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Beyond Parents: The Role of Sibling Social Capital in Self-Confidence in Emerging Adulthood

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Abstract

A robust literature focused on social capital created in the family has emphasized the efficacy of parental involvement in child, adolescent, and young adult development. Social capital created with and derived from parents has strong and consistent connections to academic achievement and attainments and pro-social behavior, as well as protective effects against delinquent behavior and mental health difficulties. Other forms of family social capital, however, are less well understood. In this paper, we explore the association between social capital built with and derived from siblings and self-confidence during emerging adulthood, including examining how sibling social capital built at different times might contribute to the development of self-confidence. We use restricted-use data from the National Longitudinal Study of Adolescent to Adult Health (Add Health), with information on 3630 respondents who had siblings who were also study participants, and Ordinary Least Squares (OLS) models with robust standard errors to test our hypothesis that greater sibling social capital would be associated with greater self-confidence in adolescents and emerging adulthood, net of other forms of social capital and demographic characteristics. Our findings support that hypothesis, suggesting that social capital derived from siblings is another significant potential source of key resources during important developmental stages. In particular, sibling social capital has a significant correlation to the self-confidence of individuals transitioning to adulthood.

Keywords: adolescents; emerging adulthood; self-confidence; social capital; siblings; sibling relationships; family

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1. Introduction

To date, most research on family social capital has focused on the parent–child relationship. While this work has identified family social capital derived from parents as a key resource in child and youth development (cf. Parcel et al. 2010), the question of how efficacious social capital derived from other family members might be has not been resolved. At the same time, there is clear logic that connects social resources and ties among siblings to the exchange of social capital. The sibling relationship plays an important role in a child's development. Their experiences together encourage emotional, social, and intellectual development through both positive and negative experiences (Sisler and Ittel 2014). Siblings can strengthen the development of self-confidence in youth by providing adolescents with encouragement and support, and by transmitting norms about individual values or providing information that leads to the successful completion of tasks and goals

(Coleman 1988, 1990). We argue that sibling social capital is also important to development, and in particular that greater sibling social capital will be associated with increased self-confidence during a key part of the life course, the transition from adolescence to adulthood. Understanding how sibling social capital is created and its potential effects on important developmental outcomes like self-confidence can help families, educators, and communities better support the rising generations.

1.1. Self-Confidence

Self-confidence is a baseline for success and a critical factor in young people's development. Self-confidence can be understood as one's belief in their abilities, qualities, and judgment (Milevsky 2005). Early understanding of self-confidence has identified it as a quality measured through a mix of personality and ability questions (Burns et al. 2016). Self-confidence is not an inherent personality trait; rather, it is a learned attribute that fosters positivity and self-acceptance (Arora and Kishor 2019). This belief in one's abilities is a factor that can boost academic achievement, mental health, and social success (Tucker and Winzeler 2007). Self-confidence can help young people see tasks as less of a threat and increase their ability to perform under pressure (Hollenbeck and Hall 2004). Research has identified several key factors that positively influence the development of self confidence, including cultural, religious, and social experiences (Arora and Kishor 2019). Other factors negatively affect self-confidence, such as mental health challenges, lack of social support, and fears (Arora and Kishor 2019). That is to say that the development of self-confidence is a process in which individuals are inherently embedded in larger structures, and they gain or lose self-confidence through their interactions with these structures.

Studies show that individuals who have self-confidence are likely to work harder and participate more in society (Urdan 2006). Self-confidence allows for greater resilience, as those with increased self-confidence are better equipped to frame challenges and disappointments as external to themselves and find positive outlooks on negative experiences that allow for forward movement (Halilsoy 2024). One study found that teachers of school-aged children would assign more confident students higher grades regardless of their performance, intelligence, and age (Kleitman et al. 2012). By contrast, low self-esteem or a lack of self-confidence increases the probability of suffering from depression or self-harm (Jain 2010). Developing self-confidence at a young age is a way to set an individual up for greater success, as they are more likely to try new things and keep persisting when confronted with difficulty. While overconfidence can result in taking high risks, ignoring feedback from others, or stunting personal development, overall, self-confidence has been found to help individuals overcome life's challenges and live a life of purpose, passion, and fulfillment (Halilsoy 2024).

1.2. Social Capital Within the Family

How, then, can societies encourage the development of self-confidence during sensitive times in the life course such as the transition to adulthood? One potential mechanism is through social capital. Social capital denotes both social ties and resources that flow across those ties (Coleman 1990). The most common understanding of social capital is the connections and shared values between individuals, which help them support one another through a variety of mechanisms, including communicating norms and sharing reciprocal resources (Conrad 2008). The advantages that accrue to greater social capital range widely, but all stem from obtaining and providing access to resources through social connections. James Coleman's approach to social capital, which has been widely applied to child, adolescent, and youth development, posits that social networks and the information,

obligations, and norms that flow across those connections comprise the social capital available to young people (Coleman 1988, 1990).

The intimate nature of family units is an especially potent location for the exchange of social capital. While alternative perspectives such as social bonding theory (Hirschi 1969) or family cohesion theory (Olson et al. 1979) consider family bonding and interconnectedness, family social capital theory suggests a broader application of these components by considering them as one among many social resources that can be exchanged across actors, in this case specifically within families, as and through social capital. Social bonds or cohesion, then, join other indicators of capital that can transmit information, obligations, and norms from one actor to another (Coleman 1990). In doing so, family social capital theory better explicates the mechanisms through which not only family interconnectedness, but specific social resources transmitted between or across specific actors, translate social investments into positive outcomes (Hoffmann and Dufur 2018).

