THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF COMMUNICATION SCIENCES AND DISORDERS

IMPROVING ACCURACY OF PARTNER JUDGEMENT OF COMMUNICATION WITH INDIVIDUALS WITH SEVERE AND MULTIPLE DISABILITIES

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SPRING 2017

A thesis
submitted in partial fulfillment
of the requirements
for a baccalaureate degree in Communication Sciences and Disorders
with honors in Communication Sciences and Disorders

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ABSTRACT

The idiosyncratic communicative attempts of those with multiple disabilities are often difficult to identify and interpret. Research shows that consistent responses to the communicative acts of these individuals can facilitate the development of intentional communication (Wilcox, Kouri, & Caswell, 1990, as cited in Carter & Iacono 2002). The current case study was completed to pilot a larger study that proposes an attempt to resolve the inconsistencies of partners' responses to the communicative acts of individuals with multiple disabilities. A video inventory of the communicative acts of middle school students with multiple disabilities was used to improve the accuracy of partners' interpretations. Parents and teachers' perceptions of these communicative acts were documented for the purpose of creating consistency of responses among partners. A graduate student in Communication Sciences and Disorders was trained using this same video inventory to more accurately identify if an act is communicative and if so, to correctly interpret its meaning.

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ACKNOWLEDGEMENTS

I would like to extend my thanks to my thesis supervisor, Dr. Kathy Drager, for her assistance and support throughout this endeavor. I also would like to express my gratitude to Doctoral Candidate, Christine Holyfield for her teaching and guidance in the research and writing process. Both Dr. Drager and Christine's passion for research and improving the lives of those with disabilities serves as an inspiration to all. Lastly, I would like to thank Dr. Ingrid Blood for her ongoing support and instruction in my undergraduate studies both as a teacher and an advisor.

Chapter 1

Literature Review

Individuals progress through stages of communicative behavior during typical early language development. This progression begins with partner-perceived communication (*perlocutionary stage*) and typically develops into a symbolic communication system (*locutionary stage)* (Bates, Camaioni, & Volterra, 1975; McLean & Snyder-McLean, 1987). Infants from birth exhibit partner-perceived communication (*perlocutionary stage*). These are behaviors that have an effect on the partner without the intent to communicate, such as yawning to communicate fatigue (Sigel & Cress, 2002). Siegel and Cress (2002) further categorized partner-perceived communication into two types of behaviors: spontaneous (*reactive*) and intentional (*proactive*). Spontaneous behaviors result from biological or environmental events, and intentional behaviors act on objects or events in the environment directly without directing a message toward a listener (Sigel & Cress, 2002). Around age nine months, infants exhibit intentional communication, transitioning them into the illocutionary stage. These are preverbal behaviors that have the deliberate intent to communicate with an interactive partner, such as pointing to the cookie jar on top of the refrigerator. Typically-developing children enter the final stage, the locutionary stage, at about 13 months. During this time, children begin to intentionally communicate through symbolic communication such as spoken or written words, sign language, or picture symbols (Bates, Camaioni, & Volterra, 1975; McLean & Snyder-McLean, 1987).

There is a lack of research regarding the progression of intentional communication in individuals with multiple and severe disabilities. These individuals follow a different trajectory

due to varying cognitive, motor, and perceptual impairments. According to Light, Parsons, and Drager (2002), infants with severe disabilities often differ from typically-developing peers in socially attending to caregivers. They tend to smile and vocalize less frequently while also displaying inconsistent and idiosyncratic behaviors. These behaviors may look different than Wetherby and Prizant's (1989) criteria for intentionality. Caregivers often misinterpret these idiosyncratic behaviors and neglect to respond. In these instances, the behavior is not reinforced and is therefore terminated (Iacono, Carter, & Hook, 1998).

