Longitudinal Changes in Adolescents’ School Bonding During the COVID-19 Pandemic: Individual, Parenting, and Family Correlates

Sahitya Maiya, Aryn M. Dotterer, and Shawn D. Whiteman
Utah State University

The current study examined changes in adolescents’ school bonding from before to during the COVID-19 pandemic and its individual, parenting, and family-level correlates. Participants were two adolescents (50% male; $M_{\text{age}} = 14$ years) and one parent (85% female; $M_{\text{age}} = 45$ years) from 682 families ($N = 2046$) from an ongoing longitudinal study. Adolescents reported on their school bonding, stress, and coping, while parents reported on their involvement in adolescents’ education and pandemic-related financial need. A two-wave latent change score model suggested that adolescents’ school bonding decreased from before to during the COVID-19 pandemic. Stress and pandemic-related financial need served as risk factors, whereas coping and parental involvement served as protective factors against declines in adolescents’ school bonding.

Key words: coping – financial need – parental involvement – school bonding – stress

INTRODUCTION

In the Spring of 2020, the COVID-19 pandemic forced schools to shut down in order to mitigate the spread of the virus. It is estimated that these shutdowns affected over 55 million students in the United States, with nearly every state ordering or recommending that schools remain closed through the end of the 2020 school year (Education Week, 2020). These closures altered the daily lives of students, families, and educators as they quickly made the switch to remote and online schooling. Emerging research has explored how changes related to the pandemic affected adolescents’ mental health (e.g., Magson et al., 2021). The pandemic also impacted educational outcomes as simulation models projected that students ended the 2020 school year with 63–68% of the learning gains in reading and 37–50% of the gains in mathematics compared to gains in a typical school year (Kuhfeld et al., 2020).

A next step in advancing our understanding of the impact of the COVID-19 pandemic on adolescent well-being is to utilize empirical, longitudinal data to examine the extent to which adolescents’ school bonding changed from before to during the pandemic. Conceptualized as the connections that adolescents have with their schools, school bonding is an important indicator of well-being because of its predictive associations with academic achievement (Fredricks, Blumenfeld, & Paris, 2004). From a developmental assets framework, school bonding is indicative of adolescents’ internal assets and commitment to learning (Scales, 2005). Guided by an ecological risk and resilience framework (Powers, 2010), the present study examined changes in adolescents’ school bonding from before to during pandemic-related shutdowns and whether individual, parenting, and family-level correlates were associated with those changes over time.

Theoretical Framework

The present study draws upon an ecological risk and resilience framework to examine changes in school bonding in the context of the COVID-19 pandemic shutdowns experienced in Spring 2020. Resilience can be thought of as a process in which an individual overcomes, copes successfully, or avoids negative factors associated with exposure to risk (Masten, 2013). An important feature of this framework is the recognition that both risk and protective factors can help mitigate negative out-
comes and promote positive adaptation. Risk factors include any influences that increase the probability of a negative outcome, such as stress or financial need. Protective factors are influences that have the potential to reduce the negative effects of risk or increase an individual’s ability to overcome such risks, such as coping or parental involvement. Consistent with an ecological perspective on risk and resilience (Powers, 2010) that acknowledges the embeddedness of adolescents’ multiple ecological contexts, in this study, we explored risk and protective factors across individual, parenting, and family levels.

Adolescence, School Context, and School Bonding

School is a salient ecological context in the lives of adolescents. It is within this context that many aspects of adolescents’ development including cognitive development, identity, and social relationships are supported. A feature of adolescents’ experiences in school that has garnered scholarly attention is school bonding. Researchers operationalize school bonding as the extent to which students feel close to people at their school, feel a part of their school, and are happy to be at their school (Johnson, Robert, & Elder, 2001). Important, this definition emphasizes the broader socio-ecological context of peers, students, and teachers present in the school environment (Allen, Kern, Vella-Brodrick, Hattie, & Waters, 2018). A related construct, school engagement, is multidimensional, consisting of behavioral, cognitive, and emotional dimensions (Fredricks et al., 2004). School bonding is often used to index the emotional dimension of engagement, though researchers may use different terminology such as connectedness or attachment.

A well-established body of research documents numerous benefits of school bonding as it pertains to youths’ academic and psychosocial well-being. For instance, stronger bonds to school are associated with better grades, increased competence, and academic motivation (Allen et al., 2018; Wang & Sheikh-Khalil, 2014). Considering that school bonding is an aspect of internal assets (Scales, 2005), it is not surprising that school bonding is associated with higher levels of happiness, psychological functioning, and adjustment (Jose, Ryan, & Pryor, 2012). Given that school bonding is thought to be malleable and responsive to environmental conditions (Allen et al., 2018), it is possible that school-related disruptions due to the COVID-19 pandemic could alter youths’ school bonding. Recent research, for example, has linked pandemic-related school closures and virtual learning to feelings of social isolation and loneliness among adolescents (Larsen, Helland, & Holt, 2021; Ng, Cosma, Svacina, Boniel-Nissim, & Badura, 2021). In the present study, we explored how school bonding changed during a pandemic that necessitated that adolescents stay home and move to online learning environments.

