An Analysis of Childhood Sibling Relationship as Mediator of the Link between Sibling Size and Adulthood Social Interaction

Master’s Thesis

Presented to

The Faculty of the Graduate School of Arts and Sciences
Brandeis University
Department of Psychology
Xiaodong Liu, Advisor

In Partial Fulfillment
of the Requirements for the Degree

Master of Arts
in
Psychology

by
Keyi Cai

February 2014
ABSTRACT

An Analysis of Childhood Sibling Relationship as Mediator of the Link between Sibling Size and Adulthood Social Interaction

A thesis presented to the Psychology Department

Graduate School of Arts and Sciences
Brandeis University
Waltham, Massachusetts

By Keyi Cai

There are four variables that are generally included in study of sibling relationships: birth order, sibship size, gender difference and age space. Prior study has focused on the effect of birth order but places less emphasis on sibship size. The present research proposes three studies. Firstly, I propose to use the General Linear Model to investigate how sibling size affects childhood sibling relationships. Secondly, I propose to use a regression model to investigate how childhood sibling relationships affect social interaction in adulthood. Finally, I use the Sobel Test to find the relationship between sibship size and social interaction in adulthood mediated through the effect of sibling relationships. Five hundred Boston-area college students are collected to participate in the study by completing a set of questionnaires. I expect a larger sibship size will negatively impact a
child's sibling relationship, which in turn negatively affects his or her social interaction in adulthood. This research promises to add to the larger discussion of childhood influences on individual outcome in adulthood by emphasizing the significant role of sibship size on a child's development.
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Introduction

According to the US Census Bureau’s 2013 report, the average family size in America is 3.13 people. Although tradition believes education plays an important role in a person’s ability to communicate with his/her social surroundings, the childhood sibling relationship is a noteworthy experience, which can have a significant impact on adulthood social ability.

I propose to explore the relationship between sibling size and childhood sibling interaction. Then, I will explore the relationship between childhood sibling interaction and adulthood social interaction. The purpose of my research is to investigate how the sibling size affects the adulthood social interaction. I predict that there is an indirect relationship between the sibling size and the social interaction in adulthood. Furthermore, I suggest that large sibling size may have negative effects on adulthood social interaction. Figure 1 illustrates the logic of relationships between childhood sibling relationship, sibling size and social outcome in adult. Below are the two steps of the proposed exploration:

1) To investigate the role of sibling size plays in childhood sibling interaction.

In 1972, Bert wrote a review of birth order research. He noted that one of two consistent findings was that the first-born child had the greater educational attainment. The findings also included a conclusion about only-children. From reviewing past studies on sibling relationship (Whiteman, 2007), birth-order, sibling size, age spacing and gender were thought to help explain the influence of sibling relationships. In my research proposal, I will put more emphasis on sibling size since there was not much previous literature
discussing the direct impact that the number of sibling could have on sibling interaction. In order to explore how sibling size affects childhood sibling relationship, college students will be recruited for a questionnaire designed for the purpose of study. My expectation is that a larger sibling size will distract children from the most effective learning experience of social interaction techniques.

2) To explore how childhood sibling interaction affects adulthood social interaction

Social interaction refers to the ability to interact with others under various conditions. This is not only the interaction within the family but also with people in society by using the learned strategy and personal skills. In the previous studies, such linkage between childhood experience and adulthood has been identified clearly in various perspectives. For example, the positive cognitive appraisal of sibling relationship in early years had a positive affect in the middle and later age (Bedford, 1998). The sibling relationship in childhood has offered a safer environment rather than the “real world” for children to develop the understanding of social relationship (Howe, 2006). However, the development of interaction skills that happens as a child grows up has not been explained clearly enough. If a child is competitive among the siblings in his early age, will the same characteristic be maintained in adulthood? Or is there another possibility that a competitive trait is changed into aggression in adulthood? In order to clarify these questions, a self-report survey for college student will be designed to help track the evidence.

Figure 1. Conceptual Idea of Proposed Study
The figure demonstrates the conceptual idea of the proposed study
Theoretical Considerations

Sibling relationships and family structure

As we know, a network of relationships closely affects children's growing up and their behaviors in adulthood. It is consistent in findings that sibling relationship qualities are linked with family structural characteristics. For instance, a parent-child relationship attributes that linkage between father and child is more socially involved than linkage between mother and child (Brody, Stoneman, & McCoy, 1992; Stocker & Mcale, 1992). The difference is caused by the role played by parents. The mother focuses on caring and father focuses on playing (Parke & Buriel, 1998). The family structure also differs according to the dyad gender constellation (Kim, McHale, Osgood & Crouter, 2006). On the other hand, parents' marital relationship has been examined as one of the potential correlates of sibling relationships as well (Kim, McHale, Osgood, & Crouter, 2006). They find that sibling conflict is positively linked with mother's marital conflict, but negatively related with father's.

