Neither the only-child nor the last-child has a younger sibling to teach. Not all research supported this tutoring explanation. Hauser and Sewell found only-children were neither at an advantage or disadvantage in this aspect compared to children in small families. Polit and Falbo found, in some cases, an advantage being an only-child with respect to intelligence and educational achievement. The findings of higher scores in last-borns at low SES levels led some researchers to believe that the only-child was more at a disadvantage due to a lack of interaction with peers than the lack of a tutoring effect (Steelman and Mercy,1958).

Even if the finding of Steelman et al is true, however, the disadvantage due to a lack of interaction with peers will not apply to most Chinese only children. Because of high population density in both urban areas and rural areas, Chinese only children have much more opportunities of interaction with peers than only children in the United States. Falbo et al (1993) also found that this was true in their research. In addition, many of the Chinese only-child family have grandparents living together as tradition. Therefore, only children in China would have more opportunity to play with cousins, as if they were brothers and

sisters. As a matter of fact, the Chinese consider cousins from uncles of their father's side their brothers and sisters because they have the same family name. So, many of them also have tutoring opportunities as well, and in effect are not only children.

Meta-analysis results also tend to discredit the deprivation mechanism (Falbo and Polit, 1986). With respect to achievement and intelligence, results suggest that growing up without siblings is an advantage, particularly in comparison to those who grow up with several or older siblings. The tendency for some researchers to explain differences between only borns and others in terms of sibling absence would be appropriate only if sibling presence is portrayed as a suppressor, rather than an enhancer of development.

b) Parent-child Relationship

One mechanism special to only children could enhance their achievement: their noncompetitive relationship with their parents. The acquisition of adult-like behavior is probably accelerated in only children because they have solely adult models of behavior in their immediate family environment. This may create a tendency to take responsibility for outcomes. First and special only borns have been found to have a more internal locus of control than later borns (Crandall et al, 1965), which may contribute to the achievement.

Both direct and indirect support was found for the parent-

child relationship explanations. Recall that direct support for this mechanism would consist of a specific pattern of results: (1) only borns would be found to have more positive relationships with their parents than others and (2) only borns would be found to have more positive developmental outcomes than others. This pattern was obtained (Polit, 1984), suggesting that positive relationships which only borns have with their parents contribute to their more desirable developmental of outcomes.

Results of the quantitative review (Falbo & Polit,1986, see Table 1) suggest that parent-child relationship influences are not limited to only children, but also influnce outcomes of firstborn and children in small families. These groups share a specific type of relationship with their parents, one characterized by heightened parental anxiety, attention and expectations.

Parental anxiety: In general, parent-child relationship for only and firstborns was typified by high anxiety levels of parents (Schachter,1959) due to lack of childrearing experience (Waddell & Ball, 1980). Because of this high anxiety, parents of only child were presumably overly responsive, causing the only child to exhibit greater affiliativeness (Schachter, 1959). But parental anxiety also motivates parents to have high-quality interactions with their children. This, in conjunction with the tendency for such parents to have more time to attend to their children, means that their children are more likely to experience greater quantities of high-quality parent-child interactions. In

turn, these interactions are thought to bring about better academic outcomes. This was supported by recent research on single children-parent relationships; investigators found that responsive behaviors of parents promoted greater achievement motivation, internal locus of control (Falbo, 1984), intellectual development and achievement (Blake, 1981; Falbo & Cooper, 1980).

Parental attention: First-time or two-child parent have more time to spend with each child than do parents with more children. Mercy and Steelman (1982) have argued that large family size constrains both the amount of time parents have for each child and the type of activities they engage in with that child. Similarly, others have suggested that families of varying sizes provide differential learning environments which mediate developmental outcomes (Marjoribanks, 1976a,1976b). From this perspective, one would expect first-time or two-child parents to have more opportunity to spend one-on-one time with their children. Results of several studies support the position that only borns may receive more attention and have more parent-child conversations with more information exchange than other children. This enhanced parental attention probably aids the child in acquiring more sophisticated intellectual skills, such as vocabulary, and further enhances their academic achievement.

