Ecobehavioral Analysis of the Experiences of Students with Complex Support Needs in Different Classroom Types

Alison L. Zagona, Ph.D.[1]
Jennifer A. Kurth, Ph.D.[1]
Elissa Lockman Turner, M.A.[1]
Jesse Pace, Ph.D.[1]
Karrie Shogren, Ph.D.[1]
Kirsten Lansey, Ph.D.[2]
Matt Jameson, Ph.D.[2]
Kristin Burnette, M.Ed.[3]
Mary Mansouri, M.S.[1]
Tyler Hicks, Ph.D.[1]
Daria Gerasimova, Ph.D.[1]

[1]University of Kansas

[2]University of Utah

[3]East Carolina University

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Abstract

Students with complex support needs frequently experience restrictive educational placements such as self-contained and separate school classrooms. Given the need to support students with

complex support needs to experience positive outcomes and make progress in the general education curriculum, there is a need to investigate the characteristics of the classroom contexts in which they are learning. The purpose of this study was to use ecobehavioral assessment observation methods to investigate how student behaviors, educator behaviors, and classroom ecology vary across general education, resource, self-contained, and separate school classrooms. We observed 116 students with complex support needs across the United States, and results indicated that contextual features of resource, self-contained, and separate school classrooms do not offer superior levels of instruction or supports for students with complex support needs as compared to general education classrooms. We were more likely to observe no one interacting with the focus student, no instruction, and the presence of distractions in self-contained and separate school classrooms compared to general education classrooms. Implications for policy, research, and practice are presented.

Keywords: complex support needs, inclusive education, least restrictive environment, intellectual disability, educational placement

Ecobehavioral Analysis of the Experiences of Students with Complex Support Needs in Different Classroom Types

The Individuals with Disabilities Education Improvement Act (IDEA, 2004) requires that students with complex support needs (a) are provided a free and appropriate public education (FAPE), (b) are educated with peers without disabilities to the maximum extent appropriate, (c) participate and make progress in the general education curriculum, and (d) are educated in the least restrictive environment (LRE). The LRE and FAPE principles of IDEA emphasize special education services and instruction should be delivered in environments that offer access to the general education curriculum and meet the student's unique learning needs. Although IDEA requires students with complex support needs to be educated in the LRE (i.e., general education), individualized education program (IEP) teams have leeway for deciding the "appropriate" place for a particular student to receive FAPE. Schools continue to operate a placement continuum where decisions about a student's placement are influenced by IEP team members' attitudes and biases related to individuals with disabilities (Giangreco, 2020), perceived level of student support needs (Kleinert et al., 2015), location and resources available (Brock & Schaefer, 2015), and race or ethnicity of the student (Grindal et al., 2019). As a result, students with complex support needs experience a range of educational placements, but the majority of students with complex support needs continue to be placed in the most restrictive types of classrooms (Morningstar et al., 2017).

Given the need to ensure students with complex support needs not only participate in the general education curriculum but also make progress (Turnbull et al., 2018), it is important to investigate the characteristics of various classroom types (e.g., general education, resource, self-contained, separate school classrooms) in which students with complex support needs are placed.

Ecobehavioral assessment provides researchers with a way to document the complex features of a classroom by focusing on the teacher, student, and the environment of the classroom through observations (Greenwood et al., 1994). Ecobehavioral assessment has been used to investigate the engagement of students with intellectual disability (Logan et al., 1997), access to the general education curriculum for students with intellectual disability and other developmental disabilities (Soukup et al., 2007), and aspects of classroom ecology such as distractions and accommodations or modifications (Kurth et al., 2016). Observations conducted using ecobehavioral assessment are distinct from other research methods because of the focus on multiple contextual features of the classroom including the student, educator (e.g., instruction), and environment (e.g. instructional arrangement, materials; Greenwood et al., 1994). The Ecobehavioral Assessment Systems Software (EBASS) is one type of computer-based ecobehavioral assessment that was developed and first validated in 1994. It uses a time sampling system to collect data (Greenwood et al., 1994). The EBASS includes the Code for Instructional Structure and Student Academic Response (CISSAR) and the MainStream Version of the CISSAR (MS-CISSAR), which gather specific data on the educator's instruction, student responses, and classroom characteristics. In 2003, Wehmeyer et al. expanded the MS-CISSAR to examine access to general education curriculum for students with intellectual disability, introducing the Access CISSAR.

Recently, researchers developed an updated version of the EBASS and CISSAR taxonomies known as the Ecobehavioral Classroom Assessment application (ECAT). The ECAT is an app-based ecobehavioral observation instrument that uses time-sampling to document the characteristics of (a) student behaviors, (b) educator behaviors, and (c) classroom ecology (Kurth & Lockman Turner, 2019). Toews et al. (2020) used the ECAT to observe 10 students with

complex support needs in elementary and middle school general education classrooms and found positive characteristics of general education classrooms including high levels of student engagement, provision of accommodations and modifications, and low levels of distractions. Students were highly engaged with academic content, replicating findings of earlier ecobehavioral assessment research (Logan et al., 1997). Other research teams have also observed high levels of engagement for students in general education classrooms compared to students in self-contained classrooms (Gee et al., 2020).