Individual Level: Stress, Coping, and School Bonding

Stress is defined as the experience of anticipating or encountering demands in individuals’ goal-related contexts, whereas coping is defined as individuals’ efforts to avoid or minimize threat, harm, and loss, and/or to lower any distress (Carver & Connor-Smith, 2010). Adolescents’ perceptions of stress and coping processes are critical to consider due to the many disruptions associated with the COVID-19 pandemic. Given the range of stressors (e.g., COVID-19 worries, school closures, diminished face-to-face contact with peers; Ellis, Dumas, & Forbes, 2020) and coping strategies (e.g., emotion-focused, problem-focused; Duan et al., 2020) operating in tandem, we investigated adolescents’ perceptions of general stress and coping during the pandemic in relation to their change in school bonding.

Conceptually, adolescents’ experiences of stress and coping can be considered individual-level risk and protective factors, respectively. Perceived stress could be detrimental to adolescents’ capacity to focus on their schooling and to feel connected to their school, whereas perceived coping could be beneficial for adolescents’ capacity to solve unexpected problems and to seek connections at school. Indeed, researchers have linked higher levels of stress to lower school engagement and bonding (Goldstein, Boxer, & Rudolph, 2015; Raufelder et al., 2014); in contrast, greater coping has been linked to more school engagement and connectedness (Frydenberg, Care, Chan, & Freeman, 2009; Reschly, Huebner, Appleton, & Antaramian, 2008). However, research that explores stress-coping processes in relation to changes in school bonding as a function of the COVID-19 pandemic is lacking.

Parenting Level: Parental Involvement and School Bonding

Parental involvement in education is defined as parents’ work with their child and their child’s school to promote positive academic development
Parental involvement is a multi-dimensional construct that includes a variety of parenting practices drawing upon both home-based and school-based involvement strategies (Grolnick & Slowiaczek, 1994; Hoover-Dempsey, Ice, & Whitaker, 2009). Home-based involvement often includes parents’ help with homework and knowledge of school performance. School-based involvement typically includes parents’ interactions with their child’s teacher or school. During adolescence, parental involvement in education includes indirect strategies such as academic socialization and entails communicating the value of education, discussing potential courses, and relating what is being learned in school to potential future careers.

Parental involvement in education is generally positively associated with dimensions of school engagement, including school bonding (Beckmeyer & Russell, 2018; Dotterer & Wehrspann, 2016). Further, Wang and Eccles (2012) found that parental support, which included aspects of parental involvement in education, was associated with reduced declines in school bonding (operationalized as school identification). Based on this past research, we reasoned that parent involvement in education might serve as a protective factor and buffer the potential decline in school bonding in the midst of the COVID-19 pandemic.

**Family Level: Educational, Economic, and Occupational Correlates and School Bonding**

Family socioeconomic status (SES) can be indexed by general markers such as household income and parental education as well as COVID-19-specific markers such as parent essential worker status and pandemic-related financial need. Prior research suggests that higher family SES is positively related to school bonding and engagement (Assari, 2019; Li, Doyle Lynch, Kalvin, Liu, & Lerner, 2011). Economic and occupational conditions can also create stress at the family level, which can have cascading effects on adolescents’ outcomes (Kim, Kim, Yoo, & Ryu, 2019; Mistry & Elenbaas, 2021), including school bonding (Assari, 2019). Theoretically, socioeconomic stressors can be detrimental to school bonding due to limited financial and social resources and school-related supports (Budescu & Taylor, 2013; Owens & Candipan, 2019). In addition to income and parental education, parents’ essential worker status is a key demographic variable, given the unique stressors (e.g., fear of getting/transmitting COVID-19; Luceno-Moreno, Talavera-Velasco, Garcia-Alburque, & Martin-Garcia, 2020) essential workers experienced working in person during a pandemic. Furthermore, recessions and pandemics often require families to make economic cuts to adjust to any financial hardship (Conger & Elder, 1994; Mann, Krueger, & Vohs, 2020), underscoring the importance of studying pandemic-related financial need. Emerging pandemic-related scholarship suggests that adolescents showed elevated distress when their parents were essential workers (Mahajan, Kapoor, & Prabhakar, 2020; Skokauskas et al., 2020). Additionally, extant research on subjective economic hardship illustrates that financial need can be deleterious to adolescents’ school engagement (Mistry & Elenbaas, 2021; Yang, Chen, Rhodes, & Orooji, 2018). Drawing upon the notion of family stress created by socioeconomic challenges, we examined relations from general (i.e., household income and parental education) and COVID-19-specific (i.e., parent essential worker status and pandemic-related financial need) family socioeconomic factors to longitudinal changes in adolescents’ school bonding.

**Current Study**

Rooted in an ecological risk and resilience framework, we investigated whether adolescents’ school bonding changed from before to during the COVID-19 pandemic, and whether individual, parenting, and family-level correlates were associated with longitudinal changes in school bonding. Because of the dramatic changes in school contexts following pandemic-related shutdowns, we hypothesized that adolescents’ school bonding would decrease from before to the beginning months of the COVID-19 pandemic. At the individual level, we hypothesized that adolescents’ stress would be negatively related to the predicted change in school bonding (i.e., more stress, greater decline in school bonding); in contrast, we hypothesized that adolescents’ coping would be positively related to the predicted change in school bonding (i.e., greater coping, less decline in school bonding). At the parenting level, we expected that parental involvement prior to the pandemic would be positively associated with the predicted change in school bonding (i.e., more parental involvement, less decline in school bonding). At the family level, we hypothesized that pandemic-related financial need and parents’ essential worker status would be negatively related to the predicted declines in school bonding, whereas parental education and household income would be positively related to
the predicted declines in school bonding. Importantly, we also tested whether adolescents’ age was related to changes in school bonding to delineate whether potential changes were due to normative developmental or age-related effects. Finally, based on prior research (Troesch, Ledermann, Jones, & Grob, 2018; Wang & Eccles, 2012), we accounted for adolescents’ gender, race, and birth order as control variables in our analyses.

