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Student Characteristics and Perceived Sense of Connectedness in Middle School Online Learning Environments

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Abstract

The COVID-19 pandemic disrupted face-to-face instruction in schools across the United States and the world. Using the Online Student Connectedness Survey (OSCS), we analyzed data from three middle schools in a suburban school district in the southeastern United States in order to determine if there were any statistically significant interaction effects between student characteristics (grade level, gender, and race/ethnicity) and their sense of connectedness in a non-traditional online learning environment. Factorial Analysis of Variance (ANOVA) tests revealed that neither grade level nor gender independently were associated with students' perceived connectedness during online instruction. However, there was a statistically significant difference in student connectedness within the online environment based on race/ethnicity, such that White students reported significantly higher sense of connectedness than non-White students. We also found a statistically significant interaction effect between students' grade level and gender on students' perceived connectedness in the online learning environment. Female students had a lower sense of connectedness in the 7th grade, but sense of connectedness increased in the 8th grade. Finally, we found no statistically significant interaction effects among grade-level, gender, and race/ethnicity on students' perceived connectedness in the online learning environment.

Keywords

online learning, student characteristics, sense of connectedness

Introduction

In March 2020, the COVID-19 pandemic led to massive disruptions to everyday life, commerce, and education in communities all around the world. These included social distancing, self-quarantining, stay-at-home measures, hospitalizations, and deaths. As state officials and school leaders began developing reopening plans for the 2020-2021 school year, they bore the responsibility for safeguarding the health, safety, and well-being of students and staff members.

Educational leaders weighed decisions of reopening schools, keeping them closed, or adopting online instruction, also known as non-traditional instruction (NTI). Hoffman and Miller (2020) proclaimed that, "prolonged school closures are one of the most disruptive forces in the COVID-19 era" (p. 301). Viner et al. (2021), however, noted that school closures mitigated COVID-19's transmission.

With NTI, teachers and students continue with academic instruction through online platforms such as Zoom, Google Meet, or Microsoft Teams. This change in instructional delivery required a shift in the way teachers and students engaged in the learning process. With school buildings closed and classrooms shifted to virtual meeting spaces, the coronavirus presented many obstacles for educators. Teachers dramatically altered lesson plans and adapted quickly to new technology (Kaden, 2020). District and school administrators had to address logistical challenges associated with providing internet access, technology, and resources to ensure an equitable online learning environment for students (Fagell, 2020). Furthermore, the pandemic forced educators to consider other logistical concerns, such as students' access to food (Van Lancker & Parolin, 2020) and mental health needs (Hoffman & Miller, 2020; Torres-Pagán & Terepka, 2020). Not only has COVID-19 had an impact on how teachers and administrators work, it also presented challenges for students and their parents. Students had to adapt to the changes in instructional delivery by developing new learning strategies while struggling with social isolation and loneliness (Brooks et al., 2020). Furthermore, the pandemic caused disruptions to daily schedules and financial stress in household budgets (Kaden, 2020; Phelps & Sperry, 2020).

Research Questions

Given the importance of providing equitable and engaging learning opportunities for students in successful middle schools (Bishop & Harrison, 2021), we sought to answer four research questions:

1. Is there a statistically significant interaction effect between students' grade level and gender on students' perceived connectedness in the non-traditional learning environment as measured by the online connectedness survey?

2. Is there a statistically significant interaction effect between students' grade level and race on students' perceived connectedness in the non-traditional learning environment as measured by the online connectedness survey?

3. Is there a statistically significant interaction effect between gender and race/ethnicity on students' perceived connectedness in the non-traditional learning environment as measured by the online connectedness survey?

4. Is there a statistically significant interaction effect among grade level, gender, and race/ethnicity on students' perceived connectedness in the non-traditional learning environment as measured by the online connectedness survey?