The nature of sibling relationship

To define sibling relationship, Stoneman and Brody (1993) give five codes of sibling relations, which are “positive”, “negative”, “manage”, “help” and “social engagement”. The “positive” and “negative” codes include a corresponding physical and emotional connection between siblings, such as a hug, a kiss, praise and hitting, pushing or crying (Stoneman and Brody, 1993). The “manage” and “help” codes refer to the behavior controlling between siblings, either in a positive (i.e., offering assistance) or negative (i.e., commanding) way.
The "social engagement" evaluates the level of interaction of one child to their siblings. Stoneman and Brody find that intimacy level is negatively linked to the activity. Similar activity levels create positivity and warmth, whereas good social engagements are resulted by high level of adaptability among siblings. Overall, Stoneman and Brody conclude that elder siblings have more adaptability than younger siblings, which results in more social engagement. As the research reflects, the sibling relationships refer to the interaction between siblings, which includes the way contacting and cooperating with brothers and sisters. Most research on sibling relationships in the past observed these results due to the different behaviors between siblings. However, few studies have shown dynamic changes over a specific period in human’s life (e.g., a sibling relationship from childhood through adolescence, Kim, McHale, 2006). In this study, I expect longitudinal data from individual's memory can provide information with children's development over time. For example, a longitudinal chart can address how "adaptability” in a sibling relationship becomes an “optimistic” attitude toward the social environment in adulthood. The literature has provided few descriptions of the implications of siblings’ behavior during their growing-up. Therefore, this study is interested in finding out characteristics in adulthood that are possibly tied with the one in childhood by linking with the sibling relationship.

Dunn (1983) suggests that there is a possibility that the different siblings who were raised within the same family could develop huge different ways of expression when they have an interaction with others in adulthood. The reason was because the interaction among siblings created a unique environment for each other. Therefore, the observation of childhood interaction could be one of the clues to investigate the effect of sibling relationships and the outcome in adulthood. Dunn introduced two concepts, the
“reciprocal” features and the “complementary” features. To illustrate the definition of reciprocal relationships, Dunn argued that the sibling difference and related development were attributed to the complementary features. An example of interaction between an elder sibling and a younger sibling could explain how complementary behavior works when interaction occurs. Like Dunn reviewed, it is common to think that elder siblings tend to be more dominant in an activity than younger siblings. The phenomenon is easy to be understood as a “complementary” behavior. However, the significance view doesn’t lies into the role that child plays, but in the exchange of information. A younger child is more likely to imitate what an elder child does. The exchange brings the “sharing” of each other.

Younger child’s imitation is to confirm what they agree upon, such as the acts and interests. Piaget and other developmental psychologists have already found that the pleasure atmosphere among siblings happened only when they were in a “co-action sequences” (Dunn, 1983). The “simultaneously actions” doesn’t mean the sibling itself, but refers to the affective feelings produced by them. In addition, Meisner and Fisher in 1980 found that older children cognitively benefited from peer game, which also reflects the importance of “reciprocal” features in children development study. The explanation of “complementarity” is like “difference comes from difference”, but the “reciprocity” is “difference comes from the same”.

Dunn’s review merited the study of sibling interaction. He gave a positive and broad perspective to observe the interaction between siblings. He also carefully mentioned that the interaction between the first-born child and parents would gain more intention with the increasing of newborn siblings. He didn’t review much about the sibling size and the results of the interaction among siblings. Does “reciprocity” have the same effect when the
number of siblings changes? If sibling size is bigger than two, then who is considered
dominant overall? For a child who has more than one elder sibling, will the merit of
“reciprocity” still be stable? Furthermore, according to the advantage of “reciprocity”, does
it possibly exist the best number of siblings in a family that can optimize the feature?

