



Honors College Theses


---

11-20-2019

## Physical Therapists' Perspectives of School Functioning for Children with Cerebral Palsy (CP)

Vevian Grace A. Lee  
*Georgia Southern University*

Follow this and additional works at: <https://digitalcommons.georgiasouthern.edu/honors-theses>

 Part of the [Educational Assessment, Evaluation, and Research Commons](#), [Gifted Education Commons](#), [Kinesiotherapy Commons](#), [Other Rehabilitation and Therapy Commons](#), [Physical Therapy Commons](#), [Physiotherapy Commons](#), and the [Special Education and Teaching Commons](#)

---

### Recommended Citation

Lee, Vevian Grace A., "Physical Therapists' Perspectives of School Functioning for Children with Cerebral Palsy (CP)" (2019). *Honors College Theses*. 449.  
<https://digitalcommons.georgiasouthern.edu/honors-theses/449>

This thesis (open access) is brought to you for free and open access by Georgia Southern Commons. It has been accepted for inclusion in Honors College Theses by an authorized administrator of Georgia Southern Commons. For more information, please contact [digitalcommons@georgiasouthern.edu](mailto:digitalcommons@georgiasouthern.edu).

**Physical Therapists' Perspectives of School Functioning  
for Children with Cerebral Palsy (CP)**

An Honors Thesis submitted in partial fulfillment of the requirements for Honors in  
Department of Health Sciences and Kinesiology

By  
Vevian Grace Alexandria Lee

Under the mentorship of Dr. Gavin Colquitt

**ABSTRACT**

The purpose of this study was to use a qualitative participatory action research method – Photovoice – to identify perceived barriers and facilitators to school functioning among school-based physical therapists of children with cerebral palsy (CP). Seven physical therapists made up the participants in this study. The researchers followed the nine-step methodology recommended for Photovoice. During the training session, participants were educated on the background of Photovoice and the purpose of the study. They were given 14 days to take photographs after which researchers used a focus group interview structured by the SHOWeD method. The International Classification of Functioning, Disability and Health (ICF) was used to analyze the transcript and identify common themes. Perceived barriers included lack of inclusiveness, restricted independence, and limited accessibility of equipment and resources. Facilitators included support and relationships and education and training services. Photovoice serves as a powerful tool to initiate change to improve the ability of children with CP to function in school.

*Keywords:* cerebral palsy, photovoice, physical therapist, school function, barriers, facilitators

Thesis Mentor: \_\_\_\_\_

Dr. Gavin Colquitt

Honors Director: \_\_\_\_\_

Dr. Steven Engel

November 2019  
Department of Health Sciences and Kinesiology  
University Honors Program  
**Georgia Southern University**

Physical Therapists' Perspectives of School Functioning  
for Children with Cerebral Palsy (CP)

Vevian Grace Lee

Dr. Gavin Colquitt EdD, CAPE, CSCS

Dr. Ashley Walker Ph.D., CHES & Dr. Heather Lorden PT, DPT

Georgia Southern University

Author Note

Vevian Grace Lee, Exercise Science student in Department of Health Sciences & Kinesiology, Georgia Southern University

Dr. Gavin Colquitt EdD, CAPE, CSCS, Associate Professor Department of Health Sciences & Kinesiology, Georgia Southern University

Dr. Ashley Walker Ph.D., CHES, Dean Jack N. Averitt College of Graduate Studies and Associate Professor, Health Policy & Community Health, Jiann-Ping Hsu College of Public Health, Georgia Southern University

Dr. Heather Lorden PT, DPT, Assistant Professor Department of Rehabilitation Sciences, Georgia Southern University Armstrong Campus

Correspondence concerning this article should be addressed to Vevian Grace Lee, Department of Health Sciences & Kinesiology, Georgia Southern University, Statesboro, GA 30460

Contact: vl00736@georgiasouthern.edu

### Abstract

The purpose of this study was to use a qualitative participatory action research method – Photovoice – to identify perceived barriers and facilitators to school functioning among school-based physical therapists of children with cerebral palsy (CP). Seven physical therapists made up the participants in this study. The researchers followed the nine-step methodology recommended for Photovoice. During the training session, participants were educated on the background of Photovoice and the purpose of the study. They were given 14 days to take photographs after which researchers used a focus group interview structured by the SHOWeD method. The International Classification of Functioning, Disability and Health (ICF) was used to analyze the transcript and identify common themes. Perceived barriers included lack of inclusiveness, restricted independence, and limited accessibility of equipment and resources. Facilitators included support and relationships and education and training services. Photovoice serves as a powerful tool to initiate change to improve the ability of children with CP to function in school.

*Keywords:* cerebral palsy, photovoice, physical therapist, school function, barriers, facilitators

Physical Therapists' Perspectives of School Functioning  
for Children with Cerebral Palsy (CP)

Cerebral palsy (CP), the most common movement disability in children (O'neil et al., 2016), is a neuromuscular disorder following damage to the cerebrospinal segment of the brain during or after pregnancy (Shariat, Shariat, Abedi, & Bahri, 2014). It is estimated that approximately 2 in 1,000 births are diagnosed with CP, and those born before 28 weeks' gestation have the highest prevalence of CP diagnosis (O'Shea, 2008). Previously, CP was thought to be a disorder with motor impairments that do not change; however, it has developed into an umbrella term that covers many non-progressive, but changing motor deficiencies (Bhutia et al., 2015). Although CP is caused by a non-progressive lesion, it has been shown that some children have decreased motor ability as they get older (Van Wely, Balemans, Becher, & Dallmeijer, 2014). Various symptoms associated with CP include sensory, cognitive, communication and behavior disabilities, and neuromuscular and musculoskeletal abnormalities (Shariat et al., 2014) including abnormal muscle tone and strength and persistent reflexes (Costigan & Light, 2011).

Currently, individuals with CP is categorized into groups based on function which coincide with the clinical presentation and degree of activity limitation (Rosenbaum et al., 2006). This classification of CP is also important as it can inform healthcare professionals of a patient's current and future needs, provides the ability to discriminate between cases of CP, and allows observation of the same individual over time (Rosenbaum et al., 2006). Functional classification of CP is age-dependent because abilities will vary over time in each individual (Rosenbaum et al., 2006). Children with CP are classified using the Gross Motor Function Classification System (Rosenbaum, et

al., 2008), which is based both on self-initiated movement and typical performance, specifically in sitting, transfers, and mobility. There are five levels of classification and their details are as follows: Level I – walk without limitations; Level II – walk with limitations (difficulty with long distances and balance); Level III – walk using a hand-held mobility device; Level IV – self-mobility with limitations; Level V – transported in a manual wheelchair. However, it should be noted that there are some differences in classification that are dependent on the child's age. For CP specifically, these children are at high risk for multiple physical limitations including: muscle weakness, decreased cardiovascular and muscular endurance, impaired circulation, systemic issues, lower bone density, and increased fractures (Russell, Rosenbaum, Wright, & Avery, 2011).

Children with CP have a multitude of barriers that they must overcome to have a better quality of life including cognitive deficits and functional disabilities (DeFazio & Porter, 2016). It has been reported that over 50% of children with CP experience moderate to severe pain over several areas of the body every day, and this self-reported pain is believed to inhibit emotional, social, and physical categories of health-related quality of life (HRQOL) (Badia et al., 2014). Children with CP also face severe restrictions in levels of fitness and physical activity (Van Wely et al., 2014). Multiple factors influence the ability of children with CP to participate including: lack of energy, fear of injury, lack of bodily control, and presence of cognitive impairment (DeFazio & Porter, 2016). Participation is vital to the developing child as it provides an opportunity to build relationships, social skills, and is also a conducive environment for physical activity.

Participation in physical activity (PA) of children with CP is 30% less than typically developing children (DeFazio & Porter, 2016). Because children with CP have compromised neuromuscular and musculoskeletal systems, they are more prone to sedentary behaviors and less physically active than their peers (O'neil et al., 2016). Fatigue, pain, and mobility limitations are some of the conditions of CP that cause children to not participate in PA as much as they should (Gorter, Galuppi, Gulko, Wright, & Godkin, 2017). Environmental factors like transportation, government policy, and services in the community play a significant mediating factor in the participation of children with disabilities (Furtado, Sampaio, Kirkwood, Vaz, & Mancini, 2015). Because it is so difficult for children with CP to participate in PA, home- and community-based interventions are needed to promote it; however, parents of children with CP often experience challenges with finding information about these programs in their community (Gorter et al., 2017).