In addition to student behaviors, existing research using observational or ecobehavioral assessment has focused on teacher behaviors. For example, researchers have investigated the instructional actions of educators in general education and self-contained classrooms for students with complex support needs. Kurth and Mastergeorge (2012) observed the classrooms of 15 students with autism and the results suggested students in self-contained classrooms received no instruction more frequently than students in general education classrooms. In a different study, researchers used ecobehavioral assessment to observe the self-contained classrooms of 19 students with complex support needs, documenting low levels of instruction and low levels of student engagement with teachers or peers (Kurth et al., 2016). Additionally, teachers were most often observed focused on other adults rather than students, and paraprofessionals were often providing instruction to the focus students in the self-contained classrooms (Kurth et al., 2016).

Research using ecobehavioral assessment has also documented aspects of classroom ecology such as accommodations and modifications. For example, Lee and colleagues (2010) observed 45 high school students with disabilities in general education classrooms and found the implementation of curriculum modifications predicted student academic responses. Despite the documented value of curriculum modifications (e.g., adjustments to the grade level complexity

of assignments), researchers have observed accommodations (e.g., extended time, adapted paper) are more likely to be provided to students with complex support needs (Soukup et al., 2007; Wehmeyer et al., 2003).

Given the need to ensure students make progress in the general education curriculum, additional research is needed to understand the ecobehavioral characteristics of different classroom types in which students with complex support needs are placed. Previous research documented high levels of student engagement and access to the general education curriculum in general education classrooms (Soukup et al., 2007; Toews et al., 2020). However, teams continue to make educational placement decisions that result in restrictive placements and negative student outcomes. Therefore, additional research is needed to examine the experiences of a large, nationally representative sample of students with complex support needs in different types of classrooms. Previous research has typically had small samples (50 or fewer students) from one or two regions of the United States (e.g., Kurth et al., 2016). The purpose of this study was to investigate student, teacher, and ecological factors in four different types of classrooms for a large sample of students with complex support needs across the United States. Our overall research question was: How do student behaviors, educator behaviors, and classroom ecology vary across different classroom types (e.g., general education, resource, self-contained, classroom in separate school)?

Method

This study was part of a larger investigation of educational placements for students with complex support needs with multiple sources of data collected (Kurth & Jackson, in press). The present analysis examined observational data gathered through ecobehavioral assessment to understand how student behaviors, educator behaviors, and classroom ecology vary across

different classroom types. To conduct observations, we used the ECAT which is organized into three conceptual groups: student behaviors, educator behaviors, and classroom ecology (see Figure 1 in Supplemental Materials). Within each conceptual group, there are several categories of variables. The first conceptual group, student behaviors, includes the following three categories of variables: academic responses, competing responses, and the role of the person on whom the student was focused. The second conceptual group, educator behaviors, includes four categories: the role of the educator interacting with the focus student (educator definition), the academic actions of the educator (educator academic action), the person or people on whom the educator was focused (educator focus), and the behavior management actions of the educator (educator behavioral action). The third conceptual group, classroom ecology, consists of the following five categories: instructional grouping in which the focus student was involved (e.g., whole group, small group, individual), distractions present for the focus student, presence of any peer-led instruction or support, how the educator delivered instruction to most of the students in the class, and accommodations and modifications. The ECAT manual (available as a supplemental file) includes a codebook with examples and non-examples for each variable.

Participant Recruitment

Students with complex support needs from the following four educational placements across the United States were recruited for participation in this study: (a) Placement A, students with complex support needs were represented in natural proportions in their school and spent 80% or more of the school day in the general education classroom; (b) Placement B, students with complex support needs were represented disproportionately in a school setting and spent 40-79% of the school day in the general education classroom; (c) Placement C, students with complex support needs were represented disproportionately and spent less than 40% of the

school day in the general education classroom; and (d) Placement D, a separate school where access to general education classroom was not possible.

To recruit participants, research teams contacted school districts and charter schools in four regions across the United States (West, Midwest, Northeast, and South). After providing schools with basic information about the study and student inclusion criteria, school staff were asked to forward information about the study to the families of eligible students. Approved IRB protocols for participant recruitment were followed. Signed consent forms were obtained from parents/guardians of student participants and teacher participants (e.g., special education teacher, general education teacher), and student assent was secured at the time of the observation. The sample was ultimately obtained from 59 schools across 36 local educational agencies. The larger study included 117 elementary students with complex support needs, of which 116 were observed using the ECAT. Student demographic information is included in Table 1. Research teams completed the *Supports Intensity Scale-Children's Version (SIS-C)* with teachers or parents of student participants, and the results are included in Table 1 (Thompson et al., 2016). Teacher demographic information is included in Table 1 (supplemental materials). Special education teachers were observed across all placements (range = 10-29) whereas general education teachers were only observed in general education (n = 18), resource (n = 2), and self-contained classrooms (n = 1). Teachers whose role was unknown or marked as 'other' on the demographic survey are also listed in Table 1. Most special education teachers observed in self-contained and separate schools were responsible for teaching with students complex support needs (n = 69). Few teachers across the entire sample had emergency certifications (n = 6).