Indeed, research examining such resources demonstrates strong connections between family social capital and a variety of positive developmental and pro-social outcomes (cf. Dufur et al. 2015; Parcel et al. 2010). Social capital exchanged between parents and children is associated with lower odds of participating in delinquent behavior, improved academic performance, and lower adolescent involvement in alcohol and drug consumption (cf. Dufur et al. 2015; Parcel et al. 2010).

There is also increasing evidence that family social capital is sufficiently powerful to affect outcomes not just in childhood and adolescence, but extending to outcomes later in the life course, such as during the transition from adolescence to adulthood. For example, family social capital is associated with both academic achievement and attainment, and recent studies suggest it may influence these outcomes even more than financial or human capital (Dufur et al. 2024; Leppard and Dufur 2025). This research demonstrates that family social capital is both sufficiently strong and sufficiently "stretchy" as to influence outcomes after young people are no longer co-resident with their families of origin. Still, even these inquiries that connect family social capital to young adult outcomes focus on only one kind of family social capital: capital built with or derived from parents. Such definitions of social capital, while useful, are not able to accommodate other actors with whom youth might build social capital in families, including grandparents, aunts and uncles, cousins, and, as we study here, siblings.

1.3. Family Social Capital Derived Through the Sibling Relationship

Siblings have the potential to share a uniquely close and complex relationship. In many families, siblings spend more time together than with their parents (McHale et al. 2012). This can allow siblings to form close bonds that are distinct from others made throughout life (Dunn 2002). One such example is evident in a study conducted by Buhrmester and Furman, where college-aged youth reported receiving as much emotional support from their closest sibling as they did from their mother (1990). Another study revealed that siblings actively draw guidance and support from one another (Gillies and Lucey 2006). Such resources fall squarely within Coleman's notions of social capital being not only ties with others, but also the norms, information, and obligations that move across those ties, but very little research has examined siblings as a potential source of social capital. As an example, studies have linked family cohesion with better adolescent outcomes, such as lower depression (Bian et al. 2024; Moreira and Telzer 2015) or academic outcomes (Wang et al. 2021). However, most research examining family cohesion uses variables that ask about overall family emotional warmth, communication, and adaptability without making distinctions between parents, siblings, or other family members (Roman et al. 2025), again leaving open the question of whether different actors within families provide social capital

resources in different ways or formats. In addition, such work does not examine potential forms of family social capital generated among siblings, such as time spent together and social closure, which have been shown to be important components of the social resources exchanged as part of family social capital (Coleman 1990; Dufur et al. 2024).

Given this logical connection between sibling relationships and the resources inherent in social capital, why have family social capital scholars ignored the potential social capital created among siblings? One possible explanation is the reliance on Coleman's explanation of social capital theory among family social capital scholars. Coleman's original theorizing grew from his efforts to determine how human capital was passed from adults (presumably high in human capital like knowledge or how to navigate norms) to children (presumably low in human capital) (Coleman 1988, 1990). Because siblings are usually relatively similar in age, all siblings in a family may be classified as children in inquiries that use Coleman's approaches, and thus all siblings are classified as passive consumers rather than active contributors in the exchange of social capital. However, siblings likely do a great deal to enforce norms (Hughes et al. 2018), and older siblings commonly teach younger siblings how to manage school, friendship, and neighborhood settings (Holland et al. 2007). These studies suggest that siblings contribute to increased family social capital. Another possible explanation is that the kinds of large datasets that have often been employed to examine family social capital have insufficient information about sibling relationships and interactions to support a study of sibling social capital, a shortcoming the data we employ here address. Regardless of the reasons behind this dearth, it remains true that scholars know little about the social capital young people might build and exchange with their siblings, or about the possible outcomes associated with that social capital.

1.4. Linking the Sibling Relationship and Self-Confidence

Siblings, and the social capital they create, might be especially useful in the development of self-confidence. Siblings can serve as positive social models that motivate children, increasing self-confidence and therefore helping them to overcome challenges (Urdan 2006). Some studies suggest that youth who have positive relationships with their siblings are more likely to receive support and encouragement, which fosters more feelings of competence (Yeh and Lempers 2004), while others highlight how positive sibling relationships reduce adolescent stress, potentially allowing for successful goal completion and increased self-confidence (Soler and Palacios 2022). Sibling relationships also contribute to social competence, physical self-worth, the ability to express emotions, and pro-social behavior (Francka et al. 2019). In contrast, in sibling relationships where negative norms are passed across networks or important information is withheld, one study indicated a dearth of useful family social capital, with youth experiencing long-lasting feelings of inadequacy, worthlessness, and low self-esteem (Plamondon et al. 2021). Although this study examines a lack of family social capital built with siblings, it is an indication that the sibling relationship has long-term effects on self-confidence. These sibling social resources map well onto Coleman's conceptualization of social capital as the exchange of information, obligations, and norms, increasing our confidence that sibling social capital is both an important form of family social capital and that it is related to self-confidence. We argue that sibling bonds can function as a secure base, nurturing confidence in adolescents. As a result, we argue that respondents who report higher levels of sibling social capital will also report greater self-confidence.

H1: *We predict that young people who have higher levels of social capital deriving from sibling relationships will report higher self-confidence, net of other forms of social capital and demographic advantages.*

We also test whether sibling social capital is "stretchy," or whether earlier investments of sibling social capital will continue to be associated with later outcomes as has been shown for parental social capital (Dufur et al. 2024). While we expect that sibling social capital built at any point in the life course will be positively associated with self-confidence, we also expect that more recently accrued sibling social capital will be more closely related to self-confidence.

