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# Racial/Ethnic Composition and Segregation in ECE

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**PennState**  
College of Education

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## Contents

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<b>Research Highlights .....</b>	<b>2</b>
<b>Background.....</b>	<b>3</b>
<b>Composition of the ECE Workforce .....</b>	<b>5</b>
<b>Racial/Ethnic Composition of ECE Classrooms .....</b>	<b>8</b>
<b>Racial/Ethnic Segregation in ECE Classrooms .....</b>	<b>10</b>
Isolation and Interaction Indices.....	10
Theil's H Index.....	13
Intensely Segregated ECE Classrooms .....	13
<b>Access to Diverse Teachers by ECE Classroom Composition.....</b>	<b>15</b>
<b>Discussion.....</b>	<b>20</b>
<b>Appendix A .....</b>	<b>21</b>
Data and Methods .....	21
NSECE Sampling Strategy.....	22
Sample Size, Restrictions, and Use of Weights .....	22
Note on Data Cleaning.....	23
<b>Appendix B .....</b>	<b>25</b>
<b>About the Authors.....</b>	<b>29</b>
<b>About the Center for Education and Civil Rights (CECR) .....</b>	<b>29</b>

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## Research Highlights

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- The early care and education (ECE) workforce is highly racially diverse, far more so than the K-12 workforce. The share of non-white ECE teachers also rose from 36.7% in 2012 to 40.4% in 2019, further increasing the diversity of the ECE workforce.
- Examining the racial composition of ECE classrooms indicates that students are clustered by their race/ethnicity. A large proportion of center-based ECE classrooms in 2019 (38.5%) did not enroll any Black or Hispanic students and a large majority (73.5%) do not enroll any Asian students. At the same time, 32.8% of classrooms were more than 75% white and another 7.7% and 4.6% of classrooms enrolled more than 75% Black and Hispanic students, respectively.
- Students of all racial groups were highly isolated in ECE classrooms. Further, in 2019, slightly over a quarter of classrooms in our sample enrolled 90% or more of their students from a single racial/ethnic category. However, segregation analyses in this report use a subsample of NSECE 2019 data and therefore, are not representative of all ECE classrooms in the country.
- Classroom racial composition of children varied substantially by educators' race/ethnicity. ECE educators of all races/ethnicities were most likely to serve high percentages of children who shared their same race. Classrooms with high concentrations of students from a single racial/ethnic group also had a lower likelihood of employing a teacher who did not share their racial/ethnic identity.

This report is part of a series of four research reports on racial disparities in ECE using the NSECE 2012 and 2019 data. Other reports address disparities in the ECE workforce including access to postsecondary training, wages, and health insurance benefits; beliefs and approaches to caregiving; and ECE center funding. These research reports are available here: <https://cecr.psu.edu/ece-reports>.

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## Background

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Enrollment in early care and education (ECE) is on the rise and the ECE student body is expected to become more diverse. However, significant disparities persist in access to ECE programs, especially for lower-income households and racially or ethnically minoritized children. Lower-income families are less likely to receive childcare services and to spend a significantly larger portion of their income when they pay for childcare. Disparities by children’s race/ethnicity are also prominent as Hispanic and Native American families are less likely to access benefits such as the Child Care and Development Fund (CCDF), less likely to enroll in ECE, and more likely to live in childcare deserts. Such disparities have been worsened by the COVID-19 pandemic.

Wide disparities also persist in the quality of care and education young children receive. Racially minoritized children are less likely to attend ECE programs with high-quality ratings, and ECE classrooms serving high shares of minoritized children are also less likely to receive high quality scores.<sup>1</sup> Studies have also found a pattern of funding disparities, with Black and Hispanic children’s ECE providers as well as providers serving communities with greater shares of residents of color receiving less funding from subsidy programs.<sup>2</sup> Given that ECE classrooms are highly segregated by race/ethnicity and socioeconomic status – even more so than K-12 schools – unequal access to well-resourced, well-funded ECE programs is one of many ways in which segregation in ECE classrooms negatively impacts minoritized students. Moreover, longstanding research on the impact of children’s early (i.e., prior to kindergarten) socialization to other racial groups on mitigating implicit biases and ingroup preference makes the higher levels of segregation in our ECE classrooms even more concerning.

In this report, we examined the racial/ethnic composition of ECE classrooms as well as the ECE workforce in 2019 using a nationally representative survey of early care and education. We measured segregation in ECE classrooms using multiple indices and also calculated the level of access to same- or different-race teachers by the student composition of ECE classrooms. This report’s contributions include updating analyses from earlier reports on measuring segregation in ECE classrooms using 2019 National Survey of Early Care and Education (NSECE) data, measuring teacher-student race matching, as well as measuring segregation through multiple indices that capture the various dimensions of segregation (i.e., exposure, evenness, and concentration).

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<sup>1</sup> Aguiar, A. L., & Aguiar, C. (2020). Classroom composition and quality in early childhood education: A systematic review. *Children and Youth Services Review, 115*, 105086. <https://doi.org/10.1016/j.childyouth.2020.105086>; Chung, S., Evans, S., Kent, A. H., & Coria, J. (2022). *Expanding access to high-quality early care and education through a racial equity lens: High-quality ECE generates the largest gains for Black and Hispanic children* | *Research Connections*. Federal Reserve Bank of St. Louis. <https://researchconnections.org/childcare/resources/169276>; Friedman-Krauss, A., & Barnett, S. (2020). *Access to high-quality early education and racial equity* | *Research Connections*. National Institute for Early Education Research. <https://researchconnections.org/childcare/resources/38147>.

<sup>2</sup> Hollett, K. B., & Frankenberg, E. (2022). A critical analysis of racial disparities in ECE subsidy funding. *Education Policy Analysis Archives, 30*, (14)-(14). <https://doi.org/10.14507/epaa.30.7003>.

Specifically, we answer the following research questions in this report:

1. What is the composition of the ECE Workforce, by various characteristics such as race/ethnicity, gender, age, and country of birth? How does the composition change from 2012 to 2019?
2. What is the racial/ethnic composition of children in ECE classrooms in 2019?
3. What is the extent of racial/ethnic segregation in center-based ECE classrooms?
4. Based on classroom student composition, what is the likelihood of being taught by a same- or different-race teacher?

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## Composition of the ECE Workforce

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We begin by understanding the composition of the ECE workforce and how it has changed between 2012 and 2019. Table 1 presents the composition of the ECE workforce by various characteristics of interest such as gender, nationality, and age. Much like the K-12 workforce, the ECE workforce is overwhelmingly female with around 98% of all ECE teachers being female in both 2012 and 2019. In addition, around 11% of the ECE workforce in both years was born outside of the U.S. and its territories. Among ECE teachers born outside the U.S., there was a slight decrease in the proportion born in Mexico and a corresponding increase in the proportion born in other countries between 2012 and 2019. Just over a quarter of ECE teachers in both years also spoke a language other than English. However, while the proportion of dual language learners entering ECE is expected to continue rising, we notice a small decrease in the proportion of ECE teachers who speak two or more languages between 2012 and 2019.<sup>3</sup> As multilingual teachers are crucial in supporting dual language learners, special attention must be paid to not only the overall proportion of multilingual teachers but also the linguistic diversity among dual language learners and their varied needs.

A plurality of ECE teachers were between the ages of 30 and 49. However, between 2012 and 2019, there is an increase in the percentage of ECE teachers who are 60 years or older from 6.8% to 9.0%. During the same time the percentage of teachers who are 22 years or below almost doubled from 6.7% to 12.7%. This implies a rise in reliance on both less experienced ECE teachers as well as teachers who are close to retirement age. Figure B1 in Appendix B provides a visual representation of the changes in age groups.

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<sup>3</sup> Sandstrom, H., & Schilder, D. (2021). *Strengthening the Diversity and Quality of the Early Care and Education Workforce: Summary of the 2018 and 2019 Convenings* [Research Report]. Urban Institute.