Sibling size

In 1970’s sociological studies, there used to be much focus on the family size
because they believe the size of group can result certain behavioral phenomena among
family groups (for reviews of these works, see Kidwell, 1981). Sibling relationship qualities
are linked with quantities of siblings. In Kidwell’s study, he mentions that the there is a
negative association between individual’s well being and the group size. Hare (1976) states
that larger group size featured the less concern of different opinions from group and more
controlling behavior of other people. Kidwell (1981) agreed that the same behavioral
phenomenon would apply to family group as well. Social group interaction assimilates to
sibling member interaction, because a large family size creates an environment that
involves conflicts, sharing between siblings, which are very much similar to the interaction
of other people in the real world in the future.

As described in prior studies, an increasing quantity of children will decrease the
investments on per child of parent (Becker and Lewis, 1973; Willis, 1973; Becker and
Tomes, 1976). Another aspect that relates to parental issues is how much attention or care
they can attribute to their children. Kidwell and his colleagues (1981) find that a big family
size consumes parental resources of time, energy and patience, resulting in less time for
explanation and for one-to-one interaction, which consequently results in higher risk of
worse and decreasing motivation to take care children’s needs. The effect of the findings is
easily reflected in the grades children receive in school. Once the family size is larger than three, there is “a sharp decline in the average outcomes” (Aslund and Hans, 2010, p.134). Nevertheless, the analysis of family size and education result may extent to a broad way. Some empirical studies are consistent with traditional thoughts on negative relationship observed between sibling size and child behavioral development (Silles, 2010). One possibility is that a small family size will allow a child to attach to their mother and father more than a child in big group of family, and therefore the parental relationship will have less effect on the child. Furthermore, a larger group of siblings gives chances to play between sisters and brothers, which decrease contacts with father who used to play the "play" role in a family structural characteristic. Nevertheless, the interaction between siblings may be more suggestive than with parents.

Twin births is worth noted when consider the number of siblings. Ashland et al. (2010) take much concern about twin-birth, which they have, evidence from the IFAU database (a database build from Statistics Sweden) that a twin birth at the second birth increases family size by about 0.75 children. In addition, they point out that a twin birth at an unexpected position will change parents’ plan of having another birth after the twin birth. It is convincible that a twin birth is not as same as one-child birth. Although having twins increases family size not by 1 as we count individually, it also means a very closer spacing, which is far smaller than 3, which will be reviewed in age space section. In the whole development of children’s growing up, a required caring time of parents is decrease. For instance, infancy stage requires parents spending more than 18 hours on feeding, diapering, but parents can have much more free time when stay with adolescences. Therefore, the twin-birth has a potential effect at children’s young stage. Meanwhile, Aslund
et al. (2009) find there is no size effect on the younger individuals. Hence, I will not take twin birth as a concern of one of the factors.

Other researchers recently argued in an opposite way. The larger size of sibling would create a small society that children could benefit from than those who have fewer siblings (Silles, 2010). It is worth to mention that Aslund and Gronqvist (2009) suggested that family size is not the main variable to determine children’s future behavior.

*Gender difference*

Buhrmester (1992) summarized that same gender had high level of positivity interaction than mixed gender, whereas Stocker, Lanther and Furman (1997) found mixed gender had less conflict than same gender in college-age. Regardless the inconsistent findings, it still shows the evidence that the communication with siblings daily is affected by the sex of siblings. It is considered to be an important control. A most recent study by Kim, McHale and Osgood (2006) shows evidence that girls reported greater intimacy than boys across time. However, in a mix gender family, same-gender sibling dyad showed no change in intimacy over time, but mix-gender sibling dyad, like boy-girl shows a decline intimacy from middle childhood through early adolescence. They also conclude that there is no gender effect on sibling conflicts.

*Age space*

As Alfred Adler (1956) said the birth-order effect among sibling is not visible if the age gap is greater enough. Therefore, a combination of family size and age spacing is a strong predictor than either size effect or space effect separately (Kidwell, 1981). Kidwell illustrates two different age spacing pattern. Family A has three children at age 10, 15 and 20, and family B has the same number of siblings but at closer age gap, which is 13, 15 and
17. He explains that family A allows parent to distribute their care separately to each child in their different stage, whereas children in family B will have a concentration of demand from their parents at the same period. For example, in family A when the last-born child enters the elementary school, the second-born child is in her early adolescence, and the first-born child is adult. Compare to family A, parents of family B have high risk of suffering argument and frustrated when care three children at same time. Kidwell introduces this combined variable as sibling density. In his age time-line, family A has a lower density than family B in this number and spacing patterns. The higher the family density is, the more relaxing and enjoyable atmosphere has been created in a family, therefore it allows more interaction among family members.

