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An Observational Study of Lunchroom Interactions Among Secondary Students With Visual Impairments and Their Peers

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Abstract

Introduction: This study examined the naturally occurring social interactions of adolescents with visual impairments during lunch. **Methods:** We observed nine middle and high school students with visual impairments during multiple lunch periods (i.e., 44 total observations). We used interval recording (15 s observe, 15 s record) to collect data on our three primary variables: social interactions, social engagement, and proximity to others. We also took notes on quality of interaction (i.e., degree of reciprocity, appropriateness of content, affect of students and their peers, response relevance). **Results:** Students sat in close proximity to peers without disabilities for more than half of the observed lunch periods. However, students interacted with another person during only one-third of lunch periods. Interactions were more common with peers than with adults. Moreover, students without an additional cognitive impairment had higher quality and more frequent interactions with peers than adults; the opposite was true for students who had cognitive impairments in addition to visual impairments. **Discussion:** The findings of this study demonstrate that some students with visual impairments are very socially engaged during lunch, while others, namely those with additional cognitive impairments, have infrequent or low-quality interactions with peers during lunch. **Implications for Practitioners:** This study should prompt educators to consider the cafeteria as a context for supporting peer interaction and social skill development.

Keywords

visual impairment, social interactions, adolescents

Social relationships are important for all students. Peer relationships help students experience membership and belonging in their school community. Time spent in the company of same-aged peers is a central part of the adolescent experience. In contrast, the absence of friendships and other supportive

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peer relationships can negatively affect students' well-being and engagement in school. Indeed, social isolation in middle and high school can lead to loneliness, disengagement from school, and depression (Laursen & Hartl, 2013).

For students with visual impairments, developing strong social relationships can sometimes be a challenge. Prior research finds that such students may find mainstream school settings socially challenging (Plaskett, 2015; West et al., 2004). Although some students establish friendships (Rosenblum, 1998), others lack strong peer relationships, and their school experiences are characterized as lonely (Hadidi & Al Khateeb, 2013). A student with a visual impairment who has additional disabilities may be especially at risk for isolation (de Verdier, 2016; Jessup et al., 2017). In a recent Australian study, Jessup et al. (2018) examined the experiences of 12 high school students with visual impairments in and out of school. They found that students with visual impairments and additional disabilities reported more social challenges at school and felt lonelier at school than did students with visual impairments as their only disability. This finding is perhaps not surprising, since students with cognitive impairments often struggle socially in their schools (Carter, 2018).

Lunch may be an especially important time for developing friendships. Part of building social relationships involves frequent social interactions. Indeed, the frequency of social interactions between students is one of the most commonly used operational definitions of *integration*. This unstructured time of the day can offer plentiful opportunities for students to practice interacting and develop meaningful relationships. However, lunchtime also presents unique challenges. In a recent study, Jessup et al. (2017) found that adolescents with visual impairments felt particularly lonely during lunch, even when eating in the company of friends. The authors noted that these feelings of loneliness might reflect the inability of the students with visual impairments to focus on the details of eating while also following along with ongoing group conversations. The mismatch between physical presence in a highly sociable atmosphere and feeling heightened levels of loneliness warrants further exploration and prompted the need for this pilot study.

To date, no studies have examined the naturally occurring social interactions of adolescents with visual impairments during the unstructured context of lunch periods at schools. Therefore, we addressed four research questions: With whom do students with visual impairments sit during lunch? With whom do students with visual impairments interact during lunch? What is the quality of interactions between students with and without visual impairments during lunch? How socially engaged are students with visual impairments during lunch?

Method

Participants

We observed nine students with visual impairments (see Table 1). They had to (a) receive special education services within the category of visual impairment; (b) attend lunch with their same-aged peers without disabilities; and (c) attend middle or high school (i.e., grades 6 through 12). Additional disabilities included cognitive impairments ($n = 4$; e.g., intellectual disability or functional delay), language impairment ($n = 1$), and specific learning disability in reading ($n = 1$). Eight of the students communicated primarily through speech; one used a combination of single-word utterances and pictures. All students were between the ages of 12 and 18 years; 33.3% were female, and 55.6% were racial/ethnic minorities. Four students had at least one social-related IEP goal.

Upon receiving the university institutional review board and school district approval for this study, we spoke with the district's lead vision services teacher to describe the overview of the study and its inclusion criteria. This teacher shared the recruitment materials with all of the district's teachers of visually

Table 1. Characteristics of Students with Visual Impairments.