**Table 1**

Demographics of the ECE workforce, in 2012 and 2019

Variable	2012	2019
<b>Percent Female</b>	97.59%	97.87%
<b>Speaks language other than English</b>	27.07%	26.05%
<b>Country of Birth</b>		
<b>U.S. (Including territories)</b>	88.65%	88.98%
<b>Mexico</b>	3.49%	2.66%
<b>Other</b>	7.87%	8.35%
<b>Age Group</b>		
<b>22 or under</b>	6.71%	12.73%
<b>23-29</b>	21.06%	20.43%
<b>30-49</b>	45.79%	43.12%
<b>50-59</b>	19.64%	14.70%
<b>60 or above</b>	6.80%	9.02%

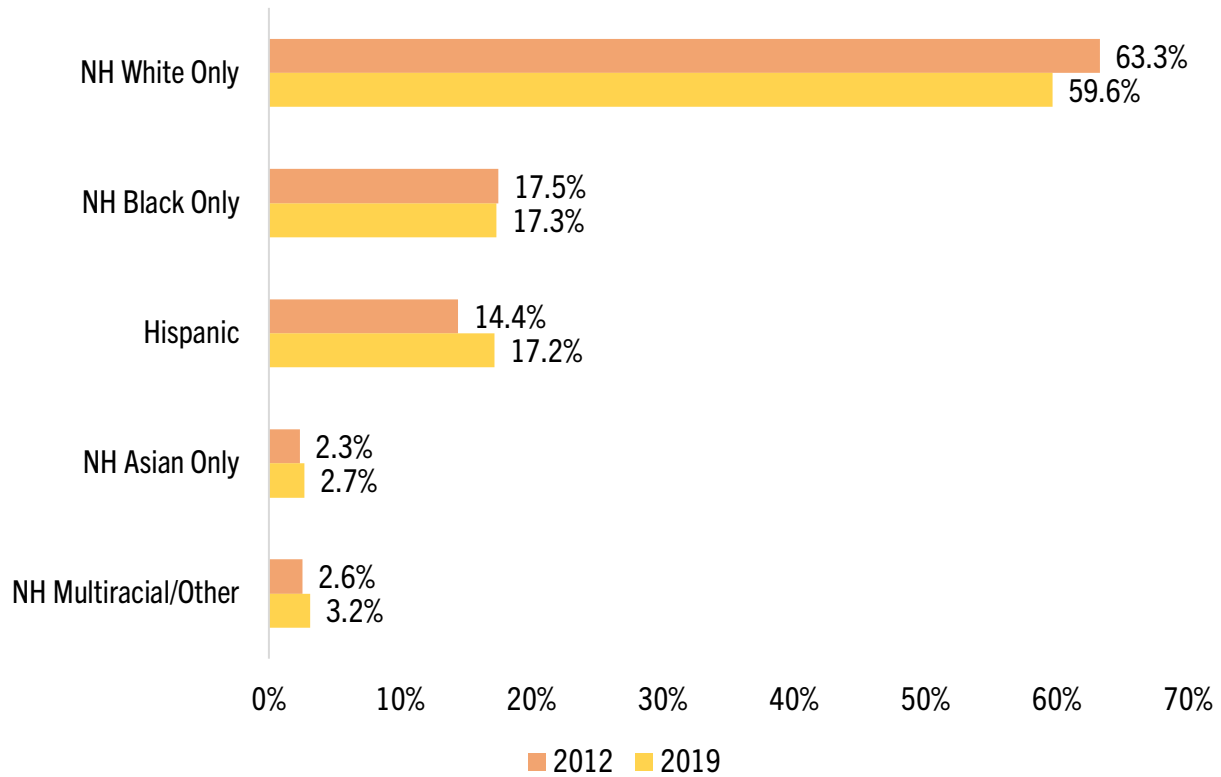
Note: Calculations made from public-use NSECE Workforce Survey dataset. These proportions were calculated with the workforce weights (WF\_METH\_WEIGHT in 2012 and WF9\_METH\_WEIGHT in 2019) using Stata's svy package.

Finally, analyzing the racial/ethnic composition of the ECE workforce, we find that around 40% of the ECE workforce were teachers of color in 2019, making the ECE workforce more diverse than the K-12 workforce.<sup>4</sup> The share of non-white ECE teachers also rose from 36.7% in 2012 to 40.4% in 2019, making the workforce marginally more diverse. In Figure 1, we can observe that white teachers make up a smaller proportion of the ECE workforce in 2019 compared to 2012, a decline of 3.7 percentage points. The decrease in the proportion of white teachers is mainly offset by a 2.8 percentage point increase in the share of Hispanic teachers, which led to Hispanic teachers occupying a similar share of the ECE workforce as Black teachers by 2019. Each group made up around 17% of the workforce. There were also smaller increases in the proportions of Asian and Multiracial/Other race teachers.

<sup>4</sup> Taie, S., & Goldring, R. (2020). *Characteristics of Public and Private Elementary and Secondary School Teachers in the United States: Results From the 2017–18 National Teacher and Principal Survey* (NCES 2020142rev). National Center for Education Statistics, U.S. Department of Education. <https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2020142rev>.

**Figure 1**

Racial/ethnic composition of the ECE workforce, in 2012 and 2019



Note: Calculations made from public-use NSECE workforce survey dataset. These proportions were calculated with the workforce weights (WF\_METH\_WEIGHT in 2012 and WF9\_METH\_WEIGHT in 2019) using Stata's svy package.

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## Racial/Ethnic Composition of ECE Classrooms

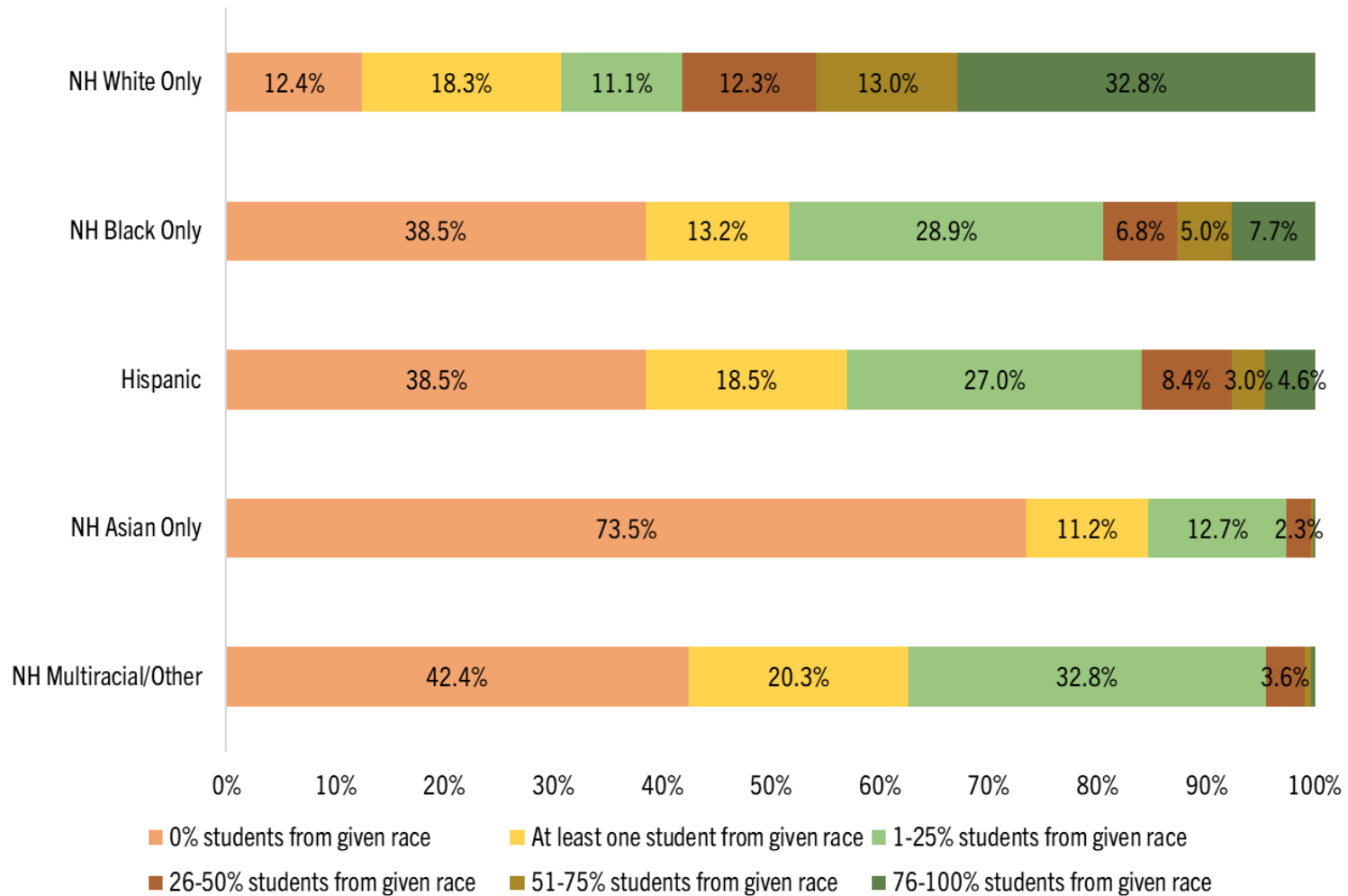
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Teachers' reports of the number of children in their classroom indicate that there were around 8.1 million students in center-based ECE classrooms in 2019 across the country. The mean classroom size was 14.26 children while the median classroom had 13 children. In this section, we examine the racial/ethnic composition of these center-based ECE classrooms in 2019. Figure 2 shows the percentage of ECE classrooms that enrolled students from each quartile of a racial/ethnic group. For this section, we did not eliminate observations that indicated that 'at least one student' in the classroom belongs to a specific racial/ethnic category (see Appendix A) and retained "At least one" as its own category. This allowed us to retain more observations but has the disadvantage of not being able to ascertain how students of various racial groups interact within classrooms.

