

Sibling Number, Sibling Composition, and Subjective Well-Being

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Abstract

Drawing on data from the 2010 China Family Panel Studies (CFPS), this study examines the effects of the number of siblings and sibling composition on individuals' subjective well-being, as well as gender heterogeneity in these associations, through the competing perspectives of Resource Dilution Theory and Sibling Interaction Theory, using ordered logistic regression models. The results show that: First, the number of siblings is significantly and negatively associated with subjective well-being. Each additional sibling decreases the probability of reporting being "happy" or "very happy" by approximately 1 percentage point. Second, the association between sibling composition and subjective well-being varies systematically by biological relatedness. Full siblings exhibit the strongest negative association with subjective well-being, followed by half-siblings, whereas stepsiblings have no statistically significant association. Third, substantial gender heterogeneity is observed in the association between sibling composition and subjective well-being. Men are more sensitive than women to differences in biological relatedness, and only among men does the presence of younger siblings significantly reduce subjective well-being. Emotional support partially offsets the resource dilution effect among women, whereas men appear to be more strongly constrained by hierarchical family norms emphasizing seniority and birth order. This study further explores the mechanisms through which sibling composition and biological relatedness shape individuals' subjective well-being.

Keywords

Siblings; subjective well-being; Resource Dilution Theory; Sibling Interaction Theory; ordered logistic regression.

1. Introduction

Subjective well-being has long been a topic of central importance in human society. The universal aspiration for psychological fulfillment has made subjective well-being and a sense of fulfillment widely shared life goals that nearly everyone seeks to attain. From a philosophical perspective, conceptions of well-being are generally organized around two major traditions: Hedonism and Eudaimonia. These two philosophical traditions have respectively given rise to concepts such as subjective well-being and psychological well-being, providing important conceptual frameworks for understanding the multiple dimensions of well-being[1].

Diener (1984) argued that subjective well-being is characterized by three defining features: subjectivity, stability, and globality. These characteristics imply that individuals evaluate their lives according to their own standards, incorporating both enduring affective experiences and overall life satisfaction [1]. Diener et al. (1999) further argued that subjective well-being is an important indicator of psychological health, reflecting individuals' social functioning and adaptive capacity. Accordingly, the assessment of subjective well-being generally encompasses two major components: life satisfaction, referring to individuals' cognitive evaluation of the quality of their lives, and affective experience, which includes both positive and negative emotions [2]. Diener et al. (2009) further demonstrated that improvements in subjective well-being substantially enhance individuals' quality of life. Higher levels of subjective well-being

are likewise associated with better psychological health, stronger work performance, and more positive social relationships. Taken together, these findings underscore the central role of subjective well-being in both individual lives and social interactions [3].

Existing studies in China have shown that subjective well-being is associated not only with individual characteristics, such as gender, age, educational attainment, and income [4], but also with broader social factors, including relative income, the urban-rural divide, employment status, housing prices, corruption, and social trust [5]. However, most existing studies have focused on specific populations, particularly college students and older adults. Research adopting a family perspective has primarily examined parents' well-being associated with childbearing, while the relationship between siblings and individuals' subjective well-being remains largely unexplored. This omission is noteworthy because siblings constitute a fundamental component of the family and represent one of the longest-lasting interpersonal relationships across the life course [6]. Indeed, individuals typically spend more time with their siblings over the course of their lives than with their parents, suggesting that sibling interactions are likely to have important implications for subjective well-being. Examining how siblings shape individuals' subjective well-being is therefore important not only for advancing theories of subjective well-being but also for addressing an important and increasingly relevant social issue

