ABSTRACT:

Introduction: The purpose of this study was to examine longitudinal associations between being a sibling of a child with chronic illness and civic-mindedness in adulthood.

Methods: Secondary data analysis was conducted using data from the Ontario Child Health Study (OCHS) in 1983 and 2000. Multiple linear regression was used to examine adult civic-mindedness in healthy siblings of children with and without chronic illness (N = 1,051).

Results: For healthy siblings, adult civic-mindedness was significantly associated with the age (older), higher family socioeconomic status (SES), being a good student and participating in extra-curricular activities. There was a positive association between family SES and adult civic-mindedness for siblings of healthy children, but this relationship was weaker for the siblings of children with chronic illness. SES significantly moderated the interaction between sibling status and adult civic-mindedness for siblings of healthy children (p < .001), but not for siblings of children with chronic illness.

Conclusion: Research supports that certain advantages in childhood, including socioeconomic advantage, are related to civic-mindedness as an adult. Siblings of children with chronic illness may develop greater social maturity than healthy siblings of healthy children in low SES households, effectively making these children equally civic-minded in adulthood as siblings who come from high-SES households.
INTRODUCTION

A diagnosis of paediatric chronic illness (a health condition lasting for years or even the entire lifespan) can be quite devastating for families and may enhance tension within the family unit, especially if other siblings are involved in the rearing of the child. Siblings of chronically ill children may experience recurrent interruptions in their daily activities and the needs of the ill child are often prioritized. Siblings face many challenges, including processing the shift in parental attention towards the child with the chronic illness and contending with subsequent feelings of abandonment, navigating the complicated workings of sibling relationships, and negotiating feelings of jealousy and guilt about perceived preferential attention towards the ill child. A study on services provided to siblings of children with chronic illness found that siblings experienced hyper-responsiveness to changes in routines, separation anxiety towards parents, and felt confused and displaced from formal family order. Siblings of children with chronic illnesses can react with stress (e.g., feelings of responsibility, jealousy, fear, guilt, loneliness, resentment, sadness and embarrassment). Other research has found that siblings of children with chronic illness are at an increased risk of psychosocial distress, emotional disorder and poor peer relations, depression, anxiety and social isolation, internalizing and externalizing behaviour problems, lower self-esteem, and poorer academic performance.

Because siblings of children with chronic illness might have early adverse childhood experiences, it is important to know how these experiences might affect their longitudinal psychosocial health outcomes when they become adults. Furthermore, there is a dearth of research on the psychosocial effects of paediatric chronic illness that uses both longitudinal data and population-based samples for analysis. Understanding the longitudinal relationship between paediatric chronic illness and psychosocial outcomes in adulthood is important in order to identify factors that mitigate risks that siblings of children with chronic illness might face.

While the vast majority of the literature in this area report negative outcomes, a small number of studies report no significant difference between siblings and their healthy counterparts in terms of social competence and adjustment and school performance. Still, most of these studies are cross-sectional and use small, clinic-based samples as sources for the data. It is also important to note that the literature on healthy siblings of children with chronic illness also reports some positive effects, in addition to the negative psychosocial effects. Some studies have found that siblings experience positive psychosocial effects including enhanced family intimacy, good sibling relations, personal growth and social maturity. These positive outcomes might point to some resilience in this population.

After examining literature on positive psychosocial development and considering the findings in the context of paediatric chronic illness and family systems, it was hypothesized that healthy siblings of children with chronic illnesses could exhibit more adult civic-mindedness than healthy siblings of healthy children because, being responsible for and attentive to a brother or sister with chronic illness may provide more opportunities to develop compassion, empathy and social maturity through caring-for and learning to understand the lived experience of their sibling with chronic illness.

Additionally, the inconsistency in the literature may represent a failure to properly account for family attitudes and resources. Family characteristics, like SES, may be a factor that affects these risks to healthy siblings of children with chronic illness. SES could be associated with a set of attitudes and expectancies, which help determine how children fare when faced with adversity. For instance, family cohesion, consistency, values, and orderliness have all been thought to moderate the relationship between SES and child resilience. Therefore, we found it important to include SES as a possible moderator of the relationship between being a sibling of a child with chronic illness and positive psychosocial health outcomes in adulthood.