ECAT Piloting and Training

As described in the Introduction, the ECAT updated and expanded the EBASS, with the

integration of more recent research to refine and add additional variables. It was pilot tested for over 30 hours across four months in both general education and self-contained classrooms (Author et al., 2020). At the start of pilot testing there were 125 possible variables, and during this process, the ECAT variables were defined and re-defined. Ninety variables remained that are included in the ECAT used in the present study. After the ECAT was finalized, 19 data collectors, all of whom were special education faculty or graduate students, were trained to use it for observations. Training procedures are described in detail in the ECAT manual. Data collection teams were required to complete a minimum of 10 hr of practice together in classrooms that would not be observed for the study. Teams were required to receive a minimum of 80% inter-observer agreement (IOA) prior to beginning data collection. An average of 14 hr (range =10-24 hr) of practice observations were completed across all data collectors, resulting in an average of 94% IOA (range = 87%- 99%).

Data Collection

Data collection began in fall 2019. The original intent of this project was to conduct observations using the ECAT in fall 2019 and complete follow-up observations in spring 2020. However, due to the global COVID-19 pandemic, limited data were collected in spring 2020, and as a result, we only analyzed data from fall 2019. ECAT data were collected electronically using an app that was developed for use on iOS and Android platforms. Students were observed in four classroom types: general education, resource, self-contained, and special schools. In some instances, a student may have been observed in more than one classroom type. During observations, the ECAT app cycled through each of the 12 categories (see Figure 1 and ECAT manual, both available as supplemental files). For 20-s, data collectors observed the classroom, looking for variables in one category at a time (e.g., academic responses) and then spent the next

20-s recording what they observed. Most variables were observed and recorded using partial interval methods. There were 23 variables observed using whole interval procedures (see Supplemental Figure 1).

One ECAT cycle included all 12 categories and lasted eight minutes (20-s observing, 20-s recording for each of the 12 categories). One complete ECAT observation included four cycles and lasted 32 minutes. We observed 1,116 cycles in general education classrooms, 274 cycles in resource classrooms, 690 cycles in self-contained classrooms, and 399 cycles in separate school classrooms. Importantly, except for the 8 (15.5%) students in separate schools, it was possible for a student to be observed in different classroom types over the course of the school day (i.e., it was possible for students in non-separate schools to migrate between general education, resource room, and self-contained classrooms). In fact, of the 98 students for whom migration was a possibility, we observed 44 (44.9%) stay in one type of classroom; 48 (49%) migrate between two different types of classrooms, and 6 (6.1%) migrate among all three different classroom types. The mean observation time for each student was 1.4 hr (min= .53, max= 2.13, *SD*= .27).

The research teams coordinated with teachers to schedule observations, with data collection periods occurring primarily during time periods focused on academic content instruction. At the beginning of each observation, the data collector indicated the subject area of focus for the upcoming observation period of 32 min: 83% of observation cycles were completed when there was at least some focus on academics (e.g., English language arts, math, science, social studies, calendar, centers, circle time), 8.2% of observation cycles occurred during specials (e.g., art, music, computers, library, physical education), 7.6% of observation cycles occurred during times focused on daily living skills, IEP goals, and motor skills, 0.9% of cycles were during other times, and these data were missing for 0.3% of observation cycles.

Interobserver agreement was completed for 21.6% of cycles and the result was 95.8%. To prevent observer fatigue and maintain accuracy, no more than eight complete observations were scheduled for a data collector in a single day.

Data Analysis

To address our research question, we used multilevel (MLM) multinomial regression, which is suitable for regressing a nominal dependent outcome on a set of predictors, with separate regressions for each of the 12 ECAT categories (e.g., academic response; see Supplemental Figure 1). The independent variable was always classroom type (general education classroom, resource classroom, self-contained classroom, classroom in separate school). Model estimation used Bayesian methods via the R package BRMS (Bürkner, 2019), which interfaces with STAN (Carpenter et al., 2017). Diffuse normal priors (*mean* 0, *SD* 10) were used for all beta and intercept parameters. Minimally informative priors were used for variance components; specifically, we used half-normal priors (*mean*= 0, *sd*=10; e.g., Gelman, 2006) which provide only positive values, thus avoiding impossible negative variances. Following common diagnostic checks (e.g., McElreath, 2020), diagnostic plots (plots of posteriors, trace plots) were checked to identify obvious issues with posterior distributions and reaching stationarity, with satisfactory results. Also, all final R-hats were below 1.01. Two-chains were used for all analyses, and chain length of 2,000 and burn-in of 2,000 was used for initial runs. Chain length was increased if sampling required it, with a maximum of 6,000, which produced satisfactory convergence. All final models passed a posterior predictive check.

Independent Variables

All analyses used classroom type as the independent variable as the primary goal was to test the predictive strength of classroom types on the 12 ECAT categories. For all analyses, the

general education classroom was used as the reference category to which all other conditions were compared. In examining the significance of comparisons, we interpreted effects as significant if their 95% Bayesian credible interval did not contain zero (Hespanhol et. al., 2019). When this is the case, assuming the model is specified correctly, there is a 95% probability that the true effect estimate would lie within that interval. As such, for effects that met the above criteria, directionality could be interpreted with confidence. Any comparison which had a 95% credible interval containing zero was not interpreted, as there was less confidence in the directionality of such effects. For those effects that were significant, the odds ratio was computed as an effect size. Model-estimated probabilities were computed and are provided (alongside an estimate of the cumulative probability over a 40-min observation window) in situations where probabilities were small (less than .002). This was done because odds ratios can be misleading when overall probabilities are small.