*Birth order*

The fourth structural control of sibling relationship is birth order. The birth order of individual makes difference not only in parental perception but also in actual behavior of sibling. Most believe that the first-born child receives more attention from parents (Rosen, 1964). At the same time, the firstborn receive stricter rules by family and higher expectation (Kammeyer, 1967; Kidwell, 1981). The last-born children enjoy the most relaxing atmosphere, which raises the possibility of having an easy-going character in the future. The middle-born child gets the least attention from researchers. One possibility is because the middle-born neither has a stressful environment as the first-born child nor is as easily spoiled as the last-born child by parents and elder siblings. Andeweg (2003) studies the relationship between birth-order and the impact of parents or siblings’ interaction to investigate its effect among sibling memberships. He concludes “A particular birth-order position, leads to a particular relationship with the parents and to particular
pattern of interactions with other siblings” (2003, p. 638). Although there is less research on the middle point child, the findings that exist are consistent: compared to the middle children, first-borns and last-borns have fewer behavioral problems (Silles, 2010).

*Individual’s characteristic outcomes in the quality of sibling relationship*

The interaction among family member is one of the social skills that individuals experience most in childhood. Although very little research has considered the sibling relationship during the development of transition to adulthood, it is still unavoidable to find signs of early sibling relationship experience appears in individual’s later life. A child who is raised in an environment of rivalries and resentments can reinforce him/her to have less feelings of obligation or dependence, which later in adulthood may become self-directed (Harvey & Bray, 1991).

White (2001) mentioned in their study, “the sibling relationships should become less important as individuals make the transition to adulthood and perhaps become more important again in later life”. Their suggestion is a dynamic point of view to make up the current vacancy of sibling relationship and adulthood outcome research. Even though the effect of childhood sibling relationship has been noticed in prior research, there is not much focus on how much characteristics that reflect from types of childhood sibling relationships transmit into individual’s later life. Based on Dunn’s study (1983), siblings’ reciprocal and mutual interaction has promoted trust and understanding. Behaviors such like teaching and caring facilitate guidance chance. (Howe, et al. 2000). In addition, they reviewed that warmth and closeness in particular affect the result of sibling disclosure, which has been confirmed to be a critical component in adolescent relationships. The reason of the complementary results is plausible, because younger children will have most of their
interaction activity with older siblings, whereas older siblings tend to observe their parents more. It is consistent with the findings that the first-born child gets more attention and expectations from parents.

Perner et al.’s (1994) suggestion that the more siblings a preschooler has, the more probable is her or his success in dealing with a formed false belief and the generated world in his own mind, which governs her/his behavior in the real world (Lewis, et al., 1996). It is believed that during the cooperative activity, the older-sibling (knowledge) teaches in the activity, where and the younger-sibling (un-knowledge) “acquire the cognitive building blocks of false belief understanding” (Lewis et al., 1996, p. 2931). Older siblings learn to take other people’s perspectives by adjusting their caring and teaching behaviors to younger siblings (Maynard, 2002). In reverse, younger siblings become more sensitive to other people’s feeling and beliefs when are cared for and taught by their older siblings (Dunn, 1988). Moreover, Hetherington (1988) suggested that younger siblings are more socially skilled and more positive in a peer relationship compared to older siblings, because they experience both direction of nurturance (positive) and conflict (negative) in sibling relationships. Brody (2004) and Howe (2006) proposed the same idea as well. Hence, through most of the researches on sibling relationships, their adulthood social interactions seem to be mainly based on experience in their childhood sibling interactions.

Another point that prior studies have considered is the causality of sibling interaction and adulthood social interaction. Most of the studies showed that the more experience children have, the more skilled they become at preparing for the “real world”. This conclusion is plausible. However do we neglect one possibility that personal experience will affect the recognition of self? Children are gaining experience as rehearsal
for the future, but at the same time, are they having to keep revise the skills they are using now? A new action is consciously produced according to the former experience within the family. Consequently, we do not only want to clear of the issues from the quantitative level (i.e. more experience results in more skills), but also to know which experience will result what skill. In contrast, some childhood experiences will arouse a negative skill, which might be hazard to other people in the future.
Key Research Questions

By reviewing the recent research findings, three key research questions have been driven from previous research on sibling relations to find clues that affect individual’s social interaction skills in adulthood through sibling size. Following are three key questions that have been raised:

1) Can sibling size predict the quality of sibling relationship? I expect child with large sibling size performs not as well as child with small sibling size in sibling relationship.

