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PARENT-CHILD RELATIONSHIPS AND STUDENT OUTCOMES IN CHILDREN: A
COMPARISON BEFORE AND DURING THE COVID-19 PANDEMIC

by

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Submitted in partial fulfillment of the requirements

For graduation with Honors

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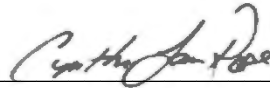
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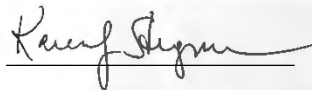
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Abstract

The current study investigated the connection between parent-child relationships, academic achievement, and child attitudes in school-aged children both before and during the COVID-19 pandemic. Specifically, I examined relationships among parent- and child-perceived emotional closeness, attitudes toward school, and child achievement in elementary and middle school aged children. The current study examined associations between parent-child relationship factors and academic student outcomes, comparing these associations both before and during the COVID-19 pandemic. Differences in student outcomes were examined based off of COVID-19 circumstances as well as what level of emotional closeness and interaction the parents and child have. Attitudes and achievement of children were also compared prior to and during the pandemic. Factors were also compared between groups of neurotypical children and those with an ADHD diagnosis. Key findings that emerged include declines in academic achievement and child attitudes toward school during the COVID-19 pandemic. ADHD diagnosis did not interact with these declines, suggesting that children overall (rather than a particularly at-risk group) were negatively affected by the shift to remote learning. Parent- and child-perceived emotional closeness tended to serve as a predictive factor of student outcomes (attitudes and achievement) when in face-to-face schooling, but these relationships were not seen in an online setting.

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Parent-Child Relationships and Student Outcomes in Children: A Comparison Before and During the COVID-19 Pandemic

Introduction

The SARS-CoV-2 coronavirus pandemic has affected the entire world in the past year. The pandemic eliminated the ease of social interaction, created alarming rates of unemployment for Americans (Falk et. al., 2021), and has brought upon many unforeseen hardships and difficulties for individuals and families. The COVID-19 pandemic has also affected students and the format of their learning. As many students faced during the 2020 spring and fall semesters, student learning took place at home on a computer screen. The education system has undergone many changes in order to keep schooling active while accommodating the virus' widespread infectious rate, but difficulties in student outcomes, such as achievement and learning, have been increasing.

Student learning and performance in school has decreased due to the pandemic. What is described as a "COVID slide" is occurring across schools in the United States due to the sudden shift in online learning (García & Weiss, 2020). Students are undergoing learning losses and are projected to experience declines in their academic achievement (Soland et. al., 2020). During their at-home learning, students were not able to retain or learn as much information as they normally would have had they been in an in-person environment. This could in part be due to a variety of factors, such as lack of technology access or a decrease in structure at home, but learning has not been as effective for students at home as opposed to in school. The effects of this learning loss could set children up to be almost a full year behind their typical achievement level (Soland et. al., 2020). Even when the COVID-19 restrictions lessen and schools return to primarily face-to-face formats, it is still helpful from a basic research perspective to know of any

factors that are predictive of success during such a “COVID slide” throughout this period. One relevant body of research that may help answer this question comes from prior studies examining which factors are important in predicting academic success in typical circumstances. Decades of prior work point to the importance of family interactions in supporting the social and academic wellbeing of children.

Prior to the COVID-19 pandemic, research on family interactions and climate, specifically those between parents and the child, has been extensively discussed in typical children. Previous researchers indicate strong correlations between positive parent-child interactions and better academic achievement in schools with emphasis on how the child maintains their attention in the classroom (Eisenberg et. al., 2005). Other studies have also analyzed parent acceptance in addition to perceived teacher acceptance. For example, Ali, Khaleque, & Rohner (2015) found that both maternal and paternal acceptance as well as teacher acceptance correlated significantly with children’s adjustment and conduct in school. Researchers in this study measured acceptance on scales of warmth/affection, hostility/aggression, indifference/neglect, and undifferentiated rejection. Thus, overall it appears that positive and accepting relationships correlate with better achievement and conduct.

Parent-child relationships and family environment have also been extensively researched in relation to the effects it has on other student outcomes, such as academic achievement, motivation, competence, and executive functioning. Typically developing students who come from families that are engaged in their schoolwork show higher levels of motivation and achievement (Hafner et. al., 2018). The family characteristics that were specifically measured were parents’ behavior and involvement with schoolwork, general beliefs (family math interest and parental self-concept), child-specific beliefs (child’s need for support) and resources

(parents' time and energy). Therefore, parental involvement is shown to predict a child's performance in school. Research has also shown that academic success is higher among children with parents that have a supportive relationship with them (Hughes, 2007).