H2a: *We predict that sibling social capital will be positively associated with self-confidence in emerging adulthood regardless of when it was acquired.*

H2b: *We predict that more temporally proximate sibling social capital will be more strongly associated with self-confidence in emerging adulthood than is sibling social capital built earlier in the life course.*

Finally, social capital approaches are most useful when they can provide practical suggestions for where social investments can be most useful. While we expect that all forms of investments siblings make in each other will be useful, based on previous research examining parental social capital (cf. Hoffmann and Dufur 2018), we expect that social capital measures that tap emotional bonding and reciprocity will be most closely associated with self-confidence.

H3: *We predict that respondents' emotional closeness to their sibling will have the strongest associations with self-confidence during emerging adulthood among the sibling social capital variables.*

2. Materials and Methods

2.1. Data

We use data from the National Longitudinal Study of Adolescent to Adult Health (Add Health), a nationally representative study from the United States that focuses on health, relationships, beliefs, and behaviors as adolescents age into adulthood. The Add Health includes five waves of study data; some waves also include data from parents and teachers. During the first wave of surveys conducted in 1994–1995, 20,745 adolescents in grades 7–12 were interviewed. During this first wave, there was additional data collected about 17,669 parents of these respondents and an in-home survey of the same subset of respondents. It is this subset of respondents that was followed through subsequent waves of data collection. Wave II was conducted in 1996, with approximately 15,000 of the original participants completing additional questions. Wave III was collected in late 2001 and early 2002, when respondents were between 19 and 26 years old, or in an emerging adulthood life stage, with interviews with 14,979 of the original in-home sample.

Add Health is an especially appropriate data set for us to use to study sibling social capital because the dataset includes a subsample of respondents who also had a sibling in the study; we use restricted-use data on those siblings here. In this way, we are able to overcome the lack of sibling information in other data collection efforts that may have thwarted efforts to examine sibling social capital. This results in a sample of 3640 respondents who have data on sibling relationships and interactions. Our study uses data from Wave III to measure self-confidence, and data from Waves I–III to measure sibling social capital at different times and to establish demographic control variables (see Table 1).

Table 1. Variable Descriptions and Descriptive Statistics.

Variable	Mean	SE
Dependent Variables		
Self confidence	2.74	0.008
Independent Variables		
Sibling Social Capital		
Wave 1		
Time spent with sibling	2.19	0.014
Time respondent and sibling spends with the same friend group	1.43	0.018
Frequency of fights with sibling	1.94	0.018
Felt love toward sibling	2.92	0.017
Sibling social capital scale for Wave 1	8.49	0.044
Wave 2		
Time spent with sibling	2.34	0.012
Time respondent and sibling spends with the same friend group	1.69	0.019
Frequency of fights with sibling	2.2	0.019
Felt love toward sibling	3.06	0.017
Sibling social capital scale for Wave 2	9.15	0.045
Wave 3		
Frequency of fights with sibling	2.88	0.018
How often respondent sees sibling	1.99	0.024
How often respondent talks with sibling on the phone	2.40	0.022
How often respondent writes or emails sibling	1.485	0.028
Does respondent have a desire for more contact with sibling	0.698	0.009
How often respondent asks sibling for help	2.18	0.026
Emotional closeness to sibling	2.96	0.016
Sibling social capital for Wave 3	14.6	0.061
Total Sibling Social Capital	32.24	0.109
Other Social Capital Variables		
Father Social Capital	4.31	0.019
Mother Social Capital	4.55	0.015
Control Variables		
Biological Sex (1 = female)	0.50	
Age	15.55	0.028
Race 1 'White' 2 'Hispanic' 3 'Black' 4 'Native American' 5 'Asian/Pacific Islander' 6 'Other' 7 'Mixed; 2 races' 8 'Other; 3+ races. Proportions reported here	1: 0.585 2: 0.153 3: 0.115 4: 0.003 5: 0.098 6: 0.009 7: 0.034 8: 0.004	
Marriage-like relationship	0.349	
Household income	48.60	0.941
Respondent education 1 'No academic credential' 2 'High school credential' 3 'Associate's degree' 4 'Bachelor's degree' 5 'Graduate/Professional degree'. Proportions reported here.	1: 0.063 2: 0.803 3: 0.126 4: 0.007 5: 0.0001	

Table 1. *Cont.*

Variable	Mean	SE
Parent education 0 ' Never went to school' 1 '8th grade or less' 2 'More than 8th grade, did not graduate high school' 3 'Business or trade school, not high school' 4 'High school graduate' 5 'Completed GED' 6 'Business or trade school after high school' 7 'Went to college, but did not graduate' 8 'Graduated from a college or university' 9 'Professional training beyond a 4-year degree'. Proportions reported here.	0: 0.003 1: 0.057 2: 0.081 3: 0.026 4: 0.246 5: 0.055 6: 0.102 7: 0.186 8:0.149 9: 0.095	—
Parent marital status	0.799	0.007
Felt depressed	0.499	0.012
Suicidal thoughts	0.13	
Academic performance	2.76	0.017

Notes: N = 3630.

2.2. Measures

2.2.1. Dependent Variable: Self-Confidence

Table 1 highlights descriptive statistics and measures for the different variables and scales we use. Our dependent variable is a composite measure of self-confidence created using eight self-perception variables from Wave III, when respondents are between 19 and 26 years old. Respondents rated their agreement with statements like "I have many good qualities," "I have a lot to be proud of," "I like myself just the way I am," and "I feel I am doing things just about right." We also used variables that asked "how intelligent are you," "how popular are you," "how attractive are you" and "how confident are you in yourself?" Each question ranged from 1 = strongly agree to 5 = strongly disagree; we reverse coded variables so higher values indicated more confidence (1 = strongly disagree; 5 = strongly agree). We combined the answers to these questions and divided by the number of variables to return the scale to the original measurement strategy of a 5-point scale (0–5) with 5 reflecting the highest self-confidence scores (alpha = 0.77).