Literature Review

The school environment is a focal point for the development of academic learning, socialization skills, and interpersonal relationships among adolescents (Booker, 2007) from which emerges a sense of connectedness (Murphy & Zirkel, 2015). A review of the education and health research literatures reveal a number of interrelated terms and concepts used to understand student relationships in schools. These include school engagement, school attachment, school bonding, school involvement, teacher support, school belonging, and school connectedness (Libbey, 2004). Given the variety of constructs used in the research and the lack of pre-eminence of one over the other (Libbey, 2004), researchers must choose and justify their selection. Connectedness draws upon a number of concepts that emerged in the school climate literature, including perceptions of school attachment, bonding, engagement, involvement, belonging, and support (Debnam et al., 2021; Goodenow, 1993).

Research reveals that students' perceptions of connectedness within schools are positively associated with a number of educational outcomes, including school engagement, achievement, avoidance of risky behaviors (e.g., drug use), and graduation. A strong sense of connectedness and involvement among students promotes positive adolescent development, both academically and behaviorally (Hussain et al., 2018). Stronger perceptions of connectedness are negatively associated with the occurrence of a number of adverse mental health issues such as depression and anxiety (Shochet et al., 2006) as well as risky behaviors such as substance abuse and engaging in sex (Bond et al., 2007; McNeely et al., 2004). Connections and relationships among peers, teachers, and administrators significantly affect students' feeling accepted, respected, included, engaged, and supported. When students feel a sense of connectedness, they are more optimistic and passionate within the school environment. Gray et al. (2018) contend that creating a school environment that fosters sense of connectedness, acts of cultural distinctiveness, and citizenship are key within the school environment. Doing so validates students by respecting their norms, standards, and practices, promoting a sense of respect, acceptance, and support. Students have a stronger sense of connectedness to their school when the cultural values of the school are reflective of the cultural values students have of themselves. Regarding citizenship, Gray et al. (2018) assert that students involved in civic-related experiences within the school environment have a greater sense of connectedness. Capps (2004) found that students who perceive their school as an accepting and supportive environment "in which they actively participate and have opportunities to influence, will feel attached to the school community" (p. 4).

Scholars have sought to identify factors that promote success within online learning environments in both K-12 and postsecondary online instructional environments (Bolliger & Inan, 2012; Garrison et al., 1999; Rovai, 2002a; Rovai, 2002b; Slagter van Tyron & Bishop, 2009; Zimmerman & Nimon, 2017). Online student connectedness research has resulted in the development and application of three prominent sense of connectedness instruments to measure online learner classroom connectedness in non-traditional settings (Zimmerman & Nimon, 2017). These include the Classroom Community Scale (Rovai, 2002a; Rovai, 2002b), Community of Inquiry (Garrison et al., 1999), and the Online Student Connectedness Survey (Bolliger & Inan, 2012).

Among the student characteristics commonly operationalized and tested are gender, race, socioeconomic status, and program enrollments, such as special education (Abimbola & Ugbede, 2018; Cholewa et al., 2018; Tomul & Savasci 2012; Voight et al., 2015; Witherspoon & Ennett, 2011). Research also explores student transitions—from elementary to middle school and middle school to high school—and its relationship to academic success and sense of connectedness (Chase et al., 2014; Holas & Huston, 2012; McMillen, 2004; Stevenson, 2006; Witherspoon & Ennett, 2011). School-level transitions require students to meet higher academic expectations and adapt to their new school environment (Chase et al., 2014). These transitions can be challenging and contribute to academic achievement gaps (Friend et al., 2018). The gap continues to widen during students' elementary matriculation and becomes a notable disparity during their middle and high school years of education (Paschall et al., 2018).