Whether or not individuals with severe disabilities communicate intentionally is a conflicting viewpoint in the literature. Wetherby and Prizant (1989) define the criteria of intentional behavior for typically-developing individuals and individuals with disabilities as the following: (1) alternative eye gaze between a goal and a listener, (2) persistence in signaling, (3) changing the quality of a signal until a goal is met, (4) using a signal with a conventional or ritualized form, (5) awaiting a response from the receiver, (6) terminating the signal when the goal is achieved, and (7) indicating satisfaction or dissatisfaction, depending on whether the goal is achieved (as cited in Carter & Iacono, 2002). Iacono and colleagues (1998) argue that due to various impairments (e.g., restrictions in motor movement), individuals with disabilities face challenges in producing these signals (as cited in Carter & Iacono, 2002).

Even though it may (or may not) look different than in typical development, Siegel and Wetherby (2000) also note that individuals with severe disabilities display these idiosyncratic, but potentially communicative behaviors. Acts of vocalization, facial expression, hand and body positioning, gaze, and mouth opening can be interpreted as communicative attempts. Whether these behaviors are intentional or not is unknown, but the current literature suggests that continuous responding to these communicative attempts aides these individuals in the

development of intentional communication and potentially, symbolic communication (Wilcox, Kouri, & Caswell, 1990, as cited in Carter & Iacono 2002). Through a partner's continuous responses, the individual who initiated the interaction recognizes the effect of their signal (Hanson & Hanline, 1985; Schweigert, 1989, as cited in Carter & Iacono 2002). The problem is that these behaviors can be difficult for communication partners to recognize and interpret. It is also difficult to keep consistent responses among a variety of partners. In addition, unlike typically-developing infants, individuals with severe disabilities interact with a variety of partners making consistency less likely. They also have limited experiences for this reinforcement in comparison to typically-developing individuals.

Although their opportunities for reinforcement differ than those of typically-developing individuals, parents of individuals with multiple and severe disabilities are skilled at recognizing and responding to their communicative attempts. Matthews-Somerville and Cress (2005) conducted a study on parents of infants with physical disabilities and neurological impairments who were at risk for vocally expressive communication impairments. While interacting with their child through play or daily activities, parents used a list of signals (facial expressions, gaze, vocalizations, etc.) and functions (social conversations, attention to self, reject/protest, etc.) from Sigafoos et al. (2000) to identify a communication signal and then determine its function. Parents were able to identify communicative acts as well as changes in these acts over time (Matthews-Somerville & Cress, 2005).

Parents of individuals with multiple and severe disabilities may accurately identify their children's attempts to communicate, but realistically, they are not the only communication partners in these individuals' lives. School-aged and adult individuals with disabilities interact with a variety of partners on a daily basis. Wilcox et al. (1990) highlighted the lack of research

on frequent communicative partners such as teachers and clinicians and their interpretations of the intentionality of individuals with severe disabilities. Most of the research focuses on judgements of primary caregivers. Wilcox et al. (1990) discovered a mixture of results when teachers, clinicians, and parents, were asked to identify intentionality without knowledge of clear operational definitions (as cited in Carter & Iacono, 2002). To further explore the area of partner's perceptions, Carter and Iacono (2002) focused on a group of special education teachers and speech-language pathologists' interpretations of individuals with disabilities. The study found that special education teachers assigned intentionality to more communicative acts than did speech-language pathologists. This shows the potential differences in judgements of communicative behaviors between these two groups of highly-trained individuals. Given that there were differences of interpretation across such knowledgeable groups, it seems plausible that responses across non-professional partners might be even less consistent.

The inconsistencies in responses to the potentially communicative acts of this group of individuals puts them in a vulnerable position and could interfere with their quality of life. Individuals with severe communication impairments are at the mercy of those that they interact with and depend on them to properly interpret their messages. Grove et al. (1999) stated that these individuals have "inconsistent ways of communication leading to ambiguity of meaning" (p. 190). In addition, they have "a tendency to acquiesce to the suggestions of others and an inability to contradict an interpretation and tell you 'No, that's not what I meant'" (p. 190-191). Not only is this situation not ideal for the individual with communication impairments, but it is also a gray area for communication partners. The uncertainty of these individuals' intentions can make caregivers feel insecure and uneasy (Grove et al. 1999). Consistent and correct responses among caregivers that shape intentional communication could be a solution to this problem. To