A key person to assist children with CP and their families in improving function and participation in daily activities is the physical therapist (PT). Previously, PT's have identified abnormal muscle tone, the presence of the movement disorder, decreased balance, decreased range of motion, lower muscle force, decline in endurance, less motivation, and lack of family support as impairments to improving motor ability in children with CP (Bartlett & Palisano, 2002). Almost all children with CP undergo long-term conventional physical therapy, and one way this therapy is often delivered is through schools (Mccoy, Effgen, Chiarello, Jeffries, & Villasante-Tezanos, 2018). According to Every Student Succeeds Act, physical therapy must be provided to students with CP if the condition is impacting the education of the child (ESSA, 2015). If a child

with CP has an impairment that is negatively impacting educational attainment, the child's Individualized Education Plan (IEP) must include the provision of these services. Each year a child's annual progress is evaluated, and service provision is agreed upon by the child's parent or guardian, teachers, and service providers. For many young people with CP, the provision of physical therapy services in the school setting is vital to their overall success in school.

School-based physical therapists (SBPTs) often have unique insight into the lives of children with CP as they are able to observe patients in an environment where they spend a great deal of time. A school-based setting could make it easier to practice context-focused behavior with patients. The synthesis of improving the health and function of the child with CP and knowing the course of their education will maximize the activity and participation of the student (Mccoy et al., 2018). Previous examinations have shown that SBPTs identified the centrality of the student as the driving factor towards attaining success in the patient's care (Holt, Kuperstein, & Effgen, 2015). The role of the parents in rehabilitation is vital to understanding the needs of the patient, a key aspect of the collaborative role of SBPT's in the overall education of the child. The idea of family-centered services has been around for many years, been widely accepted, and has led to care satisfaction and reduced parental stress (Alsem et al., 2016). School-based therapy services are an effective way to promote participation among children with CP in the school environment.

In order to be effective in school, PTs must understand the atmosphere and the barriers to participation that exist (Flights, 2016). Although SBPT's play a significant role in improving the functional abilities of children with CP and therefore facilitating



their participation in school, it may be difficult for some SBPT's to identify and understand common barriers to participation in schools. Typically, the governance of SBPT practices come from multiple areas of the educational hierarchy including district leaders, administrators, parents, teachers, and therapists (Holt et al., 2015). Therefore, it is important that all stakeholders in the provision of therapy services for children with CP understand how the school environment can mediate participation in daily activities. The International Classification of Functioning, Disability and Health (ICF) can be used to identify the barriers to participation in the environment. These barriers are classified using categories that are narrowed down into a specific code. The codes can then be used to identify the prevalence of barriers in each category.

The ICF is a framework that can be used as a tool for coordinating school health programs for students with disabilities and assessing their health needs. It is a classification with more than 1450 hierarchically organized categories which are divided into two parts: 1) body structure/function, participation, and activities; and 2) contextual factors including environmental and personal factors (Cieza, Fayed, Bickenbach, & Prodinger, 2016). The ICF focuses on how the individual's health condition affects activities of daily living and participation and how activities and participation are further mediated by the environment. The categories provide descriptive vocabulary for the overall context for how a person's health is affected, which described the lived experience of the individual's health (Cieza et al., 2016).

This study will employ a participatory action research method called Photovoice (Wang & Burris, 1997). Photovoice is a methodology ground in Empowerment Theory (Freire, 1970). Empowerment Theory provides a framework to barriers and facilitators to

participation in school from SBPT's perspective. The theory suggests that participation from those who share lived experiences promotes critical analysis and dialogue about social issues; the goal of which is to devise action-based solutions to initiate change. There are three stages that serve as the foundation of the theory: Listening, Dialoguing, and Action. In the Listening stage, stakeholders share their experiences with others so commonalities can be identified. In the second stage, Dialoguing, the stakeholders reflect on the issues discussed in the first stage. The reflection process uses a physical item (e.g. a photograph) to represent the stakeholders' every day realities (Wallerstein & Bernstein, 1988). In the final stage, Action, stakeholders determine action-based solutions that might remedy issues identified and reflected upon in the first two stages (Wallerstein & Bernstein, 1988).

Therefore, the purpose of this study will be to examine barriers and facilitators to school function from the perspective of SBPT's using Photovoice.

### **Methods and Materials**

This study utilized Photovoice in order to collect data on the lived experience of children with CP through the perceptions of their school-based physical therapists regarding barriers and facilitators to school function. The research questions were:

1. What are the perceived facilitators to school functioning of children with CP as identified by school-based physical therapists?
2. What are the perceived limitations to school functioning of children with CP as identified by school-based physical therapists?

## **Participants**

The participants for this study were physical therapists that work part or full time in schools in Southeast Georgia. Physical therapists have been chosen as participants because, school-based therapists specifically, interact with children with CP closely and have experienced their difficulties with them. They also work with children with CP to overcome obstacles and improve their quality of life. Photovoice follows a nine-step methodology (Table 1), and following step 1, 7 participants were recruited in order to provide efficiency in collecting data and adequate discussion (Wang & Burris, 1997).

## **Photovoice**

Photovoice is a method developed by Wang and Burris (1997) that allows participants to illustrate their lived experiences with photographs. It is a process that allows stakeholders to identify issues in their community of practice, and imitate positive change (Wang & Burris, 1997)<sup>7</sup>. Three main goals of Photovoice are 1) to record and present daily realities using photographs, 2) to promote effective dialogue and information about the strengths and weaknesses of a community or program, and 3) to impact policymakers (Wang, 2006).

Photovoice aims to engage the target audience through the generation of new knowledge and shared experiences. Previously, it has allowed researchers and clinicians to see the world from the perspective of their patients (Wang & Burris, 1997). Photovoice also enables people to see what the community need is instead of what they believe is needed (Wang & Burris, 1997). The community is able to describe their needs in a more literal and easier way (Wang & Burris, 1997). This method allows people to become their own advocates and work first-hand to help improve their own needs (Wang &

Burris, 1997). The ultimate goal of Photovoice is to construct an action plan to initiate change for a group of people (Walker, Langdon, Colquitt, & McCollum, 2017).

Following Photovoice methodology, the participants attended 1-hour training and brainstorming sessions which covered steps 2-6. Four separate training/brainstorming sessions were set in order to fit into the participants' schedules. During the training sessions, the participants were presented with the background of Photovoice and the purpose of the study. Participants then signed the informed consent and photo release. Participants were instructed to use their cellphones to take the photographs, and were informed to not take any photographs of the students. Lastly, participants spent the rest of the time brainstorming ideas for their photographs.

Table 1. The recommended nine-step Photovoice methodology adapted from Wang and Burris (1997).

---

Recommended step

---

1. Recruit photovoice participants. A sample should include six to ten people. This provides efficiency in collecting data and adequate discussion.
2. Select a target audience of decision makers. The participants select this group based on the target audience's ability to make decisions that will improve the problems identified through Photovoice activities.
3. Introduce photovoice to the participants. The researcher must conduct a workshop or training session to introduce Photovoice. This session is also used to review ethical considerations with the participants.
4. Obtain informed consent. The researcher must obtain informed consent from each participant.
5. Brainstorm with participants. A brainstorming activity is highly recommended to familiarize the participants with initial themes for taking photographs
6. Distribute cameras. Each participant will need a camera to complete the Photovoice activity.
7. Provide time for participants to take pictures. Participants need at least seven days to take photographs. This provides each participant enough time to take a

sufficient quantity of pictures related to the research questions.

8. Meet to discuss the photographs. Participants are asked to return with their cameras and discuss photographs taken. Focus groups are recommended. The facilitator will then work with participants to select and contextualize their photographs using the SHOWeD Method. Common themes are identified and discussed with participants.

9. Plan a format to share photographs and stories. The facilitator and participants will choose the best medium to present the photographs.

---

#### CP application

---

The sample was 7 participants. School-based physical therapists in surrounding counties were recruited to participate. For each group this aligned with the recommended sample.

The participants identified key community stakeholders during the training session and focus group to target. The participants identified school administration, bus transportation team, risk management, special education directors, program managers, and heads of facilities.

The researchers conducted 4 separate training sessions for the therapists in each school district.

Informed consent was completed during the training sessions.

This was completed at each of the training sessions. Each training and brainstorming session lasted approximately 1 hour.

The participants were instructed to use their cellphone cameras to record the photographs during the training session.

In this study, the participants were allowed 14 days to take photographs.

The school-based physical therapists all participated in one focus group together.

A community forum will be planned and conducted to present the photographs and recommended actions to the audience selected in Step 2.