**METHOD**

**Participants**

Participants of this study included two adolescent-aged siblings and one parent from 682 families \((N = 2046)\) from an ongoing longitudinal study. At Wave 1, adolescents (50% male, 50% female, <1% transgender) averaged 14.45 \((SD = 1.55)\) years of age and parents (85% female, 15% male, <1% transgender) averaged 45.15 \((SD = 5.37)\) years old. Eighty-two percent of parents were married, and 97% of parents were adolescents’ biological parents, 1% were stepparents, 1% were adopted parents, and 1% were other kin. A majority of parents identified as White (87%), 9% identified as Black or African American, and 4% other racial groups. Five percent of parents identified their ethnicity as Latinx. At Wave 1, parental education was predominantly 4-year college degree or higher (67%), followed by some college or 2-year degree (25%), high school (6%), and less than high school (2%) education. Household incomes varied such that 21% were below $59,999, 22% between $60,000 and $99,999, 27% between $100,000 and $149,999, and 30% above $150,000. Additionally, 59% of parents reported full time employment, whereas 23% reported part time employment, 12% reported unemployment, and 6% reported other employment statuses.

During the COVID-19 shutdown assessment wave, 45% of parents reported being essential workers and 15% reported a change in their employment status as a result of the COVID-19 pandemic. Eighty-five percent of parents continued their employment from Wave 1 to the beginning of the pandemic, with 70% transitioning their work to remote, telework conditions. In terms of the schooling context, school buildings were closed for 98% of adolescents, and 96% of adolescents were in online classes. Additionally, 99% reported easy access to the Internet and a computer, and 96% of adolescents had assignments to complete. Finally, 72% of adolescents were still able to receive meals from their schools.

**Procedure**

The data were collected as a part of an ongoing longitudinal study called the Parent, Adolescent, and Sibling Study aimed at examining bidirectional sibling influences on adolescents’ health risk behaviors and well-being. Given that the current study focused on adolescents and their parents, sibling data were accounted for in our analytic model and we utilized responses from both adolescents and one parent per family. The sample was recruited from five states in the United States (Illinois, Indiana, Ohio, Pennsylvania, and Wisconsin). A survey research firm was used to procure lists with names and addresses of potential families with at least one adolescent in their home. Parents from these lists were mailed notification letters with the study information and a website link with an accompanying unique 8-digit code to determine study eligibility. Interested parents entered their demographic information on this website and received feedback on their eligibility to participate. To be eligible to be a part of this study, families had to include one parent and two adolescents with an older sibling in grades 8–10 and a consecutively-born younger sibling in grades 5–9. Eligible parents shared their own and their two adolescents’ contact information. Participating parents provided informed consent and participating adolescents provided informed assent before starting the Wave 1 online surveys.

Among the 1448 parents who participated in the eligibility screening process, 1008 families were eligible, and 682 families with all three members (2046 participants) participated in Wave 1. Wave 1 annual surveys were collected between March 2019 and March 2020. The median survey response time was 38 min for adolescents and parents. All participating family members received $30 each upon completing the Wave 1 surveys. Due to the COVID-19 pandemic and related shutdowns, data were collected for a special COVID-19 shutdown assessment between May 1 and June 15, 2020. We followed up with the same 682 families regarding this unplanned special assessment on examining family, school, work, and health-related consequences of the pandemic. Similar screening, consent and assent, and online survey procedures were used. Because this survey was specifically tailored to the COVID-19 pandemic, surveys were
briefer with a median response time of 26 min for adolescents and 36 min for parents. All participants received $20 for survey completion. The time between Wave 1 and COVID-19 shutdown assessments averaged between 5 to 6 months (parents: $M = 5.35$ months, $SD = 3.31$; adolescents: $M = 5.39$ months, $SD = 3.19$).

Among the 2046 Wave 1 participants, 1054 adolescents and 568 parents completed the COVID-19 shutdown surveys. Attrition analyses suggested that parents who participated in the COVID-19 shutdown assessment reported higher education incomes ($t = 2.97$, $p = .003$, Cohen’s $d = .24$) and household incomes ($t = 2.22$, $p = .027$, Cohen’s $d = .18$) compared to their nonparticipating counterparts. However, the magnitude of these effect sizes suggested small differences. Further, there were no differences between the two groups by parents’ age, gender, marital status, employment status, race, or ethnicity and adolescents’ age or gender.

The study employed a three-form planned missing design to increase survey efficiency and decrease respondent burdens (Little & Rhemtulla, 2013) at the Wave 1 and COVID-19 shutdown assessments. Twenty-five percent of items were planned to be missing for all scales with more than four items. Such planned missingness creates data that are missing completely at random (Little & Rhemtulla, 2013) and that can be addressed via full information maximum likelihood. The Institutional Review Board at Utah State University approved the study protocols.