2. Resource Dilution Theory

Existing research has primarily examined siblings as an independent variable within the framework of Resource Dilution Theory, focusing largely on their effects on educational and other family resources. As the number of siblings increases, the educational resources available to each child are diluted, thereby constraining children's educational attainment. Research has shown that women's years of schooling are more strongly affected by the number of siblings than men's. A larger number of siblings, especially brothers, is associated with fewer years of schooling among women [7]. Studies focusing on children have likewise found that academic performance declines as the number of siblings increases. These findings provide support for Resource Dilution Theory by suggesting that family educational resources are finite and that an increase in the number of children reduces the educational resources available to each child [8]. Using micro-level household data from China, subsequent research further documented a resource dilution effect of siblings on educational attainment and showed that this effect varies significantly by gender [9]. However, subjective well-being, often described as a "hidden form of national wealth," has received increasing scholarly attention worldwide. Like educational resources, subjective well-being may also be understood as a family resource subject to processes of resource dilution. Nevertheless, existing research has paid little attention to whether siblings, as an independent variable, shape individuals' subjective well-being through the mechanism proposed by Resource Dilution Theory.

Within the Chinese cultural context, the family, as a fundamental social institution, exerts a profound influence on individuals' subjective well-being [10]. As core members of the family, siblings may likewise influence individuals' subjective well-being through their direct and indirect interactions within family life. From the perspective of Resource Dilution Theory, competition for limited family resources may generate conflict among siblings [11], thereby undermining attachment relationships and individuals' sense of security, ultimately reducing subjective well-being. However, evidence derived from Resource Dilution Theory also suggests that siblings may have a positive association with adolescents' subjective well-being. Specifically, having one sibling has been found to improve adolescents' subjective well-being, and this positive association strengthens with age and remains stable into adulthood [12]. Nevertheless, these studies remain focused on the association between the number of siblings

and subjective well-being. By treating sibling number as the primary explanatory factor, they engage with Resource Dilution Theory only at a macro level and provide little insight into the micro-level mechanisms through which siblings influence subjective well-being. Building on this literature, the present study shifts the focus from the number of siblings to sibling composition to examine how the structure underlying sibling number shapes subjective well-being. By doing so, this study seeks to provide a plausible micro-level explanation for how siblings shape subjective well-being and, more broadly, for how Resource Dilution Theory can account for variations in subjective well-being.

3. Sibling Interaction Theory

Beyond competing for limited family resources and thereby reducing subjective well-being, interactions among siblings may also enhance subjective well-being by functioning as an important source of social support. Sibling relationships provide adolescents with an important developmental context in which they interact with peers, receive social support, and acquire social skills [13]. Because siblings share approximately 50 percent of their genetic makeup and typically grow up in the same family environment, they are more likely to develop similar values and patterns of everyday life through ongoing interaction. These shared experiences foster closer interpersonal relationships and increase the likelihood of emotional support, which in turn promotes individuals' subjective well-being [13,14]. Taken together, these two theoretical perspectives generate competing expectations regarding the relationship between siblings and subjective well-being. Do siblings reduce subjective well-being by diluting family resources, or do they enhance subjective well-being by providing social support? This study argues that an implicit assumption underlying Sibling Interaction Theory is that the social support exchanged between siblings is rooted in the ascribed nature of biological ties. In his analysis of family structure and intergenerational order in Chinese society, Fei Xiaotong argued that biological ties possess a dual social character. First, biological ties are ascribed, in that kinship relationships are established prior to an individual's birth and are shaped not only by biological inheritance but also by deeply embedded social and moral norms. Second, biological ties are interactional rather than static, as they are continuously reproduced and reconstructed through everyday social interaction [15]. Viewing biological relatedness as a structural dimension of sibling relationships may therefore provide a way to reconcile these two theoretical perspectives. Accordingly, unlike previous studies on siblings and subjective well-being, this study incorporates biological relatedness into the analysis to examine the mechanism through which Sibling Interaction Theory explains variation in subjective well-being.

4. Research Hypotheses

Existing research suggests that an increase in the number of siblings dilutes the educational resources available to each child, thereby constraining educational attainment. At the same time, competition for limited family resources may undermine the quality of sibling relationships. Based on these arguments, we propose the following hypothesis:

Hypothesis 1. Individuals with a greater number of siblings will report lower levels of subjective well-being.