2.2.2. Independent Variable: Sibling Social Capital

We measure sibling social capital using variables across Waves I, II, and III that capture the quality and frequency of sibling interaction. These variables reflect a range of relationship dimensions, including time spent together, conflict, closeness, communication, and shared friend groups. In the first two waves, respondents were asked how much time they spend with their sibling and how much time the two siblings spend together with the same group of friends, reflecting both connectedness to the sibling and social closure with siblings knowing the same friends (both measured as 0 'None' 1 'Little' 2 'Some' 3 'A lot'). They were also asked how often they fight with their sibling (0 'Very often' 1 'Often' 2 'Sometimes' 3 'Seldom' 4 'Never') and how often they feel love for their sibling (0 'Never' 1 'Seldom' 2 'Sometimes' 3 'Often' 4 'Very often'). For both Wave I and Wave II, we combine these four variables into a total measure of sibling social capital for that particular wave, measured from 0–14, with 14 indicating higher social capital.

Reflecting the fact that some siblings are no longer co-resident in early adulthood, questions asked in Wave III include how often respondents see their sibling (0 'Never' 1 'Seldom' 2 'Sometimes' 3 'Often' 4 'Very often'), talk on the phone (0 'Never' 1 'Seldom' 2 'Sometimes' 3 'Often' 4 'Very often'), or writes/emails them (0 'Never' 1 'A few times a year' 2 'Once or twice a month' 3 'Once or twice a week' 4 'Almost every day'). Additionally, they were asked whether they wish they had more contact with their sibling (0 'No' 1 'Yes'),

how often they ask their sibling for help when needed (0 'Never' 1 'Seldom' 2 'Sometimes' 3 'Often' 4 'Very often'), how emotionally close they feel to them (0 'Not at all close' 1 'Not very close' 2 'Somewhat close' 3 'Quite close' 4 'Very close'), and how often they fight (0 'Very often' 1 'Often' 2 'Sometimes' 3 'Seldom' 4 'Never'). Each of these are coded so that larger numbers reflect higher social capital. We combined these seven variables into an overall measure of sibling capital for Wave III, ranging from 0–21, with 21 indicating the highest level of social capital. As an overall measure of sibling social capital, we include a composite variable of the 15 different variables across Waves I–III ranging from 0–52, with a mean of 32. Between Waves I–III, questions capture both the positive and negative dynamics of sibling relationships and allow us to explore how those experiences relate to self-confidence. Including both positive and negative components of relationships, or the choice to include inverse items, even with such items recoded so higher scores indicate greater social capital, is an approach with both pros and cons. One concerning possibility is that respondents do not read or listen carefully, and that their responses on inverse items might be out of step with the way they answer other items (cf. Colosi 2005; van Sonderen et al. 2013). Fortunately, correlational and crosstabular analyses examining the sibling social capital items we use here indicate this is probably not a large issue in these data. Some research suggests that the directionality or wording of inverse items introduces enough difference that inverse items are likely to indicate a separate dimension in empirical data reduction techniques (cf. Merritt 2012). We did not find any such pattern with the items we use here. By contrast, the inclusion of inverse items can help to prevent acquiescence bias by requiring respondents to think carefully about their answers (D'Urso et al. 2023; Podsakoff et al. 2003; Salazar 2015). Given our empirical evidence that the inverse items we use here are in step with the other social capital measures and do not represent a separate dimension, we chose to continue to use measures of fighting (reverse coded) here. Sensitivity analyses with fighting removed from the sibling social capital scale did not produce different patterns of results.

2.2.3. Other Forms of Social Capital

Beyond sibling relationships, we've included several measures of other possible avenues of social support, including parental social capital (Dufur et al. 2015), which has been shown to promote many pro-social outcomes. It is possible that sibling social capital might represent merely a "spillover" of overall strong family relationships that parents promote; we control for parental social capital here to try to determine whether any associations we see with sibling social capital and self-confidence might be spurious. To measure father social capital, we include a measure of five yes or no questions about the respondents' relationship with their father (0 'No' 1 'Yes'), taken from Wave I. These questions ask about if the respondent feels emotional warmth toward their father, is satisfied with their communication in their relationship, if they are satisfied with the overall relationship with their father, how close they feel to their father, and if the respondents' feel like their father cares about them. We use these same variables to measure social capital with the respondent's mother. These measures are consistent with the most widely used approaches to what is typically called family social capital, but is really social capital generated from parents, in large quantitative data sets of youth respondents (Barton et al. 2020; Crosnoe 2004; Dufur et al. 2024; Hoffmann et al. 2020; Jarvis et al. 2020; Poff et al. 2024; Teachman et al. 1997; Wright et al. 2001), and are designed to be comparable to previous work using Add Health that measures parent social capital (cf. Leppard and Dufur 2025; Dufur et al. 2015, 2019; Hoffmann and Dufur 2018; Schiefer and Dufur 2025). We also check for correlations between sibling social capital and both father and mother social capital. Sibling social capital is weakly correlated with fathers' social capital (r = 0.08) and mothers'

social capital (r = 0.10), suggesting that sibling social capital captures a distinct aspect of family relationships that parental social capital does not cover. While this in part likely reflects slightly different measurement opportunities across parents and siblings, these weak correlations also help support our assertion that sibling social capital is a distinct construct from family cohesion, which has typically measured global family warmth, adaptability, and communication (Bian et al. 2024). Our findings instead provide evidence that siblings and parents create different kinds of social capital and in different ways.

While it is logical that parents and siblings might build social capital in different ways, necessitating this inquiry into how sibling social capital works, it is unfortunate that the Add Health data lack inverse items on parental social capital so that we are unable to measure parental social capital in part as the ability to avoid or repair relationships after conflict in similar ways we were able to measure sibling social capital. While our measurement approaches to both forms of social capital are empirically sound, we caution readers against making direct comparisons of coefficients between sibling social capital and parental social capital given these sometimes understandable and sometimes unavoidable differences in measurement across the two constructs.