Among grade levels, studies highlight the underperformance in achievement and the social isolation of middle school students compared to elementary students (Holas & Huston, 2012; Irvin et al., 2011). Scholars speculate that this variation in attitude is due to changes in the classroom environment and instructional quality (Mann et al., 2013; Witherspoon & Ennett, 2011). Holas and Huston (2012) contend that as students shift from elementary to middle school, they must redefine their relationships with peers and adults. During this transition, adolescents seek inclusion from peers, trust from teachers, and greater autonomy in their new learning environment. Similar challenges arise as students matriculate from middle school to high school (Chase et al., 2014). While many high school students can transition successfully, other students develop feelings of disdain toward teachers, lack of interest in schoolwork, and disconnection from school (Abimbola & Ugbede, 2018; Loukas et al., 2009).

Research suggests that gender is a predominant variable for predicting academic success and sense of connectedness (Carney et al., 2020; Tomul & Savasci, 2012); however, the results of gender differences are inconclusive. Abimbola and Ugbede (2018) found no significant difference in male and female students and sense of connectedness. Lamport and Bartolo (2012) found that males have a higher sense of connectedness. Still others found that females reported a more heightened sense of connectedness (Carney et al., 2020; Ja & Jose, 2017). Niehaus et al. (2012) assert that females have a stronger sense of connectedness at the beginning of the school year than males. They posit that females' more meaningful sense of connectedness led to increased academic success and fewer behavior issues.

Research also suggests that minority students have fewer supportive interactions within schools, which results in a weakened sense of connectedness among students (Konold et al., 2017; Shirley & Cornell, 2012). Bottiani et al. (2016) found that African American students have fewer supportive relationships with their teachers and diminished feelings of connectedness than their White peers. Bottiani et al. (2016) also posit that in "schools with larger discipline disparities, Black students may perceive a more negative school climate than their white classmates within the same school" (p. 539). One must also consider student gender when discussing discipline disparities and how these disparities influence feelings of connectedness. Male students are more likely to participate in violent behaviors than female students (Volungis, 2016), and they are also more apt to be perceived as a threat than their female counterparts (Friend et al., 2018). This notion

is especially true for African American males, who are more likely than any other student group to be sent to the office, removed from the classroom, or referred to law enforcement (Gregory & Fergus, 2017). Socioeconomic status (SES) is another factor that contributes to the growing achievement disparities and lower feelings of connectedness (McMillen, 2004; Paschall et al., 2018; Qian et al., 2017).

Student program enrollments that provide supports for English language learners, special education students, and impoverished students may be associated with student sense of connectedness. Adoniou and Qing (2014) found a correlation between language proficiency and achievement, surmising that underachievement and a lack of connectedness result from language barriers. Riley and White (2016) found that when gifted students engage with like-minded peers, they have a stronger sense of connectedness. Students with special education needs or learning differences have greater feelings of connectedness when they are respected and treated in similar ways as their peers (Rose & Shelvin, 2017).

With the increased use of NTI in response to the COVID-19 pandemic, conditions forced educational leaders and teachers to adapt their instruction and environment. Likewise, students had to respond to new learning environments and strategies while struggling with social isolation and loneliness (Brooks et al., 2020). Many students have faced additional challenges, such as access to food, mental health needs, and financial stress (Hoffman & Miller, 2020; Kaden, 2020; Phelps & Sperry, 2020; Torres-Pagán & Terepka, 2020; Van Lancker & Parolin, 2020). COVID-19 seems to have affected students, their families, and the educational enterprise significantly and negatively. These challenges were in addition to those associated with being an adolescent navigating the transition from elementary to middle school and puberty (Nelemans et al., 2018; Ng-Knight et al., 2016).

Methodology

We will now discuss our methods used to examine the interaction effects between student characteristics and their sense of connectedness in a non-traditional online learning environment in middle school. We first discuss the context of our study. We then discuss the instrument and procedures utilized in data collection. Finally, we discuss our analytical strategies, including descriptive analysis of our respondents and inferential analysis used to answer our four research questions.