In sum, parent-child relationship and quality of interaction have been shown to correlate with better achievement in typically developing children at least under typical circumstances in which children's schooling takes place largely outside the home. Now more than ever, however, children are spending a significantly greater time with their parents due to at-home working opportunities and online school. Indeed, due to the circumstances surrounding the pandemic, a majority of parents are now interacting with their children more than ever before. Therefore, how might parent-child relationships predict academic achievement in this new context?

It is clear that the COVID-19 pandemic has brought upon many stressors and difficulties to parents and families. Many parents began either working from home or faced unemployment, and children were learning at home due to school closures, leading to forced increased time spent together between parents and their child. The burden of unemployment, caregiving, and emotional stress have taken a toll on parent-child relationships during this time. Uzun et. al. (2020) assessed parent-child relationships during the coronavirus pandemic on the basis of various factors, such as parent employment, education, location of the family, and time spent caring for the child. The father's and mother's employment status impacted some aspect of the relationship with the child. For example, unemployed and occasionally employed parents tended to have stronger relationships with their child than did parents that were employed full-time, allowing the unemployed parents to have more opportunities to spend time with their child. The age of a child's mother also seemed to influence the child's relationship with their parent, as women aged 38-43 seemed to have a better relationship than younger mothers (Uzun et. al.,

2020). Some factors, as described, have shown to strengthen relationships, yet the unknown circumstances surrounding this global pandemic have provided some individuals with challenges within their families.

Similar findings point to the specific stressors that parents face during the pandemic. While many children were sent home to complete their schooling during the spring and fall 2020 semesters, some parents faced challenges finding caregivers to watch their children as they worked, or some struggled economically. These events and various others created stress for numerous families across the world, and, sometimes, this stress unfortunately put some strain on relationships with their families and children. Russell et. al. (2020) described some of the challenges that parents faced during the initial stages of the pandemic, including mental health concerns and the parent-child relationship. The authors found that parents, both fathers and mothers, acknowledged a feeling of higher stress, which correlated with increased parent-child conflict. Burdens that emerged as a result of school closures and government shutdowns negatively affected certain families. The parent-child relationship seemed to worsen during the preliminary stages of the pandemic.

In addition to asking questions about how parent-child relationships predict academic outcomes both before and during COVID, another important area to examine is whether these relationships differ based on specific learning challenges faced by children. The previous literature on family characteristics have primarily been conducted using participants that do not possess any disorders or learning disabilities; however, certain studies have assessed the relationship between children with ADHD and their family climates, a focus addressed in the current study as well. Attention-Deficit/Hyperactivity Disorder (ADHD) is one of the most common neurodevelopmental disorders in childhood in the United States with 9.4% of children

(ages 2-17) having a diagnosis (Centers for Disease Control and Prevention, 2019). ADHD is characterized by significant inattentiveness, trouble controlling impulsive behaviors, as well as hyperactivity. Specific symptoms of children who exhibit attention problems include difficulties regarding attention to detail, maintaining attention over longer periods of time, listening to other people and following through with assignments, organizing, staying on task, and remembering information. Children who have problems with hyperactivity may fidget and squirm, have trouble remaining seated, and are typically very talkative. Symptoms that are evident in children who have difficulty with impulsivity in the school setting include acting without thinking, blurting out in class, having trouble waiting in line, and interrupting others' conversations. (Weis, 2018). Due to these varying symptoms that may be exhibited, there are also three different subtypes, or presentations, of the disorder: ADHD combined type, predominantly hyperactive-impulsive type, and primarily inattentive type.

Children with the predominantly inattentive presentation exhibit significant attention problems but do not meet the threshold for problems with hyperactivity and impulsivity. These students are normally disorganized and easily distracted in class as they may not pay attention to teachers. Children who display symptoms of this type are typically overlooked by parents and teachers despite the higher frequency in the general population and community (Weis, 2018). This presentation is normally seen in older children and adolescents and is most commonly seen among girls as well.

Children with ADHD predominantly hyperactive-impulsive presentation show significant symptoms of hyperactivity and impulsivity but are considered below the threshold for inattention (Weis, 2018). These children could still have slight problems with attention; however, they are not severe enough to have the combined presentation of the disorder. Children who have this

specific presentation are often described as “on the go” and “driven by a motor”. Those that tend to exhibit these symptoms are usually younger boys. Most children tend to shift over to the combined type between the ages of 6 and 12 as attention problems tend to develop around this time (Weis, 2018).