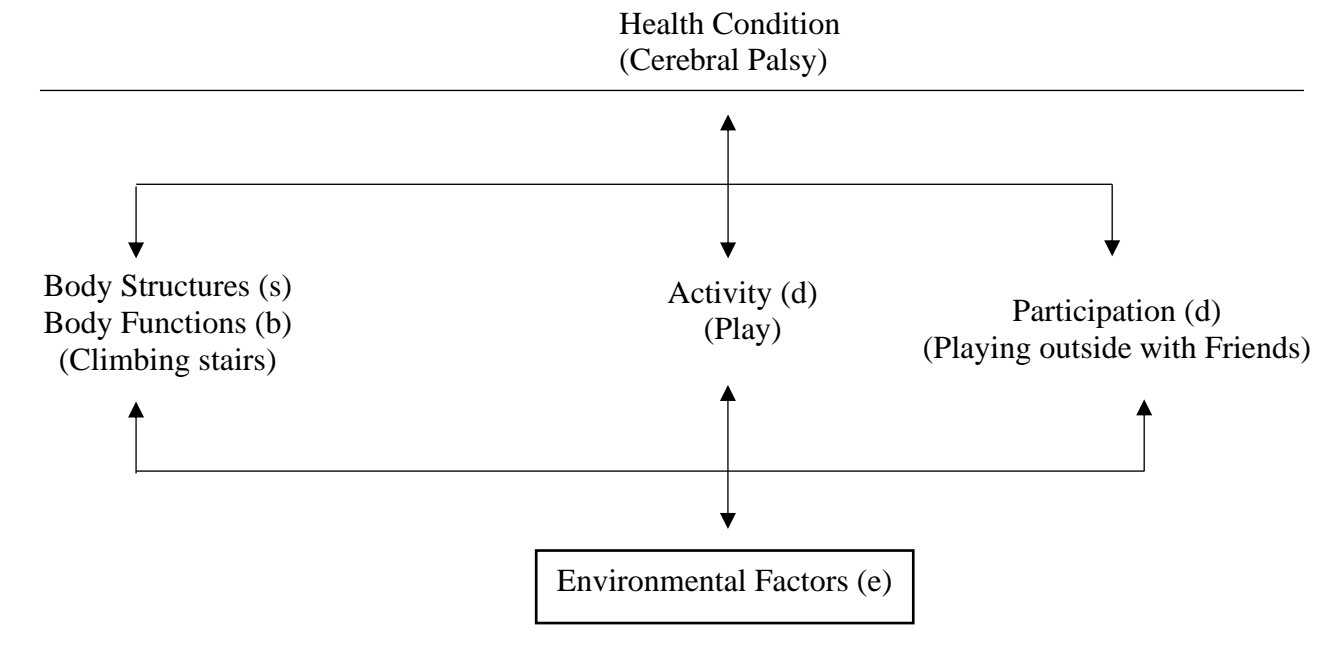
---

#### **Instrumentation and ICF Linking**

Rules have been developed to link health and clinical measures to the ICF, which are 1) Identify all meaningful concepts within each specific health status measure before linking them to the ICF categories; 2) The response options of an item are linked to ICF

categories if there are meaningful concepts; 3) The timing of the issues do not interfere with the ICF category; 4) A meaningful concept is linked to its example, and used as an example for the specific ICF category (Cieza et al., 2005). There are four umbrella categories of the ICF codes that are then broken down into more classifications until it is as specific as possible. Those categories are: body structures, body functions, activities/participation, and environmental factors which can be seen in Figure 1 (Schiariti et al., 2014). The significant statements made by the participants during the focus group were identified and categorized using the above classifications. They were then coded by assigning a letter 'b', 's', 'd', or 'e' which refer to the categories listed previously. Following the letter, a numerical code was given which may have included a chapter number (one digit), then followed by a second-, third-, and fourth-level code depending on how specific the statement needed to be coded (Schiariti et al., 2014).

Figure 1. Example of the International Classification of Functioning, Disability, and Health Categories and Interactions



### **Data Collection**

Following steps 7 and 8, participants were given 14 days to take photographs. Participants were instructed to send the photographs to the researchers via email at the end of the allotted time. They were then asked to come in for a focus group, where the photographs were discussed. The participants were able contextualize their photographs using the SHOWeD Method. The SHOWeD Method was used in order to help participants contextualize the meanings of their photographs. The questions were (a) What do you see here? (b) What is really happening here? (c) How does this relate to our lives? (d) Why does this problem or strength exist? and (e) What can we do about it? (Wang & Burris, 1997).

The focus group was audio-recorded and the recordings were transcribed verbatim. The researchers analyzed the audio transcript using ICF linking rules to identify and validate the significant themes and patterns from the dialogue with the physical therapists. The photographs will be used to as the visual source of themes along with the audio interpretations. Following Step 9, the analysis of the photographs and emerging themes will be presented during a community forum, which will be attended by those who could benefit from the information found in the study. The researchers and forum attendants will initiate an action plan to improve participation among children with CP in schools. The community forum will focus on gathering information specific to actions needed to improve the participation of children with CP in schools in Southeast Georgia.

## Data Analysis

The SHOWeD Method was used in order to help participants contextualize the meanings of their photographs. The questions are (a) What do you see here? (b) What is really happening here? (c) How does this relate to our lives? (d) Why does this problem or strength exist? and (e) What can we do about it? (Wang & Burris, 1997). These questions helped the participants produce the statements needed for the ICF which was used to analyze the audio recordings of the participants when they were discussing the photographs. A transcript of the focus group was created from the audio recording. This transcript was analyzed using the ICF linking rules. Keywords were established when reading the transcript that indicated certain outcome measures. Comments from the transcript that described barriers and facilitators pictured were coded using the ICF categories. An ICF browser website was used as a guide to code each statement. The ICF categories have been defined using ICF Core Sets, which serve as standards for reporting functionality and health, and define “what to measure” for functioning (Cieza et al., 2005). Once the classifications were found, the amount of statements that are classified as each category were taken into account. The prevalence of statements in each category were observed, which will help initiate the ideas for an action plan during the community forum to improve participation.

## Results

### Focus Group

With the ICF being used as a guide, physical therapists identified 400 unique codes. Of those, approximately 77.75% were categorized as environmental factors ( $n=311$ ), 16.8% categorized as activities and participation ( $n=67$ ), 5.2% categorized as body functions ( $n=21$ ), and 0.25% categorized as body structures ( $n=1$ ). Environmental



factors was the most common classification used throughout the transcript. Category e1, *products and technology* had the highest number of codes ( $n=193$ ), with the second highest being e5, *services, systems and policies* ( $n=94$ ). The second most coded classification was activities and participation with code d4, *mobility* ( $n=45$ ), accounting for the most codes in that classification. Table 2 provides frequency information for each ICF category/code. Based on the discussions during the focus group, four overarching themes were identified: independence, inclusiveness, accessibility, and functionality. These themes and the codes that each represent can be seen in Table 3.

Table 3. Overarching themes and the codes they represent.

Theme	Code
Independence	e115, e585, e1401, e1201, e1501, e1503, e340
Inclusiveness	e1401, e5550
Accessibility	e1500, e1508, e515, e1502, e1501, e1200, e160
Functionality	e130, e1401, e1151, e1201, e1150, e1502, e1300, e1150

### Characteristics of School Functioning within the ICF

#### Body Functions

Body functions was coded a total of 21 times within the transcript.

*Neuromusculoskeletal and movement related functions* (b7) was most commonly used to describe the functions that were affected by barriers and facilitators.

#### *b755 Involuntary movement reaction functions*

There's our little t-stools in the lunchroom they offer no postural support whatsoever. And um, it's, you know, it can be a struggle for the child with

decreased trunk control, increased tone, very low tone. There's it just doesn't offer any, you know, good seating, um, possibilities on that T stool.

The therapists frequently identified how seating often did not offer the necessary support for students while participating in school activities. *Sensory functions and pain* (b2) were also addressed when describing how students ambulated throughout the school.

Therapists suggested that multiple parties with expertise in universal design and similar inclusive practices be consulted in the planning phase of new school facilities.

*b2351 Vestibular function of balance*

To me a barrier is always where the lunchroom line ends and where they're either coming around to the lunchroom lady to pay for their meal. All that dead space when they're trying to carry a milk, carry things that can spill, try to balance all that, keep themselves balanced, no real support, um, to me it's a barrier sometimes for our kids that have those issues.

**Activities and Participation**

*Mobility (d4)* was the most frequent code regarding activities and participation.

The participant discussed how a child's walker gave her the ability to safely climb up and down the stairs in order to get to the playground.

*d4551 Climbing*

So this is a child doing the stairs if she wants to access the playground otherwise she has to go all the way to the other side of the school...so this is a facilitator to get there quickly and she can go down the stairs with one crutch in one hand and one hand on the rail.

*Self-care (d5)* was used to code the activity of going to the bathroom. The participant wanted to show how much time it takes for students to go to the bathroom using the equipment they have.