Levels of Analysis

MLM was used for all multinomial regressions as observations were nested within students. The Student's school presented as another, higher level of nesting. To determine if this level of nesting needed to be considered in the models, a model fit comparison was conducted for each analysis. Leave-one-out cross-validation information criterion (LOOIC), an information criterion similar in scale/interpretation to frequentist Akaike Information Criterion (Vehtari et al., 2017), was used to test the model fit improvement of adding school as an additional level of nesting. Smaller values indicate superior fit, and values two or smaller are viewed as trivial (in which case the more parsimonious model is favored; Burnham & Anderson, 2004).

Data Analysis Procedures for Each ECAT Category

The 12 ECAT categories were used as dependent variables in the 12, separate MLM

multinomial regressions. The original ECAT variables within each of the 12 categories were used to derive a set of variables for purposes of the analysis. The process of deriving these analysis variables occurred through discussion between the research team (content experts) and data analysis team (see Table 2 in Supplemental Materials). For example, the original ECAT variables of writing, math, reading, and talking about academic content were collapsed to create an academic response variable for analysis. There were missing data for some variables that presented incompatible combinations (e.g., simultaneous codes of "out of the room or on a break" and "academic response-reading"). Details of missing data can be found in Table 3 (supplemental materials).

Results

In the following sections, we present the significant results from the analyses of the 12 ECAT categories across the four classroom types (general education, resource, self-contained, separate school). All results, including non-significant results, are provided in Table 2. Results of the LOOIC comparisons are included in Table 4 (supplemental materials). For all 12 categories except educator focus, LOOIC indicated that adding the school-level of nesting improved model fit. Thus, this level of nesting was retained in all analyses except for the educator focus analysis, which was analyzed with only two levels (i.e., observations nested within students).

Student Behaviors: Academic Responses

The first conceptual group of the ECAT focuses on student behaviors with three categories: academic responses, competing responses, and student focus. The first category, academic responses, included academic responses, non-academic responses, and no content responses. When examining the impact of classroom type on student academic responses, the odds of observing no content responses (relative to academic responses) was higher for

observations in separate school classrooms than for observations in general education classrooms. No content responses were coded when for the entire 20-second interval, the student did not provide an academic response. The odds ratio was 4.974, indicating that the odds of observing no content responses from the focus student (relative to academic responses) were 4.974 times higher for observations in separate school classrooms than for observations in general education classrooms. During the academic responses interval, the odds of observing the student out of the room or on a break (relative to an academic response) were 5.247 times higher for observations in separate school classrooms than in general education classrooms.

Student Behaviors: Competing Responses

No significant effects were found when examining the impact of classroom type on student competing responses (see Table 2).

Student Behaviors: Student Focus

When examining the impact of classroom type on the role of the person the focus student was focused on, the odds of observing the student focused on no one (relative to a certified teacher) were 3.084 times higher for observations in the separate school classrooms than general education classrooms. Additionally, in separate school classrooms, the odds of observing the focus student focused on a paraprofessional (relative to the certified teacher) were 3.194 times higher than for observations in general education classrooms.

The odds of observing the focus student focused on a peer only (relative to certified teacher only) were 0.428 times lower for observations in self-contained classrooms than for observations in general education classrooms. The odds of observing the student focused on two or more people (certified teacher, paraprofessional, and/or peer; relative to certified teacher only) were 0.400 times lower for observations in self-contained classrooms than for observations in

general education classrooms. The odds of observing the student out of the room or on a break (relative to focusing on a certified teacher only) were 5.796 times higher for observations in separate school classrooms than for observations in general education classrooms.

Educator Behaviors: Educator Definition

The second conceptual group of the ECAT was focused on four categories of educator behaviors: Educator definition, educator academic action, focus of the educator, and behavioral actions of the educator. The educator definition category of the ECAT is focused on the role of any educator interacting with the focus student (e.g., paraprofessional, certified teacher, peer tutor, other, no one). The odds of observing no one interacting with the focus student (relative to a certified teacher only) were 1.76 times higher for observations in self-contained classrooms than for observations in general education classrooms. This result was more significant in separate school classrooms because the odds of observing no one interacting with the focus student were 4.373 times higher in separate school classrooms than in general education classrooms. The odds of observing a student teacher, related services provider, or substitute teacher interacting with the focus student (relative to a certified teacher only) were 2.841 times higher in self-contained classrooms than in general education classrooms.

The odds of observing the student focused on the paraeducator and a certified teacher (relative to certified teacher only) were lower for observations in resource classrooms than in general education classrooms (odds ratio = 0.363). Additionally, in resource classrooms, the odds of observing the student focused on a peer only (relative to a certified teacher) were lower than for observations in general education classrooms (odds ratio = 0). However, the model implied probabilities of these findings were small in both this setting and in general education classrooms (each < .002). For example, in 15-min observation (45 opportunities to observe using 20-s

intervals), the model implied cumulative probability of observing this behavior at least once was <.001, compared to 0.044 in general education.