2.2.4. Control Variables

We also include various demographic data in our study. Key control variables we consider include family background, such as family income and parent education. Parent income is continuously measured in thousands from 0–999. We used the highest education attained by any parent to measure parent education, where 0 'Never went to school' 1 '8th grade or less' 2 'More than 8th grade, did not graduate high school' 3 'Business or trade school, not high school' 4 'High school graduate' 5 'Completed GED' 6 'Business or trade school after high school' 7 'Went to college, but did not graduate' 8 'Graduated from a college or university' 9 'Professional training beyond a 4-year degree.' Parental education is important to control because of the previously established relationship between this factor and a wide variety of child and youth outcomes. We also consider demographic factors, including race (1 'White', 2 'Hispanic' 3 'Black' 4 'Native America' 5 'Asian/Pacific Islander' 6 'Other' 7 'Mixed; 2 races' 8 'Other; 3+ races'), gender (0 'Male' 1 'Female'), level of education at time of Wave III survey (1 'No academic credential' 2 'High school credential' 3 'Associate's degree' 4 'Bachelor's degree' 5 'Graduate/Professional degree'), and age at time of Wave I survey (12–19), as well as a measure of whether the respondent had been in a marriage-like relationship for one month or longer at the time of the Wave III survey (0 'No' 1 'Yes'). These factors can all shape social experiences and opportunities. Mental health is another critical control variable that we include in the study, as psychological challenges can affect self-perception. We include a measure of how often the respondent felt depressed during the past week at the time of the Wave I survey (0 'Never or rarely' 1 'Sometimes' 2 'A lot of the time' 3 'Most or all of the time') as well as a measure of whether they had seriously considered suicide in the past year (0 'No' 1 'Yes'). We also include respondent's self-reported math grade at Wave I (1 'D or lower' 2 'C' 3 'B' 4 'A'), as a measure of academic performance during adolescence, as this may also affect self-confidence.

2.3. Analytic Plan

To test our hypothesis, we use Ordinary Least Square regression models (OLS) to examine associations between sibling social capital and reported self-confidence. While the range on the self-confidence outcome variables is from 1–5, the measurement strategy creates decimal places between whole numbers, mimicking a continuous variable, so OLS is an appropriate modeling strategy. Alternative modeling strategies (e.g., rounding to whole numbers and using ordinal logistic regression to predict category placement) demonstrate

similar patterns to the OLS models but introduce unnecessary complexity to interpretation, so we report the OLS models here. We also used robust clustered errors to address any shared error introduced by siblings being paired. Alternative modeling approaches such as multilevel modeling did not reveal different patterns and, again, introduced unnecessary complexity in interpretation, so we report the models with robust standard errors here. To address missing data across variables and waves, we used Stata 18's MICE protocol, creating 25 complete data sets for analysis.

Our first model uses the composite measure of sibling social capital from all three waves to provide a global baseline test of Hypothesis 1, that greater levels of sibling social capital would be associated with self-confidence during emerging adulthood. The first model includes only that composite measure of sibling social capital to predict Wave III self-confidence. In Model 2, we add parent social capital variables and presence of marriage-like partnership to see whether any observed association between sibling social capital and self-confidence persists in the presence of other forms of social capital. Model 3 introduces control variables to ensure all observed associations between sibling social capital and self-confidence are not an artifact of associations with greater financial or human capital or other demographic advantages.

We then repeat these analyses using the measures of sibling social capital broken out into Waves I, II, and III to test the potential "stretchiness" of social capital and whether temporally proximate sibling social capital is more influential on self-confidence in emerging adulthood than sibling social capital built earlier in the life course. As in our first set of tests, in our first model we include only sibling social capital variables. Model 2 adds other forms of social capital, and Model 3 introduces demographic controls.

Finally, we repeat these analyses again but look at sibling social capital as separate items, hoping to determine whether there are certain forms of sibling social capital that would be most efficacious for specific investment. As above, Model 1 tests these specific social capital items, Model 2 includes other social capital variables, and Model 3 adds demographic controls.

3. Results

Table 1 provides descriptives for all study variables. On average, respondents reported self-confidence slightly above the midpoint of the scale, with an average score of 2.74 out of 5. In Wave I, siblings spend on average "some" time together, but more time with each other than together with the same set of shared friends. They report fighting often–perhaps typical of siblings close enough in age to be in the dataset together–but also that they often feel love for their sibling. Overall, respondents in Wave I report average levels of sibling social capital at 8.5 on a 14-point scale. Respondents report similar levels of sibling social capital in Wave II, though with somewhat less fighting. In Wave III, where more siblings are not co-resident with each other, on average respondents report seeing, talking with, or asking for help from their siblings "sometimes." At the same time, they report slightly higher scores on feeling emotionally close to siblings, and two-thirds of respondents report wanting more contact with their siblings. The average overall score for Wave III sibling social capital is 14.6 on a 21-point scale; the average score for the sibling social capital measure that includes all waves of sibling data is just over 32 on a 52-point scale.