Context of the Study

Three middle schools within a suburban Kentucky school district served as the context of our study (see Table 1). In response to the COVID-19 pandemic and state leaders' recommendations, the district began the 2020-2021 school year with non-traditional instruction (NTI). In the 2020-2021 school year, the suburban district that served as the context of our study served approximately 7,300 students, of which approximately 64% are White. Approximately 51% of students in the district receive free or reduced lunch and classify as economically disadvantaged. Other groups in the district include English Language Learners (12%), special education—gifted and talented (15%), homeless students (0.4%), migrant (0.6%), and special education students on Individualized Education Programs (17%).

Table 1

Middle School and District Demographic Data, 2020-2021

Variable		School A		School B		School C		District	
		Total	Percent	Total	Percent	Total	Percent	Total	Percent
Enrollments	Total	610	100.0	676	100.0	782	100.0	7,306	100.0
	6	201	32.9	218	32.2	151	19.8	558	7.6
	7	183	30.0	214	31.7	147	18.8	534	7.3
	8	226	37.1	244	36.1	132	16.9	594	8.1
Gender	Female	332	54.4	325	48.1	354	45.3	3,480	47.6
	Male	287	47.0	351	51.9	428	54.7	3,826	52.4
Race/Ethnicity	African American	22	3.6	63	9.3	56	7.2	488	6.7
	Native American	2	0.3	1	0.1	1	0.1	11	0.2
	Asian	0	0.0	2	0.2	9	1.2	54	0.7
	Hispanic/ Latino	107	17.5	206	30.5	220	28.1	1,670	22.9
	Hawaiian/Pacific Islander	2	0.3	0	0.0	1	0.1	6	0.1
	Two or More Races	29	4.8	51	7.5	41	5.2	417	5.7
	White	448	73.4	353	52.2	454	58.0	4,660	63.8
Program Enrollment	Free/Reduced Lunch	313	51.3	393	58.1	425	54.3	3,710	50.8
	English Learners	33	5.4	100	14.8	153	19.6	886	12.1
	Gifted and Talented	74	12.1	77	11.4	118	15.1	1,088	14.9
	Homeless	3	0.4	4	0.5	4	0.5	31	0.4
	Migrant	1	0.1	7	1.0	10	1.3	46	0.6
	Special Education	76	12.5	93	13.8	122	15.6	1,207	16.5

Instrumentation and Data Collection

We utilized Bolliger and Inan's (2012) Online Student Connectedness Survey (OSCS), a 25-item self-report survey. We administered the survey electronically in spring 2021 during a 7-day window specified by the cooperating school district. Bolliger and Inan's factor analysis identified four factors and subscales: 1.) comfort, 2.) community, 3.) facilitation, and 4.) interaction and collaboration. Bollinger and Inan determined the Cronbach's Alpha for the OSCS to be 0.97, suggesting strong internal consistency. Our middle school student respondents answered the items using a five-point Likert-type scale: (1) strongly disagree, (2) disagree, (3) neither agree nor disagree, (4) agree, (5) strongly agree. Because the OSCS has 25 Likert-type questions using the standard coding scheme of 1- *strongly disagree* to 5- *strongly agree*, total scale scores ranged from 25 to 125. Participants' scores were then divided by 25 to calculate the average and reflect participants' sense of connectedness measure (Jamison & Bolliger, 2020). While we did not modify any of the questions in the OSCS, we did ask respondents to provide additional demographic data, including their grade-level, gender, and race/ethnicity.

Analytical Strategies

Descriptive statistics included analysis of the student respondents in terms of their race, gender, grade levels, and sense of connectedness. Furthermore, we undertook frequency counts by level for each of the four factors in the OSCS. Additional statistical analysis for student connectedness reflected center (mean), shape (histograms, kurtosis, and skewness), and spread (standard deviation). In terms of inferential analysis, we undertook factorial ANOVAs to determine any statistically significant interaction effects between student characteristics and their sense of connectedness in a non-traditional online learning environment by comparing means across several independent variables (Field, 2013; Shavelson, 1996). Specifically, we undertook a 3 (grade-level: 6, 7, or 8) by 2 (gender: female or male) by 2 (race/ethnicity: white or non-white) factorial ANOVA (see Table 2 for the variables included in the model).