The odds of the student being out of the room or on a break during this interval were higher for observations in self-contained classrooms (odds ratio = 1.971) and separate school classrooms (odds ratio = 5.42) than for observations in general education classrooms.

Educator Behaviors: Educator Academic Action

The educator academic action category of the ECAT is focused on the academic instructional behaviors of the educator. Academic instruction includes questions, commands, lectures, and reading aloud. If educators provided no academic instruction for an entire 20-s interval, then no academic instruction was recorded. The odds of observing the educator not providing academic instruction to the focus student or the group of students in which the focus student was a member (relative to providing academic instruction) were 1.403 times higher for observations in self-contained classrooms than for observations in general education classrooms. The odds of observing no academic instruction (relative to academic instruction) were also 2.71 times higher for observations in separate school classrooms than for observations in general education classrooms. During this interval, the odds of the student being out of the room or on a break (relative to receiving academic instruction) were higher for observations in self-contained classrooms (odds ratio = 1.777) and separate school classrooms (odds ratio= 3.969) than for observations in general education classrooms.

Educator Behaviors: Educator Focus

The third category of the educator behaviors conceptual group is the educator's focus, which involves students only (focus student, focus student and classmates, classmates), adults only, focus student and adults, and no one. The odds of observing the educator focused on no one

(relative to the focus student, focus student and classmates, and classmates) were 2.267 times higher for observations in self-contained classrooms than in general education classrooms. The odds of observing the educator focused on no one (relative to the focus student, focus student and classmates, and classmates) were 3.467 times higher for observations in separate school classrooms than for observations in general education classrooms.

Compared to the general education classrooms, the odds of observing the educator focused on adults in the classrooms (relative to the focus student, focus student and classmates, or classmates) were higher in the resource (odds ratio = 2.964), self-contained (odds ratio = 3.01), and separate school (odds ratio = 7.575) classrooms. In separate schools, the odds of observing teachers focusing on adults only (relative to focusing on students) were 7.575 times higher than in general education classrooms. The odds of observing the educator focused on students and adults (relative to the focus student, focus student and classmates, and classmates) were 5.545 times higher for observations in self-contained classrooms than in general education classrooms. Similar results were evident in separate school classrooms: The odds of observing the educator focused on students and adults (relative to the focus student, focus student and classmates, and classmates) were 11.537 times higher for observations in separate school classrooms than in general education classrooms. During this interval, the odds of observing the student out of the room or on a break (relative to the educator being focused on students) were 4.439 times higher for students in separate school classrooms than in general education classrooms.

Educator Behaviors: Educator Behavioral Action

The educator behavioral action category of the ECAT is focused on the educator's reinforcement and correction to the group of which the focus student is a member. The odds of

observing the educator issuing a correction to the focus student or whole group (relative to no corrective action) were lower for observations in the self-contained classrooms than for observations in general education classrooms (odds ratio = 0.592). The odds of observing restraint (relative to no corrective action) were 17.805 times higher for observations in self-contained classrooms than for observations in general education classrooms. The model-implied probabilities of making this observation were small in both self-contained classrooms and in general education classrooms (each <.002); in 15-min observation (45 opportunities to observe using 20-s intervals), the model implied cumulative probability of observing this behavior at least once was 0.044, compared to <.001 in general education. The odds of observing restraint (relative to no corrective action) were higher for observations in separate school classrooms than those in general education classrooms (odds ratio = 269.403). The odds of observing out of room/on break (relative to no corrective action) were higher for observations in separate school classrooms than in general education classrooms (odds ratio = 2.643).

Classroom Ecology: Instructional Grouping

The classroom ecology conceptual group of the ECAT includes five categories: instructional grouping, distraction, peer assisted learning, how students were accessing academic content, and accommodations/ modifications. The first of these, instructional grouping, is focused on documenting whether the student was working in a group (whole group, small group, peer), working individually, or working both individually and with a group. The odds of observing the student working in a whole group, small group, or with a peer (relative to working individually) were lower for observations in resource classrooms (odds ratio = 0.459 times lower), self-contained classrooms (odds ratio = 0.329 times lower), and separate school classrooms (odds ratio=0.339 times lower) than general education classrooms. The odds of

observing the student working alone and with a group in the same interval (relative to working alone only) were lower for observations in self-contained classrooms than in general education classrooms (odds ratio = 0.031). The odds of observing the student out of the room or on a break (relative to working alone) were lower for observations in resource classrooms than for observations in general education classrooms (odds ratio = 0.031).

Classroom Ecology: Distraction

The next category in the ecology conceptual group is distractions, which is dedicated to who or what (if anything) was distracting the student. The odds of observing a staff member distracting the focus student (relative to no distraction for the focus student) were 2.61 times higher for observations in self-contained classrooms than for observations in general education classrooms. The odds of observing the student distracted by a staff member (relative to no distraction) were 11.711 times higher for observations in separate school classrooms than for observations in general education classrooms.

The odds of observing the focus student distracted by objects in their immediate area (relative to no distraction) were 0.527 times lower for observations in self-contained classrooms than for observations in general education classrooms. The odds of observing two or more distractions for the focus student (relative to no distraction) were 4.093 times higher for observations in self-contained classrooms than for observations in general education classrooms. The odds of observing two or more distractions (relative to no distraction) were 33.818 times higher for observations in separate school classrooms than for observations in general education classrooms. The odds of the student being out of the room or on a break (relative to no distractions) were higher for observations in the separate school than for observations in the general education classrooms (odds ratio= 4.743).