Participant	Age	Grade	Sex	Race or ethnicity	Visual conditions	Learning medium(s)	Visual acuity	Additional disabilities
Matt	12	6	Male	African American	Macular dragging, ROP	Print	Not reported	Cognitive impairment
Nicole	12	6	Female	African American	ROP, Amblyopia, Strabismus, Nystagmus, High myopia	Print, auditory	OD: 20/125 (distance), 20/200 (near) OS: counts fingers at 3 ft	Cognitive impairment
Vince	17	11	Male	Asian/Pacific Islander	Cortical visual impairment	Tactile	Not reported	Cognitive impairment
Chris	18	12	Male	African American	Corrective lens implants	Print	OU (with both eyes with glasses): 20/125 (distance), 20/63 (near)	Cognitive impairment
Erin	16	9	Female	Caucasian, non-Hispanic	ROP, Nystagmus	Print, auditory	OD: LP OS: 20/300 (distance), 20/200 (near)	Language impairment
Stewart	15	9	Male	Caucasian, non-Hispanic	Ocular albinism, Hyperopia	Print, auditory	OU: 20/200	None
Mike	16	11	Male	Caucasian, non-Hispanic	Aniridia; Nystagmus, Strabismus	Print	OU: 20/250 (distance), 20/200 (near)	None
Alberto	13	7	Male	Caucasian, Hispanic	Oculocutaneous albinism, Nystagmus	Print	OU: 20/200	None
Christina	13	7	Female	Caucasian, non-Hispanic	Aniridia, Nystagmus, Strabismus	Print	Not reported	Specific learning disability in reading

Note. LP = light perception; OD = oculus dexter (right eye); OS = oculus sinister (left eye); OU = oculus uterque (both eyes); ROP = retinopathy of prematurity.

impaired students and encouraged them to send home parent consent forms on our behalf. Eleven teachers distributed consent forms to the parents or caregivers of eligible students to obtain verbal or written assent. The parents were asked to return the forms by mail to the district's vision office.

During the consenting and assenting process, the first author described the purpose of the study and procedures to each eligible student. Specifically, she told each student that the observers were collecting information about how students interacted with their friends during lunch and that they, the students, did not need to do anything different while being observed. All eligible peers agreed to participate.

Schools and Settings

Participants attended four middle schools and four high schools in a southeastern state. All schools were a part of an urban school district and were selected based on their diversity and the size of their student populations. The number of students in each of the eight schools ranged from 414 to 2,210 (M = 980.4). Across schools, the race/ethnicity of students was 35.0% Caucasian, non-Hispanic (range = 17.3%–49.2%); 34.9% Black or African American (range = 20.0%–44.3%); 24.6% Hispanic or Latino (range = 5.0%–59.3%); 5.0% Asian (range = 2.0%–11.0%); and 5.0% "other" (range = 0.0%–5.0%). The average percentage of students who were economically disadvantaged (i.e., eligible for free or reduced price meals) was 61.8% (range = 26.0%–87.0%).

We observed the participants in each school's cafeteria, all of which served students with and without disabilities. At the time of our observations, the total number of students and adults in the cafeteria during lunch averaged 166 students (range = 50–350) and 5 adults (range = 1–15).

Three students (i.e., Nicole, Vince, and Chris), all of whom had cognitive impairments, were required to sit with their classmates with disabilities throughout the lunch period. The remaining six students could choose where and with whom they sat during lunch.

Measures and Procedures

We observed each student during four or five lunch periods during the spring of 2019 (i.e., 44 total observations). Each observation lasted an average of 27 min (SD = 3.7). During each live observation, we used interval recording to collect data on our three primary variables: social interactions, social engagement, and proximity to others. All definitions were adapted from similar lunchroom observational studies focused on students with other disabilities (Hochman et al., 2015; Hughes et al., 1999). Observation sessions started when the focus student was seated at a lunch table and ended when students were dismissed from lunch or after 60 intervals (i.e., 30 min max). All data were collected using paper and pencil data collection sheets. The observers remained at least 5 ft from the student during all observations and repositioned themselves if the student moved. No directives were given to students.

Social Interactions. We coded social interactions involving other students using partial-interval recording. Each observation interval lasted 15 s followed by a 15 s record interval. Social interactions referred to any communicative behaviors—verbal or nonverbal (e.g., gestures, signs)—directed toward another person. Moreover, there must have been evidence of communicative intent. We noted whether the communicative behaviors of students with visual impairments were directed to (a) peers without disabilities, (b) peers with disabilities, (c) paraeducators, (d) educators, or (e) others. We also noted whether any of these six categories of people directed any communicative behaviors to the students. Multiple codes could be recorded during each interval. At the end of the observation, we tallied the total number of different peers with whom the student had at least one

interaction. We noted which peers had easily identifiable disabilities.