Figure 2 contains several indications of segregation, especially when we focus on the extremes of quartiles (i.e., no students from a given race and 76-100% categories). For example, 32.8% of all center-based classrooms enrolled 76-100% white students while another 7.7% and 4.6% of classrooms have more than 75% Black and Hispanic students, respectively. The proportion of ECE classrooms that do not enroll any children from a given race is also substantially high. In 2019, 12.4% of ECE classrooms did not enroll any white children while the plurality of center-based ECE classrooms (38.5%) did not enroll any Black or Hispanic students. Further, a large majority (73.5%) do not enroll any Asian students. The extremes on both ends, of classrooms that either enroll no students or an overwhelming majority from a single racial group, provide initial indications of segregation in ECE classrooms.

**Figure 2**

Percentage of ECE classrooms that enroll each quartile of given racial/ethnic group



Note: Calculations made from public-use NSECE 2019 workforce survey dataset using the classroom sampling weight variable, WF9\_WEIGHT\_CLSM in Stata's svy package.

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## Racial/Ethnic Segregation in ECE Classrooms

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In this section, we take a comprehensive view of classroom segregation in ECE with a range of indices that capture three dimensions of segregation: exposure, evenness, and concentration. For the analyses in this section, we have eliminated observations with “Don’t know but at least one” responses in the NSECE 2019 dataset; thus, these results are not representative of all the ECE classrooms in the country. As with all other classroom-level analyses in this report, this section only includes classrooms with at least 5 children to allow for sufficient potential for integration.

### Isolation and Interaction Indices

The isolation index calculates the percentage of same-race students in the average student’s classroom while the interaction index is the percentage of other-race students in the average student’s classroom. For example, the Black isolation index indicates the percentage of Black children in the average Black student’s classroom while the Black-white interaction index is the proportion of white children in the average Black student’s classroom. If students were evenly distributed across schools, we would expect the isolation index to reflect a particular group’s share in the overall composition and the interaction index to reflect the other group’s share in the population. In other words, in a sample where Black students made up 19.0% of the population and white students made up 54.2% of the population, we would expect that, in the absence of segregation, the Black isolation index would be around 19.0% and the Black-white interaction index would be around 54.2%.

In reality, however, students from all racial backgrounds are extremely isolated in ECE classrooms and have low possibilities of interaction with students from other racial groups. As mentioned above, Black students make up 19.0% of children in the current sample. Yet, the average Black student’s classroom is about 63.0% Black and only about 20.2% white and 10.0% Hispanic (Figure 3(a)). However, as white students make up 54.2% of the population and Hispanic students make up only 17.2% of the population, Black children have much lower exposure to white students compared to Hispanic students. Similarly, the average Hispanic student’s classroom is 58.5% Hispanic despite Hispanic students comprising only 17.2% of the total enrollment in the sample (Figure 3(b)). The percentage of white students in the average Hispanic student’s classroom is also quite low at only 22.7%. However, unlike Black and Hispanic students, the average Asian and Multiracial/Other race students have relatively higher probability of interaction with white students.

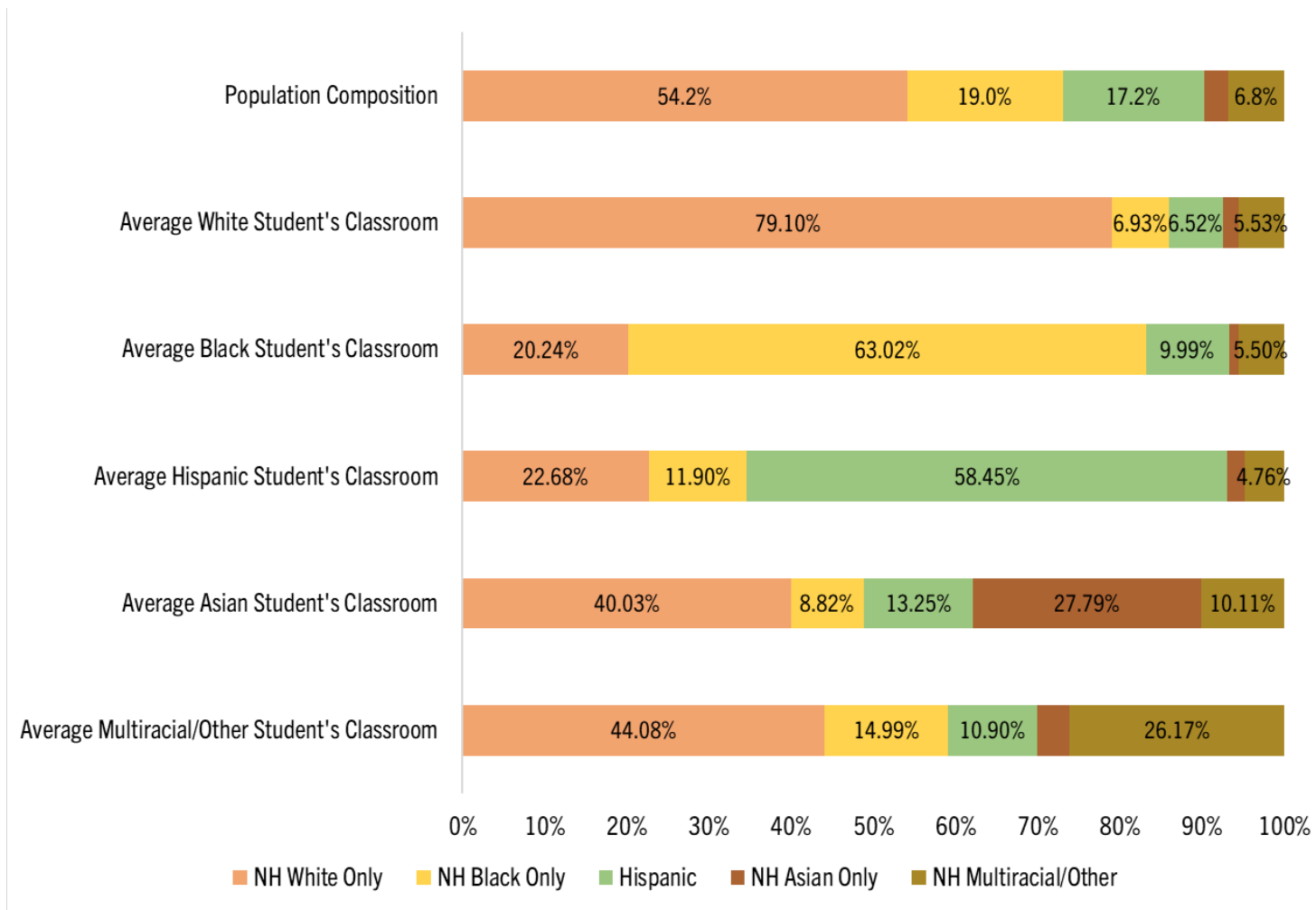
White students in ECE classrooms are also highly isolated with the average white student’s classroom being almost 80% white (Figure 3(c)). While the percentage of same-race peers in the average Asian and Multiracial/Other race students’ classroom is relatively lower, at 27.8% and 26.2% respectively, it is still many times higher than their share of enrollment, which is only 2.9%



for Asian students and 6.8% for Multiracial/Other race students (Figures 3(d) and 3(e)). These results emphasize that students are racially isolated in center-based ECE classrooms.