Classroom Ecology: Peer Assisted Learning

Due to the inadequately small cell sample sizes for resource classrooms and separate school classrooms for the peer assisted learning variable, these effects could not be estimated. The odds of the student being out of room or on a break (relative to no peer assistance) during this interval were higher for observations in separate school classrooms compared to general education classrooms (odds ratio = 2.875).

Classroom Ecology: Access Academic Content

The access academic content category is focused on how the educator was providing instruction for most students in the classroom. Variables in this category include lectures and/or demonstrations, objects, visuals, audio-video, two or more, and none (see Supplemental Table 2). The odds of observing most students receiving information through a lecture (relative to no access to instruction, materials, or objects) were 0.245 times lower for observations in self-contained classrooms than in the general education classrooms. The odds of observing lectures (relative to no access to instruction, materials, or objects) were also lower for observations in separate school classrooms than in general education classrooms (odds ratio= 0.065).

The odds of observing the focus student interacting with objects that support academic access (e.g., books, papers, or other objects supporting academic instruction), relative to no supports for accessing academic content, were lower for observations in self-contained classrooms than for observations in general education classrooms (odds ratio = 0.257). A similar result was evident in separate school classrooms: The odds of observing the focus student interacting with objects were lower for observations in separate school classrooms than for observations in general education classrooms (odds ratio = 0.227).

The odds of observing most students in the class focused on audio-video content (e.g.,

audio recording of a book, other audio connected to class content, video supporting instruction) were lower for observations in self-contained classrooms (odds ratio = 0.317) and separate school classrooms (odds ratio = 0.191) than observations in general education classrooms.

The odds of observing two or more ways of accessing academic content (relative to none) were lower for observations in self-contained classrooms than for observations in general education classrooms (odds ratio = 0.425). A similar result was evident in separate school classrooms: The odds of observing two or more ways of accessing academic content (relative to none) were lower for observations in separate school classrooms than for observations in general education classrooms (odds ratio = 0.118).

Classroom Ecology: Accommodations and Modifications

The final ECAT category is accommodations and modifications, and it includes the following supports for the student: environmental, academic, personnel, behavior, alternative tasks, communication, two or more, and none. Across all four classroom types, behavior supports were rarely the only code that was entered during an interval. The odds of observing a behavior support such as using a first-then chart, visual schedule, or token economy system (relative to no accommodation/ modification) were higher for observations in resource classrooms than for observations in general education classrooms (odds ratio = 23.39). The model-implied probabilities of making this observation were small in both this setting and in general education classrooms (each <.002); in 15-min observation (45 opportunities to observe using 20-s intervals), the (model implied) cumulative probability of observing a behavior support at least once would be <.001, compared to <.001 in general education.

Similar to behavior supports, communication supports were rarely the only code entered during an interval for all classroom types. The odds of observing the student being provided

support for communication (e.g. pictures, augmentative and alternative communication device) relative to no accommodation or modification were higher for observations in resource classrooms than in the general education classrooms (odds ratio = 1206.704). The model-implied probabilities of making this observation were small in both the resource classrooms and in the general education classrooms (each <.002); in a 15-min observation (45 opportunities to observe using 20-s intervals), the (model implied) cumulative probability of observing communication support at least once would be <.001, compared to <.001 in general education.

One of the accommodations/modifications coded was alternative task, which was defined as a task that differed from the major content, tasks, or materials of the other students in the class. An example of a time when alternative task would have been coded was if the student completed math worksheets about coin identification while the rest of the class completed a worksheet on double-digit subtraction. The odds of observing the student engaged in an alternative task (relative to no accommodation/modification) were higher for observations in resource classrooms than for observations in general education classrooms (odds ratio = 3.667). The odds of observing the student engaged in an alternative task (relative to no accommodation/ modification) were lower for observations in self-contained classrooms than for observations in general education classrooms (odds ratio = 0.132). The odds of observing the student being provided two or more accommodations or modifications were higher for observations in the resource classroom than for observations in general education classrooms (odds ratio = 2.714). Additional results were found in this category and are reported in Table 2.

Discussion

The purpose of this study was to investigate how student behaviors, educator behaviors, and classroom ecology vary across different classroom types for students with complex support

needs. During observations of 116 students with complex support needs across the United States, we were more likely to observe no one interacting with the focus student, no instruction, and the presence of distractions in self-contained and separate school classrooms compared to general education classrooms. Overall, the results of this study provided no evidence that self-contained and separate school classrooms provide instruction or supports for students with complex support needs that are superior to those delivered in the general education classroom.

When examining the impact of classroom type on student behaviors, significant effects were found for the types of student academic responses and the person on whom the student was focused. The odds of observing no academic content responses (relative to academic responses) from focus students were almost five times more likely in separate school classrooms than in general education classrooms. These findings confirm the frequent passive participation of students with complex support needs in self-contained classrooms evident in earlier work (Gee et al., 2020; Kurth et al., 2016) with a much larger number of participants across the United States.