Although the number of siblings represents an important dimension of family structure, sibling composition—that is, the distribution of older brothers, older sisters, younger brothers, and younger sisters within the sibship—may shape individuals' subjective well-being in different ways. For example, Wei and Zhang (2021) found that the presence of brothers does not crowd out girls' educational resources. In urban families, parents are even more likely to increase investment in girls' extracurricular education. These findings suggest that different forms of

sibling composition may have distinct implications for individuals' subjective well-being [16]. Accordingly, we propose the following hypothesis:

Hypothesis 2. The association between sibling composition and individuals' subjective well-being varies by sibling type (i.e., older brothers, older sisters, younger brothers, and younger sisters).

Existing studies generally define siblings as biologically related family members or simply do not distinguish biological relatedness when treating siblings as an independent variable. However, in the baseline wave of the China Family Panel Studies (CFPS 2010), siblings are defined as individuals who are related either biologically or legally. The survey further distinguishes among full siblings, paternal half-siblings, maternal half-siblings, and non-biological siblings, making it both feasible and theoretically meaningful to differentiate sibling composition according to biological relatedness. Excluding non-biological siblings would overlook the influence of sibling interactions on subjective well-being, whereas failing to distinguish between biologically related and non-biological siblings may introduce endogeneity into the analysis. Within the context of stepfamilies, Kathryn Harker Tillman (2008) examined the influence of "nontraditional" siblings—namely, stepsiblings—on adolescents' development. She found that adolescents living in such family structures performed significantly worse in school and exhibited significantly higher rates of problem behaviors than their counterparts from traditional families. These findings suggest that biological relatedness among siblings may also shape individuals' subjective well-being [17]. Accordingly, we propose the following hypothesis:

Hypothesis 3. The association between sibling composition and individuals' subjective well-being varies according to biological relatedness.

Finally, this study further examines whether the relationship between sibling composition and subjective well-being differs by gender. Liang and He (2025) found that, compared with only children, having one sibling significantly improves interpersonal relationship satisfaction for both boys and girls, whereas having two siblings significantly improves interpersonal relationship satisfaction only among girls. These findings suggest that the effects of sibling relationships may differ across gender [12]. Accordingly, we propose the following hypothesis:

Hypothesis 4. The association between sibling composition and individuals' subjective well-being varies by gender.

5. Data and Variables

5.1. Data

This study uses data from the baseline wave of the China Family Panel Studies (CFPS 2010), a nationally representative longitudinal survey conducted by the Institute of Social Science Survey at Peking University between 2010 and 2018. Among large-scale survey datasets in China, the CFPS is one of the few that simultaneously collects detailed information on respondents' siblings and their subjective well-being. These data provide an appropriate basis for identifying the association between sibling characteristics and individuals' subjective well-being. In addition, the survey includes rich information on respondents' income, education, social status, interpersonal relationships, and other socioeconomic characteristics, allowing for a comprehensive set of control variables.

5.2. Variables

The dependent variable is individuals' subjective well-being. It is measured using respondents' answers to the question, "How happy do you think you are?" in the adult questionnaire of the CFPS baseline survey. Respondents selected one of five response categories. The response options range from "very unhappy," "unhappy," and "neutral" to "happy" and "very happy."

Although this is a relatively simple measure of subjective well-being, it has been widely adopted in previous research and is well suited for quantitative analysis. Accordingly, this measure is used as the dependent variable in the analysis. Responses are coded from 1 ("very unhappy") to 5 ("very happy"), with higher values indicating higher levels of subjective well-being.

The key independent variables are sibling number and sibling composition. Sibling composition is measured along two dimensions: sibling type (older brothers, older sisters, younger brothers, and younger sisters) and biological relatedness (full siblings, paternal or maternal half-siblings, and non-biological siblings). The analysis additionally controls for a range of individual characteristics, including age, gender, ethnicity, marital status, educational attainment, subjective social status, interpersonal relationships, self-rated health, and household registration (hukou) status. Including these control variables helps account for potential confounding factors associated with subjective well-being and allows for a more accurate estimation of the relationship between sibling number, sibling composition, and individuals' subjective well-being. Table 1 presents descriptive statistics for all variables included in the baseline models.