Parental expectation: Parental expectations caused by social pressure is a very important factor among Chinese children. Traditionally, Chinese people have very high educational expectations for their children. This is enhanced by social

competition pressures nowadays because a college degree seems the only way for many Chinese children to have a good future. Thus, Chinese parents have very strong expectations of academic success for their children and are willing to do anything to "support" them in this regard. This turns into competition in China, and the situation has worsened recently. An extreme example was reported that even some of the fetuses bear heavy course loads in China (Chen, 1994). Young Chinese parents let the fetuses hear music and English. This may not be the case in America.

c) Parent SES

Parental SES includes the educational level completed by parents as well as parental economic resources. Various studies have demonstrated that the relationship between family size and mental test performance of children is better explained as a function of economic (SES) than by family size differences (Kun and Peterson 1973). Steelmen and Mercy (1980) found family size effects to be less pronounced at the high SES level where they felt the cost of additional children could be more easily absorbed. However, other studies found that the effect of family size did not diminish when SES was controlled, (Breland,1982). Steelmen and Mercy (1982) found that only high SES children benefited by having a non-working mother. They suggested that the mother at the high SES level was possibly more apt to possess knowledge and skills which put her at an advantage in promoting her child's learning.

Parental education: In a large scale of empirical

investigation, Doby et al (1985) reported that parental education accounted for .29 of the explained variance from a total explained variance of .39. It is clear that parental education contributes substantially to a child's I.Q. and the child's I.Q. explains almost half of the child's achievement performance. Given the strong effect between levels of parental education and a child's I.Q., it is to be expected that level of parental education will significant impact on achievement performance. This assumes that highly educated parents have more books and magazines, and read more themselves, and that this positively affects children's reading.

Actually, parental education was the factor most consistently related to children's academic outcomes of any other factor considered. Findings in China in this regard are consistent with Western results. Studies of family environments of well-educated versus poorly educated parents indicate that better educated parents interact with their children in ways more conducive to intellectual development (Bradley et al, 1977; Caldwell & Bradley, 1984). Better educated parents are more likely to provide stimulating toys and to encourage their children to explore their environment compared to poorly educated parents. Better educated parents also provide a more ordered environment and are more likely than poorly educated parents to use disciplinary techniques that are linked to consistently applied rules which are clearly explained to the child. Thus, children growing up in families of better-educated parents are

more likely to acquire an orientation to schooling and the basic skills necessary for successful school performance.

Economic resource: In terms of economic resources, there is ample documentation that a family's living standard is inversely related to the number of children in the family. Only borns may benefit from the fact that the totality of the family's financial resource can be directed towards their care. This probably improves their chances of obtaining higher education, enriching educational experiences, and better health care. The only children advantage in IQ and achievement was sustained even when social class was controlled. But the dichotomous classification of middle- and lower-class still leaves considerable variability for the distribution of economic resources within families of different sizes. It is not clear why several only-child advantages were found to be stronger among males than females. This finding may reflect the fact that sons are generally preferred to daughters in some societies, particularly for a first birth. Consequently, parents with only daughters may give them less educational interaction and enrichment. In any event, female onlies were not at a disadvantage, relative to other girls with siblings, except for a tendency to be less outgoing and sociable (Polit, 1985).

These factors are especially powerful in China with respect to the inequality between urban area and rural areas. While children of rural areas (including the onlies) lack minimum learning resources at home and school, many urban only children

can get almost anything they need. Some urban parents of onlies even hire home tutors. This obviously creates rural-urban academic difference (Liang and Yang, 1988).

e) School Quality

Children's academic development in large part depends on school experiences, so school quality is very important. American schools in rural and urban areas may not be inequitable regarding facilities, resources and teacher qualification. But school quality factors are unequal in urban and rural areas in China. Because of the severe scarcity of educational resources and the high student population, it is a common practice for the local government to put more and better of its limited resource into some of the so called "key" schools to guarantee that they will produce a certain number of quality "products". Most of the best schools are located in the urban areas in China. Many urban schools have almost everything they need whereas facilities of many rural schools are limited and many depend on a piece of blackboard and a few benches (Liang and Yang, 1988). Given the poor situation of many rural schools, the impact of such factors as family size or parent-child relationship would not make any significant difference. Two recent studies found that different academic performance between the rural and urban students can be traced to inequity of resources in China. The findings of Falbo et al(1989, 1993) gave evidence for this point. The reason why rural children outperformed urban children in Beijing is because

the school there meets the minimum quality (they allocated more resources for the schools there because they surround the capital), while the rural children receive more social pressure to be successful.