Measures

School bonding. At both measurement occasions, adolescents reported on their level of school bonding using items from the National Longitudinal Study of Adolescent to Adult (Add Health; Harris et al., 2009). On a 5-point Likert scale ranging from 1 (Strongly disagree) to 5 (Strongly agree), adolescents rated six items on how connected they felt with their school at Wave 1. However, adolescents rated only two items on school bonding at the COVID-19 shutdown wave because items that emphasized in person contact were excluded. The two items used in both measurement occasions were “You feel close to people at your school.” and “You feel like you are part of your school.” Higher scores denoted higher school bonding for adolescents. Adolescents’ reports of school bonding were moderately stable across time ($r = .52$, $p < .001$) and demonstrated acceptable reliabilities with Cronbach’s $\alpha$ of .78 to .84. The full and shortened school bonding measure at Wave 1 demonstrated construct (i.e., positive correlations with grades at Wave 1) and predictive validity (i.e., negative correlations with depressive and anxiety symptoms at the COVID-19 shutdown wave). The school bonding measure at the COVID-19 shutdown wave also demonstrated construct validity (i.e., negative correlations with depression and anxiety).

Stress. Adolescents’ stress during the COVID-19 shutdown wave was assessed using the stress subscale of the Rhode Island Stress and Coping Inventory (Fava, Ruggiero, & Grimley, 1998). Adolescents rated seven items on how often they felt stressed on a 5-point scale ranging from 0 (Never) to 4 (Frequently). Example items included “I felt there was not enough time to complete my daily tasks.” and “I felt overwhelmed.” Higher scores implied greater levels of stress for adolescents. The measure demonstrated adequate reliability (Cronbach’s $\alpha = .89$).

Coping. Adolescents’ coping during the COVID-19 shutdown wave was assessed using the coping subscale of the Rhode Island Stress and Coping Inventory (Fava et al., 1998). Adolescents rated five items on the frequency of their coping on a 5-point scale ranging from 0 (Never) to 4 (Frequently). Example items included “I successfully solved problems that came up.” and “I was able to cope with unexpected problems.” Higher scores indicated greater levels of coping for adolescents. The measure demonstrated adequate reliability (Cronbach’s $\alpha = .91$).

Parental involvement. Parents reported on their involvement in their adolescents’ education using an adapted measure (Day & Dotterer, 2018) at Wave 1. Parents rated 12 items on how often they were involved in different domains of their child’s education on a 3-point scale ranging from 1 (Never) to 3 (Always). Sample items were “I know how [Child’s name] is doing in school.” and “I talk to [Child’s name] about his/her educational plans for the future.” Higher scores suggested greater parental involvement in education. The measure demonstrated adequate reliability (Cronbach’s $\alpha = .74$).

Financial need. Parents reported on their financial need during the COVID-19 shutdown wave using a measure developed by Conger and Elder (1994). For this study, items were revised to be more specific to economic adjustments to save
money or adjust to financial hardship. Parents rated whether or not they had made adjustments because of financial need since March 1, 2020, on nine items using a 0 (No) and 1 (Yes) response scale. Sample items included “Have you changed food shopping or eating habits to save money?” and “Have you asked relatives or friends for money or food to help you get by?” Higher scores represented greater pandemic-related financial need. The measure demonstrated acceptable reliability (KR20 = .71).

Educational, economic, and occupational variables. At the COVID-19 shutdown wave, parents reported on their education, annual household income, and whether they were an essential worker (e.g., health care, delivery worker, store worker, security, and building maintenance).

Analytic Plan
We used a two-wave latent change score model (Kievit et al., 2018) to examine the change in school bonding before and during the COVID-19 pandemic shutdowns and whether key ecological factors (i.e., parental involvement, adolescents’ stress and coping, pandemic-related financial need, parent education, parent essential worker status, and household income) were related to the change in school bonding. Using this approach, we modeled the change score, estimated item-level data in the measurement model, and accounted for planned missingness with full information maximum likelihood in Mplus. The clustered nature of the data was accommodated via multilevel structural equation modeling with family as the clustering variable.

First, the model was specified with a latent variable for school bonding at each occasion of measurement. The item-level factor loadings and intercepts for the school bonding latent variables were constrained across the two waves. Second, the mean change score in school bonding was calculated by taking the difference between the two latent variables. Third, stress, coping, parental involvement, and pandemic-related financial need were added as latent variable predictors with item-level factor loadings and parent essential worker status (0 = no, 1 = yes), parent education (continuous from 11 “less than high school graduate” to 20 “Ph.D., J.D., or M.D.” years of education), household income (continuous from 1–14; in $10,000 increments up to $100,000, then $50,000 increments to >$250,000), and adolescents’ age (continuous in years) as manifest variable predictors of the level of the change score. Lastly, adolescents’ gender (0 = female, 1 = male), birth order (0 = earlier-born, 1 = later-born), and race (0 = racial minority, 1 = White) were entered as covariates at each wave.

RESULTS
Table 1 shows the means, standard deviations, and correlations for the main study variables. For the two-wave latent change score model, at the item-level, factor loadings for all latent variables (i.e., school bonding, stress, coping, parental involvement, and pandemic-related financial need) were significant, except for one item in the pandemic-related financial need latent variable, resulting in this item being dropped from all subsequent analyses.