Table 1: Descriptive Statistics of Variables

Variable Category	Variable	Mean	SD	Min	Max	Count
Dependent Variable	Subjective Well-Being	3.837338	1.017022	1	5	30794
Main Independent Variables						
Number of Siblings	Number of Siblings	2.910794	1.912481	0	15	30794
Sibling Type Composition	Number of Older Brothers	.7898941	1.103612	0	10	30794
	Number of Older Sisters	.6897448	.9734871	0	13	30794
	Number of Younger Brothers	.6914983	.9328306	0	7	30794
	Number of Younger Sisters	.6101513	.9015599	0	7	30794
Biological Relatedness Composition	Number of Full Siblings	.7898941	1.103612	0	10	30794
	Number of Half-Siblings	1.381243	1.257049	0	13	30794
	Number of Non-biological Siblings	.6101513	.9015599	0	7	30794
Control Variables	Age	46.61181	15.50077	16	110	30794
	Gender	.4868481	.4998351	0	1	30794
	Nation	.916185	.2771147	0	1	30794
	Marriage	.8375008	.3689141	0	1	30794
	Log Household Income	6.061983	4.252606	0	13.59237	30615
	Squared Log Household Income	54.83171	41.45297	0	184.7525	30615
	Education	2.483536	1.31468	1	8	30794
	Class	2.754887	.9690078	1	5	30794
	Interpersonal Relationship	3.974995	.8559546	1	5	30794

	Self-rated Health	1.841657	1.023796	1	5	30794
	Urban Hukou	.2897967	.4536753	0	1	30794

6. Empirical Results

6.1. The Association Between Sibling Number and Subjective Well-Being

Table 2 presents the Ordered Logistic regression results and the corresponding average marginal effects for the full sample. Column (1) reports the estimated regression coefficients, while Columns (2)– (6) report the average marginal effects of the independent variables on each category of subjective well-being, corresponding to the probabilities of reporting "very unhappy," "unhappy," "neutral," "happy," and "very happy," respectively. The average marginal effects indicate that each additional sibling increases the probability of reporting "very unhappy," "unhappy," and "neutral" by 0.01, 0.2, and 0.7 percentage points, respectively, while decreasing the probability of reporting "happy" and "very happy" by 0.1 and 0.9 percentage points. Overall, sibling number exhibits a linear association with subjective well-being. The coefficient on sibling number is negative and statistically significant at the 1 percent level, indicating that subjective well-being declines as the number of siblings increases. This pattern is consistent with the resource dilution theory, suggesting that increased competition for limited family resources accompanies a larger number of siblings. In addition, social comparison among siblings may generate interpersonal tension, which could further reduce individuals' subjective well-being. These findings support Hypothesis 1, which predicts that individuals with more siblings report lower levels of subjective well-being.

The estimated effects of the control variables are largely consistent with previous studies. Income exhibits a statistically significant U-shaped relationship with subjective well-being: as income increases, subjective well-being initially declines and subsequently rises. Age and gender are both significantly associated with subjective well-being. Older adults report higher levels of subjective well-being, whereas women report significantly lower levels than men. No statistically significant association is observed between ethnicity and subjective well-being. Individuals with a spouse report significantly higher levels of subjective well-being than those who are divorced, widowed, or unmarried. Individuals with urban hukou report higher levels of subjective well-being than those with rural hukou. In addition, higher educational attainment, higher subjective social status, better interpersonal relationships, and better self-rated health are all positively associated with subjective well-being.

Table 2: Ordered Logistic Regression Estimates and Marginal Effects on Subjective Well-Being

Variables	(1) Ordered Logit Coefficient	(2) Very Unhappy	(3) Unhappy	(4) Neutral	(5) Happy	(6) Very Happy
Number of Siblings	-0.046***	0.001***	0.002***	0.007***	-0.001***	-0.009***
Log Household Income	-0.129***	0.002***	0.005***	0.021***	-0.003***	-0.025***
Squared Log Household Income	0.012***	-0.000***	-0.000***	-0.002***	0.000***	0.002***
Age	0.003***	-0.000***	-0.000***	-0.000***	0.000***	0.001***
Gender	-0.181***	0.003***	0.008***	0.029***	-0.004***	-0.036***