*d530 Toileting*

My point in this one was the Hoyer lift...and the time up top because it takes so long to change some of these kids who are in inclusion and they miss 30 minutes of instruction and then they get kind of dinged on it so they keep falling behind because they're going to the bathroom two and three times a day. So they miss that instruction throughout the day. And I think this is a huge barrier for our kids that are in regular ed or inclusion. And they just miss so much class.

*General tasks and demands (d2)* was also used to describe how bathroom design does not help facilitate the student's ability to go to the bathroom by themselves.

Figure 1 illustrates how difficult it would be for the student to maneuver within the bathroom stall by themselves.

*d2102 Undertaking a single task independently*

If you have to help in any form or fashion or you're trying to, um, get somebody in... one of these bathrooms, the door is difficult. A lot of times we have to go take them when there is nobody else in there... even at the high school, if we have any type of transfer issues and things like that, we always have to find an adult bathroom... So I don't think our bathrooms are set up real well for facilitation of independence and privacy for our children with CP and special needs.

*Interpersonal relationships (d7) and community, social, and civic life (d9)* were both coded within this quote while the participant pointed out that there are no leagues in their district that helps students participate in sports and interact with their peers.

*d7504 Informal relationships with peers & d9201 Sports*

So this one...it's kind of to show that we don't have a competitive or noncompetitive for, um, you know, CP kids to get involved in team sports. I don't know. I'm not sure, where is the picture that showed? There you go. So that would be the contrast to that, like playing with their peers. That's what I was trying to paint with those two.

*Domestic life (d6)* was also used to code how therapists are there to help maintain students' equipment during school to ensure that they can effectively go about their day. Figure 2 illustrates how therapists act as handymen.

*d6504 Maintaining assistive devices*

Okay this is one I have as a facilitator we have. I tried to depict that the wheelchair vendors and ourselves as therapists are often on-site to fix things that may break during school, in transport to and from school, or even at home. I was trying to show that we are there to aid them in fixing their equipment and allowing them to return to school the next day or even go home.

These codes were used to describe both barriers and facilitators of school functioning. Therapists wanted to highlight all aspects of school activities and how

students are able to function in those situations whether it be using the restroom, playing with their classmates, or making sure that their devices are in working condition.



Figure 1. Bathroom stall that makes it difficult students for independent restroom use.

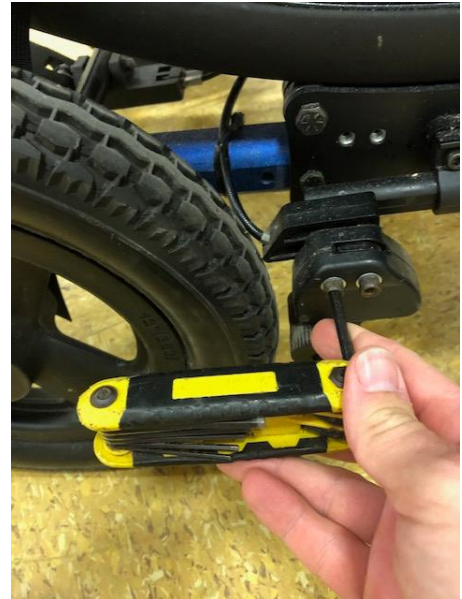


Figure 2. Therapist fixing a wheelchair.

## Environmental Factors

### Barriers to School Function

The themes mentioned earlier are represented here in the following quotes. The most common category that the therapists identified was *e1, products and technology*, as it has the biggest influence on all of the other categories described previously. A code used multiple times by the therapists was *e150 design, construction and building products and technology of buildings for public use* which was most commonly used to describe barriers. The participant wanted to show how many times, building designers do not think big picture when building a new school. This code falls under the major theme of accessibility.

*e1508 Design, construction and building products and technology of buildings for public use, other specified*

When they're building a new school, they'll say, what do you guys need in the adaptive room? We'll be like, Oh, we needed a changing table. And then they'll put in like a baby changing table. It's a problem... when [you have] an adult or a larger CP child...you can't put somebody on that to change them.

In addition to the wrong changing table, the participants also pointed out how the actual design of the building does not take into account people in wheelchairs or those who may have difficulty opening doors. This also can be classified by accessibility.

*e1500 Design, construction and building products and technology for entering and exiting buildings for public use*

I took the picture of the back door. But I really think about this sometimes when I see our parents unloading the children in the morning. We don't have any ADA accessible electronic doors in any of our schools. And, um, it is a barrier for somebody in a wheelchair or, um, you know, some of the little people really can't open the doors by themselves...To me it is a barrier that we don't offer, especially our wheelchair CP kids. Um, any type of handicap access for those front doors.

Apart from products and technology within the buildings themselves, the participants also identified transportation services as having certain characteristics that were barriers to their students. One participant identified the height of the

school bus step as a barrier for CP children who may be ambulatory, but still have difficulty climbing steps. The actual step can be seen in Figure 3.

*e1200 General products and technology for personal indoor and outdoor mobility and transportation*

I took the picture of this because that bottom step is almost always a barrier for our kids with CP. The step height is, is difficult for them. There's usually only, there's only the one rail on the left hand side. And um, it just seems that we do have issues and the, our bus drivers here technically and probably everywhere are not supposed to do any lifting or any real assistance with the steps. So just the height of each step, especially the bottom step is a challenge for our smaller, um, children for sure.



Figure 3. School bus step height that makes it difficult for children to climb up independently

Among the therapists, *e5 services, systems and policies* was the second most frequently coded environmental factor, and many of them were combined with

*e1400 general products and technology for culture, recreation and sport.* The participant wanted to show that playgrounds are not built with disabilities in mind. This prevents students from being able to easily access the playground and even play on it once they are able to get to it, this is illustrated by Figure 4.

*e515 Architecture and construction services, systems and policies*

And there's the playground picture, with the same thing everyone else has said [it is inaccessible] except that one doesn't even have a ramp. You just have to step over or do the tilt and get them over. And once you're up there, just the mulch and everything else.



Figure 4. Playground with no ramp to access and no modified playground equipment

### **Facilitators to School Function**

The same overarching themes can also be seen in the facilitators that were identified by the participants. One therapist talked about how a design component



of one of their schools does cater to the needs of the therapists and students. Figure 5 illustrates how school design can improve the functionality of the school.

*e1151 Assistive products and technology for personal use in daily living*

I was just trying to depict adaptive equipment. We do have a really cool school that is built with these little alcoves... that stores all the equipment and so I was just trying to depict one of the alcove that is a great way to build for equipment but it depicts the different positioning equipment.



Figure 5. Alcoves that help improve equipment organization and classroom space.

Category *e5, services, systems, and policies*, was a code also used to represent facilitators. The participant explained how vital a therapy room is to students' receiving the best care they can. Figure 6 illustrates how much a therapy room can improve a student's ability to receive care.

*e585 Education and training services, systems and policies*

That was another one similar to another picture of a facilitator just the therapy room that allows them to you know build strength and balancing have breaks meet their needs with equipment.

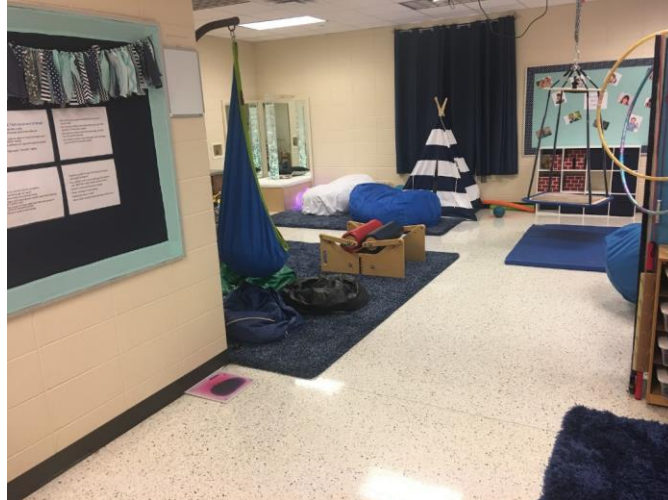


Figure 6. Therapy room that gives students a place of their own, and where therapists have the space to adequately work with students.

The third most common code derived from the transcript is *e3 support and relationships* which is, combined with *e1151 assistive products and technology for personal use in daily living*. This code was primarily used to identify facilitators. A therapist spoke about how technology can assist other people with the care of students, Figure 7 illustrates this.

*e340 Personal care providers and personal assistants*

That is a facilitator because it was a changing table but it's also electronic so it allows for good body mechanics for the caregiver and also we can lower it so students can practice sit to stand and just getting to changing table on their own.