Among the covariates of school bonding (i.e., adolescents’ gender, birth order, and race) at both Wave 1 and the COVID-19 shutdown wave, birth order \((b = 0.22, SE = .07, p < .001)\) and race \((b = 0.27, SE = .11, p = .009)\) were significantly related to school bonding (Wave 1 only). Net of these covariates on school bonding at each wave, there was a significant decrease in school bonding \((b = −1.79, SE = .79, p = .02)\) from before to during the COVID-19 pandemic shutdowns. In other words, there was a mean decrease of 1.79 standard deviations in school bonding from before to during the pandemic.

Further, this change in school bonding was conditional on a range of normative developmental and COVID-19-specific factors. Specifically, there were negative associations with adolescents’ stress \((b = −0.27, SE = .04, p < .001)\) and pandemic-related financial need \((b = −0.26, SE = .05, p < .001)\), indicating that declines in school bonding were greater when adolescents’ stress and pandemic-related financial need were greater. In contrast, there were positive associations with adolescents’ coping \((b = 0.35, SE = .04, p < .001)\) and parental involvement \((b = 0.22, SE = .05, p < .001)\), suggesting that decreases in school bonding were lower when adolescents’ coping and parental involvement were higher. There also were significant positive associations with parent education \((b = 0.09, SE = .02, p < .001)\) and household income \((b = 0.09, SE = .01, p < .001)\), denoting that school bonding decreased less for adolescents with parents with greater levels of education and household incomes. The change in school bonding was not
significantly associated with parents’ essential worker status or adolescents’ age. Table 2 summarizes the results for the latent change score model for school bonding.

**DISCUSSION**

Investigating the effects of the COVID-19 pandemic on adolescents’ school adjustment is an important area of research because of the dramatic shifts in schooling during the pandemic. Nearly all participants in the present study had their schools physically close and classes subsequently delivered online. Given such drastic changes to learning environments, we examined changes in adolescents’ school bonding from before to during the early months of the COVID-19 pandemic and explored individual (i.e., stress and coping), parenting (i.e., parental involvement), and family (i.e., pandemic-related financial need, household income, parental education, and parent essential worker status) correlates of these changes. Our findings indicate that adolescents’ school bonding decreased from before to during the pandemic, and this decrease in school bonding was conditional on a range of COVID-19-specific and normative developmental factors. In line with the risk and resilience theoretical perspective (Masten, 2013), adolescents with elevated stress and pandemic-related financial need were at risk for decreased school bonding, whereas adolescents with heightened coping and parental involvement were resilient against declines in school bonding.

In support of our first hypothesis, findings suggest that adolescents’ school bonding decreased from before the COVID-19 pandemic to during the COVID-19 pandemic. This decrease in school bonding can be explained through both developmental and public health perspectives. From a developmental lens, there is a normative decline in school bonding during adolescence due to incongruencies between adolescents’ socioemotional needs and the school environment like restricted student autonomy, decreased supportiveness in teacher–student relationships, and increased social comparison among students (Wang & Eccles, 2012). Importantly, in this study adolescents’ age did not predict observed changes in school bonding, suggesting effects beyond normative developmental declines. Further, changes in school bonding in previous research were typically observed over one to several years (e.g., Dotterer, Lowe, & McHale, 2014; Hawkins, Guo, Hill, Battin-Pearson, & Abbott, 2001; Wang &

**TABLE 1**

Bivariate Correlations Among Main Study Variables

|   | 1. Adolescents’ Stress (COVID-19 Wave) | 2. Adolescents’ Coping (COVID-19 Wave) | 3. Parental Involvement (Wave 1) | 4. Financial Need (COVID-19 Wave) | 5. Parental Education (COVID-19 Wave) | 6. Household Income (COVID-19 Wave) | 7. Essential Worker (COVID-19 Wave) | 8. School Bonding (Wave 1) | 9. School Bonding (COVID-19 Wave) |
|---|--------------------------------------|---------------------------------------|---------------------------------|----------------------------------|-------------------------------------|----------------------------------|------------------------------|---------------------------|-----------------------------|
| 1 | -33***                               | -34***                                | -28**                           | -38***                           | -35***                              | -58***                           | -109***                      | -19***                    | -33***                     |
| 2 | -04*                                 | -105**                                | -11**                           | -11***                           | -11***                              | -11***                           | -11***                       | -11***                    | -11***                     |
| 3 | -05                                 | -05                                  | -05                             | -05                              | -05                                 | -05                              | -05                          | -05                        | -05                        |
| 4 | 05                                  | 05                                    | 05                              | 05                               | 05                                  | 05                               | 05                          | 05                        | 05                         |
| 5 | -03                                 | -03                                  | -03                             | -03                              | -03                                 | -03                              | -03                          | -03                        | -03                        |
| 6 | -05                                   | -05                                  | -05                             | -05                              | -05                                 | -05                              | -05                          | -05                        | -05                        |
| 7 | -03                                 | -03                                  | -03                             | -03                              | -03                                 | -03                              | -03                          | -03                        | -03                        |
| 8 | 03                                  | 03                                    | 03                              | 03                               | 03                                  | 03                               | 03                          | 03                        | 03                         |
| 9 | 03                                  | 03                                    | 03                              | 03                               | 03                                  | 03                               | 03                          | 03                        | 03                         |

Note. *p* < .05, **p** < .01, ***p*** < .001.
Eccles, 2012) and not in the short span (~5 months) between assessments in this study. From a public health lens, the COVID-19 pandemic resulted in dramatic changes in school contexts such as school closures and virtual, home-based learning (Education Week, 2020), which can disrupt adolescents’ school bonding. For this cohort of adolescents, it is likely that their normative developmental declines in school bonding were compounded by a host of COVID-19-specific factors.