An argument against educational placements in the inclusive, general education classroom for students with complex support needs is that student needs are better met in self-contained or separate school classrooms where there is supposedly greater access to individualized supports and FAPE (Kauffman et al., 2016). However, the results of this study demonstrate the opposite: In self-contained and separate school classrooms, we were more likely to observe educators not providing instruction, and educators were more likely to be focused on no one or other adults (relative to students only) compared to educators in general education classrooms. The frequent lack of instruction and educator focus on adults in self-contained and separate school classrooms has been reported in prior work (e.g., Kurth et al., 2016). The results of this study highlight that these classrooms do not provide the needed instruction that students

with complex support needs are afforded through IDEA and as members of their school community (Giangreco et al., 2020).

Some of the most significant findings in the educator behaviors conceptual group were the person or people on whom the educator was focused. Compared to general education classrooms, the odds of observing the educator focused on no one were more than two times higher in self-contained classrooms and more than three times higher in separate school classrooms. Further, educators were more likely to be focused on adults (not students) in all three special education classrooms compared to general education classrooms. The odds of observing the educator focused on adults were nearly three times higher in resource and self-contained classrooms, and they were 7.6 times higher in separate school classrooms. Causing further concern about educator behaviors in special education classrooms, we found the odds of observing no one interacting with the focus student (relative to a certified teacher) were 1.76 times higher in self-contained classes and 4.4 times higher in separate school classrooms than in general education classrooms. These results support Kurth et al.'s (2016) findings related to the segregation and isolation that students in self-contained classrooms and separate school classrooms experience, especially considering the likelihood of students focusing on no one in separate school classrooms.

The results related to classroom ecology followed a similar trend as the student and educator conceptual groups, with a few differences. We were less likely to observe group work (relative to working individually) in special education classrooms than in general education classrooms. One of the most significant findings related to classroom ecology was the distractions present in self-contained and separate school classrooms. The odds of observing a staff member distracting the focus student (relative to no distractions for the student) were 2.61

times higher in self-contained classrooms and 11.7 times higher in separate school classrooms, compared to the general education classroom. Further, the odds of observing two or more distractions to the focus student were four times higher in self-contained classrooms and 33.8 times higher in separate school classrooms.

Compared to general education classrooms, in self-contained and separate school classrooms, we were less likely to observe supports provided for accessing academic content, and we were less likely to observe lectures, the use of academic objects such as books and papers, and two or more supports for accessing academic content. These results are consistent with previous research regarding the lack of academic supports and materials for students with complex support needs in self-contained classrooms (Kurth et al., 2016), and it is consistent with research illustrating students with complex support needs are more likely to access the general education curriculum in general education classrooms (Soukup et al., 2007).

We were less likely to observe alternative tasks in self-contained classrooms than in general education classrooms. Alternative tasks in the ECAT do not represent best practice in providing access to grade level content. Instead, alternative tasks were coded when the student was engaged in an activity that differed considerably from the rest of the group. The decreased likelihood of observing alternative tasks in self-contained classrooms could suggest the students were doing the same activity. However, it is possible that if the students were engaged in an activity, it may not have been academic in nature, or it may not have been linked with instruction or academic content.

Limitations

There are limitations in this study. First, we could only conduct observations during fall 2019 due to the COVID-19 pandemic. Second, we only have SIS-C data for 97 students for

whom we have ECAT data, so this prevents us from understanding the support needs of the entire sample. However, the selection criteria for participants did require them to receive special education services under the categories of intellectual disability, autism, or multiple disabilities and to be eligible for the state alternate assessment. Future research should include complete data collection for all student participants using the SIS-C. Such data would be valuable for understanding the support needs of the full sample of students. Third, the current data represent observational data only and cannot be used to derive causal inference. Thus, while these results are useful in describing what was observed in the various settings, we cannot say that the different settings caused these differences - only that there is evidence of the existence of the differences. Future research is needed that further explores factors that drive differences in instruction and supports across educational placements as well as placement decisions made by IEP teams. Finally, as described in the method section, observations primarily occurred during academic time periods, but it is possible other instructional targets occurred after the observation started.

Implications

There is a need for school teams to consider the contextual features of classrooms as they make decisions about a student's supports and educational placement. The majority of students with complex support needs experience the most restrictive educational placements, and the results of this study suggest a higher probability of educators in these settings not providing instruction, causing a distraction, and either focusing on no one or adults in restrictive placements (resource, self-contained, separate school classrooms). These findings run counter to many of the arguments for placing students with complex support needs in segregated settings. School teams must consider the results of this study as well as the results of previous research

(e.g., Gee et al., 2020; Soukup et al., 2007; Toews et al., 2020) regarding the benefits of learning in general education classrooms for students with complex support needs and the benefits to the entire school community when inclusive practices are implemented (Shogren et al., 2015).