Objective

The objective of this study was to use longitudinal data from the Ontario Child Health Study (OCHS) to investigate the relationship between paediatric chronic illness and a positive psychosocial outcome, conceptualized as civic-mindedness, in healthy siblings. Specifically, we looked at whether these siblings were more likely to exhibit greater levels of civic-mindedness in adulthood than healthy siblings of healthy children and how the relationship might be moderated by family SES.

Theoretical Foundations

Family Systems Theory

Children with chronic illness and their siblings grow up in many environmental contexts, including the familial environment. According to Bowen’s Family Systems Theory, the family is a social system, influencing the functioning of every family member. According to Bowen, a change in one person’s functioning can lead to changes in the functioning of others.

Paediatric chronic illness changes the system, structure and function of the family unit. The illness often becomes the organizing principle of family life, such that the family may sacrifice other priorities in an attempt to cope with changes brought on by the illness. According to Cohen, childhood chronic illness imposes severe stresses called “generalized impact of illness stresses.” Families coping with these illness stressors are more likely to develop dysfunctional family patterns and the physical, mental, social and emotional demands of chronic illness on family members exacerbate these negative effects. For instance, illness-
related stresses could restructure the roles of family members, as well as shift relationships between parents and siblings. Constant exposure to health care personnel, teachers, and social workers may invade the “uniquely intimate landscape” of the family. Furthermore, patterns in family functioning may change as a result of stresses on the family structure. Families often adopt certain roles and strategies to help them preserve normalcy and a sense of control.

Using this Family Systems framework, chronic illness could be an “infectious agent” within a family and, therefore, could be traumatic or compromise the integrity of the relationships in the family unit. The illness experience can produce incrementally traumatizing experiences, not only for the individual with the illness, but also for other family members. However, not every traumatized individual will develop trauma symptoms. In fact, some traumatized children are resilient and capable of thriving despite being exposed to severe stressors. If family units are resilient and, as such, may cope with childhood chronic illness, then the healthy sibling may benefit from the exposure to this positive coping. This is perhaps why the relationship between being a healthy sibling of a child with chronic illness and adult civic-mindedness may vary as a function of family processes and attitude variables indicative of strength or weakness (e.g., SES).

### Positive Development

“Post-traumatic growth” refers to the positive psychological change that may result from dealing with stress or challenging life circumstances – a traumatized person may function at a higher level than before. The degree of post-traumatic growth is a function of many factors, including the severity of the traumatic event(s), the traumatized individual’s optimism and self-concept, the effectiveness of that individual’s coping mechanisms, and the availability of social support.

There are factors that may distinguish all “resilient” children from others. Involvement in extracurricular activities may foster and display individual talents, thereby contributing to an individual’s global sense of competence, esteem, efficacy and wellbeing. These extracurricular activities may also promote the child’s involvement in social networks, which could then promote achievement or socially appropriate conduct. Additionally, many cross-cultural studies have found that opportunities for participation in socially or economically useful tasks are related to heightened self-esteem, enhanced moral development, increased political activism and the ability to create and maintain complex social relationships. Healthy siblings may also be caretakers of their brothers or sisters with chronic illness. While adopting the role of the “caretaker” may cause psychosocial distress or burden, it may also allow for the healthy sibling to engage in activities that promote development of social maturity, empathy, and altruism – behaviours that may be considered to be reflected in the civic-mindedness measure utilized in this study (donating to charity, volunteering with a formal organization, volunteering informally, donating blood, and being part of a religious group or community organization).

### Current Study

This study aimed to examine the longitudinal effects of pediatric chronic illness on healthy siblings. If chronic illness is considered to be a traumatic event, then, according to research on positive psychosocial development, healthy siblings of children with chronic illness may have more positive outcomes than healthy siblings of healthy children because having a sibling with a chronic illness may allow for opportunities to develop skills in social maturity, empathy, and altruism. Additionally, the mixed results in the literature about the effects of pediatric chronic illness on healthy siblings could be due to omission of the family context. Therefore, SES was tested as a moderator of the association between being a healthy sibling of a child with chronic illness and adult civic-mindedness.