Social Engagement. We captured the social engagement of students using momentary time sampling. This measure captured the degree to which students were actively involved in ongoing interactions. We considered students to be *actively engaged* if they were talking or demonstrating active listening with their peers, adults, or groups of students with whom they were sitting. Active listening was evident when students were oriented toward the speaker and their behaviors indicated listening (e.g., nodding along, smiling, or frowning in response). Students were *unengaged* if they were neither contributing nor attending to ongoing social exchanges among their peers or adults in close proximity. For example, the student may have been facing a different direction, or their head might have been down. We indicated there was *no one to engage with* when no one was in proximity, or they were positioned in a way that prevented interactions as, for example, when a peer was sitting with her back to the student and talking to another peer. We indicated a student as *gone* if they were not in the cafeteria (e.g., leaving the table to throw away the trash, going to the restroom). Each code was mutually exclusive.

Proximity. We coded a student's proximity to others using momentary time sampling. *Proximity* meant being within a physical distance of a peer or adult that allowed for interactions (~3 ft). Based on the layout of each cafeteria and typical seating patterns, the observers decided a priori which seats around a lunch table met the criteria. For round tables, the adjacent three seats were considered in proximity. For rectangular tables, only peers directly next to, across from, and/or directly diagonal from the student were in proximity.

Interaction Quality. The observers provided overall ratings addressing different aspects of interaction quality (Carter et al., 2005). These ratings were made at the end of each observation in which one or more interactions actually took place. We defined *reciprocity of interaction* as the extent to which the communicative behaviors of students and their peers were balanced. Ratings included high, medium, or low. *Content* was defined as the interaction topic was appropriate for a middle or high school student. Ratings included appropriate, neutral, or inappropriate based on the extent to which the content was the same or different from other students in the setting. *Affect* of the student or peer was defined as the expression of emotion through facial expressions, hand gestures, voice tone, and body language. Ratings included positive, neutral, or negative. *Response relevance* was defined as the extent to which the student responded to initiations in an appropriate tone or volume and with content that was related to the topic of the initiation. Ratings included mostly related, somewhat related, or not related. When the conversation topics were difficult to discern, the rating of indiscernible was assigned. *Overall quality* was determined by considering the ratings for reciprocity, content, affect, and response relevance. More positive ratings in these five areas resulted in higher overall quality, and vice versa. Responses were provided on a 5-point, Likert-type scale: high, medium–high, medium, medium–low, and low.

Conversational Topics. We noted all the conversation topics addressed during peer interactions: greetings and social amenities; food; jokes; peers; academic school events; social school events; out-of-school events; sports; family; television, movies, bands, or celebrities; dating; and jobs (Carter et al., 2005).

Observers, Observer Training, and Interobserver Agreement

Three special education doctoral students conducted all observations. First, they read and discussed coding definitions and observational

procedures. Next, they practiced coding while watching a variety of videos involving acted-out scenarios. Each coder was required to reach 80% interobserver agreement on all three observational measures during three practice sessions before collecting data. We assessed interobserver agreement for two sessions per student (41.9%) using the point-by-point agreement method (Yoder et al., 2018). Agreement for each of the three primary observational measures averaged: social interactions (97.3%; range = 91.8%–100%), social engagement (89.8%; range = 71.7%–100%), and proximity to others (99.8%, range = 99.7%–100%).

Data Analysis

To address our research questions, we combined (i.e., stacked) observations for each student to determine the percentage of all intervals in which each code was observed. We present these data for individual students as well as summarize them across students with and without cognitive impairments using descriptive statistics (see Table 2).

Results

With Whom Do Students With Visual Impairments Sit During Lunch?

On average, students were in proximity to peers without disabilities for more than half ($M = 51.9\%$; $SD = 45.9$) of the observation intervals. Proximity to peers with disabilities ($M = 24.6\%$; $SD = 42.0$), paraeducators ($M = 19.7\%$; $SD = 34.0$), and educators ($M = 1.5\%$; $SD = 1.7$) was less common. As evidenced by large standard deviations, proximity to peers and adults varied widely across students. However, there was a clear differentiation between students with and without cognitive impairments (see Table 2). For example, four of the five students without cognitive impairments sat near peers without disabilities for more than 75% of intervals. Conversely, three of the four students with cognitive impairments were in proximity to peers without disabilities for less than 1% of intervals. Proximity to adults was almost the exact inverse.