ADHD combined presentation is the most commonly seen and diagnosed subtype of the disorder. Those who present symptoms of the combined type show significant inattention as well as hyperactive-impulsive problems. Children are usually described as being messy, forgetful, careless, irresponsible, distractible, and impatient (Weis, 2018).

Children with any presentation of this disorder tend to be seen as disruptive in class and exhibit some type of impairment both in the school setting as well as in the home (Weis, 2018). With ADHD being such a prevalent disorder in school-aged children, many different factors and previous research can help give insight into how these ADHD symptoms can be better understood.

As described earlier, ADHD is very prevalent in the school systems today, and the connection between ADHD and academic underachievement has been established in the literature (DuPaul et. al., 2004). Typically, children that have been diagnosed with ADHD do not perform as well as their typically developing classmates in terms of grades and achievement. Marshall et. al. (1997) examined academic achievement in children with the varying subtypes of ADHD. They found that children with primarily inattentive type had lower achievement in math than did children with the combined presentation. This finding was also evident in another study that looked at general academic functioning, where it was seen that those students that had the inattentive presentation were more impaired in classroom performance than those with ADHD

combined type (Marshall et. al., 2014). Inattentive symptoms tend to correlate more with poor academic achievement in children with ADHD than do the hyperactive-impulsive symptoms.

Parental involvement and parent-child relationships among children with ADHD have also been at the center of important research. Families of children without ADHD tend to have more engaged, warmer, and communicative interactions than those families of children with ADHD (Tripp et. al., 2007). Weyers, Zemp, & Alpers (2019) also found that parents of a child with ADHD reported lower relationship qualities than parents of healthy children. Regardless of whether the student is typically developing or is diagnosed with ADHD, research suggests that increased parental involvement and more positive and supportive family climates show better outcomes for these students. Rogers, Wiener, Marton, & Tannock (2009) conducted a study that examined the relationship between parenting stress, parental involvement, and ADHD symptoms as predictors of academic achievement. More specifically, they found that controlling parental involvement was associated with higher levels of inattention and hyperactivity-impulsivity, where inattention negatively predicted achievement in children. The relationship between a child and their parent is crucial and essential to understanding many different factors of a child's life; however, this same relationship is even more significant for children with ADHD due to their increased risk for underachievement in schools.

With this risk for underachievement, the coronavirus pandemic presents for an interesting situation when thinking about children with a mental health diagnosis, such as ADHD. Given that parents are more likely to have spent more time in their homes during the start of the pandemic, this factor might serve a beneficiary purpose and aid children with ADHD in boosting their academic achievement due to the opportunity for more flexibility and additional help at home. However, as previous research has shown, parenting stress can influence a child's

performance in school; therefore, if parents are stressed over their employment situations, health, and academic needs of their child, this may serve as a risk factor for students in this environment. The current study aims to address this interesting subgroup of children.

In sum, prior research has established that parental involvement and parenting stress are potential predictors of academic achievement in children; however, looking at these measures through the online education lens has not been extensively conducted with this age group. The specific considerations of remote learner children with ADHD has similarly not yet been addressed. The current study will be focusing on parent-child relationships and student outcomes in school-aged children. The research will investigate how child- and parent-perceived emotional closeness correlate with academic attitudes and academic achievement, among both neurotypical children and children with ADHD. Emotional closeness is defined as the overall warmth, affection, support, and involvement that is present between the parent and the child. Comparisons of these relationships will be made before and during the COVID-19 pandemic. Based on previous research, I am predicting that 1) children will have more negative attitudes toward remote learning than face-to-face learning, as well as reductions in achievement during online learning, and 2) that parent-child emotional closeness will be positively correlated with children's positive attitudes toward school and achievement (both during face-to-face and remote learning). I will also examine if these relationships vary depending on whether the child has ADHD or not when comparing parent-child relationships across families. I predict that children with ADHD will have lower academic achievement scores and attitude scores regardless of school format.

Method

Participants

Participants consisted of one parent and their child, ages 9 – 14 ($M_{\text{age}} = 11.25$ years). For this study, there were a total of 44 parent responses to the online questionnaire. However, the number of active participants for the purposes of data collection was narrowed down to 34 parent participants and 28 child participants (15 neurotypical children, 13 children diagnosed with ADHD) due to incomplete data within the survey. Child participants were school-aged children in late elementary and middle school. The students came from a variety of different backgrounds, primarily from school districts across Ohio though other parts of the United States were represented as well.