### METHODS

#### Data Collection

This study examined data from the Ontario Child Health Study (OCHS), a prospective epidemiological study that was the collaborative work of Statistics Canada and McMaster University. Investigators followed the same cohort of children over a 17-year period in order to track early childhood experience and longitudinal health outcomes. Data were collected from 1,869 Ontario families with 3,294 children 4-16 years of age, and explored the factors that impact both pediatric health and subsequent functioning as an adult. In the first period of data collection (1983), information was obtained via home interview conducted by trained interviewers from Statistics Canada. In each household, the interview was conducted with a primary parent respondent, 95% of whom were mothers. Parental reports included both parental health and health of the children in the household. In the final follow-up period of data collection (2000), original respondents were located and interviewed, yielding a response rate of 71.5%. Detailed information regarding survey design and methodology of the OCHS can be obtained in Boyle et al.

This study used data from all children aged 4-16 years who were eligible for the study in 1983. This cohort was between 21-33 years of age when participating in the final period of data collection, which started in 2000 and continued into 2001. Of the individuals who did not participate in 2001, 910 were non-respondents, 26 were excluded because of death and 3 were excluded because they were institutionalized. Families were recruited for the study sample and the sample consists of two family groupings: one or more healthy siblings who have one or more brothers/sisters with a chronic illness.
as well as two or more siblings in families where no children have a chronic illness. This resulted in a final sample size of \(N = 1,051\) healthy siblings in 2000 that were examined in this study.

**Variables and Measures**

**Dependent Variable**

The number of civic-minded activities (donating to charity, volunteering with a formal organization, volunteering informally, donating blood, and being part of a religious group or community organization) engaged-in in adulthood was the dependent variable.

**Independent Variables**

Chronic illness included blindness, visual problems (even with glasses), deafness or hearing problems (even with hearing aids), absence of speech or other severe speech problems, persistent pain, asthma, heart problems, epilepsy or convulsions without fever, kidney disease, arthritis, cerebral palsy or other paralysis, muscular dystrophy or other muscle diseases, spina bifida, diabetes, cancer, cystic fibrosis, missing limbs, physical deformities (missing extremities, limbs, cleft palate, club foot), and miscellaneous other health problems of comparable severity and chronicity\(^{11}\).

Upon reviewing the literature on the psychosocial effects of chronic illness on healthy siblings, it was found that several variables – age and birth order, sex, academic achievement, family size, family dysfunction, and family socioeconomic status – are important predictors of both positive and negative sibling psychosocial adjustment\(^{18,22,47-53}\). For this reason, demographic variables included the child’s age in 1983, child’s sex, and whether or not their household was in a small urban-rural area or an urban area. The child level variables were the child’s birth order, whether or not their teacher reported them to be a “good student” (yes/no), a scale-based measure of their emotional and behavioural functioning (derived from 13 source variables), whether or not parents endorsed them having “good friendships” (yes/no), the number of activities the child had participated in over the past year (e.g., sports involving coaching or instruction, music lessons, dance, art, other non-sports activities or membership in a club or group with adult leadership) and a parent report of how well the child got along with family, peers, and teachers in the past six months. Family-level variables include a measure of family SES, a measure of family dysfunction (derived from 12-item McMaster Family Assessment Device)\(^{54}\), and the number of people in the household.

**Statistical Analyses**

**Preliminary Analyses**

Descriptive statistics (means and standard deviations) were generated for each variable used in the analyses. The variables in the analyses were examined for the assumptions of multivariable analysis. The dependent variable, civic mindedness, was cross-tabulated with independent variables to ensure there were no empty cells. Descriptive statistics were run to examine skewness and kurtosis. To further test for normality, Kolmogorov-Smirnov and Shapiro-Wilk tests were completed. All analyses were conducted using SPSS\(^{55}\).