With Whom Do Students With Visual Impairments Interact During Lunch?

On average, students interacted with another person during about one-third of observational intervals. Interactions were more common with peers (i.e., with or without disabilities; $M = 29.8\%$; $SD = 29.1$) than with adults (i.e., paraeducator or educator; $M = 7.2\%$; $SD = 9.3$). As shown in Table 2 and Figure 1, students without cognitive impairments interacted far more frequently with peers than with adults (48.1% vs. 1.4%). The opposite was true for students with cognitive impairments (14.4% vs. 7.0%).

The occurrence of interaction varied considerably for some students each day. For example, Stewart interacted with his peers during 90.0%, 41.8%, 61.4%, 59.6%, and 28.8% of intervals. Likewise, it varied substantially across students. For example, Vince almost never interacted with peers (i.e., 0.4% of intervals), while Christina interacted with peers regularly (i.e., 67.5% of intervals).

What Is the Quality of Students' Interactions With Peers During Lunch?

Ratings of interaction quality varied. However, clear differences were evident between students with and without cognitive impairments. Among students without cognitive impairments, interaction quality was usually high. Students tended to converse with multiple communication partners ($M = 4$) each lunch period. Their conversations were rated as fairly reciprocal, the affect of students and their peers was generally positive, and the range of conversational topics tended to be age-appropriate and typical of middle

Table 2. Proximity, Social Interactions, and Social Engagement by Student.

	Percentage of intervals									
	Proximity				Social interactions		Social engagement			
Students	Peers without disabilities	Peers with disabilities	Paraeducator	Educator	With any peer(s)	With any adult(s)	Actively engaged	Un-engaged	No one to engage with	Gone
Matt	91.2	21.5	0.4	0.8	19.9	3.2	45.0	27.9	23.9	1.2
Nicole	0.0	99.7	53.7	0.7	6.7	17.0	20.3	58.0	20.0	1.3
Vince	0.4	4.6	28.3	4.2	0.4	10.6	10.2	29.7	59.7	0.4
Chris	0.0	95.7	95.3	4.0	1.0	27.0	17.7	65.3	16.0	1.0
Erin	15.9	0.0	0.0	1.6	2.0	1.6	2.0	31.5	42.9	0.4
Stewart	100.0	0.0	0.0	0.0	56.5	1.4	60.8	26.1	12.7	0.4
Mike	79.1	0.0	0.0	0.0	57.3	0.0	67.0	14.1	18.0	1.0
Alberto	85.5	0.0	0.0	2.0	57.4	3.1	68.8	10.5	5.9	14.8
Christina	94.5	0.0	0.0	0.0	67.5	1.0	88.0	4.5	7.0	0.5
Students with cognitive impairments	22.9	55.4	44.4	2.4	7.0	14.4	23.3	45.2	29.9	1.0
Students without cognitive impairments	75.0	0.0	0.0	0.7	48.1	1.4	57.3	17.4	17.3	3.4
All students	51.9	24.6	19.7	1.5	29.8	7.2	42.2	29.7	22.9	2.3

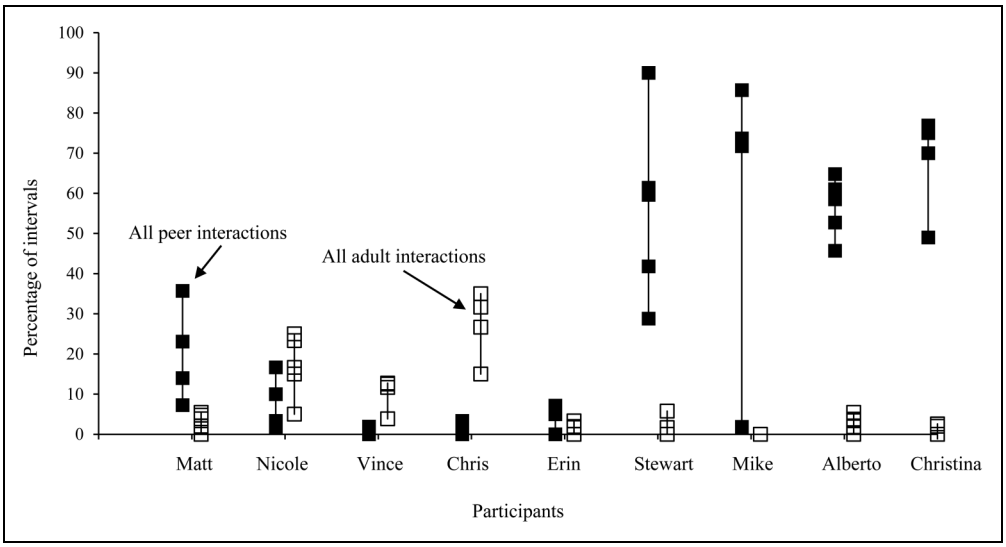

Figure 1. The Percentage of Intervals Each Participant Interacted with Peers (black Squares) or Adults (white Squares) During Each Observation.