Nation	0.008	-0.000	-0.000	-0.001	0.000	0.002
Marriage	0.330***	-0.006***	-0.014***	-0.053***	0.008***	0.065***
Education	0.046***	-0.001***	-0.002***	-0.007***	0.001***	0.009***
Class	0.256***	-0.004***	-0.011***	-0.041***	0.006***	0.050***
Interpersonal Relationship	0.872***	-0.015***	-0.036***	-0.140***	0.020***	0.172***
Self-rated Health	0.300***	-0.005***	-0.012***	-0.048***	0.007***	0.059***
Urban Hukou	0.211***	-0.004***	-0.009***	-0.034***	0.005***	0.041***
Observations	30615.000					
Pseudo R ²	0.088					

6.2. The Association Between Sibling Composition and Subjective Well-Being

6.2.1. Sibling Type Composition

Having established a significant negative linear association between sibling number and subjective well-being, we next examine the mechanisms that may underlie this relationship. Rather than focusing solely on the number of siblings, we further decompose sibling composition to explore the mechanisms through which siblings may influence subjective well-being. Specifically, sibling composition is examined from two dimensions: sibling type (older brothers, older sisters, younger brothers, and younger sisters) and biological relatedness (full siblings, half-siblings, and non-biological siblings). Ordered Logistic regression models are estimated for each dimension.

Quadratic terms for the numbers of older brothers, older sisters, younger brothers, and younger sisters were first introduced to test for potential nonlinear relationships. The results indicate that all four variables exhibit linear associations with subjective well-being. Table 3-1 reports the regression results for sibling type composition. Columns (1)–(4) present the estimates for older brothers, older sisters, younger brothers, and younger sisters, respectively. As shown in Columns (1)–(3), the numbers of older brothers, older sisters, and younger brothers are all negatively associated with subjective well-being at the 1 percent significance level. The magnitude of these negative associations decreases across the three variables, with coefficients of -0.072 , -0.046 , and -0.029 , respectively. By contrast, the number of younger sisters is not significantly associated with subjective well-being. These findings support Hypothesis 2, suggesting that different types of siblings are differently associated with subjective well-being.

The uniformly negative or statistically insignificant coefficients suggest that resource dilution may constitute the primary mechanism linking sibling composition to subjective well-being. This pattern appears to be particularly pronounced for older brothers and older sisters. The stronger associations observed among lower-income households are also consistent with the argument that resource scarcity amplifies competition among siblings. Under conditions of intensified resource competition, emotional bonds among siblings may be weakened by interpersonal conflict, particularly in larger families. One possible explanation is that older brothers are traditionally expected to receive priority in the allocation of family resources, including educational investment and property inheritance, thereby reducing the resources available to other siblings. The relatively smaller coefficient for older sisters may reflect gendered patterns of resource allocation within families, whereby daughters historically compete less intensely than sons for family resources. Moreover, the larger negative associations observed for older siblings than for younger brothers may also be consistent with the traditional Chinese norm of seniority, which places greater authority on older siblings within the family. Individuals with older siblings may therefore experience greater constraints

on autonomy, which could contribute to lower subjective well-being. Younger brothers may likewise intensify competition for family resources, particularly in the allocation of assets such as housing, especially in larger families. By contrast, the absence of a significant association for younger sisters may suggest that they exert comparatively less pressure on family resource allocation, thereby producing little measurable influence on subjective well-being.

Table 3-1: Effects of Sibling Type Composition on Subjective Well-Being

Variables	(1) Older Brothers	(2) Older Sisters	(3) Younger Brothers	(4) Younger Sisters
Number of Older Brothers	-0.072***			
Number of Older Sisters		-0.046***		
Number of Younger Brothers			-0.029**	
Number of Younger Sisters				-0.019
Log Household Income	-0.131***	-0.132***	-0.131***	-0.131***
Squared Log Household Income	0.012***	0.012***	0.012***	0.012***
Age	0.002**	0.001	0.002**	0.001*
Gender	-0.180***	-0.174***	-0.178***	-0.176***
Nation	0.016	0.016	0.015	0.016
Marriage	0.321***	0.307***	0.302***	0.299***
Education	0.048***	0.050***	0.050***	0.051***
Class	0.255***	0.255***	0.255***	0.255***
Interpersonal Relationship	0.871***	0.871***	0.871***	0.871***
Self-rated Health	0.302***	0.301***	0.302***	0.302***
Urban Hukou	0.221***	0.224***	0.224***	0.226***
Observations	30,615	30,615	30,615	30,615
Pseudo R ²	0.088	0.088	0.087	0.087