II.3. Summary

In summary, an integration of the results of the above literature review shows that the academic profiles of only children of the two countries are basically similar. In both instances, onlies generally outperformed non-onlies. The analysis of causal factors of the academic outcomes found that smaller family size seems to have more advantage for children's cognitive development, because children in small families have more learning resources and get more parental attention. Most researchers agree that the presence of siblings is not necessity for normal cognitive development and academic achievement. Parental SES seems to be a very strong causal contributor to academic outcomes of children. School quality is a fundamental factor to children's academic outcome, this is especially true in China, a developing country.

Chapter III.

Conclusions, Implications and Suggestions

III. 1. Conclusions

1.1, Synthesis Answers of the Three Questions

The three questions addressed in the previous section on statement of the problem in Chapter 1 will be discussed here:

1. Is the academic profile of the Chinese only children essentially the same as that of the only children of the United States?

From the literature review, the answer is yes in most cases. Both American and Chinese only children are doing better in their academic work than non-onlies. This is especially true for the Chinese onlies in urban schools. Lack of interaction opportunities with other children may have some effect on American only children's intellectual development but this does not apply to Chinese only children because of the concentration of the population and the tradition of large families (including grandparents living together with children and their parents). In many cases, only children in China receive educational enrichment from their grandparents as well as their parents.

2. Do academic profiles of only children of the United States and China differ from the academic profiles of non-only children of the two countries, and if so, in what respects?

Both American only children and Chinese only children academically outperform children with siblings, with the

exception of onlies in rural areas of China. This is probably due to the lack of basic quality conditions in the schools there.

3. What social, cultural or other causal factors explain the academic profiles of only children in China and the United States?

Factors such as cultural and tradition would not make a significant difference in the academic outcomes of only children of the two countries. But the political practice and the social structure of China results in seriously unequal allocations of economic and educational resources. This creates adverse effects on children's academic outcomes. Minimum school resources, including school facilities and numbers and qualification of teachers as well as administrators are prerequisite conditions before any difference between other factors such as family size, and parent-child relationship, etc. can be appropriatelly assessed.

III.1.2, Conclusions

Only children in China and the United States enjoy advantages in academic development compared with other children. Yet this does not necessarily mean that all these factors affect the academic outcomes the same or to the same degree. Some factors, such as parents' education, encouragement, and family size clearly contribute to children's cognitive development. One of the most consistent findings of this study was that the impact of intellectual ability and educational achievement decreased as

family size increased, because children in small families usually have more learning resources and get more parental attention. But this appears to be presently more of an economic resource problem than a family size or birth order one, because some children from disadvantaged families do succeed academically when they experience a better education environment such as a better school. This is supported by evidence from rural Chinese children who were highly successful in academic work. When people discuss the pressure for Chinese children to be academically successful because they do not have a second chance, they seemed simply ignored that a larger group of children in the rural area do not even have a first chance to be successful because the school conditions are so poor (Chen, 1994).

Parental education, encouragement, and income contribute to children's cognitive development. Economic and educational resources are very important and are requisite conditions for children's academic success. This is especially true in developing countries. To Chinese children, the factors of economic resource such as the quality of the school and parent-child relationship exert the strongest single influence; parents' education and birth order are the next; while number of siblings is among the least. Yet, these are only generalities. As a matter of fact, there are great variations within only children. In addition, the social and economic factors that cause a child to be an only child vary substantially from time to time, place to place, and even family to family. These same factors

have at least as strong an influence on children's outcomes as does their sibling condition (Falbo and Poston, 1993).

Although the result of so many investigations indicated that only children have advantages in cognitive and academic development, this should not be overly emphasized. It means that we cannot assumes that the only children or the first born will always be academically successful.