**Figure 3**

Levels of racial/ethnic isolation and interaction in ECE classrooms



Note: Calculations made from public-use NSECE 2019 workforce survey dataset using the classroom sampling weight variable, WF9\_WEIGHT\_CLSM in Stata's svy package.

Note: This analysis excludes classrooms with fewer than 5 students as well as observations with 'Don't know but at least one' responses for the specific racial category. Therefore, these analyses should not be interpreted as being representative of all ECE classrooms in the country.

## Theil's H Index

Theil's H index is a measure of evenness calculated by comparing each classroom's composition to the overall composition of ECE enrollment in centers. The H index for ECE classrooms (enrolling at least 5 students) was 0.525, indicating extremely high segregation. For interpretation, classrooms are 52% less diverse than the overall ECE composition. Although this H index is not representative of all ECE classrooms in the U.S. (due to the exclusion of classrooms with fewer than 5 students as well as observations with 'Don't know but at least one' responses for any of the five specific racial categories), such an extreme H index points to high levels of unevenness in the distribution of students across ECE classrooms.

This finding also indicates that segregation in ECE classrooms did not improve between 2012 and 2019. While not perfectly comparable due to differences in the data collection procedures, analysis using data from 2012 NSECE found a dissimilarity index of 0.71.<sup>5</sup> As dissimilarity indices between 70-100 are comparable to H indices of 0.40-1.00 and defined as extreme segregation,<sup>6</sup> our analyses provide an indication that the level of segregation in ECE classrooms has not substantially improved over time.

## Intensely Segregated ECE Classrooms

Finally, we focus on the percentage of intensely segregated ECE classrooms. A classroom is categorized as 'intensely segregated' if it enrolls 90% or more of its students from a single racial/ethnic category. By this definition, at least 25.9% of ECE classrooms are intensely segregated. Out of this, 18.3% of the classrooms have 90% or more white students, while another 4.8% and 2.8% enroll 90% or more Black and Hispanic students, respectively. We do not present results on the percentage of intensely segregated Asian and Multiracial/Other race classrooms as they make up a very small percentage of total classrooms.

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<sup>5</sup> Greenberg, E., & Monarrez, T. (2019). *Segregated from the Start*. Urban Institute. <https://www.urban.org/features/seggregated-start>.

<sup>6</sup> Reardon, S. F., & Yun, J. T. (2003). Integrating Neighborhoods, Segregating Schools: The Retreat from School Desegregation in the South, 1990-2000. *North Carolina Law Review*, 81.

**Table 2**

Percentage of ECE Classrooms that are Intensely Segregated, 2019

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	Percentage of ECE Classrooms with 90% or more students from a single racial/ethnic category
<b>NH White Only</b>	18.29%
<b>NH Black Only</b>	4.81%
<b>Hispanic</b>	2.78%

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Note: Calculations made from public-use NSECE 2019 workforce survey dataset using the classroom sampling weight variable, WF9\_WEIGHT\_CLSM in Stata's svy package.

Note: This analysis excludes classrooms with fewer than 5 students as well as observations with 'Don't know but at least one' responses for the specific racial category. Therefore, these analyses should not be interpreted as being representative of all ECE classrooms in the country.

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## Access to Diverse Teachers by ECE Classroom Composition

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In addition to interaction with classmates from other racial/ethnic groups, access to a diverse group of teachers is also important. Black and Hispanic children who share the same race as their ECE teacher score higher on measures of academic achievement and social growth and benefit from improved attendance and parental engagement.<sup>7</sup> ECE teachers of color who share the same race as children are also more likely to form positive relationships and strong attachments compared to white teachers of children of color.<sup>8</sup> Further, ECE teachers' race may play a particularly influential role in their perceptions of child behavior, especially for Black children. White ECE teachers are more likely to perceive Black children's behavior negatively, compared to White children engaging in similar behavior.<sup>9</sup> In contrast, Black teachers report more positive subjective evaluations of Black children's behavior compared to those reported by white teachers of Black children.<sup>10</sup> Given the egregiously high rates of suspension and expulsion among Black children in ECE settings,<sup>11</sup> Black ECE educators may play an especially important role in disrupting what some scholars have called the "preschool to prison pipeline".<sup>12</sup> At the same time, while children of color benefit from having racially diverse teachers, so do white children.<sup>13</sup> In particular, exposure to racially/ethnically diverse teachers and the role modeling they provide may help reduce the formation of racial bias during a

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<sup>7</sup> Downer, J. T., Goble, P., Myers, S. S., & Pianta, R. C. (2016). Teacher-child racial/ethnic match within pre-kindergarten classrooms and children's early school adjustment. *Early Childhood Research Quarterly*, 37, 26–38. <https://doi.org/10.1016/j.ecresq.2016.02.007>; Markowitz, A. J., Bassok, D., & Grissom, J. A. (2020). Teacher-Child Racial/Ethnic Match and Parental Engagement With Head Start. *American Educational Research Journal*, 57(5), 2132–2174. <https://doi.org/10.3102/0002831219899356>.

<sup>8</sup> Howes, C., & Shivers, E. M. (2006). New Child–Caregiver Attachment Relationships: Entering Childcare When the Caregiver Is and Is Not an Ethnic Match. *Social Development*, 15(4), 574–590. <https://doi.org/10.1111/j.1467-9507.2006.00358.x>; Saft, E. W., & Pianta, R. C. (2001). Teachers' perceptions of their relationships with students: Effects of child age, gender, and ethnicity of teachers and children. *School Psychology Quarterly*, 16(2), 125–141. <https://doi.org/10.1521/scpq.16.2.125.18698>.

<sup>9</sup> Gilliam, W. S., Maupin, A. N., Reyes, C. R., Accavitti, M., & Shic, F. (2016). *Do Early Educators' Implicit Biases Regarding Sex and Race Relate to Behavior Expectations and Recommendations of Preschool Expulsions and Suspensions?* Yale University Child Study Center.

<sup>10</sup> Bates, L. A., & Glick, J. E. (2013). Does it matter if teachers and schools match the student? Racial and ethnic disparities in problem behaviors. *Social Science Research*, 42(5), 1180–1190. <https://doi.org/10.1016/j.ssresearch.2013.04.005>.

<sup>11</sup> 2013-14 Civil Rights Data Collection: Key data highlights on equity and opportunity gaps in our nation's public schools. (2016). U.S. Department of Education, Office of Civil Rights.

<sup>12</sup> Kaplan, M. (n.d.). *How To End the Preschool to Prison Pipeline* (Liberty Podcast). Retrieved May 10, 2024, from <https://www.aclu.org/podcast/how-end-preschool-prison-pipeline-ep-172>.

<sup>13</sup> Siegel-Hawley, G. (2012). How Non-Minority Students Also Benefit from Racially Diverse Schools. Research Brief No. 8. In *National Coalition on School Diversity*. National Coalition on School Diversity. <https://eric.ed.gov/?id=ED571621>.

critical period of young children's social development.<sup>14</sup> Given the significant influence of ECE teachers' diversity on young children's outcomes, this section explores the extent to which children of different races are taught by teachers of their same and different racial/ethnic background. As ECE classrooms often have multiple teachers, a difference from many K-12 classrooms, we group classrooms by their student racial composition and assess the likelihood of having at least one same- or different-race teacher.<sup>15</sup>

Overall, children from all racial/ethnic groups except for Asian students have high probabilities of student-teacher race matching in ECE classrooms (Figure 4). Overall, 43.1% of classrooms had at least one Black staff member, 38.6% had one Hispanic member, and 80.7% of classrooms had at least one white teacher. Additionally, 12.2% of classrooms had at least one Asian teacher. For Black, Hispanic, and white children, the likelihood of having at least one teacher who shared their racial/ethnic identity increased steadily by each quartile of same-race student composition in the classroom (see Figure 4). For example, only 17% of classrooms without any Black students had at least one Black staff member but 96.4% of classrooms that had 76-100% Black students had a Black staff member. The results were similar for Hispanic and white students, with 97.7% of classrooms with 76-100% Hispanic students and 97.2% classrooms with 76-100% white students having at least one same-race teacher.