Of the codes that were used to describe environmental factors, 42% were used for both barriers and facilitators. More information about the classification of facilitators and barriers is provided in Table 4.



Figure 7. Hydraulic changing table that assists with the care of students

Table 2. Frequency of ICF Levels by Classification

<b>ICF Classification Levels</b>	
<i>Body Structures</i>	
s1 Structures of nervous system	
s2 The eye/ear related structures	
s3 Structures involved in voice and speech	
s4 Structures of the cardiovascular immunological/respiratory system	
s5 Structures related to digestive, metabolic and endocrine	
s6 Structures related to the genitourinary and reproductive systems	
s7 Structures related to movement	1
s8 Skin and related structures	
<i>Body Functions</i>	
b1 Mental functions	1
b2 Sensory functions and pain	3
b3 Voice and speech functions	
b4 Functions of the cardiovascular/hematological/immunological/respiratory	
b5 Functions digestive, metabolic and endocrine systems	
b6 Genitourinary and reproductive	
b7 Neuromusculoskeletal and movement related functions	17
b8 Functions of skin and related structures	
<i>Activities and Participation</i>	
d1 Learning/applying knowledge	1
d2 General tasks and demands	5
d3 Communication	
d4 Mobility	45
d5 Self-care	7
d6 Domestic life	2
d7 Interpersonal relationships	3
d8 Major life areas	1
d9 Community, social and civic life	3
<i>Environmental Factors</i>	

e1 Products and technology	193
e2 Natural environment, human made changes to environment	
e3 Support and relationships	24
e4 Attitudes	
e5 Services, systems and policies	94

---

Table 4. Classification of Barriers and Facilitators

<b>Environmental factors</b>	<b>Facilitator</b>	<b>Barrier</b>
e115	X	
e130	X	
e150		X
e160		X
e340	X	
e515	X	X
e540		X
e585	X	X
e1150	X	X
e1151	X	X
e1200		X
e1201	X	X
e1300		X
e1301		X
e1400	X	X
e1401	X	X
e1500		X
e1501	X	X
e1502	X	X
e1503	X	X
e1508	X	
e1602		X
e5400		X
e5550		X
e5850	X	X
e5851		X

## Discussion

The purpose of this study was to examine barriers and facilitators to school function for children with CP from the perspectives of school-based PTs using Photovoice. The participants were instructed to focus on aspects of the environment that affect their students' abilities to participate in the everyday activities of school. The photographs were supplemental to the themes identified during the focus group. The participants identified contrasts between equipment that is accessible for students without disabilities, but not necessarily accessible for students with disabilities. They also pointed out that there were several barriers within the school environment that limit the students' ability to function. Areas of the environment were also addressed that could be improved regarding inclusiveness. The participants in this study discussed how heads of facilities tried to do things to improve the ability of students to function while at school, but the "big picture" was not quite realized. For example, therapists described how it is a good idea to have a ramp going onto the playground, but it is not necessarily helpful when the mulch or sand on the playground still makes it difficult for students to maneuver in the area. Initial steps were identified to improve the school environment for children with CP, but also identified additional barriers that could be addressed.

This study's results align with that of previous findings where school function was impeded and supported by environmental factors like inclusiveness, independence, accessibility, and functionality (Gorter et al., 2017). Even though it has been reported that a lack of home- and community-based interventions are a significant barrier to school function for children with CP (Gorter et al., 2017), this study found that the availability of assisting products and technology is the most influential barrier for children with CP as

observed by school-based PTs. As stated in previous research, health professionals are one of the biggest supporters in improving the health and function of children with CP (McCoy et al., 2018), and this study found that the support and relationships of the children is the least significant barrier to school function. The participants recognized that they and people who understand the lives of children with CP are the biggest allies in addressing the factors that influence school function.

The participants in this study emphasized many design concerns such as inaccessible bathrooms, lack of automatic doors, absence of modified playground equipment, and the use of sand/mulch for playground surfaces. Bathroom accessibility is one of the biggest concerns for children with any disability, and has been found as a barrier in many previous studies. In addition, playground surfaces are also a recurring issue because they prevent students from safely and easily maneuvering throughout a part of the school that should be the most fun for them (Walker, Colquitt, Elliott, Emter & Li, 2019). Issues with bus transportation also arose during the focus group. Many of the participants brought up that the school buses, even some special transportation buses, are not adequately accessible for their students, which has also been found in previous research (Furtado et al., 2015). A big issue was just the fact that there should be more thought put behind how schools can be modified to provide better function for their students with disabilities (i.e. changing tables that can actually hold larger students and walking paths that do not end at arbitrary places). Another aspect of the school environment that participants identified as causing a lack of inclusiveness in the lives of their students was that there are minimal resources for students to get involved in team sports. This issue has also been brought up in previous research (DeFazio & Porter,



2016). Classroom placement was also an issue that the participants felt was a barrier to school function. They pointed out that the distance the student has to walk to get to essential areas of the school (i.e. bathroom, nurse, exit) is sometimes a strenuous activity for some students if those areas are not relatively near their classroom. Previous research has also stated that mobility severity is a factor in school participation, which plays into the issue of classroom placement (Furtado et al., 2015). In response to these barriers, the participants highlighted educational needs for school employees like bus drivers, heads of facilities, and school administration in order to address these concerns.

The participants in this study also identified some school designs that help facilitate school function such as alcoves in the walls for equipment storage, therapy rooms, and playground ramps. In regards to bathroom accessibility, some participants did point out that there are some cases where an adequate changing table is available, which greatly improves that aspect of the environment in that situation. This facilitator has also been found in previous research (Walker et al., 2019). Aligning with previous research, adaptive equipment, like walkers and crutches, were also described as being a big facilitator for their students (Schariti et al., 2014). In addition to adaptive equipment that assists with walking, the participants also highlighted equipment that directly helps with classroom function such as foot boxes and slant boards. Support and relationships was also identified as a facilitator in this study concerning the therapists themselves and caregivers, which can also be found in previous research (Schariti et al., 2014). They wanted to point out that physical therapists are the biggest advocates in the school setting for children with cerebral palsy in addition to their parents, and they see firsthand how the school environment affects their ability to learn and function.

### **Suggestions for Future Research**

While this study identified multiple factors that influence school function, additional research can improve these findings. It may be helpful for future research to include more participants from multiple areas that could have ranging perspectives. Our study had seven participants from only four surrounding counties, and there was some overlap. In addition, this study can be done in a different location in order to determine if a variation is found. This study was just a reflection of southeast Georgia, so research in another location could find whether or not barriers and facilitators are the same in other regions or states. Future research could also include the students themselves or their parents as participants in addition to the physical therapists. By having only physical therapists as participants, we may have only gotten one side of the story, therefore, including students and parents could provide a broader perspective on school function.

### **Limitations and Strengths**

Even though this study was able to identify barriers and facilitators to school function, it did have limitations. The study used a small, convenient sample of school-based physical therapists, but the size did remain within Photovoice recommendations (Wang & Burris, 1997). Also, the results are only representative of schools in the southeast region of Georgia, but may have the ability to be generalized to other school-based physical therapists. A strength of this study was the use of a focus group which allowed the participants to feed off of each other and have an in-depth discussion. Additionally, the use of ICF as a theoretical framework and coding tool was a strength of this study which can be used in a wide array of situations. The results of this study can

likely be used to help other communities understand the perspectives of school-based physical therapists in regards to barriers and facilitators to school function.

### **Implications**

Creating better opportunities for education is crucial to improving the accessibility, inclusiveness, and functionality of children with CP in their schools. Those opportunities can also give them a better sense of independence within that environment. This study signifies an essential first step to understand barriers and facilitators from the perspective of school-based physical therapists and establishes the need for local change and satisfies an opening in the literature that has not been filled.

### **Conclusions**

In conclusion, this qualitative study provides evidence that school-based physical therapist have a unique perspective on the factors that influence school function for children with CP. The participants indicated that school design is one of the most significant aspects of the school environment that impact school function, which can only be improved if school administration is educated on the importance of providing a completely accessible, functional, and inclusive atmosphere for their students with CP.

### Appendix A

1. Alsem, M. W., Verhoef, M., Gorter, J. W., Langezaal, L. C. M., Visser-Meily, J. M. A., & Ketelaar, M. (2016). Parents' perceptions of the services provided to children with cerebral palsy in the transition from preschool rehabilitation to school-based services. *Child: care, health and development*, 42(4), 455-463.