Multicollinearity was examined using Pearson, Point-biserial and chi-square analyses. The continuous variables were centered using group mean centering taking each score and subtracting the mean of the scores for that variable\(^{56}\). Centering data on the mean helps minimize multicollinearity\(^{56}\).

**Sample Characteristics and Group Differences**

Chi-square tests and one-way Analysis of Variance (ANOVA) were used to examine differences between healthy siblings of children with and without chronic illness on child and family-level variables, as well as the civic-mindedness variable.

**Multivariate Analysis**

A blocked multiple linear regression was used to predict number of civic-minded activities engaged-in in adulthood. The first block of predictors included child demographic variables: age, sex, and urban-rural. The second block included whether or not the healthy sibling has a chronically ill sibling. The third block included family variables: birth order, family dysfunction and family SES. Block four included child psychosocial variables: good student, emotional problems, good friendships, participation in extra-curricular activities and getting along well with others. Finally, block five included the interaction between being a sibling of a child with chronic illness and family SES.

**Post-Hoc Regression**

A post-hoc regression was done to explore the interaction between being a sibling of a child with chronic illness and family SES and the number of civic-minded activities engaged-in in adulthood in more detail. The sibling illness variable (e.g., whether the healthy child had a sibling with chronic illness), family SES, and the interaction were entered into a linear regression to obtain the regression coefficients for each variable.

**RESULTS**

**Preliminary Analyses**

**Sample Characteristics and Group Differences**

The characteristics of the sample are described in Table 1. Of the 2,026 healthy siblings included in the original 1983 sample, 82.9% \((N = 1,680)\) were siblings of healthy children and 17.1% \((N = 346)\) were siblings of children with chronic illness. In 1983, the mean age of siblings of healthy children was 10.11 (SD = 3.46), and 9.99 (SD = 3.55) for siblings of children with chronic illness. In this study,


### Table 1. Sample Characteristics and Group Differences for Healthy Siblings (N = 2,026)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Healthy Sibling of Child with Chronic Illness</th>
<th>Healthy Sibling of Healthy Child</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Children [n]</td>
<td>17.1 (346)</td>
<td>82.9 (1,680)</td>
</tr>
<tr>
<td>Age M, [SD]</td>
<td>9.99 (3.55)</td>
<td>10.11 (3.46)</td>
</tr>
<tr>
<td>% Sex (female) [n] ***</td>
<td>52.9 (183)</td>
<td>49.5 (831)</td>
</tr>
<tr>
<td>% Urban-Rural [small] [n]</td>
<td>43.10 (149)</td>
<td>39.30 (661)</td>
</tr>
<tr>
<td>Birth Order M, [SD] **</td>
<td>1.93 (0.88)</td>
<td>1.77 (0.80)</td>
</tr>
<tr>
<td>% Good Student [yes] [n] ***</td>
<td>55.90 (170)</td>
<td>59.40 (891)</td>
</tr>
<tr>
<td>Emotional Problems M, [SD] ***</td>
<td>3.11 (3.02)</td>
<td>2.68 (2.70)</td>
</tr>
<tr>
<td>% Good Friendships [yes] [n]</td>
<td>77.00 (264)</td>
<td>78.10 (1,292)</td>
</tr>
<tr>
<td>Getting Along Scale M, [SD] *</td>
<td>5.01 (1.73)</td>
<td>4.75 (1.81)</td>
</tr>
<tr>
<td>Participation Index M, [SD]</td>
<td>1.86 (1.67)</td>
<td>1.80 (1.69)</td>
</tr>
<tr>
<td>Families</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family SES M (SD)</td>
<td>0.31 (3.76)</td>
<td>0.29 (3.77)</td>
</tr>
<tr>
<td>Family Dysfunction M, (SD) **</td>
<td>21.35 (4.96)</td>
<td>20.13 (5.25)</td>
</tr>
<tr>
<td>Outcome Variables in 2001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Civic-Minded Activities M, [SD]</td>
<td>2.49 (1.29)</td>
<td>2.53 (1.29)</td>
</tr>
</tbody>
</table>

Chi-square tests were used to compare group differences between categorical variables, One-way ANOVA tests were used to compare group differences between continuous and categorical variables.