Assumptions of ANOVAs include normality, independence, and equality of variance (Shavelson, 1996). We assumed that all participants completed their survey independent of one another to meet the assumption of independence. We assessed normality using skewness and kurtosis statistics reflected on histograms. Field (2013) describes skewness as the lack of symmetry of the probability distribution. Kurtosis refers to the height and sharpness of the scores compared to a standard bell curve. Distributions with skew or kurtosis values above or below 0 indicate a variation from normal (Field, 2013). ANOVAs assume that the population variances are equal across the outcome variable. This assumption was assessed using Levene's test. The group variances are not equal if this result is significant. The significance is compared to the significance value of .05. If the significance is greater than the .05 ($p > .05$), one concludes that the result is not significant and therefore does not reject the null hypothesis of homogeneity. (Abbot & McKinney, 2012; Shavelson, 1996). In terms of limitations of our design, it is correlational in nature rather than experimental or quasi-experimental. As such, we are unable to determine cause and effect (Stevens, 2007). Furthermore, our findings are only generalizable to the responses provided by the middle school students from three campuses in a single suburban school district during the 2021-2022 school year.

Table 2

Variables in the Model with Grounding in the Literature

Category	Variable	Type	Measurement	Grounding in Literature
Student Data	Grade	Independent	Categorical (dummy-coded) • 6th grade (referent group) • 7th grade • 8th grade	Abimbola & Ugbede, 2018 Chase et al., 2014
	Gender	Independent	Categorical (0/1) • Female • Male	Ja & Jose, 2017 Lamport & Bartolo, 2012
	Racial Group	Independent	Categorical (0/1) • White • Non-White	Bottiani et al., 2016 Konold et al., 2017
Sense of Connectedness	Online Student Connectedness Survey	Dependent	Continuous	Bolliger & Inan, 2012 Zimmerman & Nimon, 2017

Descriptive Analysis

In total, 337 students submitted complete responses for a response rate of 20%. Descriptive analysis of our sample revealed that 58.5% of the respondents were White and 41.5% were non-White (see Table 3). The respondents were approximately 50% male and 50% female. Fewer 7th graders responded than 6th and 8th graders.

Table 3

Descriptive Analysis of Sample

Variable	*N*	*Mean*	*SD*	*Min.*	*Max.*
White	197	.585	.494	0	1
Non-White	140	.415	.494	0	1
Male	168	.499	.501	0	1
Female	169	.501	.501	0	1
6th Grade	131	.389	.488	0	1
7th Grade	96	.285	.452	0	1
8th Grade	110	.326	.470	0	1
Connectedness	337	.320	.765	1	5

In terms of our dependent variable (Sense of Connectedness), we also undertook descriptive analysis of the means and standard deviations for student participants by grade level, gender, and race/ethnicity (see Table 4). Our analysis revealed that White students had higher mean scores regardless of gender. In terms of grade-level differences, we found that 7th graders had lower mean scores than 6th and 8th grade respondents. White students reported higher mean scores than non-White respondents with the exception of White female respondents in 7th grade.

Table 4

Means and Standard Deviations by Grade Level, Gender, and Race/Ethnicity

Grade	*Gender*	*Race/Ethnicity*	*Mean*	*SD*	*N*
6th grade	Female	White	3.23	.73	37
		Non-White	3.15	.49	31
	Male	White	3.41	.66	39
		Non-White	3.03	.67	24
7th grade	Female	White	2.91	.69	36
		Non-White	3.24	.97	15
	Male	White	3.41	.91	30
		Non-White	3.12	1.15	15
8th grade	Female	White	3.58	.64	27
		Non-White	3.21	.69	23
	Male	White	3.28	.77	28
		Non-White	2.79	.74	32

Regarding students' comfort related to online connectedness, this subscale had a mean score of 3.18, implying that students are moderately comfortable in the online learning environment and are relatively able to communicate with their peers and instructors in non-traditional instruction (see Table 5).