In terms of other forms of social capital, respondents report very high social capital with both father and mothers during adolescence, albeit with slightly higher scores for social capital created with mothers. The sample is evenly split between men and women, with an average age of 15.55 in Wave I, which translates to an average age of 22.5 at Wave III. Of the respondents, 58.5% identified as white, 15.3% as Hispanic, 11.5% as Black, 0.3% as Native American, 9.8% as Asian or Pacific Islander, 0.9% as Other, 3.4% as mixed

with two races, and 0.4%as mixed with three or more races; these numbers reflect Add Health's strategy to oversample for racial minorities. Parental household income during adolescence averaged nearly $49,000, and the highest level of education attained by a parent was most commonly high school graduation (24.6%), followed by some college without a degree (18.6%), graduating from college or university (14.9%), and smaller proportions completing trade or business school (8.1% before and 10.2% after high school), GEDs (5.5%), or reporting limited school (0.3% never attended and 13.8% not graduating high school). 80 percent of respondents lived with parents who were married to each other during their adolescence, and most respondents reported low levels of depression or suicidal thoughts. Finally, the average respondents reported a high school GPA that reflects getting mostly Cs in classes.

The models in Table 2 test our first hypothesis that sibling social capital will be positively associated with self-confidence in emerging adulthood by using the global sibling social capital measure to predict self-confidence. Model 1 shows a small but statistically significant positive association with self-confidence ($p < 0.001$). In Model 2, we introduce parental forms of social capital. As expected given previous research on family social capital, both maternal and paternal have sizeable positive and statistically significant relationships with self-confidence in emerging adulthood. When we include the parental social capital variables, there is some attrition in the sibling social capital coefficients, but they remain statistically significant predictors of self-confidence. In Model 3, which includes all controls, sibling social capital remains highly significant with self-confidence ($p < 0.001$). While the coefficient for sibling social capital is small, this scale is large (a 52-point scale). The average respondent reported a sibling social capital score of 31; some who reported a sibling social capital score of 21 would have a self-confidence score nearly a point lower than the average respondent, which is substantial on the 5-point self-confidence scale. Maternal and paternal social capital continue to show positive correlation with self-confidence, though the confidence in those findings is slightly lower than in models without controls ($p < 0.01$, $p < 0.05$). Being female is associated with significantly lower self-confidence scores on average. Black respondents report higher levels of self-confidence ($p < 0.001$) and Asian/Pacific Islander respondents report lower levels ($p < 0.01$). Having a more educated parent and respondents being more educated themselves are significant positive predictors of self-confidence. These findings provide evidence for Hypothesis 1 and affirm the importance of sibling social capital as a potential mechanism for increased self-confidence, even after accounting for key demographic and psychological variables.

We now turn to models using the sibling social capital variables split across the three waves (capital built in earlier adolescence, later adolescence, and in emerging adulthood contemporaneous to the measures of self-confidence) (Table 3). This allowed us to view whether earlier or more recent sibling social capital is more predictive of self confidence in emerging adulthood. Model 1 shows that sibling social capital from Wave I is not significant. However, sibling social capital from Wave II is a significant positive predictor of self-confidence, though, again, the coefficient is small ($p < 0.05$). Wave III sibling social capital proves to have a much larger association with self-confidence and is significant at the $p < 0.001$ level. These effects persist in Model 2, even with maternal and paternal social capital added, and with little attrition in coefficient size. Maternal and paternal social capital are also significant, positive predictors of self-confidence (paternal: $p < 0.01$; maternal: $p< 0.001$). Wave II sibling social capital, Wave III sibling social capital, and parental social capital all remain significant when control variables are added in Model 3, with the coefficient for Wave III sibling social capital increasing slightly. Coefficients for controls were, as we could expect, similar for these models as they were in Table 2, with being female being a statistically significant negative predictor of self-confidence and more

educated parents and having experienced a marriage-like relationship being statistically significant positive predictors of self-confidence. Black respondents report significantly higher levels of self-confidence and Asian/Pacific Islander respondents report lower levels. Taken together, these models generally provide mixed evidence for Hypothesis 2a, that sibling social capital would be positively associated with self-confidence regardless of when it was acquired. Notably, Wave I sibling social capital is not a significant predictor at any stage of this set of models. These results suggest that the most recent sibling relationships, as represented in Wave III, are more strongly associated with adolescent self-confidence than the sibling relationships earlier in their youth. While sibling social capital is somewhat "stretchy," then, in that sibling social capital generated in late adolescence is still a positive predictor of self-confidence, this pattern is perhaps not as robust as patterns observed both here and in previous research that parental social capital is stretchy for a number of outcomes in emerging adulthood (cf. Leppard and Dufur 2025; Dufur et al. 2024). However, we find solid evidence for Hypothesis 2b, in that the more temporally proximate forms of sibling social capital were good predictors of self-confidence.

Table 2. Regression Results for Sibling, Mother, and Father Social Capital Models Predicting Self-Confidence.

	Model 1		Model 2		Model 3	
	Coeff.	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**
Social Capital						
Sibling Social Capital	0.011 ***	0.001	0.010 ***	0.001	0.010 ***	0.001
Father Social Capital			0.021 **	0.007	0.015 *	0.007
Mother Social Capital			0.035 ***	0.009	0.024 **	0.009
Controls						
Biological sex (female)					−0.112 ***	0.0150
Age					0.006	0.005
Hispanic					0.017	0.022
Black					0.141 ***	0.024
Native American					−0.085	0.137
Asian/Pacific Islander					−0.085 **	0.025
Other					0.089	0.082
Mixed; 2 races					0.101	0.042
Mixed; 3+ races					0.010	0.123
Household income					0.00008	0.0001
Parent education					0.001	0.003
Respondent Education					0.044 *	0.017
Parent marital status					−0.018	0.019
Felt depressed					−0.043 ** −0.032	0.011
Suicidal thoughts					−0.040	0.023
In a marriage-like relationship					0.029	0.017
Academic performance					0.008	0.008
Constants	2.40 ***	0.04	2.17 ***	0.0053	2.09 ***	0.10

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Data source: National Longitudinal Study of Adolescent to Adult Health; N = 3630.

Table 3. Regression Results for Siblings Wave I, II, III, Mother, and Father Social Capital Models Predicting Self-Confidence.