* \( p < 0.05 \); ** \( p < 0.01 \), *** \( p < 0.001 \).

† \( p < 0.10 \).

\( n = \) frequency within sample, \( M = \) mean, \( SD = \) standard deviation.

Detail may not add because of rounding.

compared to siblings of healthy children, siblings of children with chronic illness were more likely to be females who were younger than their afflicted sibling. They were also more likely to not be classified as a “good student” by their teacher, have more emotional problems, get along with others, and be from families with higher dysfunction.

### Multivariate Analysis

Results of the linear regression are presented in Table 2. Of the child demographic variables (age, female, small urban-rural), only age was significantly positively associated with number of civic-minded activities engaged-in adulthood. The illness variable (being a sibling of a child with chronic illness) was not significant. Of the family-level variables (birth order, family dysfunction, and family SES), family SES was significantly positively associated with civic-mindedness and age remained significant. In the fourth block, older age, family SES, being a good student, and participation in extra-curricular activities were all significantly positively associated with the outcome of civic-mindedness. Finally, the interaction between being a sibling of a child with chronic illness and family SES was significantly associated with the outcome. Age, higher family SES, being a good student, and participation in extra-curricular activities all remained significantly associated with the outcome in the final model. Model fit statistics for blocks one, three, four, and five indicate significant improvement to the previous models (see Table 2).

### Post-Hoc Regression

The regression equations for healthy siblings of children with chronic illness and healthy siblings of healthy children were graphed using the minimum and maximum values for SES (see Figure 1). The bar chart depicts an SES continuum, arbitrarily identified, in which the relationship between sibling status and civic-mindedness is portrayed. In the low SES condition, healthy siblings of children with chronic illness engaged in slightly more civic-minded activities (\( n = 2.62 \)) than healthy siblings of healthy children (\( n = 2.06 \)) (Figure 1). Simple slopes analysis revealed that the slope of the regression equation for healthy sibling of healthy children differed significantly from zero (\( p < .001 \)), whereas the chronic illness healthy sibling status did not.

### DISCUSSION

For all healthy siblings, civic-mindedness in adulthood was significantly associated with older age, higher family SES, being a good student and participation in extra-curricular activities. These results are consistent with much of the existing research literature on the development of prosocial behaviour in adulthood. As hypothesized, there was a positive association between the interaction variables (SES and sibling status) and adult civic-mindedness. To further tease this relationship apart, we performed a simple slopes analysis.

Simple slopes analysis revealed that family SES significantly moderated the relationship between being a sibling of a healthy child and adult civic-mindedness (\( p < .001 \)), making it stronger; however, it did not significantly moderate the relationship between being a sibling of a child with chronic illness and adult civic-mindedness, leading us to believe that the strength of the relationship between being a sibling of a child with chronic illness and being civic-minded...
in adulthood is independent of the family's SES. Therefore, if the family had a low SES, this would make the siblings no less likely to be less civic-minded in adulthood than if the family had a high SES. This result is interesting when we consider it in relation to the hypothesis that healthy siblings of children with chronic illness would be more civic-minded in adulthood because they may have more opportunities to develop skills in compassion, empathy and social maturity (as a result of caring for or living with a brother or sister with chronic illness). It could be that having a sibling with a chronic illness denotes some protective effect against the influence of family SES on civic-mindedness.