Procedure and Materials

Parents and children were given an online questionnaire to complete. Both questionnaires covered similar topics. Parents responded to questions regarding overall parent-child emotional closeness, their perceptions of their child's attitudes toward school both before and during the pandemic, and their child's academic performance both before and during the pandemic. Children responded to questions regarding overall parent-child emotional closeness, and attitudes toward school both before and during the pandemic. Parents also provided information regarding whether or not their child had ADHD, along with several demographic questions and information on how the child's schooling had changed during the pandemic. The parent survey was filled out by one parental figure in the child's family, and the parent survey always came first. Children filled out the latter half of the survey once their parent completed the first portion. [Table 1](#) highlights the measures and constructs incorporated in the online questionnaire as well as sample items from the survey. Details on each measure are provided below as well.

Parent-Child Bond and Emotional Closeness

Parents and children reflected on their relationship with each other. The parent portion of the survey assessed the parent's involvement with their child (both regarding schoolwork and their involvement in extracurricular activities and interactions), ways in which they are fostering a relationship with their child, and their perceptions on how their child views their relationship. The Child-Parent Relationship Scale (CPRS) (Driscoll & Pianta, 2011) was used as a measurement to create a modified version in order to gauge aspects of a parent-child relationship, like parental involvement and closeness. The child portion analyzed similar components; however, the questions gauged perceived bond and interaction from the perspective of the child in question. Some questions that were included in the survey asked how the child feels about their parent in how they interact with them, how much time they feel they spend doing activities with their parent, and how close they feel they are with their parent. Statements in both the parent and child portion of the survey were given on a 5-point Likert scale ranging from strongly disagree to strongly agree.

Academic Achievement

Academic achievement was measured primarily on the basis of the parents' judgement on their child's performance in school. We asked parents to provide a rating as to how well they believed their child did both before COVID-19 and during the online learning format. The ratings ranged from poor to excellent, with poor given a score of 1 and excellent corresponding with a score of 7 for numerical data analysis purposes. We additionally asked information regarding GPA, but the majority of parents reported not having this information, so this variable was not analyzed.

Child and Parent Attitudes on School and Learning

Both parents and children completed their respective portions of the online questionnaire assessing the child's attitudes on school and learning. The purpose of assessing the child's attitudes and the parent's perception of them was to gather more information on how the child viewed school to determine if there was any relationship between their attitudes and how well they performed in school. Statements again were given on a 5-point Likert scale ranging from strongly disagree to strongly agree. Children's attitudes were measured using statements, such as I enjoy learning new things in school, I enjoy doing my schoolwork, and I try my best and work hard on assignments. These same statements were presented on the parent portion of the survey to determine what the parent's perception of their child was. We believe these statements provided us with more information on the child's feelings toward school and overall performance level.

ADHD Diagnosis

Parents elaborated on the symptoms and characteristics of the child's ADHD diagnosis.

Results

Achievement and Attitude Differences in Face-to-Face vs Online Learning

A 2 (ADHD diagnosis: ADHD present vs. ADHD absent) x 2 (school format: face-to-face vs. remote) mixed between-within subjects ANOVA was conducted looking at parent-rated academic achievement. ADHD diagnosis was a between-subjects factor, and the mode of education was a within-subjects factor. There was a significant main effect of the mode of schooling ($F(1,32) = 9.267, p < 0.01, \eta_p^2 = .225$), such that academic achievement worsened during remote learning ($M = 3.754, SD = 1.046$) as opposed to the fall 2019 semester where students were face-to-face ($M = 4.204, SD = 0.824$). There was no significant main effect of ADHD diagnosis, with academic achievement not being statistically different between those with

ADHD ($M = 3.8$, $SD = 0.819$) and those without the diagnosis ($M = 4.158$, $SD = 0.834$), $F(1, 32) = 1.567$, $p > 0.05$, $\eta_p^2 = 0.047$. There was also no interaction effect of ADHD diagnosis x mode of schooling, $F(1, 32) = 1.529$, $p > 0.05$, $\eta_p^2 = 0.046$ (see [Table 2](#) for cell means).