2) Is there a connection between childhood sibling relationship and adulthood social interaction? I expect childhood sibling relationship and adulthood social interaction are positively correlated.

3) Can childhood sibling relationship play a mediating role on the effect of sibling size and adulthood social interaction? I expect sibling size can predict adulthood social interaction through mediate role of childhood sibling relationship.
Analytical Plan

Key research question 1

A General Linear Model (GLM) is designed to test the relationship between sibling size and sibling relationship. The model is presented as follow:

\[ y_i = \beta_1 x_{i1} + \beta_2 x_{i2} + \beta_3 x_{i3} + \beta_4 x_{i4} + \varepsilon_i \]

The dependent variable \( y_i \) is sibling relationship. The model will be used twice for analyzing “warmth” and “conflict” variables for sibling relationship. The independent variable \( x_1, x_2, x_3, x_4 \) refers to sibling size, birth order, gender and age space respectively. Here in the model, gender is the dummy coded indicator, where 0=female and 1=male. Also, age space is dummy coded indicator as well, where the space falls into the range from 0 to 3 is coded as 0, the range from 4-6 is coded as 1. We ignore the range above 7 since a bigger age gap decreases its effect on sibling interaction. The denoted i is the \( i^{th} \) observation on the independent variables. \( \beta_1, \beta_2, \beta_3, \beta_4 \) is the coefficient of independent variables respectively. \( \varepsilon_i \) is the residual.

Key research question 2

Before investigating whether childhood sibling relationship has an effect on adulthood social interaction, a scatter plot graph helps to check the correlation between childhood sibling relationship and adulthood social interaction. As planned before in article, there are have two variables for sibling relationship, warmth, conflict and six variables for adult social interaction, dominance, submissiveness, unfriendly behavior,
friendly behavior, opposing task orientation of established authority and accepting task orientation of established authority. Each variable of adult social interaction will be regressed on each variable of childhood sibling relationship. A regression analysis is applied as follow:

\[ y = \beta_0 + \beta_1 x + \epsilon \]

where the \( y \) is adulthood social interaction and \( x \) is childhood sibling relationship. \( \beta_1 \) is the coefficient of independent variables and \( \epsilon_i \) is the residual.

Key research question 3

A Sobel Test is used to test whether a mediator, childhood sibling relationship carries the influence of sibling size to adulthood social interaction. Therefore, the independent variable (IV) is sibling size, the mediator (MV) is childhood sibling relationship, and the dependent variable (DV) is adulthood social interaction. First, we will run a regression analysis with sibling size (IV) and adulthood social interaction (DV) to check if it is significant. The model is written as follow:

\[ y = a + \beta x + \epsilon_1 \]

where \( y \) is adulthood social interaction, \( x \) is sibling size and \( \beta \) is coefficient. Next, we will regress childhood sibling relationship (MV) on the sibling size (IV) to examine its significance. The model is written as follow:

\[ x_m = b + \alpha x + \epsilon_2 \]

where \( x_m \) is childhood sibling relationship, \( x \) is sibling size and \( \alpha \) is coefficient. Last, we will run a regression analysis with sibling size (IV) and childhood sibling relationship (MV) predicting adulthood social interaction (DV). The model is written as follow:

\[ y = c + \beta' x + \tau x_m + \epsilon_3 \]
where $\beta'$ in this model is the coefficient of sibling size (IV), $\tau$ is the coefficient of childhood sibling relationship (MV). First step, we will check if $\tau$ is significant. Then, under the condition of all significance of $\alpha, \beta$ and $\tau$, controlling for the effect of $x_m$, if $\beta'$ is no longer significant, then we can conclude that there is a meditational effect of sibling relationship.
Method

Participants

The sample includes individual who participates this study of sibling relationship for a length of approximately 3 hours. Five hundred target subjects are selected from colleges in Great Boston area. Subject is asked to give family, education and birth information with the informed consent. Family information includes parent marital status, education level, family income range, and number of sibling, age space of each sibling. Education information refers to current year in school. Birth information includes age, gender, and position in siblings of subject. In order to avoid ethnic effect, a subject whose family is based in northeastern area is target subject. Participants were recruited by lecture instructor or teaching assistant via a paper of description in psychology class. The paper describes the study and criteria for participation. We receive the signed informed consent from interested students. Then, subject will arrange a time to participate the study with us online. Because the sample size is relatively big, so all the qualified data will be drawn for analyzing.