Table 5

Student Responses by Subscales

Subscale	Weighted Average
Comfort	3.18/5.00
Facilitation	3.54/5.00
Community	2.96/5.00
Interaction and Collaboration	3.12/5.00
All Subscales	3.20/5.00

The facilitation subscale had the highest mean of the four subscales (M = 3.54), suggesting that students felt that their instructors moderately promoted collaboration, were responsive, and participated in class discussions. The community subscale had the lowest average of all the subscales (M = 2.96). The average score for the interaction and collaboration subscale was 3.12 and was the second-lowest subscale average. The mean score for the instrument was 3.20 (SD = 0.76), suggesting students felt a moderate connection to the online learning environment during non-traditional instruction.

Inferential Analysis: Main Effect of Grade-Level, Gender, Race/Ethnicity

We conducted ANOVAs to determine any statistically significant differences in student grade level, gender, and race/ethnicity on students' perceived sense of connectedness in a non-traditional setting. Table 6 presents the results of these analyses. We found no statistically significant difference in student connectedness during non-traditional instruction based on grade level, $F(2, 325) = .088$, $p = 0.91$. Regarding gender, there was no statistically significant difference in student connectedness during online instruction between male and female students, $F(1, 325) = .317$, $p = 0.57$. There was, however, a statistically significant difference in student connectedness within the online environment based on race/ethnicity, $F(1, 325) = 6.256$, $p = 0.01$.

Table 6

Factorial ANOVA for Grade, Gender, and Race/Ethnicity on Student Sense of Connectedness

	Type III Sum of Squares	*df*	Mean Square	*F*	Observed Power	η_p^2
Corrected Model	16.349[a]	11	1.486	2.683	.974	.083
Intercept	3142.226	1	3142.226	5672.398	1.000	.946
Grade	.098	2	.049	.088	.063	.001
Gender	.175	1	.175	.317	.087	.001
Race/Ethnicity	3.466	1	3.466	6.256*	.703	.019
Grade*Gender	4.007	2	2.003	3.617*	.666	.022
Grade*Race/Ethnicity	2.362	2	1.181	2.132	.436	.013
Gender*Race/Ethnicity	2.239	1	2.239	4.041*	.518	.012
Grade*Gender*Race/Ethnicity	.731	2	.336	.660	.161	.004
Error	180.034	325	.554			
Total	3639.460	337				
Corrected Total	196.383	336				

Note. R^2 Squared = .083 (Adjusted R^2 = .052);*p < .05

Inferential Analysis: Interaction Effects between Grade-Level, Gender, and Race/Ethnicity

We also sought to determine if any interaction effects exist between student grade level, gender, race/ethnicity, and students' perceived sense of connectedness in a non-traditional online learning environment. As shown in Table 6, there was a statistically significant interaction effect between students' grade level and gender on students' perceived connectedness in the non-traditional learning environment, $F(2, 325) = 3.617$, $p = 0.03$.

The results of the factorial ANOVA also indicated that for grade-level and race/ethnicity, there was no statistically significant interaction effect on student sense of connectedness during non-traditional instruction, $F(2, 325) = 2.132$, $p = 0.12$. Thus, students' grade level and race/ethnicity are not associated with their perceived sense of connectedness during online instruction. However, there was a statistically significant interaction effect between gender and race/ethnicity on students' perceived connectedness in non-traditional instruction, $F(1, 325) = 2.239$, $p = 0.05$. Finally, the results of the factorial ANOVA for perceived sense of connectedness indicated no statistically significant interaction effect among grade level, gender, and race/ethnicity on students' perceived connectedness in the non-traditional learning environment, $F(2, 325) = .336$, $p = 0.52$.