In some of the literature on chronic illness and healthy siblings, these siblings have been found to experience positive effects\(^46\)\(^{,}\)\(^47\), including enhanced family intimacy\(^48\), good sibling relations\(^49\), personal growth\(^50\) and social maturity\(^51\). In their experiences with the child with chronic illness, the healthy sibling may contribute responsibly to physical and emotional care\(^52\). In a qualitative study on siblings of children with diabetes, all of the siblings reported closer relationships with their chronically ill brother or sister\(^53\). The same study reported that many parents educate the healthy siblings about the child's condition or acknowledge that the healthy sibling has been educated through their experiences in dealing with the sick child\(^54\). It could be that responsibility, contribution, close relationships and education surrounding a chronic illness create a certain awareness of the importance of being civic-minded in the healthy sibling, one that translates to prosocial behaviour in adulthood. These interactions with a brother or sister with a chronic illness may teach the child the value of empathy, patience and altruistic behaviour. Perhaps the combined effects of the adversity of socioeconomic disadvantage and chronic illness in the family leads to other factors not measured in this study, such as greater empathy, social consciousness and social maturity in siblings, which may in turn boost levels of adult civic-mindedness to levels comparable to those who grew up in households with no childhood chronic illness and socioeconomic advantages. It could also be that families with low SES have less “baggage” (e.g., lower disappointment or guilt) and treat their child with chronic illness more normally, thus reducing the impact on the family and, inherently, the healthy sibling.

### Age

Older children were found to be more civic-minded in adulthood, perhaps because the civic-mindedness variable was measured by the number of civic-minded activities in which they engaged in adulthood and, if they were older at the time of the initial and final waves of data collection, they had more time to engage in these activities (e.g., donating to charity, volunteering with a formal organization, volunteering informally, donating blood, being part of a religious group or community organization). It is also possible that older individuals may be more mature or have more life experience (e.g., 33-year olds versus 21-year olds), which may translate into engaging in more civic-minded activities.

### Family SES

There is evidence that children from families with low SES are less likely to be civic-minded, as measured by volunteerism\(^55\). Higher levels of positive development (e.g., social competence, life satisfaction, trust and tolerance of others, trust in authorities and institutions and civic engagement) in adulthood have been related to higher SES while growing up\(^56\). Children from families with high SES may not have to work as adolescents and young adults and, therefore, may have more time to volunteer. Children who are raised in families with higher SES have more access to, and are more likely to take advantage of, neighbourhood resources and may be more likely to participate in activities and relationships that are psychosocially beneficial\(^57\).

### Good Student

Children who were considered “good students” by teachers (yes/no teacher report) engaged in more civic-minded activities in adulthood. While there are limitations to this definition (as conceptualized in the OCHS), and this measure might be quite subjective regarding the teacher’s opinion of the student, this result is consistent with other literature maintaining educational attainment is a predictor of adult volunteerism\(^58\). Similarly, better adjustment in school has been linked to higher levels of positive development in emerging adulthood\(^59\). Being a good student may facilitate this adjustment in that teachers may hold good students in higher regard; whereas, if a teacher thinks a child is a poor student, the student may be able to perceive that. These are called expectation effects, which are documented in literature on educational psychology\(^60\)\(^,\)\(^61\).

### Extra-curricular Participation

Participation in extra-curricular activities during childhood was significantly associated with adult civic-mindedness. Extra-curricular activities included sports involving coaching or instruction, music lessons, dance, art, other non-sports activities or membership in a club or group with adult leadership. All of these activities involve some degree of social interaction. A recent longitudinal study found that social interaction is associated with higher level of civic activities in youth and continues into adulthood\(^62\). In high school, participation in these sorts of activities predicts greater likelihood of volunteering\(^63\) and voting\(^64\) later in life. The authors posit that certain activities that are not necessarily inherently “psychosocial” (e.g., arts or sports) could be microcosms of public life and, as such, give individuals opportunities to build social skills needed for civic engagement\(^65\). For instance, being part of a sports team may require a child to learn teamwork, reciprocity and the value of having a common goal. These skills could also be part of the social skills needed for civic engagement. People may donate money to charity or volunteer for an organization because they believe in the goal of the civic activity and understand that it requires teamwork to attain this goal.
Limitations of this Study

There are several study limitations that must be considered. One of the caveats of longitudinal study is attrition. People drop out of the study for various reasons and longitudinal data is lost. Also, low-base rates of certain chronic illnesses in the population make chronic illness difficult to capture. Interpretation of the results should note attrition and low sample size.