Procedures

We conduct the study with a room of 25 subjects at one time on campus and repeated the procedure 20 times until we collect data of 500 subjects. Subjects are required to review and sign informed consent at the beginning of study. During study, subjects complete questionnaire on computer separately. The questionnaire includes three parts.
The first part asks about parents and personal information. For example, "How many siblings do you have?"; "How old is your eldest and youngest sibling?"; "Did your father/mother finish school above senior level?". The second part asks about memory of childhood sibling relationship. Subject is encouraged to recall either pleasant or unpleasant experience in interacting with his/her siblings. If any unpleasant experience obscures subject’s emotion, subject has right to withdraw from the study. The third part asks about current experience of social interaction with peers, professors, co-workers. The interaction results will be reflected by individual’s well-being and social support.

Measures

Sibling relationships are encoded from subject’s responses to the Sibling Quality Relationship developed by Furman and Buhrmester (1985). We followed the coding manual by Furman and Buhrmester (1985), asking children to describe their sibling relationships. The manual is called Relationship Qualities Reported In Open-Ended Interviews with a list of 16 categories presented in Table 1. The score indicates the sibling relationship quality. Positive qualities are companionship, admiration of sibling, pro-social behavior and affection (e.g., “We play a lot together” and “We hardly ever play together” are coded as companionship). Negative qualities are antagonism, quarreling. Others are some general evaluation of subject’s relationship, such as “We have good relationship”. The questionnaire contained 17 scales for measuring the 16 categories. Two scales measure the last category, “general relationship evaluation”: satisfaction and importance of the relationship. Each scale contains 3 items that describes the correlated category. For example “How much you and your sibling do nice things for each other?” is one of the items describes the first scale of the category “intimacy”. Each item consists a 5-point Likert type rating (1 = hardly at all
to 5= extremely much). For the “Parental Partiality” scale, the response choices range from “almost always him/her (favored)” to “almost always me (favored)”. Scores were computed for each of the 17 scales by averaging the designed three items. Furman and Buhrmester identifies these 17 scales into 4 dimensions: warmth/closeness, relative status/power, conflict and rivalry. In this study, the warmth and conflict scales are utilized as two variables that present the sibling relationship, because they have been demonstrated frequently in other studies (Derkman, Scholte, Van der Vel, & Engels, 2010, Guinn, 2012).

Test reliability of 4 dimensions ranges from .58 to .86 with a mean of .71.

<table>
<thead>
<tr>
<th>Qualities</th>
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<tbody>
<tr>
<td>Intimacy</td>
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<tr>
<td>Pro-social behavior</td>
</tr>
<tr>
<td>Companionship</td>
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<tr>
<td>Similarity</td>
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<tr>
<td>Nurturance by sibling</td>
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<tr>
<td>Nurturance of sibling</td>
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<tr>
<td>Admiration by sibling</td>
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<td>Admiration of sibling</td>
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<tr>
<td>Affection</td>
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<td>Dominance by sibling</td>
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<td>Dominance over sibling</td>
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<tr>
<td>Quarreling</td>
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<td>Antagonism</td>
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<tr>
<td>Competition</td>
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<tr>
<td>Parental partiality</td>
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<tr>
<td>General relationship evaluation</td>
</tr>
</tbody>
</table>

Social interaction in encoded using the System for the Multiple Level Observation of Groups (SYMLOG), which is revised by Brian and Polley in 1987. Compared to the old version that developed by Bales and Cohen in 1979, the revised version slightly changes in the naming of the dimension. The complete values are shown in Table 2. The 26 values are rated on a scale, which is 1=rarely, 2=sometimes and 3=often. SYMLOG has been mainly categorized into 6 dimensions: dominance, submissiveness, unfriendly behavior, friendly
behavior, opposing task orientation of established authority and accepting task orientation of established authority. The score will be calculated in each dimension, where the higher score represents the related type of social interaction. Therefore, the social interaction is presented in these 6 variables. Each variable will be analyzed separately.