and high school students (e.g., food, academic school events, games).

For students with cognitive impairments, their interactions were so infrequent that indicators of quality could rarely be coded. For four of the students, interactions tended not to occur unless they were precipitated by a question or comment from an adult. If interactions took place with a peer, it usually involved a peer asking the student a question (e.g., "Can I have your milk?") rather than the start of a conversation. For Matt, whose peer interactions were somewhat regular (19.9% of intervals), the overall quality was rated as low across all five observations. Despite his efforts to engage socially with nearby peers, they largely ignored his initiations and displayed negative affect toward him.

How Socially Engaged Are Students With Visual Impairments During Lunch?

Students were actively engaged in social interactions for less than half of the observation intervals ($M = 42.2\%$; $SD = 30.6$). The remainder of the time they were unengaged ($M = 29.7\%$; $SD = 20.4$), had no one to talk with ($M = 22.9\%$; $SD = 17.6$), or were gone from the cafeteria ($M = 2.3\%$; $SD = 4.7$). Amidst the wide variability across students, differentiation was evident among students with and without cognitive impairments (see Table 2).

Discussion

Increasing social connections between students with visual impairments and their schoolmates is especially important throughout secondary school. The middle and high school cafeteria comprises an unstructured setting during which interaction opportunities usually abound. We examined the extent to which students with visual impairments are engaged socially during this aspect of a typical school day, as well as characterized the nature of their interactions with peers and adults. This unique observational study extends the literature in several important ways.

We found that some students with visual impairments were very socially involved at lunch. Although interaction patterns varied day to day, four students (i.e., Stewart, Mike, Alberto, and Christina) interacted with peers for more than half of their lunch periods on

average. Moreover, the quality of their interactions was high. Anecdotally, we noticed that their interactions seemed typical of the interactions of many of their schoolmates in the same cafeteria. This finding is important considering prior research indicating that some students with visual impairments have trouble establishing relationships with sighted peers (Sacks & Wolffe, 1998), experience smaller social networks (Kef, 2002), or feel lonely or isolated (Hadidi & Al Khateeb, 2013), especially when eating (Jessup et al., 2017). Additional research attention should focus on students who enjoy strong social connections to identify the skills, personal qualities, supports, and conditions that contribute to these positive social outcomes.

In contrast, some of the students we observed were socially isolated during lunch. In particular, four students (i.e., Nicole, Vince, Chris, and Erin) conversed with peers for less than 10% of their lunch periods on average. Indeed, three of these students interacted with peers for less than 2% of observational intervals. Despite being in the midst of hundreds of fellow schoolmates, these students rarely, if ever, spoke to another student during lunch. For a fifth student (Matt), his interactions were fairly frequent, but the quality was low. Although the scope of our pilot study limits the conclusions we can definitely draw about why their interactions were so rare or poor, several possibilities warrant further exploration.

First, the presence of a cognitive impairment seemed to be associated with more limited peer interactions. All four of the students who had a co-occurring intellectual disability rarely interacted with their peers. This finding aligns with previous observational studies focused on students with intellectual disabilities who did not have visual impairments (e.g., Carter et al., 2005; Cutts & Sigafoos, 2001). For example, in an observational study of high school students at lunch, Hughes et al. (1999) found that participating students with an intellectual disability interacted with peers without disabilities for less than 1% of the observed time. For students with intellectual disability, simply being present in the same setting as their peers without disabilities does not guarantee that peer relationships will form (Carter, 2018). Additional support and facilitation may be needed to promote these interactions in more widespread ways.