The researchers, from the Brain Centre Rudolf Magnus and Centre of Excellence for Rehabilitation Medicine, studied parents' opinions on the extent of family-centered care given to children with cerebral palsy before and after changing to school-based services. The parents filled out a Measure of Processes of Care (MPOC-56), two prior and one after transitioning to school services. They used other tests to describe differences and changes in the parents' opinions over time. They found no difference in the parent's opinions between school type. However, four domains of the MPOC declined after the transition. The parent's opinions on the amount of family-centeredness decrease after their children start receiving school-based services. It is always important to gain insight to the parents of the children that you interact with each day. Their suggestions could greatly influence the care of their children in a positive way.

2. Badia, M., Riquelme, I., Orgaz, B., Acevedo, R., Longo, E., & Montoya, P. (2014). Pain, motor function and health-related quality of life in children with cerebral palsy as reported by their physiotherapists. *BMC pediatrics*, *14*(1), 192.

It has been indicated that children with CP have higher levels of pain than those without a disability. The authors' study explored the impact of pain on quality of life and motor function in those with CP, which was reported by health professionals. There were thirty-five participants who were physiotherapists that rated pain, quality of life and motor function in ninety-one children with CP. An interview was also used to get demographic and clinical data. The physiotherapists indicated that 51% of individuals with CP suffered from pain. They also perceived that pain was the factor that reduced psychological domains of quality of life. It was also found that motor function did not correlate with pain in children with CP, but was associated with physical domains of quality of life. The study showed the importance of providing interventions for pain relief in children with CP as early as possible.

3. Bartlett, D. J., & Palisano, R. J. (2002). Physical therapists' perceptions of factors influencing the acquisition of motor abilities of children with cerebral palsy: implications for clinical reasoning. *Physical therapy*, 82(3), 237-248.

The authors indicated that the evidence supporting factors of motor change for children with CP is limited, so they conducted a consensus using focus groups and surveys to identify those factors. Fifty-seven physical therapists participated in one of the focus groups and sixty completed a questionnaire survey. A nominal group technique was used for the focus groups. The physical therapists developed 12 factors that were placed into four constructs: primary impairments, secondary impairments, personality characteristics, and family factors. The study recognized some things that could determine motor change in children with CP, which could help when developing an intervention for them. These factors could aid in decision making and research that could promote motor change.

4. Bhutia, C. D., Nair, U. S., & Surujlal, J. (2015). Effect of physical exercise programme on gross motor function of children with cerebral palsy: physical activity and health. *African Journal for Physical Health Education, Recreation and Dance*, 21(Supplement 1), 1-13.

Because children with CP have issues with muscular endurance, strength, and independence, they suffer from reduced physical activity and overall wellness. The authors determined if gross motor function could be improved in children with spastic CP through a physical activity program. There were 10 children with mild to moderate CP that were divided into two groups, an experimental and control group. The experimental group participated in twelve weeks of physical activity while the control group did not. Their gross motor function in daily activities was assessed using the Gross Motor Function Measure (GMFM). They found that the experimental group had statistically significant improvement in GMFM scores after the physical activity program. The authors concluded that exercise programs could improve gross motor function in children with CP, but further investigation is needed with a larger sample size.

5. Costigan, F. A., & Light, J. (2011). Functional seating for school-age children with cerebral palsy: an evidence-based tutorial. *Language, speech, and hearing services in schools, 42*(2), 223-236.

Researchers, from Pennsylvania State University, designed a tutorial to teach speech-language pathologists how to have the best functional seating for children with cerebral palsy while they are in class and therapy. They teach the SLPs to: (1) know the positive effects of the intervention, (2) know the characteristics of the best seating, and (3) know their own role in the seating intervention. The researchers used the International Classification of Functioning, Disability and Health to find the information on the positive effects of the seating intervention. They find that the intervention is effective when the right equipment is used for weight, the pelvis is stable, and the body is in alignment. The role of SLPs in this intervention is to talk with experts on seating, and enforcing the guidelines set forth in the International Classification of Functioning, Disability and Health. The importance of this tutorial to my topic is that it gives information on things that affect the lives of children with cerebral palsy positively.



6. DeFazio, V., & Porter, H. R. (2016). Barriers and facilitators to physical activity for youth with cerebral Palsy. *Therapeutic Recreation Journal*, 50(4), 327.

The authors of this study realized that children with CP participate in 30 % less physical activity than their healthy peers, and spend double the amount of time in front of the television or computers than the Department of Health's recommended time. This observation led the authors to want to understand the factors that influence children with CP's lack of physical activity and their large amounts of screen time. The authors found barriers and facilitators to physical activity. This information was divided using certain categories including personal and environmental barriers and facilitators. Some barriers to physical activity that they found were lack of energy/fatigue, lack of control over the body, not being able to keep up, feeling insecure, and embarrassment. The authors also indicated some parental factors that influence the physical activity of their children. Some of these factors were that parents do not think that physical activity is important, fear of child not fitting in, hesitant to ask for support, doesn't accept extent of disability, and they have challenges observing their child struggle. The authors propose that physical activity interventions should be designed that will strengthen the facilitators and minimize barriers.

7. Every Student Succeeds Act, Pub. L. No. 114-95, S. 1177, 114<sup>th</sup> Cong. (2015).

This law was created in 2015 as a replacement for No Child Left Behind. It was created in order to make sure public schools are providing adequate education for all of their students, and gives states themselves more say in how schools account for the achievement of their students including those who are disadvantaged like those in special education classes. It gives states the power to choose their own education plans, and gives parents a voice. The ESSA helps parents and teachers make sure that their children/students are being given the best chance to learn. This law is important because it gives those who have actual experience with school issues a voice in determining what needs to be done to improve the learning environment for students.

8. Flights, MC (2016). The physical therapist's role in school inclusion during early childhood education. *Physiotherapy and Research*, 23 (4), 343-344.

The author, an editor of the *Fisioterapia & Pesquisa*, discussed the physical therapist's role in school inclusion during early childhood education. They talked about how it is essential for healthcare professionals pay close attention to students during their first five years of life because they grow the most in sensory, cognitive, and motor learning during this time. Physical therapists must know the rights of children with disabilities in order to aid in their inclusion in school. Physical therapists must make several visits to schools in order to evaluate the school environment and identify barriers. They should also see what skills are being developed and possible challenges that students face in order to know how they should and can help. The author also says that physical therapists should interact with other professionals to establish guidelines that will stimulate the inclusion of children with disabilities by their peers.

9. Furtado, S. R., Sampaio, R. F., Kirkwood, R. N., Vaz, D. V., & Mancini, M. C. (2015). Moderating effect of the environment in the relationship between mobility and school participation in children and adolescents with cerebral palsy. *Brazilian journal of physical therapy*, (AHEAD), 00-00.

The researchers aimed to determine whether or not the participation of children with disabilities is affected by their specific environments. They studied the effect of this on the relationship between participation and mobility. 102 children with cerebral palsy, were classified using the Gross Motor Classification System. In order to evaluate the children's participation, the researchers used the School Function Assessment. The parents' perceptions of environmental barriers were evaluated using the Craig Hospital Inventory of Environmental Factors (CHIEF). They found that mobility had a stronger effect on participation than environmental factors. The parents did mention that they believe that transportation, government policy, and services in the community were the main barriers to participation. However, the researchers concluded that mobility was most associated with participation of children with cerebral palsy in school. They also stated that school-specific context factors could help more in explaining school participation. This is highly important to my topic because I am also studying the participation of children with cerebral palsy in school. They conclude that physical therapists should work together with families, health professionals, and the child itself in order to improve the participation and development of children with disabilities.

10. Gorter, J. W., Galuppi, B. E., Gulko, R., Wright, M., & Godkin, E. (2017). Consensus planning toward a community-based approach to promote physical activity in youth with cerebral palsy. *Physical & occupational therapy in pediatrics*, 37(1), 35-50.

The authors aimed to educate themselves and people in six communities in strategies to identify elements that will guide the development of a physical activity program for children with CP and support research efforts. The researchers did an environmental scan of the communities, had six regional meetings, and gave two surveys to reach a consensus on the most important elements. The study identified twenty-four elements that involve programs that would promote physical activity in children with CP. They organized these elements into five categories: raise awareness of the options and opportunities, pique interest and motivate youth to become and stay active, ensure community programs are ready for children with disabilities, be fit, fit in, and finding the best fit, and explore the layers of physical activity and how they interact. The authors concluded that the elements could be used to evaluate aspects of outcome for children with CP when used in clinical practice.

11. Holt, S. L., Kuperstein, J., & K. Effgen, S. (2015). Physical therapists' perceptions of school-based practices. *Physical & occupational therapy in pediatrics*, 35(4), 381-395.