IDEA requires that students with complex support needs be provided with FAPE and that they be educated in the LRE. The results of this study raise serious concerns about the appropriateness of the special education services and supports provided to students with complex support needs in resource, self-contained, and separate school classrooms. Policymakers, educators, family members, and key stakeholders in education must reconsider the LRE policy, make placement decisions based upon research, and reject the assumption that separate, special education classrooms provide access to specialized instruction not available in general education classrooms. Instead, school teams must engage in a systematic planning process to design individualized supports and services for students with complex support needs so that they receive a free and appropriate public education, make progress in the general education curriculum, and have supports needed to experience success in general education contexts (Giangreco, 2020). Supports such as professional development and scheduled planning time must be provided to educators so that they are able to facilitate the inclusion of students with complex support needs in general education classrooms by collaborating, co-planning, and engaging in productive problem solving. Key stakeholders in education policy must consider the benefits of inclusive education for the entire school community; students are more likely to receive the supports they need and the classroom culture is enhanced by a sense of belonging for all students in inclusive schools (Shogren et al., 2015).

Future research is needed to understand how the ecobehavioral characteristics of classrooms predict student outcomes across an entire school year. Future research is also needed

to understand more details of the activities that students were engaged in across different classroom types. The results of this study indicated students with complex support needs were almost five times more likely to provide no academic content responses in separate school classrooms than in general education classrooms. More information is needed about the types of academic responses that were observed and the types of activities in which the students were engaged, particularly in general education classrooms. Additionally, more information is needed about the academic responses of students with complex communication needs in various classroom types and during different academic subjects. Gaining an in-depth understanding of the responses and participation of students with complex communication needs during academic instruction would reveal specific topics for future research in order to support this population of students to make progress in the general education curriculum.

Future research is also needed to understand the quality and grade-level alignment of accommodations and modifications provided to students with complex support needs in different classroom types, and the effectiveness of these supports for ensuring progress in the general education curriculum. The findings of this study indicated that the odds of students in resource classrooms receiving two or more accommodations or modifications during a single interval were higher for students in resource classrooms than students in general education classrooms. However, given the taxonomy of ECAT codes, these accommodations/ modifications could have included paraprofessionals and/or alternative tasks (not aligned with grade level content). Considering other results of this study (e.g., educators in resource classrooms were almost three times more likely to be observed focusing on adults in the classroom (relative to students) compared to educators in general education classrooms), and the findings of previous research on accommodations and modifications (Wehmeyer et al., 2003), the need for further investigation of

accommodations and modifications provided in different classroom types is evident.

The results of this study should also inform teacher preparation, to ensure that educators are aware of the importance of promoting access to the general education classroom and rigorous, grade-aligned instruction for students with complex support needs in general education classrooms. Educators must have opportunities as pre- and in-service teachers to think carefully about how to promote access to the general education classroom for the students they serve and how to design their lesson plans and management responsibilities to ensure that they are providing instruction to students and not causing distractions. Elementary general education teachers have described the importance of special educators spending time in their classroom modeling strategies and supporting the student with complex support needs directly (Zagona et al., 2021), suggesting ways special education teachers could shift their focus toward supporting students in general education classrooms rather than focusing their time in special education classrooms so dense with distractions and lack of instruction as was observed in this study.

Ultimately, the results of this study suggest the critical need for educators, administrators, families, and other key stakeholders to advocate for the best possible learning contexts for students with complex support needs, which the findings of this study unequivocally support being more probable in general education classrooms for this sample of students with complex support needs from across the United States.

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Table 1
Student Demographics

	Placement[a]				Total
	A	B	C	D	
Grade					
K	7	2	3	1	13
1	7	6	5	0	18
2	4	4	1	2	11
3	6	9	5	0	20
4	5	3	5	6	19
5	4	4	7	4	19
6	2	5	4	5	16
Gender					
Female	17	10	15	5	47
Male	18	23	15	13	69
Race					
White	26	25	21	13	85
Black or African American	3	2	2	3	10
American Indian or Alaska Native	1	0	0	1	2
Asian	1	2	1	0	4
Native Hawaiian or Pacific Islander	0	0	1	0	1
Multiracial	2	3	0	0	5
Not Disclosed/ Missing	2	1	5	1	9
Ethnicity					
Not Hispanic	28	28	19	12	87
Hispanic	4	3	7	1	15
Missing	3	2	4	5	14
Category of Eligibility[b]					
Autism Spectrum Disorder	11	11	5	7	34
Deaf-Blindness, Deafness	0	0	0	0	0
Emotional Disturbance	0	0	0	0	0
Hearing Impairment	0	1	0	2	3
Intellectual Disability	9	8	10	7	34
Multiple Disabilities	5	7	10	6	28
Orthopedic Impairment	0	0	0	2	2
Other Health Impairment	5	5	2	0	12
Specific Learning Disability	0	0	0	0	0
Speech or Language Impairment	1	4	1	2	8
Traumatic Brain Injury	0	0	0	1	1
Visual Impairment	0	0	0	1	1
Developmental Disability	5	2	3	0	10

	Placement[a]				Total
	A	B	C	D	
SIS-C Support Needs Index[c]	N=27 M=82.85 SD=14.90	N=28 M=80.36 SD=17.04	N=26 M=87.04 SD= 15.75	N=16 M=92.38 SD=15.26	N=97 M=84.82 SD=16.14

Note. [a] Student participant data aligned with educational placement; students may have been observed in more than one type of classroom. [b] Categories of eligibility include both primary and secondary categories for students. [c] SIS-C results are reported for *n*= 97 student participants who were observed using the ECAT.