In line with our second hypothesis, we found that adolescents’ perceived stress was associated with greater decrease in school bonding, whereas adolescents’ perceived coping was associated with less decline in school bonding. Early research on the pandemic revealed that adolescents were stressed about school closures, virtual learning, and diminished peer relationships at school (Ellis et al., 2020), which was associated with greater social isolation and loneliness (Larsen et al., 2021; Ng et al., 2021). Yet, many adolescents also coped with these unprecedented stressors by problem-solving and seeking support (Duan et al., 2020; Ellis et al., 2020). In this study, results suggest that perceived stress might interfere with adolescents’ ability to engage effectively in classes and to feel like a part of their school. In contrast, the decrease in school bonding was buffered for adolescents with the perceived cognitive and emotional resources to cope effectively with such stressors. These findings are consistent with risk and resilience theory that highlights stress as an individual risk factor and coping as a protective factor (Masten, 2013). These findings are also consistent with research on stress-coping processes and school bonding among adolescents (Frydenberg et al., 2009; Goldstein et al., 2015).

It is important to note that because adolescents’ perceived stress and coping were measured concurrently with school bonding during the COVID-19 shutdown wave, it is plausible that the decline in school bonding heightened adolescents’ stress and lowered adolescents’ coping capacities. Although there is preliminary research evidence that individuals’ adjustment can predict their stress-coping responses (e.g., Jenzer, Meisel, Blayney, Corder, & Read, 2020), more work is needed to examine this alternate interpretation.

Despite decreases in school bonding over time, consistent with previous research (Wang & Eccles, 2012), we found that greater parental involvement was associated with less decline in school bonding. Parental involvement in education communicates the values and messages that school is important, and to the extent that adolescents internalize these values, it is beneficial for their engagement and connection in school. In accord with risk and resilience theory (Masten, 2013), parental involvement in education operated as a protective factor for school bonding in the present study. It is reasonable that normative and COVID-19-specific stressors contributed to declines in school bonding, but results from this study also suggest that more parental involvement in education buffered declines.

Consistent with previous work (Assari, 2019; Conger & Elder, 1994), family SES and financial hardship were associated with changes in school

### Table 2

Two-Wave Latent Change Score Model of Change in School Bonding Before and During the COVID-19 Pandemic

|                  | b     | SE  | p     | β     | SE   |
|------------------|-------|-----|-------|-------|------|
| Mean of Change score | -1.79*| .79 | .02   | -2.15*| .96  |
| Wave 1 → Change score | -0.22*** | .05 | <.001 | -0.43*** | .09  |
| Change score → Adolescents’ Stress (COVID-19 shutdown wave) | -0.27*** | .04 | <.001 | -0.32*** | .05  |
| Change score → Adolescents’ Coping (COVID-19 shutdown wave) | 0.35*** | .04 | <.001 | 0.42*** | .05  |
| Change score → Parental Involvement (Wave 1) | 0.22*** | .05 | <.001 | 0.26*** | .06  |
| Change score → Financial need (COVID-19 shutdown wave) | -0.26*** | .05 | <.001 | -0.31*** | .06  |
| Change score → Parental Education (COVID-19 shutdown wave) | 0.09*** | .02 | <.001 | 0.22*** | .05  |
| Change score → Household Income (COVID-19 shutdown wave) | 0.09*** | .01 | <.001 | 0.32*** | .05  |
| Change score → Parent Essential Worker (COVID-19 shutdown wave) | -0.14 | .80 | .86  | -0.08 | .48  |
| Change score → Age (Wave 1) | -0.01 | .04 | .75  | -0.01 | .04  |

*Note. Adolescents’ gender, birth order, and race were accounted for as covariates of school bonding at each wave, but were excluded from the table for parsimony.

*p < .05, **p < .01, ***p < .001.
bonding. As expected, some of these dimensions operated as risk factors and others operated as protective factors. Regarding family SES, higher parent education and household income were associated with less decline in school bonding. When adolescents have access to greater educational and economic resources, it is beneficial for their engagement in school (Budescu & Taylor, 2013; Owens & Candipan, 2019). In contrast, stressors, such as financial hardship, are risk factors, and results from this study provide the first empirical evidence that COVID-19-related financial hardships were associated greater declines in school bonding. This finding extends theoretical models of economic stress (Conger & Elder, 1994) by highlighting the importance of including COVID-19-specific markers of economic stress.