A similar 2 (ADHD diagnosis: ADHD present vs ADHD absent) x 2 (school format: face-to-face vs online) ANOVA was conducted to analyze child attitudes toward school. There was a significant main effect of face-to-face versus online learning with more positive child attitudes during in-person school ($M = 3.837$, $SD = 0.752$) than their attitudes and feelings of online school during COVID ($M = 3.402$, $SD = 0.737$), $F(1, 25) = 12.417$, $p < 0.01$, $\eta_p^2 = 0.280$. However, there was no significant main effect of ADHD diagnosis on child attitudes, $F(1, 25) = 1.055$, $p > 0.05$, $\eta_p^2 = 0.044$, as children with ADHD did not have statistically different means from children without the diagnosis (see [Table 3](#) for cell means). There was also no ADHD x school semester interaction effect present, $F(1, 25) = 1.342$, $p > 0.05$, $\eta_p^2 = 0.027$.

A final 2 (ADHD diagnosis: ADHD present vs ADHD absent) x 2 (school format: face-to-face vs online) ANOVA analyzed parents' evaluation of children's attitudes toward school. There was a significant main effect of face-to-face vs remote learning present, such that parents believed that their child had a more positive attitude toward school prior to COVID-19 ($M = 3.623$, $SD = 0.824$) as opposed to during online school during the pandemic ($M = 3.221$, $SD = 0.663$), $F(1, 29) = 9.688$, $p < 0.01$, $\eta_p^2 = 0.250$. There was also a significant main effect of ADHD diagnosis on the parents' evaluation of their child's attitudes, where parents of children with ADHD tended to rate their child's attitudes toward school as more negative ($M = 3.157$, $SD = 0.692$) when compared to the parents of children without ADHD ($M = 3.669$, $SD = 0.591$), $F(1, 29) = 5.304$, $p < 0.05$, $\eta_p^2 = 0.155$. However, there was no interaction effect present between ADHD diagnosis and format of school semester, $F(1, 29) = 2.542$, $p > 0.05$, $\eta_p^2 = 0.081$ (see

Table 4 for cell means). In sum, analyses pointed consistently to declines in attitudes and achievement upon shifting to remote learning (consistent with a “COVID slide”), but ADHD diagnosis did not emerge as a significant interacting factor.

Emotional Closeness and Attitudes and Achievement in Face-to-Face and Online Learning

Our primary analyses involved emotional closeness as a predictor variable for the outcome variables of attitudes toward school and academic achievement. Bivariate correlations among all of the study variables can be seen in Table 7. Our primary analyses centered on how emotional closeness predicted attitudes and achievement, specifically investigating whether these relationships were present when examining the outcome variables for both face-to-face and remote learning. Parent-perceived emotional closeness was positively correlated with parents’ perception of child’s attitudes when the child was in face-to-face schooling ($r(32) = 0.42, p < 0.05$). Significant positive correlations were also found between child perceived closeness and both parent-reported and child-reported child attitudes toward school respectively ($r(26) = 0.41, p < 0.05$; $r(26) = 0.38, p < 0.05$). For both parent perceived and child perceived closeness, however, there were no significant correlations found with the child’s academic achievement. While in the online setting, there were no significant relationships between parent or child perceived closeness and any of the outcome variables. Closeness and academic achievement correlations were indicative of positive trends but were not significant (see Table 5 for closeness correlations).

The same correlations were conducted again, but separately according to whether children had or did not have ADHD diagnoses. Given the small sample sizes, however, these analyses must be treated as exploratory. While attending school face-to-face, parent-perceived emotional closeness was correlated with children’s academic achievement for the children

diagnosed with ADHD ($r(13) = 0.51, p < 0.05$). In children with ADHD, child-perceived closeness also correlated strongly with child attitudes during their face-to-face learning ($r(13) = 0.70, p < 0.05$). During online learning, many of these correlations decreased in significance or stayed relatively the same. Child closeness for those diagnosed with ADHD was still significantly positively correlated with children's school attitudes ($r(13) = 0.67, p < 0.05$). These correlations were not apparent in neurotypical children. Parent and child perceived emotional closeness were positively correlated with parent attitudes during the child's face-to-face schooling experience ($r(17) = 0.78, p < 0.05$; $r(17) = 0.62, p < 0.05$). As is seen in the children with ADHD, however, these relationships are no longer significant when the child has their schooling online. But parent-perceived emotional closeness did positively correlate with the child's academic achievement during remote learning ($r(17) = 0.47, p < 0.05$). For a more detailed breakdown of the comparison correlations, see [Table 6](#) for r values.

Discussion

The primary aim of this study was to compare attitude and achievement differences in online and face-to-face environments as it relates to the parent-child relationship. Earlier research has elaborated on the importance of the parent-child relationship on a child's achievement in schools; however, research on this relationship during an online school format has not yet been conducted. This study also included additional analyses and comparisons between neurotypical children and children with ADHD diagnoses. The specific population of children with ADHD in a time where learning was primarily occurring online was of interest and was looked at due to the vulnerability of this population for underachievement and dislike for school.