ensure these consistent responses, an inventory of communicative behaviors can serve as a primary resource. Gesture dictionaries (Beukelman & Mirenda, 1998), the *Communication Signal Inventory* (CSI; Blackstone, 1991) and the *Inventory of Potential Communication Acts* (IPCA) (Sigafoos et al., 2000), are current examples of documenting these communicative acts (Matthews-Somerville & Cress, 2005). In this study, we have created our own personalized inventory in an attempt to improve the accuracy of peer partners' interpretations of the idiosyncratic acts of those with multiple and severe disabilities. Parents and teachers' interpretations of communicative acts are documented in this inventory in an attempt to create consistency of responses among partners. This paper focuses on a case study piloting a larger study in which peers of students with severe disabilities are trained on the communication of those students through the video inventory. In this case study, a graduate student in Communication Sciences and Disorders (CSD) was trained in this way.

Chapter 2

Methods

Design

This study focuses on a case study used for the purpose of piloting for a larger study. In the current case study, the participant was administered a pre-test, the treatment condition, and a post-test. Therefore, the study was a pre-test-post-test case study quasiexperimental design (Campbell & Stanley, 1971). The three parts of this study all occurred on the same day within about a 25-min interval. The treatment condition lasted for about 15 min.

Participants

Graduate Students. This case study focused on one graduate student in Communication Sciences and Disorders (CSD). Kelly (name changed to a pseudonym for confidentiality purposes) was a 24 year-old with a Bachelor of Science in CSD. Her background with individuals with disabilities consisted of working as an aide in a classroom for individuals with autism and complex communication needs. At the time of the study, she was three months into her clinical practicum as part of her graduate program. In this practicum, she worked with individuals with various impairments.

Students with Multiple Disabilities. Three middle school students with multiple disabilities (MD) played an important role in this study. The communication of the students with disabilities served as a tool for measuring the participant's judgement of their communication.

Videos of this communication were recorded and shown to the participant. The students with MD communicated through pre-symbolic, idiosyncratic methods. These students had their guardians' consent to participate in this study. To provide more information about the students with MD's communication styles, a guardian and a teacher were interviewed using an adaption from the Communication Matrix (Rowland, 1996). These interviewees determined perceived communicative behaviors (PCB). The two most frequent PCBs in each of the individuals' repertoires were used as targets for the study.

In the larger study for which this study served as the pilot, the participants were 24 typically-developing middle school students. These students were involved in a school program aimed at creating relationships in a middle school between typically-developing students and their peers who have multiple disabilities. The students in this study with multiple disabilities were members of this program. The typically-developing students had experience frequently interacting with the students with MD through their involvement in the program. The graduate student participant in this case study did not have experience interacting with these particular students with MD.

Materials

Video Probes. Footage of the students with MD engaging in their daily school activities were recorded. From this footage, an inventory of clips for each participant was created. Each clip in the inventory lasted 1-3 sec long. Each student's video inventory incorporated at least six instances of the two target PCBs identified by the teacher and guardian. The inventories also

incorporated at least six instances of behavior that were not categorized as communicative by the teacher and guardian. These instances were separated by appointing meaning in the following categories: one of the target PCBs or non-meaning. After this separation, the teacher reviewed the instances and also approved or disapproved of the assigned meaning or non-meaning.

After the teacher confirmed which categories each instance should fall under, the categories were randomly assigned to two separate video probes. Two moments of each target PCB and two moments of non-communicative behaviors from each individual with MD played on each of the two separate video probes. There was a total of 18 video clips randomly arranged, numbered 1-18, and transferred over to a tablet computer with EasyVSD software (Jakobs, Innvotek).

The participant was given a paper response form to accompany the video probe. The form consisted of 18 bold headings (one for each video clip) titled "clip" followed by the number of the clip. Underneath each heading were two questions: (a) "Was the person communicating? Circle one: yes/no;" and (b) "If yes, what was the person communicating?"