In the same vein, the likelihood of having a same-race teacher was significantly lower if the classrooms had only 1-25% of students from a given race. For example, there was a 41.0% chance that a classroom with 1-25% Black students would have at least one Black staff member. Further, only 37.7% of classrooms that have 1-25% Hispanic students have at least one Hispanic staff member. While integration of classrooms is important, we must also focus on evenness in teacher distribution as the lower likelihood of student-teacher racial match in classrooms where marginalized students are in the minority may compound stressors for the marginalized students in these classrooms.

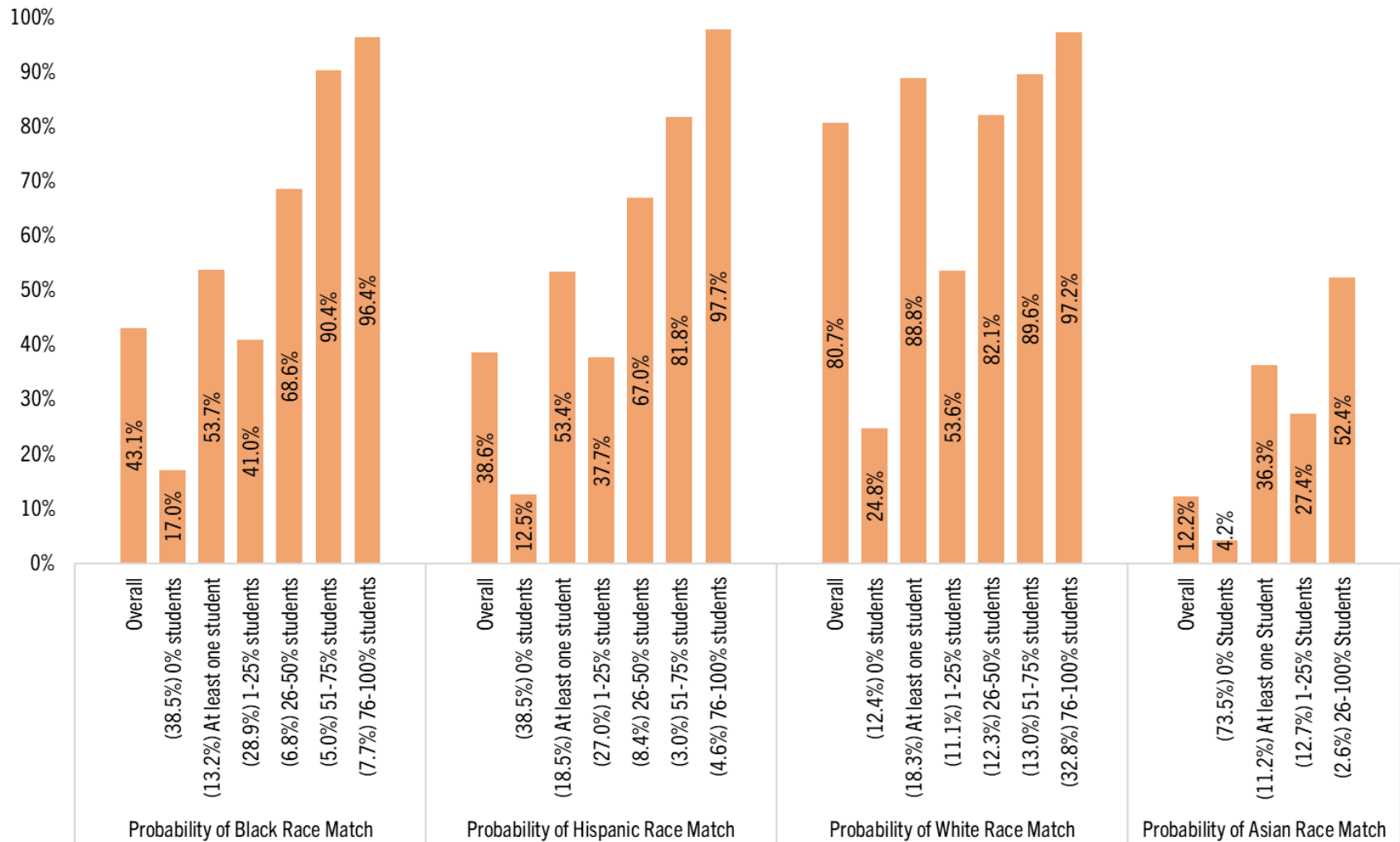
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<sup>14</sup> Gaias, L. M., Gal, D. E., Abry, T., Taylor, M., & Granger, K. L. (2018). Diversity exposure in preschool: Longitudinal implications for cross-race friendships and racial bias. *Journal of Applied Developmental Psychology, 59*, 5–15. <https://doi.org/10.1016/j.appdev.2018.02.005>.

<sup>15</sup> Data are not available on the presence of Multiracial/Other teachers in classrooms.

**Figure 4**

Probability of having at least one same-race staff member



Note: Parentheses in the X-axis labels are used to indicate the percentage of total classrooms that fall into each category.

At the same time, exposure to teachers of various racial/ethnic backgrounds is important at an early age. However, as shown in Table 3, highly segregated classrooms offer few chances for students to be exposed to teachers from a different racial background. Classrooms with no or few white students were very likely to have at least one ECE staff member who is Black, Hispanic, or Asian (90% or greater). In contrast, classrooms with the fewest students of color and greatest share of white students only had a 31.5% chance of having a staff member of color. The same is true for classrooms with 75-100% Black students which only have 24.5% probability of having a non-Black staff member. Compared to Black children, Hispanic children in highly segregated classrooms had relatively greater access to diverse teachers. Overall, these results indicate that children in segregated ECE classrooms often lack diversity not only in their classroom peers but also among the educators in their classroom.

**Table 3**

Probability of having at least one staff member of different race/ethnicity

(a) Probability of non-white staff member, by percentage of white students in the classroom

	Frequency of Classrooms	Probability of having at least one Black, Hispanic, or Asian staff member
<b>Overall</b>		64.85%
<b>0% White Students</b>	12.40%	96.29%
<b>At least one White Student</b>	18.30%	72.97%
<b>1-25% White Students</b>	11.10%	91.14%
<b>26-50% White Students</b>	12.30%	79.74%
<b>51-75% White Students</b>	13.00%	58.95%
<b>76-100% White Students</b>	32.80%	31.85%

(b) Probability of non-Black staff member, by percentage of Black students in the classroom

	Frequency of Classrooms	Probability of having at least one white, Hispanic, or Asian staff member
<b>Overall</b>		90.45%
<b>0% Black students</b>	38.50%	98.39%
<b>At least one Black student</b>	13.20%	95.64%
<b>1-25% Black students</b>	28.90%	96.67%
<b>26-50% Black students</b>	6.80%	88.91%
<b>51-75% Black students</b>	5.00%	61.00%
<b>76-100% Black students</b>	7.70%	24.52%

(b) Probability of non-Hispanic staff member, by percentage of Hispanic students in the classroom

	Frequency of Classrooms	Probability of having at least one white, Black, or Asian staff member
<b>Overall</b>		95.29%
<b>0% Hispanic students</b>	38.50%	98.70%
<b>At least one Hispanic student</b>	18.50%	98.16%
<b>1-25% Hispanic students</b>	27.00%	97.99%
<b>26-50% Hispanic students</b>	8.40%	89.60%
<b>51-75% Hispanic students</b>	3.00%	79.19%
<b>76-100% Hispanic students</b>	4.60%	54.74%

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## Discussion

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This report spans a range of topics, including the racial/ethnic composition of the ECE workforce and classrooms as well as the levels of student segregation and students' access to diverse teachers. First, the ECE workforce is more racially and ethnically diverse than the K-12 workforce. While such diversity is encouraging and likely to benefit children at an early age, considering the much lower pay and social status that is generally accorded to ECE in comparison to K-12, we must also question the factors of systemic racism that lead to such diversity. Further, given the racial/ethnic wage disparities within the ECE workforce (especially with Black teachers earning much lower wages; Report 2 in this Series), we must also consider the impacts on the livelihoods of minoritized teachers in ECE as well as the education of children in their care. As the final section of this report shows the high levels of student-teacher race matching in ECE, such disparities in the workforce are also likely to disproportionately impact children of color.