	Model 1		Model 2		Model 3	
	Coeff.	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**
Social Capital						
Sibling Social Capital (Wave I)	0.003	0.003	0.0003	0.003	0.001	0.003
Sibling Social Capital (Wave II)	0.009 *	0.003	0.009 **	0.003	0.007 *	0.003
Sibling Social Capital (Wave III)	0.018 ***	0.003	0.018 ***	0.003	0.019 ***	0.003
Father Social Capital			0.023 **	0.007	0.016 *	0.007
Mother Social Capital			0.036 ***	0.009	0.026 **	0.009
Controls						
Biological sex (female)					−0.111 ***	0.015
Age					0.007	0.005
Hispanic					0.019	0.022
Black					0.146 ***	0.024
Native American					−0.075	0.137
Asian/Pacific Islander					−0.083 **	0.026
Other					0.078	0.082
Mixed; 2 races					0.104 *	0.042
Mixed; 3+ races					−0.001	0.123
Household income					0.0001	0.0001
Parent education					0.002 *	0.003
Respondent Education					0.038 *	0.017
Parent Marital Status					−0.021	0.019
Felt depressed					−0.033 **	0.011
Suicidal thoughts					−0.041	0.023
In a marriage-like relationship					0.028	0.017
Academic performance					0.009	0.008
Constants	2.362 ***	0.043	2.125 ***	0.054	2.05 ***	0.101

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; Data source: National Longitudinal Study of Adolescent to Adult Health; N = 3630.

Our final set of models is represented in Table 4, where we test Hypothesis 3 concerning what kinds of sibling social capital might be most related to self-confidence in emerging adulthood. Because the findings from Table 3 suggested that temporal proximity of sibling social capital was important, we focus in these models on individual indicators of sibling social capital from Wave III data. A clear pattern among these indicators emerges. Less fighting with sibling and greater emotional closeness with sibling are consistently positive and significant predictors of self-confidence, in the main, in models including both forms of parental social capital, and in models that include all controls. Interestingly, while seeing or talking on the phone with siblings were not significant in any model, frequency of writing to or emailing sibling becomes a significant and negative predictor of self-confidence in the presence of demographic controls, perhaps indicating that physical distance translates to emotional distance. The other items indicating sibling social capital were not significant in any model. Maternal and paternal social capital remain notable positive predictors of self-confidence, and controls continue to act in similar ways to previous models, with being female a negative predictor of self-confidence and higher parental education and having had a marriage-like relationship being significant positive predictors. With respect to race, Black respondents continue to report higher levels of self-confidence and Asian/Pacific Islander respondents report lower levels. These models provide support for Hypothesis 3, which predicted that emotional components of social capital would be better predictors of self-confidence during emerging adulthood. Indeed, we found no significant effects of

repeated and regular contact, but positive significant effects of emotional closeness and avoiding strong negative emotions in the form of fighting.

Table 4. Regression Results for Sibling and Social Capital Models Predicting Self-Confidence.

	Model 1		Model 2		Model 3	
	Coeff.	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**
Social Capital						
How often respondent sees sibling (Wave III)	−0.008	0.011	−0.009	0.010	−0.004	0.010
How often respondent talks with sibling on the phone (Wave III)	0.004	0.011	0.007	0.011	0.008	0.011
How often respondent writes or emails sibling (Wave III)	0.010	0.009	0.009	0.009	0.007	0.009
Desire for more sibling contact (Wave III)	0.001	0.022	0.004	0.021	0.006	0.021
Frequency of fights with sibling (Wave III)	0.047 ***	0.008	0.047 ***	0.008	0.041 ***	0.008
Helping sibling when needed (Wave III)	0.028 **	0.010	0.028 **	0.010	0.038 ***	0.010
Emotional closeness to sibling (Wave III)	0.046 ***	0.011	0.041 ***	0.011	0.029 **	0.010
Father Social Capital			0.022 **	0.007	0.017 *	0.007
Mother Social Capital			0.038 ***	0.009	0.028 **	0.009
Controls						
Biological Sex (female)					−0.105 ***	0.016
Age					0.009	0.005
Hispanic					0.023	0.022
Black					0.152 ***	0.024
Native American					−0.077	0.137
Asian/Pacific Islander					−0.081 **	0.026
Other					0.088	0.082
Mixed; 2 races					0.105 *	0.042
Mixed; 3+ races					−0.014	0.123
Household income					0.0001	0.0002
Parent education					0.001	0.004
Respondent education					0.034 *	0.017
Parent marital status					−0.018	0.019
Felt depressed					−0.032 **	0.011
Suicidal thoughts					−0.047	0.023
In a marriage-like relationship					0.023	0.017
Academic performance					0.008	0.008
Constants	2.397 ***	0.045	2.139 ***	0.057	2.057 ***	0.101

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; Data source: National Longitudinal Study of Adolescent to Adult Health; N = 3630.

4. Discussion

One of the overarching goals of our research was to explore an area that has remained largely untested: whether the sibling relationship serves as a significant source of family social capital. If sibling social capital is a distinct and efficacious resource, families and societies have an additional tool with which to encourage positive development in the key life stage of emerging adulthood. Specifically, we aimed to determine how sibling social capital might help develop self-confidence, which is a key component in motivation and achievement in early adulthood. Our results support this claim: sibling social capital is a significant and relevant source of family social capital, and it is influential on prosocial young adult outcomes, at least in the form of self-confidence. Previous research that has established family social capital as a key resource in development, even into adulthood when offspring often leave the family home, has been built on a literature that defined family social capital only as a resource obtained from parents. We extend this concept to demonstrate that emerging adults also draw on the support and influence of their siblings, suggesting a new and potent source of family social capital. While these findings are novel in terms of examining family social capital, they do echo some previous work comparing family social capital and social capital derived from non-familial sources, such as schools and neighborhoods. This research found evidence that as children aged, social capital from

outside the family became increasingly important in promoting prosocial behaviors (Dufur et al. 2015). Perhaps the same is true in terms of young people starting to use social capital from their siblings as they age. Emerging adults may strive to maintain relationships with their siblings, as it is likely that they no longer have as close of proximity to each other. This shift may reflect the natural process that occurs when teens begin to lean towards independence, though we note parental social capital remained "stretchy" in our inquiry here, as well.