The results indicate that differences in attitude and achievement do exist when comparing student outcomes in a regular face-to-face school setting and a remote learning experience. Declines in academic achievement were noted during the time that children were completing school online, and attitudes toward school (both children's attitudes and parent-perceived child attitudes) tended to be more negative during the online format as well. Soland et. al. (2020) discuss expected and current declines in student achievement as the pandemic has progressed. Parents judged their child's academic performance to be lower than what it was when the child had in-person school, and they expressed more negative judgements of their child's attitudes toward school. In addition, children expressed having greater negative attitudes on school and learning during their online schooling as compared to their face-to-face format. Research regarding online learning indicates that it is effective if the child has the adequate resources and personalized learning implemented in the home (Garcia & Weiss, 2020). Due to the sudden shift to remote learning, parents and children most likely did not have the time nor the resources to set the child up for success academically. These findings are reflective of what had been predicted prior to beginning data collection.

Children with and without ADHD were also compared on their academic achievement and attitude differences. Both groups saw declines in both achievement and attitudes toward school. Overall, however, ADHD diagnosis did not have any effect on children's academic achievement and attitude toward school, except when measuring parent's perceived ratings of their child's attitudes toward school. This finding is not aligned with hypotheses generated prior to data collection on attitude and achievement differences in children with ADHD or previous literature on general underachievement in children with ADHD (DuPaul et. al., 2004). Current research highlights that children who tend to be lower achieving, such as those with ADHD, will

only be further behind their average to high achieving peers (Soland et. al., 2020). However, this unfortunate achievement gap was not true in this study. While both students with ADHD and those without the diagnosis saw declines in academic achievement and attitudes about school, the differences in declines between the two groups was not significant. This is most likely due to the fact that a majority of the children in our study came from families and homes that had more access to supports and resources than other children who tend to have this diagnosis.

Another key aspect of this research was to determine if there was a relationship between parent-child emotional closeness and student outcomes for children of this age group, both before and during the pandemic. After conducting bivariate correlations between parent and child perceived emotional closeness and the student outcome variables (achievement and attitudes), the results suggest that parent and child perceived emotional closeness was positively correlated with parent-perceived child attitudes during the face-to-face schooling environment period. Child-perceived closeness also correlated positively with the child's attitudes toward school for the time when school was face-to-face. While there were trends indicating associations between parent-perceived closeness and academic achievement during both modes of schooling, there were no significant findings. All relationships that were significant during the face-to-face format were not found to be significant during the time when children were completing school remotely. This possibly indicates that the parent-child relationship is no longer a factor in increasing child's attitudes and their academic achievement once schooling became remote. While parent- and child-perceived emotional closeness tends to have a greater effect on student outcomes in a traditional, in-person setting, Garcia & Weiss (2020) emphasize that personalized instruction and appropriate supports have more of a mitigating effect on this

decline in learning and academic achievement. This then serves as a greater, more impactful factor on attitudes and achievement as opposed to the parent-child relationship strength.

Contrary to my hypothesis, parent-child emotional closeness did not seem to positively correlate to achievement and attitudes during both face-to-face and remote learning; the positive correlations were only seen during face-to-face formats, not in both contexts. This suggests that the parent-child relationship was not as significant a predictor as was thought for student outcomes during the online setting. While in the traditional in-person school setting the parent-child relationship seemed to factor in to a child's success and performance in school, the online setting and global pandemic appear to be influencing a child's outcomes more so than the relationship they have with their parent. This is important to note as what was once regarded as a mitigating factor in the parent-child relationship now seems to not play a significant role in the child's achievement. Factors such as online work, health stressors, lack of social interaction, and inappropriate academic supports could be related to student outcomes that are being seen.

These relationships were also examined further by specifying those children with ADHD diagnoses and those without. I wanted to see if the findings varied depending on the child's diagnosis. For children with ADHD diagnoses, parent-perceived emotional closeness was positively correlated with academic achievement during the in-person format. However, that relationship dissipated during the online setting. Child-perceived emotional closeness among those with ADHD was associated with child attitudes toward school for both schooling formats. For the children without ADHD diagnoses, parent and child perceived emotional closeness correlated significantly with parent-perceived child school attitudes during the face-to-face school format. However, in the online setting, parent-perceived emotional closeness only correlated with the child's academic achievement. When comparing students with and without

ADHD, varying relationships were found as certain predictor variables seemed to correlate with differing outcome variables across the school settings. These varying findings seem to indicate that a variety of factors may be influencing a child's performance and attitudes. With a disorder, such as ADHD, that impacts multiple facets of a child's education (Weis, 2018), it is important to note the relationships that are seen between emotional closeness and student outcomes.