Table 2. Individual And Organizational Values

<table>
<thead>
<tr>
<th>Polley Revision of Bales and SYMLOG Consulting Group</th>
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<tbody>
<tr>
<td>Individual financial success, personal prominence and power</td>
</tr>
<tr>
<td>Popularity and social success, being liked and admired</td>
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<tr>
<td>Active teamwork toward common goals, organization unity</td>
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<tr>
<td>Efficiency, strong impartial management</td>
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<tr>
<td>Dogmatic enforcement of authority, rules, and regulations</td>
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<tr>
<td>Tough-minded, self-oriented assertiveness</td>
</tr>
<tr>
<td>Rugged, self-oriented individualism, resistance to authority</td>
</tr>
<tr>
<td>Active pursuit of change, new and unorthodox ideas</td>
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<tr>
<td>Leading group-centered efforts to change and seek new solution</td>
</tr>
<tr>
<td>Friendship, mutual pleasure, recreation</td>
</tr>
<tr>
<td>Responsible idealism, collaborative work</td>
</tr>
<tr>
<td>Conservative, established, “correct” ways of doing things</td>
</tr>
<tr>
<td>Rigid adherence to organizational expectations and rules</td>
</tr>
<tr>
<td>Self-protection, self-interest first, self-sufficiency</td>
</tr>
<tr>
<td>Rejection of established procedures, rejection of conformity</td>
</tr>
<tr>
<td>Change to new procedures, different ideas</td>
</tr>
<tr>
<td>Group-centered approaches to new ideas and new procedures</td>
</tr>
<tr>
<td>Trust in the goodness of others</td>
</tr>
<tr>
<td>Dedication, faithfulness, loyalty to the organization</td>
</tr>
<tr>
<td>Obedience to the chain of command, compliance with authority</td>
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<tr>
<td>Grudging self-sacrifice in the interests of the organization</td>
</tr>
<tr>
<td>Passive rejection of popularity, going it alone</td>
</tr>
<tr>
<td>Admission of failure, withdrawal of effort from the task</td>
</tr>
<tr>
<td>Tolerance for new ideas and different procedures</td>
</tr>
<tr>
<td>Comfort with coworker’s new ideas and suggestions for change</td>
</tr>
<tr>
<td>Giving up personal needs and desires, passivity</td>
</tr>
</tbody>
</table>

Birth order is the position relative to the target subject in siblings by age from old to young. For example, the first-born child is noted as 1. Only-child is noted as 0 in this item.

Sibling size is the number of siblings that subject has (including subject self). Gender is a dummy variable. Male subject is noted as 1 and female subject is noted as 0. Age space has been separate into 3 levels. Siblings whose age difference from 0 to 3 is noted as small age space, difference from 4 to 6 is noted as medium age space and difference larger than 7 is
noted as large age space.
**Expected Results and Implications**

In this study I expect a child with fewer siblings interacts better with family and has a better social interaction outcome in adulthood. The first reason is that child with fewer siblings receives more attention from parents and have a better connection with them child with more siblings. Moreover, parents with fewer children are more likely to have the patience to solve problems that their children might have. Secondly, compared to interactions with peers, interactions with adults, such as parents, are closer to real-world social interaction.

The second result that I expect is although a child with more siblings would adapt more easily to new surroundings, it still have a higher chance to form a characteristic of competitive, which might become an aggressive characteristic in adulthood. The practice of interacting from early childhood will unsurprisingly cultivate a concept of how to communicate with the outside world into a child’s mind. However, there also exists a possibility that too early to be exposed under a complicated interaction circumstances may turn out over self-protection and cause an obstacle to social interaction in adulthood. Therefore, the present study, which investigates the social interactions of young adults, is that who with fewer siblings will behave better than those with more siblings in social interactions.

Previous research has focused a lot of attention on birth-order. In this study, I think investigating the effect of number of siblings on the development of child attributes
one more possibility of understanding how childhood experience affects behavior in adulthood. Exploring the linkage between sibling size and social interactions can also help young couples determine how many children to have. Also, for developmental psychology study, understanding the process of how childhood experiences affect adulthood social interaction can inspire researchers to find more undiscovered linkages between childhood experience and adulthood outcome.

Although the expectation of the translation of sibling size and social interaction sheds some light on the sibling research, limitation exists need to be addressed in the future. Sibling relationship is just part of one's life. As White says the effect of sibling relationship will maintain and endure until gaining importance, as we get older. Therefore the present study considers sibling relationship as one of the key factors that have effects on adult life, it is not a time valid variable if looking at the association of later periods in one's life. Further studies can focuses on the target subject of middle aged and senior people with the same research method to compare the different effects of sibling size on adult outcome in young adulthood, middle-aged and senior years respectively.
Reference