Second, the chronic illness variable was parent-report and not verified by an external source. There is limited agreement between parents and children in report data\textsuperscript{66,67}. One study found that parents of children with chronic illness reported more sibling adjustment problems than did the siblings themselves\textsuperscript{64}. Parents might self-diagnose their child or exaggerate their child’s symptoms. They also might misunderstand their child’s diagnosis and report something that is inaccurate.

CONCLUSION

The findings of this study indicate that, in this combined sample of healthy siblings, adult civic-mindedness is significantly associated with being older, being a good student, higher family SES and more participation in extra-curricular activities, which is consistent with research on predictors of civic-mindedness or prosocial behaviour in adulthood\textsuperscript{38,50,58}.

There was a significant association between number of civic-minded activities engaged-in in adulthood and the interaction between being a sibling of a child with chronic illness and family SES. Living with a sibling with a chronic illness in a family with lower SES could lead to greater social maturity and consciousness in these siblings, which may enhance levels of adult civic-mindedness to levels comparable those who spent their formative years in more affluent households, without any paediatric chronic illness.

It is important that we further explore exactly why siblings of children with chronic illness seem to be less affected (when compared to siblings of healthy children) by the influence of family SES, when it comes to demonstrating civic-mindedness in adulthood. It will be important to broaden our research and find ways to elucidate whether or not these children, in fact, do have more opportunities to cultivate skills and practice in social maturity, empathy, responsibility and altruistic behaviour. This way, our research might be able to inform policies and practices within realms of child health and development, allowing us to find ways of nurturing children, helping them to realize their potential as functioning, contributing members of society.
References


**Table 2.** Linear Regression Predicting Adult Civic-Mindedness (Number of Civic-Minded Activities Engaged-In) in Healthy Sibling.

(N = 1,051) in 2001

<table>
<thead>
<tr>
<th>Block 1</th>
<th>Block 2</th>
<th>Block 3</th>
<th>Block 4</th>
<th>Block 5</th>
</tr>
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<tbody>
<tr>
<td><strong>B</strong></td>
<td><strong>SE</strong></td>
<td><strong>β</strong></td>
<td><strong>B</strong></td>
<td><strong>SE</strong></td>
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<tr>
<td>Child Demographic Variables</td>
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</tr>
<tr>
<td>Age</td>
<td>0.04</td>
<td>0.01</td>
<td>0.11***</td>
<td>0.04</td>
</tr>
<tr>
<td>Sex (female)</td>
<td>0.05</td>
<td>0.08</td>
<td>0.11***</td>
<td>0.05</td>
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<tr>
<td>Urban-Rural (small)</td>
<td>0.03</td>
<td>0.08</td>
<td>0.03</td>
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<td>Sibling of Chronic Illness (Yes)</td>
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<td>0.11</td>
<td>0.01</td>
<td>0.05</td>
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<td>Birth Order</td>
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<td>0.06</td>
<td>0.003</td>
<td>0.02</td>
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<tr>
<td>Family Dysfunction</td>
<td>-0.02</td>
<td>0.01</td>
<td>-0.57†</td>
<td>-0.01</td>
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<td>Family SES</td>
<td>0.04</td>
<td>0.01</td>
<td>0.12***</td>
<td>0.03</td>
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<td>Good Student (Yes)</td>
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<tr>
<td>Emotional Problems</td>
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<tr>
<td>Good Friendships (Yes)</td>
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<td>Participation in Extra Curricular (Yes)</td>
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<td>Getting Along With Others</td>
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<td>Interaction Term</td>
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<tr>
<td>Sibling of Chronic Illness x Family SES</td>
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<tr>
<td>R2</td>
<td>0.01</td>
<td>0.01</td>
<td>0.03</td>
<td>0.04</td>
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<tr>
<td>F for Change in R2 a</td>
<td>4.57**</td>
<td>6.99***</td>
<td>2.32*</td>
<td>9.931**</td>
</tr>
</tbody>
</table>

* p < .05, ** p < .01, *** p < .001
† p < .10, * (N = 1,051) in 2001

*a Block 1 fit statistics indicate improvement to the null model and Block 3, 4 and 5 fit statistics indicate improvement to the previous model.*