However, this does not mean that these are the only factors that play a role. The varying findings may be in part due to the complexity and difficulties associated with the ADHD diagnosis.

Children with ADHD tend to have lower academic achievement, stronger negative attitudes toward school, and poorer relationships with their parents when compared to their neurotypical peers (DuPaul et. al., 2004; Weyers et. al., 2019). But, the current study indicates that, depending on their specific circumstances, the parent-child relationship of children with ADHD may differ from that same relationship between neurotypical children and their parents and how that influences their child's performance in school.

This research has provided insight into children's achievement and attitudes in the school environment during a global pandemic. With the coronavirus pandemic in its preliminary stages at the beginning of our data collection, little to no research had been conducted on child's academic achievement as it relates to the parent-child relationship. This study was unprecedented in the fact that these variables had yet to be looked at through an online educational lens.

Although more research needs to be conducted on this topic, it is important to understand a child's relationship with their parents as a factor of performance and other student outcomes, especially under the circumstances where students are spending even more time in their home environment.

Limitations and Future Research

Although the current study provides evidence for differences in attitudes and academic achievement when comparing face-to-face and remote learning, the generalizability of the results are limited by a small sample size and limited ability to measure academic performance. We were only able to ask parents about their broad impressions regarding learning and achievement as opposed to also including GPA or academic grades as part of the measure of academic achievement. Overall, this research study involved 34 parent responses and 28 child responses, which is a relatively small sample size for a study to be generalized to a larger population. Some of the findings of this study may be significant, but it is not guaranteed to be reflected and universal for all late elementary/middle school students. In addition, when conducting analyses comparing children with and without ADHD, the samples were even smaller, making them less likely to be representative of the greater population. We largely reached individuals who are well-educated parents with time and resources available to them. The implication for the purposes of this study as it relates to the general public is that the population that tends to see greater underachievement and lower student outcomes is in those that do not have access to many resources and financial stability. This is another limitation to consider.

In terms of procedure and structure of the survey, future work can benefit by having variable measures, such as academic achievement, include both parent's perceptions of their child's performance as well as direct evidence as to what their child is completing in school. Originally, I wanted to measure academic achievement with children's GPA/report card scores; however, as parents completed the survey, it was noted that many parents did not have knowledge of their child's grades nor did their school systems have a structure in place for their child to receive any form of standard grading. This process was more of an exploratory step and future research should include GPA and more traditional academic grades. I believe that asking

parents for their judgement on their child's performance measured the child's academic achievement, but next steps can include both parent's judgements and report card grades for more in-depth numerical analysis.

In order to address these limitations, there are many different directions for future research in this topic area. Due to the widespread effects brought on by the pandemic, more research should be conducted on how this event is influencing students in schools and in their home environments. Achievement and attitudes are two variables that were chosen to be analyzed in this study, but future research can expand upon these and look at motivation and online engagement in relation to the amount of academic support and emotional closeness present at home. The achievement measure should be expanded, recruitment of more families should be increased, and looking at how the pandemic especially has affected disadvantaged students, such as those with a mental health diagnosis like ADHD, is an important aspect to consider. In addition, I also feel that a new aspect of this study could be gaining insight into children's mental health as a result of the pandemic. A child's emotional and mental state can be a determining factor in how they perform in school; therefore, adding this as a factor could prove for interesting results.

In sum, our current study identified differences in attitudes and achievement when comparing children's experiences in an in-person and online school setting. Child attitudes and academic achievement declined when children were remote for school, and the presence of a child's ADHD diagnosis had no effect on these differences. Children with and without ADHD alike experienced similar declines in school attitudes and achievement. In addition, we found that the parent-child relationship correlated with child attitudes during the time when children were in face-to-face schooling, but that relationship was not significant during the pandemic. The

COVID-19 pandemic proved to be a difficult time for many, especially parents and their children, and this research offers a glimpse of some of the effects brought on by the pandemic in terms of children's experiences in school and their performance.