Authors from physical therapy divisions in West Virginia and Kentucky aimed to understand the perceptions of physical therapists on school-based practices. They used an open-ended inquiry following a survey about school-based physical therapy practice. Out of 561 people, 250 provided open-ended answers that were analyzed using interpretive phenomenology. The authors found that six qualitative themes arose from their responses. These themes were that school-based practices seemed to try to meet students' needs through physical therapy, find teams that work, developing a voice within the school, managing workloads, and developing services outside of school that the children need. The authors concluded that school-based physical therapists try to meet the needs of students when it pertains to physical therapy. This is done through therapist expertise, team dynamics, and support.

12. McCoy, S. W., Effgen, S. K., Chiarello, L. A., Jeffries, L. M., & Villasante Tezanos, A. G. (2018). School-based physical therapy services and student functional performance at school. *Developmental Medicine & Child Neurology*.

The researchers studied the relationships of school-based physical therapy and the outcomes of students who are receiving physical therapy. They explored 296 students' School Function Assessment (SFA) outcomes. Physical therapists completed SFA scales for each student at the beginning and end of the school year. The therapists collected data weekly using the School-Physical Therapy Interventions for Pediatrics (S-PTIP) system. They found that mobility, sensory, motor learning, aerobic/conditioning, functional strengthening, playground access interventions, and higher student participation during therapy correlated positively with the SFA outcomes. The services that correlated negatively with the SFA outcomes were services with student groups, school activity, with students not in special education, during recreation activities, hands-on facilitation, sensory integration, and orthoses. They concluded that considering SFA outcomes is essential to focus services. To do this, they suggested emphasizing active mobility practice by using motor learning interventions and engaging students during therapy sessions.

13. O'neil, M. E., Fragala-Pinkham, M., Lennon, N., George, A., Forman, J., & Trost, S. G. (2016). Reliability and validity of objective measures of physical activity in youth with cerebral palsy who are ambulatory. *Physical therapy*, 96(1), 37-45.

This study evaluated the reliability and validity of accelerometer-based motion sensors and an indirect calorimeter to measure the intensity of physical activity in children with cerebral palsy. They had fifty-seven children complete physical activity protocols including resting, writing, chores, video gaming, and walking at certain speeds while wearing the accelerometer and portable indirect calorimeter. The researchers used multiple coefficients to calculate the correlation between the accelerometer and the calorimeter. They also examined the validity of the accelerometer to differentiate physical activity intensity throughout multiple activities. The study found that the accelerometer provided reliable and valid physical activity intensity measures in children with cerebral palsy. This study helps give more information on how to rehabilitate children with cerebral palsy, and allows them to be able to do daily activities with less of a struggle. These physical therapy interventions help develop better ways to improve mobility and it is important to make sure that research is valid and reliable.



14. O'Shea T. M. (2008). Diagnosis, treatment, and prevention of cerebral palsy. *Clinical obstetrics and gynecology*, 51(4), 816–828. doi:10.1097/GRF.0b013e3181870ba7

The author aimed to educate on the diagnosis, treatment, and prevention of cerebral palsy in infants. Because CP is the most prevalent cause of persisting motor function impairment, the author wanted to give information on the best ways to ensure that those diagnosed with CP are given adequate care. Individuals with CP should be provided with multiple healthcare groups including primary care and medical home for care coordination, support and diagnostic evaluations. In regards to CP prevention, there are multiple strategies which include interventions to prolong pregnancy, limiting the number of multiple gestations related to assisted reproductive technology, antenatal steroids for mothers expected to deliver prematurely, and caffeine for extremely low birth weight infants. This article is important because it provides information on how essential the care of CP is, and how many resources are available. The diagnosis, treatment, and prevention of CP is significant information for this study because it should be known in order to understand how certain barriers and facilitators can impact the lives of those with CP.

15. Rosenbaum, P. L., Palisano, R. J., Bartlett, D. J., Galuppi, B. E., & Russell, D. J. (2008). Development of the gross motor function classification system for cerebral palsy. *Developmental Medicine & Child Neurology*, 50(4), 249-253.

The researchers aimed to discuss the creation of the Gross Motor Function Classification System (GMFCS), and identify the challenges that accompany trying to develop an ordered, valid, and consistent system to describe function in children and adolescents with developmental disorders. This study is important because it provides insight into how this system was created and the issues that could arise if another system like this was created. It also highlights how much work is put into creating a system like this that is widely used in research and administration.

16. Rosenbaum, P., Paneth, N., Leviton, A., Goldstein, M., Bax, M., Damiano, D., ... & Jacobsson, B. (2007). A report: the definition and classification of cerebral palsy April 2006. *Dev Med Child Neurol Suppl*, 109(suppl 109), 8-14.

The authors discussed that the and definition and classification of CP needs to be readdressed. They gave additional information indicating that modern technology has produced more information on the nature of the injury and the development of the brain. They stressed that activity restrictions are an important part of CP evaluation. They also address that non-motor disabilities are not given enough standing in the CP rubric. The progression of certain musculoskeletal issues has also not been addressed. The authors explained that they reviewed material pertaining to the definition and classification of CP, and attended a workshop where they made revisions to the concept of CP. This article is important because it refines the idea of CP and gives better information on how to identify and classify this prevalent condition.

17. Russell, J.D., Rosenbaum, L.P., Wright, M. & Avery, M.L. (2011). Gross Function Measure (GMFM- 66 & GMFM- 88) User's Manual (2<sup>nd</sup> ed.). UK: Mac Keith Press

This resource is an updated version of the original Gross Motor Function Measure (GMFM) User's Manual, which is used to measure changes in gross motor function of children with CP. The manual has two components, GMFM-66 and GMFM-88. While GMFM-66 can only be used for children with CP, GMFM-88 can also be used for children with Down syndrome and those with acquired brain damage. GMFM-88 is also used for children with orthoses or mobility aids. Since GMFM-66 is only for children with CP, it is shorter than the GMFM-88 and saves examination time. This resource is important because it makes sure that children with disabilities are being monitored with the most accurate and up to date research in order to give them the best care.

18. Schiariti, V., Sauve, K., Klassen, A. F., O'Donnell, M., Cieza, A., & Mâsse, L. C. (2014). 'He does not see himself as being different': the perspectives of children and caregivers on relevant areas of functioning in cerebral palsy. *Developmental Medicine & Child Neurology*, 56(9), 853-861.

The researchers aimed to investigate the strengths and limitations in functioning of children with CP through the perspectives of the child and their caregiver. They did this by conducting interviews with 10 children with CP and 22 caregivers. Those interviews were audio-recorded and the transcription was then coded using the ICF framework. The researchers found 1956 themes which mostly represented ICF categories activities and participation and environmental factors. They found a difference between what the children reported (mobility, self-care and recreation and leisure) and what the caregivers reported (physical limitations). This study is important because it focuses on the perspectives of the children and caregivers who are actually experiencing this functioning firsthand.

19. Shariat, A., Shariat, A., Abedi, A., & Bahri, S. M. T. (2014). Physical activity as a prescription for the children with cerebral palsy. *Russian Open Medical Journal*, 3(1), 108-108.

The authors summarized the results of researchers who studied the importance of exercise for children with cerebral palsy. This meta-analysis was conducted in order to determine if exercise therapy is effective on children with spastic cerebral palsy. The method they used to study the research was by calculating effect sizes for each study, then finding the average effect. They find that the effect of exercise therapy on children with spastic cerebral palsy is moderate. They conclude that treatment to impact cerebral palsy symptoms can be chosen by the therapist. It is also stated that sensory-motor integration therapy could also be used in daily programs for these children. Most of the studies propose that more research be conducted that finds a way to minimize the damages during this stage of birth, and also improve the process of cerebral palsy detection in infants. The meta-analysis finds that it is beneficial for children with cerebral palsy participate in rehabilitation with high standards multiple times a week for a few months in order to enhance motor performance.

20. Van Wely, L., Balemans, A. C., Becher, J. G., & Dallmeijer, A. J. (2014). The effectiveness of a physical activity stimulation programme for children with cerebral palsy on social participation, self-perception and quality of life: a randomized controlled trial. *Clinical rehabilitation*, 28(10), 972-982.

The authors' goal is to determine the effects of a six-month physical activity stimulation programme on social participation, self-perception and quality of life in children with cerebral palsy. They used a multicenter randomized controlled trial with blind assessments and intention-to-treat analysis. The study was conducted in pediatric physiotherapy practices, schools for children with disabilities, and the child's home. Forty-nine children with spastic cerebral palsy that are able to walk with and without walking aids were chosen for the study. There was a control group and an intervention group that were compared to see how physical activity would affect participation, self-perception, and quality of life. The intervention group followed a six-month physical activity program. The authors found that counseling, home-based physiotherapy, and physical activity were not effective in improving participation in recreation, self-perception, or quality of life, but it did show that it could improve social participation in domestic life over time.