6.2.2. Biological Relatedness

Quadratic terms were likewise introduced for the three categories of biological relatedness—full siblings, half-siblings, and non-biological siblings—to test for potential nonlinear relationships. The results indicate that all three variables exhibit linear associations with subjective well-being. Table 3-2 presents the regression results for biological relatedness among siblings. Columns (1)–(3) report the estimates for full siblings, half-siblings, and non-biological siblings, respectively. As shown in Columns (1) and (2), both the number of full siblings and the number of half-siblings is negatively associated with subjective well-being at

the 1 percent significance level. Moreover, the negative association is stronger for full siblings than for half-siblings. By contrast, the number of non-biological siblings is not significantly associated with subjective well-being. These findings support Hypothesis 3, indicating that the association between siblings and subjective well-being varies according to biological relatedness.

The regression results show that the estimated coefficient is larger in magnitude for full siblings (-0.072) than for half-siblings (-0.046), whereas no statistically significant association is observed for non-biological siblings. According to the sibling interaction theory, biological relatedness strengthens emotional support among siblings because they share genetic ties as well as common life experiences, dispositions, and developmental environments. From this perspective, sibling relationships are generally expected to contribute positively to subjective well-being. However, resource dilution theory alone cannot readily explain why the association between siblings and subjective well-being differs systematically across levels of biological relatedness. The discrepancy between the empirical findings and existing theoretical expectations suggests that an additional explanatory mechanism may be operating. Rather than privileging theoretical perspective, we instead focus on the social characteristics of biological relatedness itself. Building on Fei Xiaotong's discussion of the ascribed and relational nature of kinship, we further interpret these findings through his theory of the differential mode of association. First, different forms of biological relatedness correspond to different positions within the concentric circles of kinship. Full siblings occupy the innermost circle because they share the strongest biological ties. As a result, they tend to interact more frequently and are subject to stronger normative expectations regarding mutual obligations and family responsibilities. The relatively larger negative coefficient for full siblings may therefore reflect the hidden pressures embedded in these core relationships, including expectations of parental care, reciprocal support, and other family obligations. The smaller coefficient for half-siblings may indicate comparatively weaker biological and emotional ties. Consequently, interactions among half-siblings may be shaped more by instrumental considerations than by moral obligations, thereby reducing their negative association with subjective well-being. Non-biological siblings occupy a more peripheral position within the kinship network. The absence of a statistically significant association is consistent with the possibility that relationships without biological ties involve fewer normative obligations and rely more heavily on voluntary interaction, thereby exerting only a limited influence on subjective well-being. Second, different kinship circles may also operate under different principles governing the allocation of family resources. Strong biological ties may legitimize and reinforce unequal patterns of resource allocation within families, whereas weaker or more ambiguous biological ties may provide parents with greater flexibility in distributing resources. Half-siblings are often members of stepfamilies, in which parental investments may be distributed across multiple households. Under such circumstances, competition for family resources among siblings within the same household may be relatively less intense because family boundaries are less clearly defined. For example, parental investments in children from a previous marriage may be made independently of the current household, thereby reducing direct competition among siblings. By contrast, in traditional nuclear families, full siblings are generally regarded as core members of the same family unit. Parents therefore face greater difficulty distributing financial, educational, and emotional resources equally among their children. Given the inherent scarcity of family resources and the practical impossibility of treating every child the same, resource competition and resource dilution are likely to become more pronounced among full siblings.