This set of findings on risk and protective factors at the individual, parenting, and family levels can shed light on both pandemic-specific and universal developmental processes that influence adolescent well-being. We found support that some pandemic-specific factors such as pandemic-related financial need (but not parent essential worker status) served as risk factors for adolescents’ school bonding declines. While other risk factors such as adolescents’ perceptions of stress can be considered universal risk factors for decreased school bonding that extend beyond the pandemic, adolescents’ general stress levels also could be particularly elevated during the pandemic. Further, we found support that factors such as adolescents’ perceived coping and parental involvement can serve as universal protective mechanisms against declines in school bonding in the context of general stress and the pandemic. Additionally, our findings on the declines in school bonding and their qualifying factors were robust, even after accounting for adolescents’ gender, race, and birth order, which is consistent with prior research on sociodemographic predictors of school bonding (Troesch et al., 2018; Wang & Eccles, 2012). Ultimately, these findings extend the ecological risk and resilience framework (Powers, 2010) and prior, mainly prepandemic, research on school bonding (e.g., Assari, 2019; Beckmeyer & Russell, 2018; Goldstein et al., 2015) to aid our understanding of risk and resilience factors both unique to the pandemic and universal to adolescent well-being in the context of stress.

**Limitations and Future Directions**

Although this study presents important findings, the results should be interpreted in light of the study limitations. The study was limited to comparing school bonding across two points of time. While a latent change score model allows for pre- and during pandemic comparisons, a growth curve model that maps school bonding over multiple occasions of measurement during the COVID-19 pandemic is an important direction for future research. Similarly, several of our correlates were measured concurrently at the COVID-19 shutdown wave. As this is an ongoing study, future assessments will be able to ascertain if declines in school bonding persist or if there is any “recovery” or increase in school bonding following school resumption of in-person activities. Future assessments also will be able to disentangle the longitudinal patterning of individual and family-level predictors of change in school bonding (e.g., does increased stress precede declines in school bonding or vice versa?).

Our findings are largely restricted to predominantly White, working to upper income families. Although not representative of the United States, data from this sample of families largely represents the five Midwestern states in which they were drawn (81.4% White, 12% Black, 9.2% Latinx; US Census Bureau, 2019). With that said, given the importance of pandemic-related financial need and race-related educational disparities, future researchers should conduct research with more ethnically and socioeconomically diverse samples. This study also relied upon self (youth and parent) reports to assess the study constructs. Future work would benefit from multiple assessment methods to avoid potential response biases. We also utilized a brief measure of school bonding in this study to ensure that the measure was valid under conditions of remote learning in the pandemic-shutdown wave. In future work, researchers should develop and use more in-depth measures of school bonding that are applicable to both in-person and remote learning. Additionally, we used a general measure of stress and coping that highlighted adolescents’ perceptions of stress and coping, but not their range of pandemic-related stress and coping experiences. Future research could build on this study by delineating adolescents’ pandemic-related sources of stress and coping.

Our results highlight financial need as a pandemic-specific family stressor that directly impacts adolescents’ school bonding. Research would benefit from exploring potential indirect effects of financial need on adolescents’ school bonding via their mental health symptoms like anxiety and psychological distress. Researchers
could also examine the effects of other family stressors such as family life disruptions and conflict on school bonding during the pandemic. Finally, we focused on school bonding as a key metric of academic and social adjustment. The current study did not examine adolescents’ academic achievement because grades were unavailable for most adolescents as a result of the schooling disruptions during the early months of the pandemic. Researchers should explore grades and other academic outcomes in future research conducted during the later months of the pandemic.

Conclusions

This study makes key contributions to our understanding of school bonding before and during the COVID-19 pandemic shutdowns. Our findings highlight individual (i.e., stress and coping), parenting (i.e., parental involvement), and family-level (i.e., family SES) correlates as embedded systems that affect school bonding. Additionally, the emphasis on normative developmental (e.g., parental involvement) and COVID-specific (e.g., pandemic-related financial need) predictors helps present a holistic picture of changes in school bonding during adolescence. Moreover, the findings help contextualize the risk and resilience framework in the context of the pandemic shutdowns by presenting adolescents’ stress and family SES as risk factors and adolescents’ coping and parental involvement as protective factors for and against declines in school bonding. The findings inform future intervention efforts to foster school bonding amidst an ongoing pandemic and other related challenges. Such interventions can target malleable factors such as adolescents’ coping and parents’ involvement to offset declines in adolescents’ academic and school adjustment.

REFERENCES

Allen, K., Kern, M. L., Vella-Brodrick, D., Hattie, J., & Waters, L. (2018). What schools need to know about fostering school belonging: A meta-analysis. *Educational Psychology Review*, 30(1), 1–34. https://doi.org/10.1007/s10648-016-9389-8

Assari, S. (2019). Family socioeconomic position at birth and school bonding at age 15: Blacks’ diminished returns. *Behavioral Sciences*, 9(3), 26. https://doi.org/10.3390/bs9030026

Beckmeyer, J. J., & Russell, L. T. (2018). Family structure and family management practices: Associations with positive aspects of youth well-being. *Journal of Family Issues*, 39, 2131–2154. https://doi.org/10.1177/01925131741921

Budescu, M., & Taylor, R. D. (2013). Order in the home: Family routines moderate the impact of financial hardship. *Journal of Applied Developmental Psychology*, 34(2), 63–72. https://doi.org/10.1016/j.appdev.2012.11.006

Carver, C. S., & Connor-Smith, J. (2010). Personality and coping. *Annual Review of Psychology*, 61, 679–704. https://doi.org/10.1146/annurev.psych.093008.100352

Conger, R. D., & Elder, G. H., Jr (1994). *Families in troubled times: Adapting to change in rural America*. Hawthorne, NY: Aldine De Gruyter.