Video Training. In addition to the two video probes, a video inventory was used in this study to complete the participant training, also known as the treatment condition. This inventory contained four video documentations of each of the three students' target common PCBs. It also included three video documentations of non-communication from each of the three students with MD. These clips were transferred over to the tablet using the EasyVSD software (Jakobs, Innvotek). On this device, the clips were organized into a block for each of the three students. In each student's block, the first two clips to appear were instances of their two target PCBs. The remaining nine clips in each student's block were randomly ordered.

Procedures

Video Probes. The participant, Kelly, was informed that she would watch video clips of students with MD. She was told to indicate on the response sheet whether or not each clip displayed communication, and if so, to assign meaning to the communication. Judgments of behaviors were made after viewing each clip twice. She watched a probe while taking the pre-test, and then underwent a short training. After the training, she watched a second probe while completing the post-test. For the pre-test probe, she watched each of the 18 video clips twice and made a judgement on her response sheet after the second viewing. She received no feedback, but was allowed to ask for assistance regarding technical or procedural issues. The procedures for the post-test, which occurred following the treatment condition (described below) were identical to those of the video probe that served as the pre-test. The pre-test and post-test probes contained clips of the same PCBs, but acted out in different circumstances.

Treatment Condition. The researcher and Kelly sat next to one another with the tablet in the middle of them. The task and its purpose were explained to her. Both the researcher and Kelly watched two clips of Student 1's two PCBs. After each clip, the researcher voiced a) the communication she viewed (i.e., the operational definition of the communication), and (b) the meaning attached to that communication (i.e., the linguistic map). For each of the video VSDs, a hotspot was formed using the linguistic map. For the nine clips of Student 1 that remained, Kelly practiced identifying if communication existed and interpreting its meaning. Feedback was provided during these attempts. This process was repeated for video clips of Student 2 and Student 3.

Measures

This case study's fundamental measure was the accuracy of video clip judgements out of 18 trials. Kelly was scored on a scale of 0-18 for each of the three video probes completed. Scores were based on responses from the response form. To earn a score of one, she was required to accurately complete both steps for each item on the response sheet. A score of zero was given if only one step was answered correctly. If Kelly correctly determined a clip as displaying communication, she only earned a point if she correctly assigned the meaning behind the communication (e.g., "excited").

Chapter 3

Results

During the pre-test in which the graduate student watched 18 of the video clips twice through with no feedback, Kelly received a score of 10 out of 18. She correctly identified 8 instances of non-communicative behaviors and 2 instances of communicative behaviors. In the 2 instances of communicative behaviors, Kelly also judged the appropriate linguistic meaning that matched the behavior. In 4 of the 8 incorrect trials, she correctly identified that communicative behavior took place, but did not attribute the appropriate linguistic meaning. In the 4 other incorrect trials, Kelly misidentified an instance of communication as a non-communicative behavior.

After the treatment condition was applied, a post-test was administered. In this test, Kelly received a score of 18 out of 18. She correctly identified instances of communication and their assigned meanings. She also correctly identified the instances of non-communicative behaviors.

Figure 1 shows the percentages of accurate responding. Her total score on the pre-test was 55%; her total score on the post-test was 100%. Therefore, there was an increase of 45% between the pre-test and post-test.