Table 3-2: Effects of Biological Relatedness Composition on Subjective Well-Being

Variables	(1) Full Siblings	(2) Half-Siblings	(3) Non-biological Siblings
Number of Full Siblings	-0.072***		
Number of Half-Siblings		-0.045***	
Number of Non-biological Siblings			-0.019
Log Household Income	-0.131***	-0.131***	-0.131***
Squared Log Household Income	0.012***	0.012***	0.012***
Age	0.002**	0.002**	0.001*
Gender	-0.180***	-0.179***	-0.176***
Nation	0.016	0.015	0.016
Marriage	0.321***	0.318***	0.299***
Education	0.048***	0.049***	0.051***
Class	0.255***	0.255***	0.255***
Interpersonal Relationship	0.871***	0.872***	0.871***
Self-rated Health	0.302***	0.301***	0.302***
Urban Hukou	0.221***	0.219***	0.226***
Observations	30,615	30,615	30,615
Pseudo R ²	0.088	0.088	0.087

6.3. Gender Heterogeneity in the Association Between Sibling Composition and Subjective Well-Being

6.3.1. Sibling Type Composition

Table 4-1 presents the gender-specific regression results for sibling type composition. Among men, the numbers of older brothers, older sisters, younger brothers, and younger sisters are all negatively associated with subjective well-being. The negative association is strongest for older brothers (coefficient = −0.082) and is larger in magnitude than the corresponding estimate for women. One possible explanation is that this pattern reflects more intense competition for family resources among male siblings. Within the context of traditional patrilineal family norms, eldest sons have often been accorded priority in inheritance and family expectations, potentially placing younger brothers at a disadvantage in the allocation of family resources. Families may therefore be more likely to invest educational and other family resources in eldest sons, leaving younger brothers with comparatively fewer resources. Such unequal allocation may generate feelings of relative deprivation and consequently reduce subjective well-being. Another possible explanation concerns the traditional norm that “an elder brother assumes a father-like role” in Chinese families. Eldest sons are often expected to assume greater family responsibilities, including caring for aging parents and supporting younger siblings. These socially prescribed roles may increase the psychological burden on both older and younger brothers.

Among women, however, only the numbers of older brothers and older sisters are significantly associated with lower levels of subjective well-being, whereas the numbers of younger brothers and younger sisters show no statistically significant associations. By contrast, younger brothers and younger sisters remain negatively associated with subjective well-being among men. This pattern may indicate that the consequences of resource dilution are moderated by gendered

family roles and expectations, resulting in different associations between sibling composition and subjective well-being for men and women.

Table 4-1: Effects of Sibling Type Composition on Subjective Well-Being by Gender

Variables	Female				Male			
	(1) Older Brothers	(2) Older Sisters	(3) Younger Brothers	(4) Younger Sisters	(5) Older Brothers	(6) Older Sisters	(7) Younger Brothers	(8) Younger Sisters
Number of Older Brothers	- 0.062***				- 0.082** *			
Number of Older Sisters		- 0.046** *				- 0.044** *		
Number of Younger Brothers			- 0.013				- 0.046** *	
Number of Younger Sisters				- 0.005				- 0.037**
Observations	15,688	15,688	15,688	15,688	14,927	14,927	14,927	14,927
Pseudo R ²	0.089	0.089	0.089	0.089	0.087	0.086	0.086	0.086

6.3.2. Biological Relatedness

The pattern observed for the full sample is replicated in both the male and female subsamples. In both groups, full siblings exhibit the strongest negative association with subjective well-being, whereas non-biological siblings exhibit the weakest association. Among men, the relatively larger negative coefficient for full siblings (−0.082) suggests that stronger biological ties may also be associated with stronger family obligations and greater competition for family resources. Within traditional patrilineal family systems, eldest sons have often occupied privileged positions in the distribution of family resources, potentially creating unequal patterns of resource allocation among male siblings. The smaller coefficient for half-siblings (−0.054) may indicate that weaker biological ties reduce both kinship obligations and competition for family resources. The even smaller and statistically weaker association observed for non-biological siblings (−0.037) is consistent with the possibility that relationships lacking biological ties impose fewer normative obligations on individuals.