Further, this report shows high levels of racial/ethnic isolation and segregation in ECE classrooms. Over a quarter of ECE classrooms (that enrolled at least 5 students) were intensely segregated, i.e., 90% or more of the students in the classroom belonged to a single racial/ethnic category. Although this portion of the analysis is not representative of all ECE classrooms in the country, the shockingly high segregation levels along with the lack of improvement between 2012 and 2019,<sup>16</sup> must be a cause for concern. Given the benefits associated with racial integration at an early age, including improved academic outcomes as well as reductions in prejudice and biases,<sup>17</sup> further research on ways to mitigate segregation in ECE programs is necessary. Significant efforts should also be made to improve access to high-quality ECE programs for minoritized children.<sup>18</sup>

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<sup>16</sup> Greenberg, E., & Monarrez, T. (2019).

<sup>17</sup> Bigler, R. S., & Liben, L. S. (2007); Dunham, Y., Baron, A. S., & Banaji, M. R. (2008); Kelly, D. J., Quinn, P. C., Slater, A. M., Lee, K., Gibson, A., Smith, M., Ge, L., & Pascalis, O. (2005).

<sup>18</sup> Aguiar, A. L., & Aguiar, C. (2020).

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## Appendix A

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### Data and Methods

Data for this study comes from the National Survey of Early Care and Education (NSECE), a nationally representative study on the availability and use of early care and education in the U.S. NSECE involved four surveys: a survey of households with children under the age of 13, a home-based ECE provider survey, a center-based ECE provider survey, and a center-based workforce survey. In this report, we primarily relied on public-use data from the center-based workforce survey, which contained teachers' reports of their race/ethnicity, the race/ethnicity of other teachers in the classroom, the total number of children in their classroom as well as the racial composition of the classroom. See below for more details on the sampling strategy for the NSECE workforce survey, sample size and restrictions, use of teacher and classroom weights, as well as the data cleaning processes used in the study.

Throughout this report, we used NSECE-provided racial/ethnic categories: Hispanic; non-Hispanic (NH) white; NH Black; NH Asian; and NH Multiracial/Other race.<sup>19</sup> NSECE relied on teachers' self-reported race/ethnicity and teachers' reports of the racial/ethnic identities of students in their classrooms. Among the workforce survey respondents, the NH Multiracial/Other race category includes individuals who identified as belonging to two or more racial categories as well as survey respondents who chose 'Other' or who identified as either American Indian/Alaskan Native or Native Hawaiian or other Pacific Islander.<sup>20</sup> In the classroom composition data, the NH Multiracial/Other race category includes children who the teacher indicated as 'Mixed race, another race, or you are not certain' among those children who are not Hispanic or Latino.<sup>21</sup>

In this report, we first presented descriptive statistics on the composition of the ECE workforce, by gender, age, country of birth, languages spoken, and race/ethnicity. Second, to understand the racial/ethnic composition of ECE classrooms, we reported the percentage of ECE classrooms that enrolled each quartile of a given racial/ethnic group. All classroom-level analyses in this report exclude classrooms with fewer than 5 students as we are primarily interested in how students of different racial backgrounds interact in ECE classrooms. Then, to understand the extent and nature of segregation in center-based ECE classrooms, we used four segregation measures that capture three different dimensions of segregation, i.e., exposure, evenness, and concentration.<sup>22</sup> We

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<sup>19</sup> Any respondent identifying as Hispanic was categorized as Hispanic irrespective of their selected race.

<sup>20</sup> NH Multiracial/Other race category is only available as a consolidated group in the public-use datasets in order to reduce disclosure risk given the low sample sizes of the individual racial groups included in this category.

<sup>21</sup> NSECE Project Team (National Opinion Research Center). (2019). National Survey of Early Care and Education (NSECE) 2019 Classroom Staff (Workforce) Questionnaire (No. 2019–119). Office of Planning, Research, and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services., p. CL–2.

<sup>22</sup> Massey & Denton, 1988.

used the isolation and interaction indices to understand the potential for exposure between students of same or different racial/ethnic groups. The isolation index captures the extent of interaction between same-race children in ECE classrooms while the interaction index measures the potential for interaction between children of two different racial groups. Both of these indices are best interpreted alongside the percentage of children belonging to each racial/ethnic group in the overall population. Second, to capture the evenness dimension, we calculated the Theil's H index, which measures how evenly students of different racial/ethnic groups are distributed across classrooms. Theil's H ranges from 0 (no segregation) to 1 (perfect segregation) and a H index of 0.25 is considered to be 'high segregation' while an index of 0.40 or over is considered to be 'extreme segregation'.<sup>23</sup> Third, we calculated the intense segregation index, i.e., the percentage of ECE classrooms that enroll 90% or more of their students from one racial/ethnic group. This measure captures the extent of racial/ethnic concentration in ECE classrooms. Finally, after a comprehensive review of the state of segregation in ECE classrooms, we also documented the level of teacher-student race matching in ECE classrooms by calculating the probability of having a same- or different-race teacher across different quartiles of racial/ethnic classroom composition.

### **NSECE Sampling Strategy**

The NSECE center-based workforce survey derives its sample from the center-based provider survey. First, the center-based provider survey interviewed directors or instructional leaders of center-based programs serving children aged birth through five. From each center participating in this survey, one classroom/group was randomly selected and an instructional staff member from that classroom was interviewed for the workforce survey. In this brief, we mainly rely on the NSECE 2019 public-use workforce survey dataset for our analysis, which contains teachers' reports of the total number of children in their classroom as well as the racial composition of the classroom.

### **Sample Size, Restrictions, and Use of Weights**

The NSECE 2019 unweighted sample consists of 5,192 observations, out of which 483 observations are missing responses to the teacher workforce survey. The workforce dataset also includes both teacher/workforce sampling and classroom sampling weights. The workforce sampling weights, which provide estimates that represent all teachers and assistant teachers/aides in center-based ECE programs, were used to answer the first research question about the composition of the ECE workforce. The classroom sampling weights, which provide estimates that "represent all classrooms/groups serving children up to age 13 years in centers that serve at least one child aged 5 and under not yet in kindergarten regarding detailed activities in the classrooms and people in the classroom"<sup>24</sup>, were used to answer research questions 2-4 on classroom composition, segregation, and access to diverse teachers. Analysis using the workforce weights represents around 1.36 million

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<sup>23</sup> Reardon, S. F., & Yun, J. T. (2003). Integrating Neighborhoods, Segregating Schools: The Retreat from School Desegregation in the South, 1990-2000. *North Carolina Law Review*, 81.

<sup>24</sup> NSECE 2019 User's Guide for Workforce Public-Use Data File. (2019). NSECE Project Team (National Opinion Research Center), p. 45.

ECE teachers in 2019 while the classroom weight is designed to represent 591,568 classrooms in center-based ECE programs.

However, in calculating the various segregation indices, we restricted the sample to classrooms with at least 5 children, which impacts the representativeness of this section of our analysis. As our analyses focus on studying racial/ethnic segregation and the possibility of integration in classrooms, we decided that classrooms with fewer than 5 children do not offer sufficient potential for integration, a decision also included in previous research on this topic.<sup>25</sup> In addition, our sample for the classroom composition and student-teacher race match analyses (research questions 2 and 4) consists of only those observations that have complete categorical data on their classroom composition (at least 4,070 observations). Finally, our segregation analyses (research question 3) used only those observations for which we have complete numerical data on classroom composition (at least 3,190 observations; further explanation of these two samples in the ‘note on data cleaning’ section below). These two subsamples represent approximately 512,490 and 413,297 classrooms, respectively, compared to the 573,323 classrooms (which have at least five students) in the complete NSECE weighted sample. As the categorical racial composition variable has fewer missing values, we place higher confidence in representativeness of the results obtained from this sample, i.e., analysis of racial composition and student-teacher race match. Our calculations of segregation indices using the smaller sample is not representative of all center-based ECE classrooms.