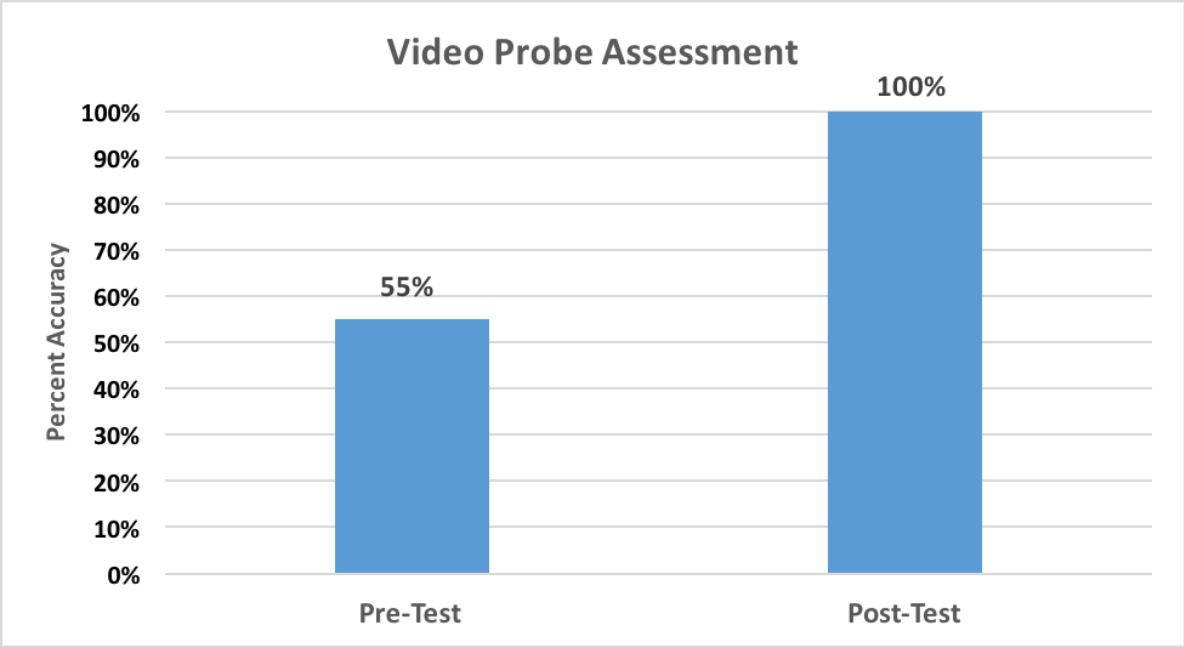

Figure 1: Video Probe Assessment Pre-test vs. Post-test

Chapter 4

Discussion

As current literature suggests, consistent responses to the communicative attempts of those with MD fosters the development of intentional communication (Wilcox, Kouri, & Caswell, 1990, as cited in Carter & Iacono 2002). With that being said, it is known that these behaviors can be difficult to identify and interpret. There is also the issue of keeping these responses consistent among the various communication partners in the lives of people with MD. The current case study was completed to pilot a larger study that proposes an attempt to resolve the inconsistencies of partners' responses to the communicative acts of individuals with severe and multiple disabilities. A communicative video inventory of middle school students with multiple disabilities was used to improve the accuracy of partners' interpretations of their idiosyncratic acts. Parents and teachers' perceptions of these communicative acts were documented for the purpose of creating consistency of responses among partners. A graduate student in Communication Sciences and Disorders was trained using this same video inventory to more accurately identify if an act is communicative and if so, correctly interpret its meaning.

Upon first viewing the video probe of the idiosyncratic acts of the individuals with MD, the graduate student, Kelly, completed the pre-test response form with about 55% accuracy. After receiving the treatment condition, she completed the post-test response form with 100% accuracy in identifying whether or not a behavior was communicative and if so, interpreting the correct meaning. There was clear improvement from pre-intervention to post-intervention, which may indicate the benefits of training communication partners to recognize and interpret communicative attempts. This case study demonstrates that providing exposure to the idiosyncratic behaviors of those with MD and training in identifying which are communicative in

nature could increase the accuracy of partners' responses. However, given that the quasiexperimental nature of the design and the inclusion of only one participant, the results of this study must be interpreted with caution. Although the increase between the pre-test and post-test may be attributable to the training, it is impossible to know for sure because of the threats to validity that were not controlled.

Although this case study seemed to show improvements in identifying communication, it is important to consider the background knowledge of the participant. She was a graduate student in CSD, so her knowledge of communicative development and experience with individuals with disabilities could have enhanced her abilities to improve in this area. When applied to the middle school students who were the communication partners in the larger study, the intervention will be evaluated more rigorously. These students lack the background education in CSD. In contrast, however, it is possible that these students will respond with similar improvements due to their familiarity with the students with MD. Their involvement in the school program could have familiarized them with the communicative acts of the students with MD.

The improvement in the brief 25-min duration of this case study could point to its potential benefits. If Kelly improved with only a 15 min intervention, then repeated trainings may result in more precise judgements of the communicative acts of those with MD. Such a large improvement in accuracy after undergoing a short intervention shows the promise in trainings to recognize communicative behavior. However, long-term maintenance of improvement is unknown.