Appendix (Tables)

Table 1. Questionnaire Measures and Constructs

Measures and Constructs	Parent-Rated	Child-Rated	Scoring	Sample Question/Item
<i>Emotional Closeness</i>	X	X	1 – 5 (1 = low closeness, 5 = high closeness)	<i>If my child is upset, they will seek comfort from me/When I am upset, I go to my parent to feel better</i>
<i>Child Attitudes on School (Face-to-face)</i>	X	X	1 – 5 (1 = negative attitude, 5 = positive attitude)	<i>My child enjoyed learning new things in school/I enjoyed learning new things in school</i>
<i>Child Attitudes on School (Online Schooling)</i>	X	X	1 – 5 (1 = negative attitude, 5 = positive attitude)	<i>My child enjoyed learning new things in school/I enjoyed learning new things in school</i>
<i>Academic Achievement (Face-to-face)</i>	X		1 – 7 (1 = poor, 7 = excellent)	<i>At the end of Fall 2019 (the first half of the school year, and prior to COVID-19), how would you judge your child's academic achievement in school (for the year up to that point)?</i>
<i>Academic Achievement (Online Schooling)</i>	X		1 – 7 (1 = poor, 7 = excellent)	<i>How would you judge your child's academic achievement in school within the second semester of the year (January 2020-June 2020)?</i>
<i>ADHD Diagnosis</i>	X		N/A	<i>Has your child been diagnosed with Attention Deficit Hyperactivity Disorder (ADHD)?</i>

Table 2. Cell Means of 2 x 2 ANOVA (Academic Achievement)

RM Factor 1	ADHD	Mean	SD	N
Face-to-Face Learning	Yes	3.933	0.884	15
	No	4.474	0.697	19
Online Learning	Yes	3.667	0.976	15

Table 2. Cell Means of 2 x 2 ANOVA (Academic Achievement)

RM Factor 1	ADHD	Mean	SD	N
	No	3.842	1.119	19

Table 3. Cell Means of 2 x 2 ANOVA (Child Attitudes Toward School)

RM Factor 1	ADHD	Mean	SD	N
Face-to-Face Learning	Yes	3.638	0.894	13
	No	4.036	0.399	14
Online Learning	Yes	3.346	0.882	13
	No	3.457	0.606	14

Table 4. Cell Means of 2 x 2 ANOVA (Parent Evaluation of Child Attitudes)

RM Factor 1	ADHD	Mean	SD	N
Face-to-Face Learning	Yes	3.273	0.612	13
	No	3.972	0.781	18
Online Learning	Yes	3.077	0.629	13
	No	3.365	0.677	18

Table 5. Correlations Between Emotional Closeness and Outcome Variables in Face-to-Face and Online Settings

Parent Attitudes Child Attitudes Achievement

<i>Face-to-Face Learning</i>	Parent Closeness	0.42*	0.09	0.28
	Child Closeness	0.41*	0.38*	0.07
<i>Online Learning</i>	Parent Closeness	0.21	0.12	0.31
	Child Closeness	0.11	0.26	0.29

* $p < 0.05$

Table 6. Correlations Between Emotional Closeness and Outcome Variables in Face-to-Face and Online Settings: Comparisons of ADHD Diagnosis

ADHD Diagnosis			Parent Attitudes	Child Attitudes	Achievement
<i>Yes</i>	<i>Face-to-Face Learning</i>	Parent Closeness	-0.003	0.11	0.51*
		Child Closeness	0.31	0.70*	0.31
<i>Yes</i>	<i>Online Learning</i>	Parent Closeness	0.07	0.004	-0.03
		Child Closeness	0.41	0.67*	0.37
<i>No</i>	<i>Face-to-Face Learning</i>	Parent Closeness	0.78*	0.27	0.31
		Child Closeness	0.62*	0.44	0.01
<i>No</i>	<i>Online Learning</i>	Parent Closeness	0.33	0.31	0.47*
		Child Closeness	0.04	0.09	0.28

* $p < 0.05$

Table 7. Bivariate Correlations Among Study Variables

Variable	1	2	3	4	5	6	7	8
1. Parent Emotional Closeness	—							
2. Child Emotional Closeness	0.70**	—						

Variable	1	2	3	4	5	6	7	8
3. Parent Attitudes Pre-COVID	0.42*	0.41*	—					
4. Parent Attitudes During COVID	0.21	0.11	0.51**	—				
5. Child Attitudes Pre-COVID	0.09	0.38*	0.47**	0.14	—			
6. Child Attitudes During COVID	0.12	0.23	0.17	0.51**	0.60**	—		
7. Face-to-Face Achievement	0.28	0.07	0.55**	0.45*	0.42*	0.23	—	
8. Online Achievement	0.31	0.29	0.49**	0.61**	0.24	0.44*	0.60**	—

* $p < 0.05$ ** $p < 0.01$

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