21. Walker, A., Colquitt, G., Elliott, S., Emter, M., & Li, L. (2019). Using participatory action research to examine barriers and facilitators to physical activity among rural adolescents with cerebral palsy. *Disability and rehabilitation*, 1-12.

The authors wanted to use Photovoice in order to identify barriers and facilitators to physical activity for adolescents with CP within a rural community. The study included 7 children with CP and 8 of their parents, and followed the nine-step methodology of Photovoice. The participants completed a questionnaire which gave descriptive information about the barriers and facilitators. Interviews were held to collect more data, and the SHOWeD method was used to generate the content needed to identify common themes. The researchers found that perceived barriers were lack of inclusiveness, family isolation, and limited accessibility of equipment and resources. Facilitators found were support services and adaptive sports leagues. This study is important because it utilizes Photovoice in order to initiate a change to promote physical activity among adolescents with CP in a rural community.



22. Wang C, Burris MA. (2006). Photovoice: concept methodology and use for participatory needs assessment. *Health Educ Behav.* 1997;24(3):369-387.

The Photovoice method was developed by the authors, and they wrote this article to explain what it is and the ideas that contributed to its development were. Photovoice is a methodology that is used to help people identify, present, and enhance their community through photographic technique. There are three main goals of Photovoice which are: to enable people to record and reflect their community's strengths and concerns, promote critical dialogue and knowledge about important issues through large and small group discussions of the photographs, and to reach policy makers. This methodology will be utilized in my study in order to identify the barriers and facilitators to the participation of children with CP as indicated by school-based physical therapists.

## Appendix B



**COLLEGE: Waters College of Health Professions**

---

**DEPARTMENT: Health Sciences and Kinesiology**

---

### Informed Consent

My name is Vevian Lee and I am a student at Georgia Southern University. Under the guidance of my professors, Drs. Gavin Colquitt and Ashley Walker, we are conducting a study that will examine the perspectives of physical therapists regarding facilitators and barriers of participating in school activities among young people with cerebral palsy (CP) in southeast Georgia. If you agree to participate in this study, you will be asked to participate in a required, one-day Photovoice training, take photographs of things that make it easy/difficult for children you serve with CP to participate in various aspects of school functioning, and participate in a focus group with other therapists. The researchers will be the only people with access to the results.

In the training session, the researcher will provide you with a digital camera and show you how to effectively use this camera to take photographs of images that will be used in the study. **At the end of the training session, you will then be asked to take the camera with you to take photos of places, things, or situations that either:** (1) facilitate the participation of physical activity or (2) limit participation in physical activity. You will have 7 days to take photographs. You will then participate in a focus group interview with other therapists.

Participation in this study involves no more than minimal risk. Minimal risks include fatigue and physical and emotional discomfort during the interviews and release of confidentiality. You may take breaks throughout the interviews and/or focus group session(s) or discontinue participation at any time.

Our research method, Photovoice, often makes people feel empowered. You may experience psychosocial benefits associated with expression of your experiences. The results of this study may help local communities develop and school districts develop an action plan to improve participation in school activities for youth with CP.

The Photovoice training session will take approximately 2 hours. You will then spend 7 days taking photographs. You will participate in a 90-minute focus group session with other therapists who serve children with CP.

You may feel slight emotional discomfort in discussing your images with the researcher. If you feel any discomfort, please remember that your participation in this study is

voluntary and you may skip a question or withdraw completely from the study at any time without penalty. If, as a result of your participation in this study you need or want to visit with someone about the sensitive issues which might arise, you may contact a low-cost community based counseling service- Pineland at 912-764-6906.

Please keep in mind that confidentiality is paramount in this study so please feel free to answer honestly. The researchers have no moral or legal obligations to report any answers or information provided to anyone. Your name will never be used on any recorded information so that your data cannot be linked back to you. Your information will be assigned a code number. The list connecting your name to this code will be kept in a locked filing cabinet. When the study is completed and the data have been analyzed, this list will be destroyed. Your name will not be used in any report. You will also maintain ownership of the photographs, therefore, only the photographs you agree to release will be used. The interviews will be audio recorded. The audio recordings of the interviews will only be available to the researchers. The recordings, hard copies of the interview transcriptions, jump drives containing transcribed text, and photographs will be stored in locked filing cabinet in Dr. Colquitt's office for a period of three years. After three years, all the information will be deleted permanently. Dr. Walker will assign code names during transcription to ensure individual participants' statements remain anonymous. No data files will show your name or other personal identifying information. To protect the confidentiality of individuals, we ask that you not to take any photographs of individuals, especially students in schools.

You have the right to ask questions and have those questions answered. If you have questions about this study, please contact any of the above researchers, whose contact information is located at the end of the informed consent. If you have any questions or concerns about your rights as a research participant in this study, you can contact the Institutional Review Board coordinator at the Georgia Southern University office of Research Services and Sponsored Programs at **(912) 478-5465**.

Participation in this study is completely voluntary. You may choose not to answer any question you do not want to answer and you may withdraw your participation from the study at any time. There is no penalty for not participating. You will receive a \$25 Walmart gift card after participation in each brainstorming session, focus group, and community forum session to compensate for time and travel. **Participants may receive a total of \$75 in gift cards by attending all three sessions.**

You will be given a copy of this consent form to keep for your records. This project has been reviewed and approved by the GSU Institutional Review Board under tracking number **H19317**.

**Title of Project:** Physical Therapists' Perspectives of School Functioning for Children with Cerebral Palsy (CP)

**Principal Investigator:** Vevian Grace Lee, PO Box 8076, Statesboro, GA, 30460, [vl00736@georgiasouthern.edu](mailto:vl00736@georgiasouthern.edu), 912-478-0889

**Other Investigator(s):**

Dr. Gavin Colquitt, Georgia Southern University, PO Box 8076, Statesboro, GA, 30460,  
[gcolquitt@georgiasouthern.edu](mailto:gcolquitt@georgiasouthern.edu), 912-478-0889

Dr. Ashley Walker, Georgia Southern University, PO Box 8015, Statesboro, GA, 30460,  
[awalker@georgiasouthern.edu](mailto:awalker@georgiasouthern.edu), 912-478-2477

Dr. Heather Lorden, Georgia Southern University, Armstrong Campus-Armstrong Center  
– Room 238, [hlorden@georgiasouthern.edu](mailto:hlorden@georgiasouthern.edu), 912-344-2767

\_\_\_\_\_  
Participant Signature

\_\_\_\_\_  
Date

I, the undersigned, verify that the above informed consent procedure has been followed.

\_\_\_\_\_  
Investigator Signature

\_\_\_\_\_  
Date

## Appendix C



**GEORGIA  
SOUTHERN  
UNIVERSITY**

## Participant Photo Release

I, the undersigned, hereby grant to Georgia Southern University, Vevian Lee, and Drs. Gavin Colquitt and Ashley Walker (“Researchers”) an irrevocable non-exclusive license to use at Researchers’ sole discretion for the purposes of their study any photographs (the “Participant Work”) which I take as proof of barriers and facilitators to participation in my school.

Such Participant Work may include (but is not limited to) photographs taken during week of data collection, which indicate barriers and facilitators to participation for children with cerebral palsy (CP). Possible uses for the Participant Work may include (but are not limited to) analysis of school function in surrounding school districts, thesis publication, and presentation at a community forum and symposium. Participant Work may be edited and used in excerpted form.

I certify that am the owner of the copyright to the Participant Work, and the Participant Work is not now subject to any grant, contract, work-for-hire or restriction that would prevent its use consistent with this permission. Except as explicitly indicated on the Participant Work, all aspects of the Participant Work are original to me and have not been copied or adapted from other sources.

I understand that I will continue to own the Participant Work, and that I will be given proper attribution as the owner of the Participant Work pursuant to my instructions specified below:

*(Check and initial one of the following options)*

\_\_\_\_\_ Use my full name in association with my Participant Work;

\_\_\_\_\_ Use only my first name in association with my Participant Work; or

\_\_\_\_\_ Do not use my name in association with my Participant Work.

I hereby release The University, Vevian Grace Lee, Drs. Gavin Colquitt and Ashley Walker, and any other person who may be legally liable, from any and all claims, demands, causes of action, and suits, including but not limited to claims for invasion of privacy, defamation, breach of contract or other breach of duty (including but not limited to the Family Educational Rights and Privacy Act of 1974), arising out of or in connection with the maintenance, use or release of any personal information as described above.

**Research Participant**

Name: \_\_\_\_\_

Signature:  
\_\_\_\_\_

Date: \_\_\_\_\_