### **Note on Data Cleaning**

In this section, we detail the adjustments made to the 2019 NSECE classroom composition data in order to address two complications: large number of missing observations and the ‘Don’t know but at least one’ option in the survey design. First, around 1,700 teachers in the sample chose ‘Don’t know/Refused/No answer’ for at least one student racial group in their classroom. Second, an additional 1,318 out of 4,709 teachers chose the ‘Don’t know [the exact number of students belonging to a group], but at least one student’ option for at least one racial group.

In addressing these two complications, we used imputation techniques to replace missing and ‘Don’t know but at least one’ values wherever it was reasonable (defined conservatively). To address the missing data, i.e., “Don’t know/Refused/No answer” observations, we imputed each racial group’s missing values to 0 if the proportions of other racial groups summed up to ~100 percent. For example, if an observation contained numeric values for four racial groups which add to ~100% and “Don’t know/Refused/No answer” for the fifth racial group, we assumed that the proportion for the fifth racial group was 0 percent. To address “Don’t know but at least one” values, we identified observations where the existing numeric racial compositions did not account for only one student. Then, we identified the subset of observations which only have one “Don’t know but at least one” value and assumed that the “Don’t know but at least one” value refers to the only missing student. For example, if 9 out of 10 students were identified as white and the teacher

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<sup>25</sup> Greenberg & Monarrez, 2019.



indicated that at least one student is Black, but no students are Hispanic, Asian, or Multiracial/Other race, we then assumed that the one remaining student is Black.

We presented classroom racial composition as a categorical variable wherever possible in order to utilize observations with “Don’t know but at least one” values. This formed a sample of at least 4,070 observations that were used in the classroom composition and student-teacher race match analyses. However, as we cannot use categorical variables to calculate segregation, results for the segregation indices use a smaller sample of observations (at least 3,190) for which continuous data were available. Information regarding which samples and weights have been used in each stage of the analysis is included along with each table or graph.

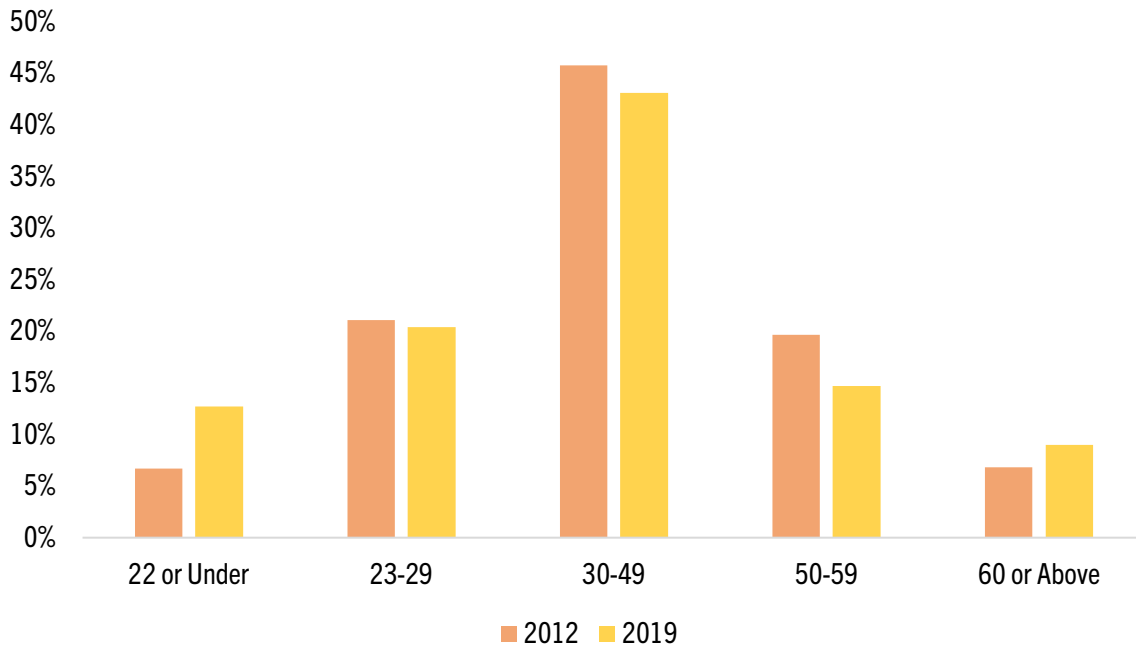
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## Appendix B

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**Figure B1**

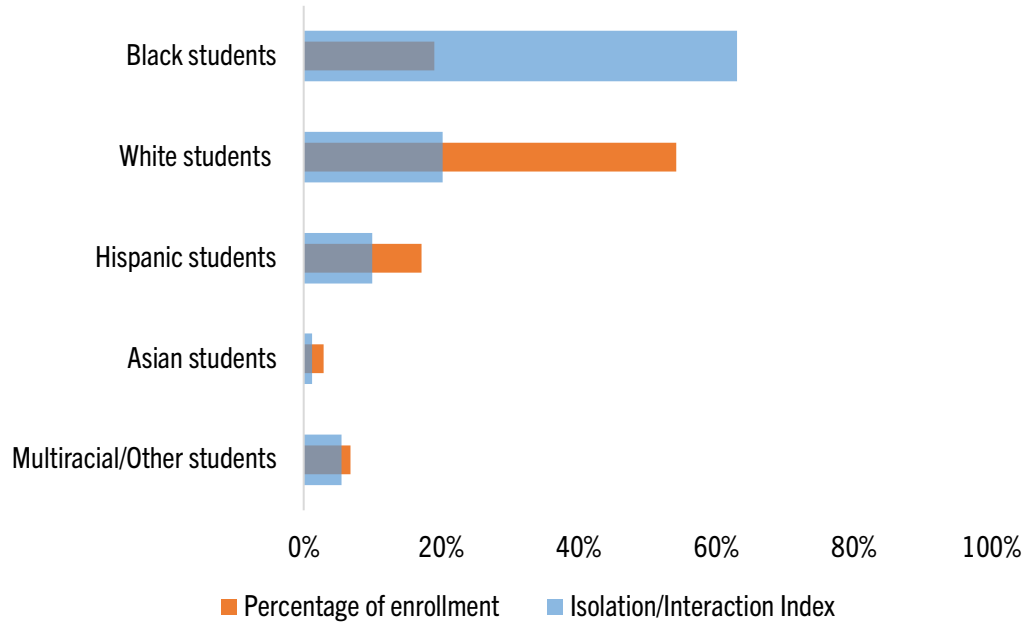
Composition of ECE workforce by age, in 2012 and 2019