III. 2. Problems of the Field

Specific Birth Cohort In Western research conducted in the early part of this century, it was typical for investigators to examine the relationship between specific birth order and academic achievement. This approach was criticized (Price & Hare, 1969) because investigators failed to consider the incidence of specific birth order or family size categories within the relevant birth cohort. For example, in the United States a high proportion of families was formed after World War II, resulting in a surge of first births between 1947 and 1950. Between 39% and 43% of all Americans of this birth cohort are firstborns. Thus it is not surprising that first-borns predominate in samples drawn from this birth cohort.

Status of the Theory: Few of the studies on only children have been motivated by a formal theory; instead, the bulk of this literature has been motivated by either curiosity or convenience. Among those studies motivated by formal theories, two types of

theories can be distinguished. The most frequent is an application of a theory developed originally for other purposes. Examples include the application of social comparison theory to understanding the relationship between self-esteem and birth order (e.g, Zimbardo & Formica, 1963). The second type of theory was developed solely to explain family phenomena. The most well known and recent theory fitting this description is the confluence model (Zajonc & Markus, 1974). This model was originally devised to explain a negative correlation between family size and intelligence.

Researchers have frequently tried to explain any observed only child difference in a post hoc fashion. These efforts have resulted in diverse and often conflicting propositions about the breadth of outcomes examined as well as discrepancies among studies in the direction and degree of differences between onlyborns and others (Falbo & Polit, 1986).

III. 3. Implications for the Future Studies

Findings in this research paper may be implied for both industrially developed countries such as America and for the less developed countries such as China.

For industrialized countries, the question of population growth and continued increase in levels of affluence is of major concern. There are those who take the "limits to economic and technological growth" perspective as the road to the future. They argue that unless population growth is curtailed individual

affluence will decline since economic and technological growth must be reduced for ecological reasons. Then there are those who argue that continued economic and technological growth are not only possible, without serious environmental damage, but are necessary.

Developing countries present different priorities. They are primarily concerned with modernizing and industrializing in order to gain now a better life for their people. The argument for the need to reduce the rate of population growth on a world-wide basis is generally accepted as a necessary condition for the future development of less developed nations and a highly desirable condition for developed nations.

Given the above argument, and the findings reported in this research paper, the following new research problems are suggested for replicative investigations:

1. Results of this study show that higher cognitive development and academic achievement are related positively to the level of education of the parents and the family income, and that, in general, these two are negatively related to family size. Therefore, smaller family size is desirable for people both in developed and developing countries. But both disadvantaged groups from both America and China tend to be disproportionately represented in larger families. More research needs to be conducted on what is the major cause of this cycle and how to break it.

2. In the extremely disadvantaged learning environment of

developing countries (such as schools without minimum required conditions), it is hard for children to develop basic academic skills, especially since many students depend so much on their school experiences. In this regard, policy makers need to identify which is the first factor and which is the second, school or the family; replication studies are needed before such questions can be comprehensively addressed.

3. Educational achievement is becoming increasingly essential in modern societies for the economic well being of the individual and of the society. The current study has shown that some children from larger families among low socioeconomic groups are higher achievers, ambitious and successful when given the required conditions such as better schools. Replication studies are needed to determine how populations and individuals can be identified, who are likely to respond to policy designs intended to promote the learning of some target populations.

It may be important to contrast the children mentioned above with children in the same family or children in similar families who are low achievers. This kind of research will help to understand the reasons why so many of them fail while others succeed, and how more children could be enable to enjoy educational success. This, as a matter of fact, is the major challenge for this field.

4. Gender differences were reported in a number of cases, several only-child advantages were found to be stronger among males than females. This may reflect the fact that sons are

generally preferred to daughters in both the Chinese and the American societies. Again, replication studies are in order.

5. Many studies on only-children are poorly designed. Falbo and Polit set five criteria in their quantitative review of the only-children literature: large sample size (e.g, greater than 500); use of probability sampling, controls for extraneous variables; sophisticated analytic approach, and use of established instruments). In these review, only 115 out of 200 studies passed the test. Few of the Chinese studies meet these criteria. Future research in China and in the United States should, if possible, utilize these criteria.

Chapter IV.

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