Second, where students sit within the cafeteria may also make a difference to their social interactions. Three students (i.e., Nicole, Vince, and Chris) were required to sit at the same tables with other students from their special education classroom during lunch. Thus, the only peers they had the opportunity to interact with were students with intellectual disability and autism from the same self-contained classrooms. Although these three students communicated using speech or a combination of single-word utterances and pictures, many of their classmates were nonverbal or lacked access to their communication devices during lunch. Not having the same communication mode as their interaction partner and the lack of communication devices substantially constrained the opportunities these students and peers had for reciprocal conversations unless an adult provided support. Finally, because Vince engaged in challenging behaviors, the teachers were reluctant to have any peers sit near him. This protective posture cut off opportunities for socialization.

Third, the constant presence of adults may also hinder interactions between students with and without disabilities. Several observational studies have documented the ways in which the close proximity of special educators and paraeducators can inadvertently affect interactions among students in the classroom (e.g., Carter et al., 2008; Chung et al., 2012). The same situation may occur in highly social contexts like the school cafeteria. Although there are circumstances in which adult support can help facilitate peer interactions, students with visual impairments should have the freedom to eat lunch with others in the absence of a constant adult presence. Indeed, lunch is one of the few times throughout the school day when adolescents

experience a large degree of independence from school staff members. When paraeducators or special educators function in ways that are perceived to be either mothering or monitoring, peers may be reluctant to sit with students who have disabilities (or invite these students to their table). Establishing peer networks is one promising alternative to the extensive use of adult support during lunch (Carter, 2018; Hochman et al., 2015). Adults convene a group of interested peers, introduce a shared activity that students can do together, and then fade back their direct support as students gain more comfort and confidence eating together on their own.

Limitations and Future Research

Several limitations to this pilot study should be considered. First, we did not collect data on a comparison sample of peers. Therefore, we cannot accurately address the degree to which the interactions we observed were comparable to others who were present in the same lunchroom. Future studies should also collect social interaction data for a random sample of peers without disabilities. Establishing a "normative range" of interaction could help identify which students with visual impairments may need additional support or intervention in the cafeteria. Second, we only collected data on the vision status of each student from their medical eye reports, since we did not have access to functional vision evaluations. Although we observed each participating student's ability to visually track and recognize peers and staff in their environment, without access to their functional vision evaluations, we cannot draw conclusions about the effect of functional vision on the variables of interest. It may be that students with less severe visual impairment had more awareness of the presence of peers and therefore moved closer to preferred peers for opportunities for social interaction and engagement. Future studies should collect and report data about both visual acuity, as well as functional vision, to more fully understand how a student's functional vision may affect interaction outcomes. Third, students with visual impairments are a very heterogeneous population. Although the students in our study varied with regard to their disability characteristics and vision status, they are not representative of all students who have visual impairments in the United States. Future observational studies need to seek out larger samples of students to corroborate our findings and to explore more fully those factors that may contribute to variations in social outcomes. Additionally, future studies should work to include students who have very low vision or who are totally blind. Fourth, observing in a loud and busy cafeteria can produce many challenges. Given the high noise levels, along with students who spoke at low volumes, it was not always possible to hear the ongoing conversations between students and peers. Moreover, although we took care to observe unobtrusively, we cannot be certain that our presence in the lunchroom did not affect the responses of peers toward the student being observed and vice versa. Future studies should consider using methods of capturing the nature of student interactions without the need for a physical presence from an observer (e.g., videotaping, audio recording). Fifth, all of our observations were conducted in lunchrooms within a single state in the United States. The structure of lunchtime and the physical layout of cafeterias and courtyards can vary across school levels (e.g., middle school, high school) and across countries. Future replications of this study should be conducted across contexts to determine how contextual features of the setting impact the social experiences of students.

Implications for Practice

First, our findings offer an important reminder that lunch should not be overlooked as a context for promoting peer interactions. Learning social skills is a mandatory part of the expanded core curriculum for students with visual impairments. The cafeteria is a natural and opportunity-rich setting in which students can learn or practice skills, such as initiating conversations, using social

amenities, and engaging in age-appropriate social behaviors. Furthermore, knowing how to socialize with peers over a shared meal is a lifelong skill. Second, educators should advocate for freedom-of-choice seating for all students, including those with cognitive impairments. Although some students may still choose to eat with their classmates, adults should not unnecessarily constrain the number of peers who have the opportunity to meet and get to know their schoolmates with visual impairments. Third, students who struggle socially may benefit from evidence-based practices like peer networks (Carter, 2018). The intentionality, reciprocity, and support that characterize these interventions may be all a student needs to forge new connections with peers. Fourth, in situations where higher levels of adult support are warranted (e.g., students with challenging behaviors or complex communication challenges), paraeducators may benefit from receiving additional training on how best to support social and communication outcomes during these unstructured periods of the school day.

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