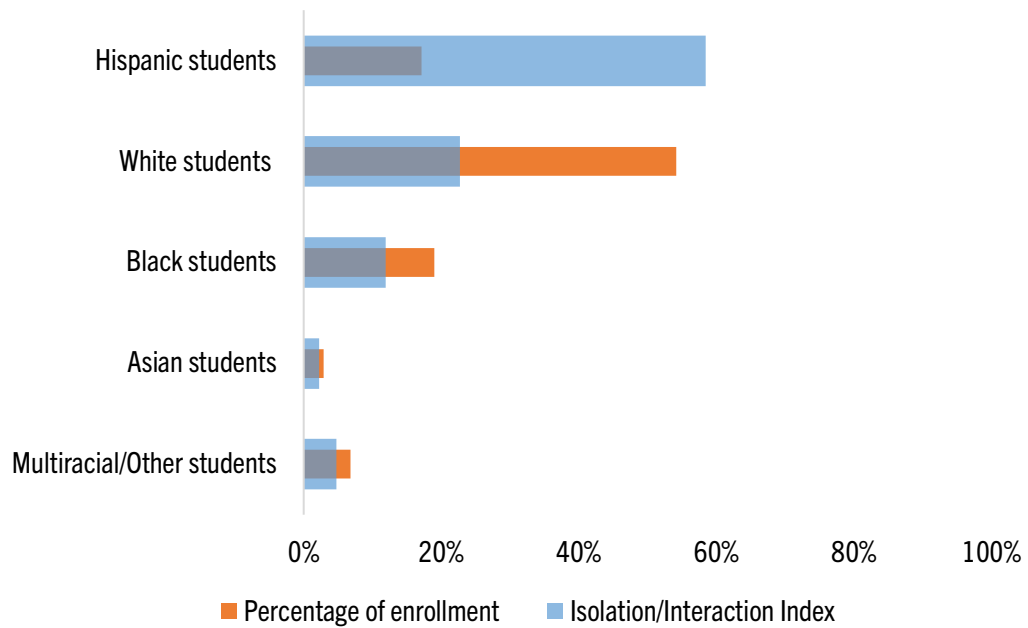
## Figure B2

Levels of racial/ethnic isolation and interaction in ECE classrooms

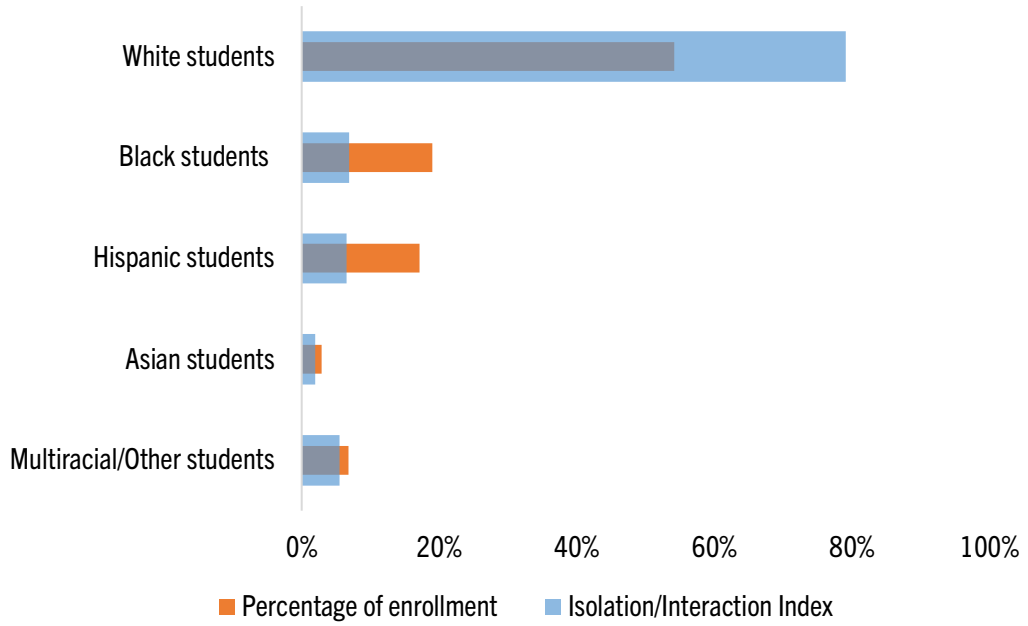
(a) Black students' interaction with:



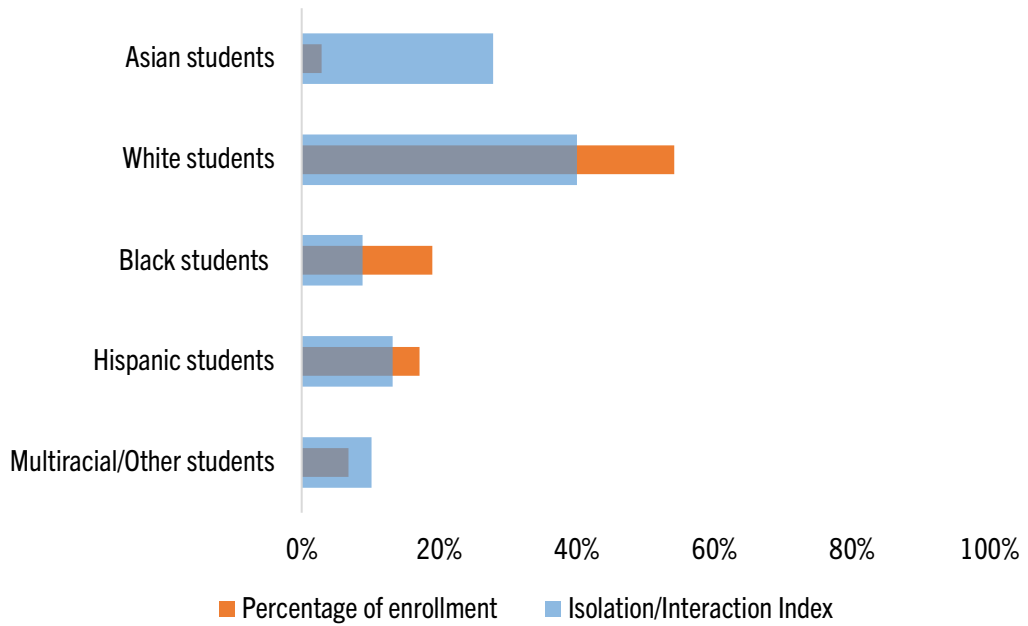
(b) Hispanic students' interaction with:



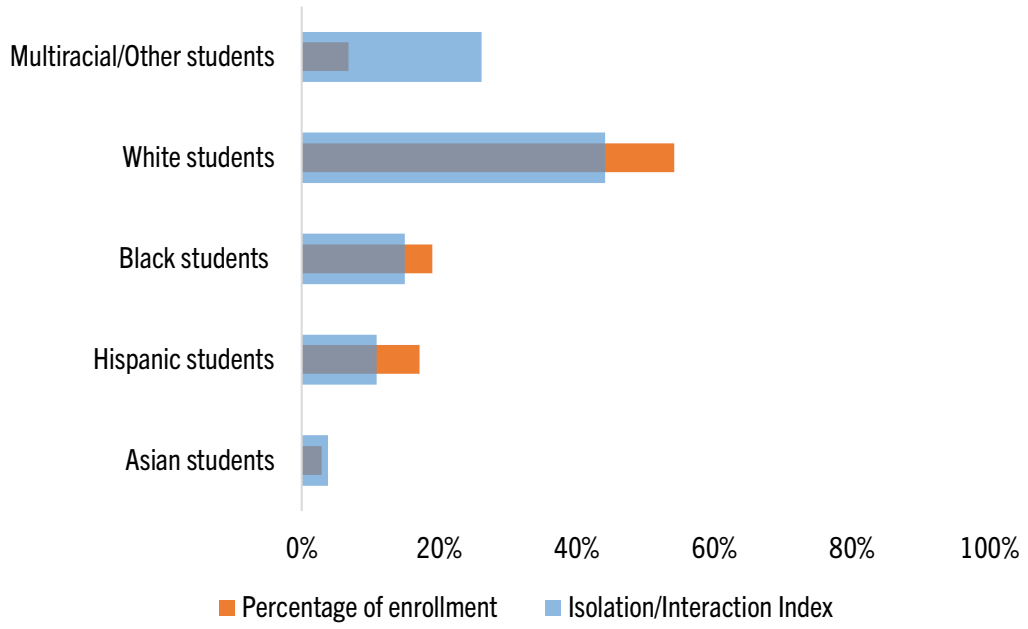
(c) White students' interaction with:



(d) Asian students' interaction with:



(e) Multiracial/Other race students' interaction with:



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## About the Authors

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**Rohitha Edara** received her Ph.D. in Education Policy and Leadership from Pennsylvania State University in 2025. Her research interests lie at the intersection of public policy, educational equity, and international development.

**Karen Babbs Hollett** holds a PhD in educational leadership and studies equity in early care and education (ECE) policy. She is an assistant teaching professor in the Department of Curriculum and Instruction at Pennsylvania State University.

**Erica Frankenberg** is a professor of education and demography at the Pennsylvania State University, and director of the Center for Education and Civil Rights. Her research interests focus on racial desegregation and inequality in K-12 schools and the connections between school segregation and other metropolitan policies.

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## About the Center for Education and Civil Rights (CECR)

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The Center for Education and Civil Rights seeks to be a hub for the generation of knowledge and coalition-building among the education and civil rights communities to promote research-based actions that address the complicated nature of racial and ethnic inequality in the 21st century. The Center's collective work is intended to promote equity across the educational pipeline by supporting efforts that facilitate integration through an inter-disciplinary approach. CECR is directed by Erica Frankenberg. For more information, see <https://cecr.psu.edu/>.