The intervention not only improved the ability to recognize communicative behaviors, but also non-communicative behaviors. There is merit in recognizing these non-communicative attempts. By distinguishing between which attempts are non-communicative and which are

communicative, partners can determine which instances to respond to. It is imperative that these types of interventions also inform communication partners that not all idiosyncratic acts are meant for communication.

Clinical Implications

The purpose of this case study was to determine the effects of training communication partners in identifying and interpreting the communicative attempts of those with multiple disabilities. The goal of this clinical intervention was to create accurate and consistent responses to these communicative attempts among the various communication partners of those with MD. Ideally, continuous responses to these pre-symbolic, idiosyncratic communicative behaviors would shape intentional and eventually symbolic communication in individuals with MD. If clinicians can train communication partners in identifying these behaviors, a contingency in responses could emerge among the caregivers, educators, peers, and other individuals that interact with those with MD. Clinicians could benefit from the knowledge gained in this study to better implement this intervention.

The communication inventory developed with the help of teachers and parents is an essential tool in this intervention. Not only is this video inventory of PCBs helpful for training, it also could be used as a quick reference for infrequent or one-time communication partners. In the future, this type of inventory could be transferred to a tablet or an iPhone and used as an augmentative and alternative communication system. Communication partners, familiar and new, could reference this inventory on hand in order to more accurately recognize and interpret the

communicative acts of individuals with MD. This could make communication much easier for both the individuals with MD and their partners.

The 25-min duration of this case study shows promise for clinical implication considering that the actual intervention only took about 15 min to implement. In terms of the larger study, a 15 min intervention could easily be implemented into the school day schedule of the target population, the middle school students. In terms of a more widespread intervention with the frequent communication partners of an individual with MD, this time-efficient intervention could be an easy addition into their schedules

Limitations and Directions for Future Research

When reviewing this case study, it is important to consider the coinciding limitations. The case study at hand served as a pilot study in which there was only one participant. Although the findings of this study show positive effects of the intervention, it only focused on one individual's reaction to the intervention. Also, this individual was considered to have background education in the area of communicative development and experience working with individuals with communication impairments. To produce sound and methodical results, this study should be repeated with a larger, more diverse population. In addition to the small sample size, this case study was used as a pilot. The larger study will utilize a method that establishes strong experimental control and will allow for findings that can be interpreted with more clarity and assurance. More will be known about this intervention once the larger study focusing on middle school students is completed.

This study focuses on the effects of training on the communication partners of those with multiple disabilities. In the future, researchers should examine the effects of these trained communication partners on the individuals with MD. Future studies should focus on any changes in these individuals' communicative development over time as a result of reinforcement from communication partners.

Conclusion

Communication partners of those with multiple disabilities often face challenges in identifying instances of communication within these individuals' idiosyncratic behaviors. They also have trouble deciphering their meaning and in turn, often miss chances to respond and reinforce the communicative behaviors. The current research suggests that recurrent responses to these behaviors that are consistent from various communication partners could pave the way for intentional communication. Creating an inventory documenting the appearance and meaning of these idiosyncratic acts could help communication partners identify these instances during interactions. Training partners on how to recognize, interpret, and respond to these behaviors could broaden communication opportunities for individuals with multiple and severe disabilities. Interventions like the current study show the potential in training communication partners to identify and decipher the communicative acts of those with MD. This study points to the need for more research in this area in order to better the lives of those with MD.

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- **CI 280 Peer Tutoring**
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    - Tutored a fourth-grade English Language Learner by lesson planning and assisting in homework assignments
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Work Experience:

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  - Train new employees and communicate with a team of workers to ensure success in the workplace
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  - Prepared meals and planned activities including trips to the pool and movies

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  - Engage in fun activities like going to the movies, Best Buddies Ball, and trips to the Penn State Arboretum
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  Rules and Regulations Committee Member
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- **Penn State IFC/Panhellenic Dance MaraTHON: FOTO**
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  Organization Member
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