Day, E., & Dotterer, A. M. (2018). Parental involvement and adolescent academic outcomes: Exploring differences in beneficial strategies across racial/ethnic groups. *Journal of Youth and Adolescence*, 7, 1332–1349. https://doi.org/10.1007/s10964-018-0853-2

Dotterer, A. M., Lowe, K., & McHale, S. M. (2014). Academic growth trajectories and family relationships among African American youth. *Journal of Research on Adolescence*, 24, 734–747. https://doi.org/10.1111/jora.12080

Dotterer, A. M., & Wehrspann, E. (2016). Parent involvement and academic outcomes among urban adolescents: Examining the role of school engagement. *Educational Psychology*, 36, 812–830. https://doi.org/10.1080/01443410.2015.1099617

Duan, L., Shao, X., Wang, Y., Huang, Y., Miao, J., Yang, X., & Zhu, G. (2020). An investigation of mental health status of children and adolescents in China during the outbreak of COVID-19. *Journal of Affective Disorders*, 275, 112–118. https://doi.org/10.1016/j.jad.2020.06.029

Education Week. (2020, March 6). Map: Coronavirus and school closures in 2019-2020. Retrieved March 9, 2021, from https://www.edweek.org/leadership/map-coronavirus-and-school-closures-in-2019-2020/2020/03

Ellis, W. E., Dumas, T. M., & Forbes, L. M. (2020). Physically isolated but socially connected: Psychological adjustment and stress among adolescents during the initial COVID-19 crisis. *Canadian Journal of Behavioural Science/Revue Canadienne Des Sciences Du Comportement*, 52(3), 177–187. https://doi.org/10.1037/bsc0000215

Fava, J. L., Ruggiero, L., & Grimley, D. M. (1998). The development and structural confirmation of the Rhode Island Stress and Coping Inventory. *Journal of Behavioral Medicine*, 21(6), 601–611. https://doi.org/10.1023/A:1018752813896

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research*, 74(1), 59–109. https://doi.org/10.3102/00346543074001059

Frydenberg, E., Care, E., Chan, E., & Freeman, E. (2009). Interrelationships between coping, school connectedness and wellbeing. *Australian Journal of Education*, 53(3), 261–276. https://doi.org/10.1177/00049441090300305

Goldstein, S. E., Boxer, P., & Rudolph, E. (2015). Middle school transition stress: Links with academic...
Powers, J. D. (2010). Ecological risk and resilience perspective: A theoretical framework supporting evidence-based practice in schools. *Journal of Evidence-Based Social Work, 7*, 443–451. https://doi.org/10.1080/15433714.2010.509216

Raufelder, D., Kittler, F., Braun, S. R., Litsch, A., Wilkinson, R. P., & Hoferichter, F. (2014). The interplay of perceived stress, self-determination and school engagement in adolescence. *School Psychology International, 35*(4), 405–420. https://doi.org/10.1177/0143034313498953.

Reschly, A. L., Huebner, E. S., Appleton, J. J., & Antaramian, S. (2008). Engagement as flourishing: The contribution of positive emotions and coping to adolescents' engagement at school and with learning. *Psychology in the Schools, 45*(5), 419–431. https://doi.org/10.1002/pits.20306

Scales, P. C. (2005). Developmental assets and the middle school counselor. *Professional School Counseling, 9*(2), 104–111. https://doi.org/10.1177/15327823050090205

Skokauskas, N., Leventhal, B., Cardeli, E. L., Belfer, M., Kaasboll, J., & Cohen, J. (2020). Supporting children of healthcare workers during the COVID-19 pandemic. *European Child and Adolescent Psychiatry, 1–2*. https://doi.org/10.1007/s00787-020-01604-6. Advance online publication.

Troesch, L. M., Ledermann, T., Jones, J. W., & Grob, A. (2018). School engagement and achievement in sibling pairs: Gender and birth order matter. *Journal of Relationships Research, 9*(e19), 1–8. https://doi.org/10.1017/jrr.2018.18

US Census Bureau (2019). Quick facts: Pennsylvania, Ohio, Indiana, Illinois, Wisconsin, United States. Retrieved March 21, 2021, from https://www.census.gov/quickfacts/fact/table/PA,OH,IN,IL,WI,US/PST045219

Wang, M. T., & Eccles, J. S. (2012). Social support matters: Longitudinal effects of social support on three dimensions of school engagement from middle to high school. *Child Development, 83*(3), 877–895. https://doi.org/10.1111/j.1467-8624.2012.01745.x

Wang, M. T., & Sheikh-Khalil, S. (2014). Does parental involvement matter for student achievement and mental health in high school? *Child Development, 85*(2), 610–625. https://doi.org/10.1111/cdev.12153

Yang, M. Y., Chen, Z., Rhodes, J. L., & Orooji, M. (2018). A longitudinal study on risk factors of grade retention among elementary school students using a multilevel analysis: Focusing on material hardship and lack of school engagement. *Children and Youth Services Review, 88*, 25–32. https://doi.org/10.1016/j.childyouth.2018.02.043