Additionally, we note that emotional closeness was the most important predictor among sibling social capital variables. This supports the notion that quality in the sibling relationship is more important than the frequency of contact. As siblings age and move out of their family home, it stands to reason that their interactions will be less consistent and frequent. However, if youth are able to develop and maintain emotionally close relationships during childhood and adolescence, these investments are more closely linked to the development of self-confidence. Our findings are also supportive of the general thrust of previous work that linked family cohesion to positive adolescent outcomes (Bian et al. 2024; Moreira and Telzer 2015; Wang et al. 2021), but again shows that global measures of family social capital that do not take into account the structural positional differences between siblings and parents are missing important distinctions in the resources available to youth.

These findings highlight the way social capital can evolve as children age and move towards independence. Based on our findings, families may benefit from fostering the relationships their children have with one another through family practices that assist siblings in building close and supportive relationships, such as constructive conflict resolution and family recreational activities. As children grow older, they may begin to look more to their siblings for support than to their parents, highlighting the possibility that a stronger family unit may provide conditions wherein sibling social capital is more likely to develop. Likewise, ongoing research could provide policymakers, governments, educational institutions, and religious organizations with the context and evidence needed to consider initiatives that meaningfully strengthen sibling and family relationships.

This research of course has some limitations. While Add Health is perhaps the only large, nationally representative dataset with this degree of information on sibling relationships over time, it does include only siblings who are very near to each other in age. We are thus unable to make comparisons between, for example, such siblings and families where a much younger sibling views a much older sibling as a role model (Her et al. 2021), which may make the older sibling especially effective at transmitting the kinds of norms that help make up social capital. In addition, Wave III of the Add Health, from which we take our emerging adulthood outcome, was gathered nearly 25 years ago. While robust data collection for Add Health continues to this day, respondents in Wave III did not have the same challenges to their self-confidence that youth exposed to modern social media pressures face today (Midgley et al. 2021); in addition, later cohorts may come from smaller sibships (Kearney et al. 2022), which may change the nature of both how sibling social capital is created and the uses it has. We are also unable to make direct comparisons across different types and sources of family social capital, such as directly comparing social capital derived from siblings to that derived from parents. Given our establishment of basic benchmarks of the efficacy of sibling social capital here, future research could attempt measurement strategies such as standardization to make these forms of capital more comparable. In addition, researchers should consider collecting data for all forms of social capital that include or account for inverse items to address potential acquiescence bias (D'Urso et al. 2023; Podsakoff et al. 2003; Salazar 2015), which would, again, improve comparability across different forms of capital. At the same time, it is logical that young people would

build social capital with their siblings in different ways than they would with their parents, and any measurement or modeling strategy must still take into account these differences in structural positions. Still, the Add Health has many strengths, including its large sample and generalizability, and with appropriate cautions to consider these limitations when interpreting results, we believe they represent strong data with which to address these questions about how sibling social capital and self-confidence may be connected.

The future of this line of inquiry is bright. Future research could further investigate how sibling social capital influences mental health and psychological well-being. Additionally, studies could examine the degree to which sibling social capital might be influential on health behaviors, including substance use, likelihood of seeking medical attention when needed, and balanced eating habits and regular exercise.

We also could examine how social capital accumulation might differ across different sibling configurations. Understanding the complexity of sibling social capital is essential, as sibling dynamics vary widely from family to family. We look forward to investigating the social capital exchanged between older vs. younger siblings, and seeing how age and gender of siblings affect the exchange of social capital and improved self-confidence and other pro-social outcomes. This may be especially pertinent to how social capital can be expressed as norms; older siblings may be more influential in enforcing norms. Key questions driving future investigation could include: How does self-confidence differ when social capital is derived from older siblings versus younger siblings? Is sibling social capital diluted when one has many siblings (Downey 2001)? Expanding research on sibling social capital will provide valuable insights into the long-term benefits of sibling relationships on overall adolescent to adult development.

5. Conclusions

Our study explores the way sibling social capital is associated with self-confidence in emerging adults. Existing research highlights the role family social capital, as measured by parental investment, has on adolescent development. Our study examines a new perspective on family social capital that has not been studied thoroughly before, the role of siblings and the exchange of pro-social resources across these familial ties. Our study provides novel evidence demonstrating that sibling relationships represent a significant and meaningful facet of family social capital, contributing to the information, obligations, and norms exchanged in the family. We examine the outcome of self-confidence and how it is influenced by the social support siblings provide to one another, particularly during the transition from adolescence to adulthood. By examining data collected through the National Longitudinal Study of Adolescent to Adult Health (Add Health), we have been able to better understand the correlation between these variables and learn how the sibling relationship affects self-confidence development.

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Data Availability Statement: The authors are unable to share datafiles because the restricted-use data is only available via contract. Interested parties may initiate access to the restricted-use data process by contacting The National Longitudinal Study of Adolescent to Adult Health. https://addhealth.cpc.unc.edu/data/restricted-use-data-sets/, accessed on 12 October 2025.

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Abbreviations

The following abbreviations are used in this manuscript:

Add Health	National Longitudinal Study of Adolescent to Adult Health
OLS	Ordinary Least Square regression models

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