Table 4-2 further indicates that men are more sensitive than women to differences in biological relatedness. The negative association of full siblings with subjective well-being is stronger among men (−0.082) than among women (−0.062). Similarly, the estimated coefficient for half-siblings is larger in magnitude among men (−0.054) than among women (−0.037), suggesting that men may be more strongly affected by nontraditional family structures. One possible explanation is that men may place greater emphasis on competition for family resources in families with more ambiguous biological relationships, thereby experiencing greater psychological pressure and lower levels of subjective well-being.

Among women, the estimated effects of biological relatedness remain negative but are consistently smaller than those observed among men (−0.062 versus −0.082 for full siblings;

–0.037 versus –0.054 for half-siblings). One possible interpretation is that biologically related sisters may function not only as competitors for family resources but also as important sources of emotional support, as suggested by sibling interaction theory. Emotional support may therefore partially offset the negative consequences of resource dilution. Overall, these findings do not provide support for Hypothesis 4, which predicted that sibling composition would have a stronger association with subjective well-being among women than among men. Instead, both dimensions of sibling composition exhibit stronger negative associations among men. These results suggest that additional mechanisms may underlie the observed gender differences and warrant further investigation in future research.

Table 4-2: Effects of Biological Relatedness Composition on Subjective Well-Being by Gender

Variables	Female			Male		
	(1) Full Siblings	(2) Half-Siblings	(3) Non-biological Siblings	(4) Full Siblings	(5) Half-Siblings	(6) Non-biological Siblings
Number of Full Siblings						
	-0.062***			-0.082***		
	(-4.50)			(-5.65)		
Number of Half-Siblings						
		-0.037***			-0.054***	
		(-2.92)			(-4.19)	
Number of Non-biological Siblings						
Number of Full Siblings			-0.005			-0.037**
			(-0.28)			(-2.08)
Observations	15,688	15,688	15,688	14,927	14,927	14,927
Pseudo R ²	0.089	0.089	0.089	0.087	0.087	0.086

7. Conclusion and Discussion

By examining sibling composition in terms of both sibling type and biological relatedness, this study explores the mechanisms through which sibling relationships are associated with subjective well-being. Three principal findings emerge from the analysis. First, the number of siblings is negatively associated with subjective well-being. As the number of siblings increases, the probability of reporting that one is “happy” or “very happy” declines. Second, the association between sibling relationships and subjective well-being varies systematically by biological relatedness. Full siblings exhibit the strongest negative association, followed by half-siblings, whereas non-biological siblings show no statistically significant association. Third, substantial gender heterogeneity is observed. Compared with women, men are more sensitive to differences in biological relatedness, and only among men are younger brothers and younger sisters significantly associated with lower levels of subjective well-being. One possible explanation is that emotional support partially offsets the effects of resource dilution among women, whereas men may be more strongly constrained by traditional family norms concerning seniority and family obligations.

These findings extend resource dilution theory by demonstrating that sibling composition, rather than sibling number alone, shapes subjective well-being. Both sibling type and biological relatedness provide important insights into the mechanisms linking sibling relationships to

subjective well-being. More specifically, stronger biological relatedness may intensify competition for family resources through both inheritance expectations and kinship obligations. Contrary to the expectations of sibling interaction theory, the anticipated positive association between sibling relationships and subjective well-being is not supported. Instead, the obligations embedded in biologically related sibling relationships may offset the emotional support that such relationships are expected to provide. This pattern is particularly evident among men, for whom full brothers may simultaneously represent the closest kinship ties and the strongest competitors for family resources, highlighting an inherent tension within traditional patrilineal family systems.

This study has several limitations that should be acknowledged. First, the analysis does not distinguish among different pathways through which non-biological sibling relationships are formed, such as adoption and stepfamily formation. Second, the analysis does not explicitly consider generational differences. Future research could incorporate cohort variation associated with major demographic policies, such as the One-Child Policy and the Two-Child Policy, to better understand changes in sibling relationships across generations. Third, although urban–rural differences may moderate the association between biological relatedness and subjective well-being, this possibility is not examined in the present study and deserves further investigation.

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