Summary and Implications

Our findings have implications for middle school classroom teachers and school leaders. We found that non-White male students had the lowest sense of connectedness scores. This finding aligns with previous research that notes that minority students have a lower sense of connectedness than their White peers (Bottiani et al., 2016). Educators in the online classroom setting may enhance student sense of belonging by creating an online classroom environment that honors students' lived experiences and racial identity. Muhammad (2010) proposes that the curriculum should reflect students' multifaceted identities. Green et al. (2016) further supports this notion, asserting that the curriculum should affirm students' race and cultural identities. However, in some educational contexts, this has become challenging to navigate. For example, educators in the state of Florida must be cognizant of legislation, most notably, Florida's Individual Freedom Act (IFA), which took effect in July 2022. IFA seeks to "prevent discrimination in the workplace and public schools." Under the legislation, instructional personnel may facilitate age-appropriate discussions of how sexism, slavery, racial oppression, racial segregation, and racial discrimination has infringed upon individual freedoms, but may not engage in efforts to indoctrinate or impose a particular point for view upon any of their students. However, IFA is purported to have caused confusion for educators and created a chilling effect in their classrooms and instruction in their effort to avoid running afoul of the law (Cineas, 2023). Legal practitioners and scholars note that challenges to the legislation will undoubtedly be filed (e.g., Hofmeyer & Adams, 2022). In the interim, instructors in contexts such as Florida, whether online or face-to-face, may increase student sense of connectedness of non-White students by simply being supportive, respectful, and caring. Researchers suggest that the more positive interactions students have with responsive instructors, the greater their students' sense of connectedness (Konold et al., 2017; Shirley & Cornell, 2011).

Our analysis revealed that the community subscale had the lowest average of all the subscales. This suggests that student participants do not perceive strong feelings that other students in their online class rely on them. Nor do they perceive feeling emotionally attached to their peers. These responses suggest a relative lack of community and relationship during non-traditional instruction. To improve student sense of connectedness in this aspect, online educators may want to plan

activities strategically that allow students to get to know their peers and develop a social presence (Louwrens & Hartnett, 2015). These include the provision of substantial feedback to students, engaging students in the provision of peer feedback, and seeking to ensure that instructional activities are relevant and engaging to students (Louwrens & Hartnett, 2015).

While our study sheds light on interaction effects between student characteristics such as grade level, gender, and race/ethnicity on students' perceived sense of connectedness in a non-traditional online learning environment, there is still a need to continue this research. Our study narrowly focused on middle school grade levels in a single suburban school district at a discrete point in time (spring 2021, in the midst of the COVID-19 pandemic). Future researchers may want to replicate beyond the narrow temporal and geographic constraints of our study. For as Molnar et al. (2021) note, "Enrollments in virtual schools increased by approximately 34,600 students between 2017-18 and 2019-20, and enrollments in blended learning schools increased by approximately 19,500 during this same time period" (p. 4). There may also exist stronger feelings of sense of connectedness among students who self-select for online learning environments.

The global COVID-19 pandemic has only accelerated the trend of increased interest and enrollment in virtual schools. Given the novel, disruptive, and deadly nature of the COVID-19 virus, educational researchers will continue to explore the influence of the virus on the provision of students' mental health, physical well-being, and the education system as a whole. Trauma and stress may lead to a decreased sense of connectedness to the school environment. As schools continue to re-open and students return to school, student safety and well-being is a priority. Formosinho (2021) described the "new normal" regarding sanitary policies within schools and classrooms. These newly focused policies include frequent hand washing, diligent cleaning of common spaces, face coverings, and social distancing. The continued social distancing in the classroom may affect students' feelings of connectedness as their relationships and interactions are limited due to the distance. Süt and Öznaçar (2021) noted that COVID-19 has significantly affected the education structure as operational activities ceased and academic progress slowed. Undoubtedly, some of the long-term impacts of the pandemic remain unseen. Future researchers will want to consider the long-term mental, physical, and educational effects caused by the coronavirus pandemic and their association to student sense of connectedness.

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