Increasing Autonomous Access to AAC Devices at School: Beneficial or Detrimental? A Single-Case Study for Level 3 Autism

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ABSTRACT

Lou, an 18-year-old nonspeaking autistic student with Level 3 autism, uses Proloquo2Go on an iPad as her primary means of expressive communication and frequently produces repetitive non-school related AAC requests in the classroom. At school, her iPad is normally restricted to Proloquo2Go using Guided Access. This study investigated whether removing this restriction and allowing autonomous access to preferred digital content was associated with changes in repetitive requesting, regulation and engagement. A single-case mixed-methods design combined 26 one-hour observations, with 13 observations under each Guided Access condition, with a semi-structured interview with Lou's mother. Across the observations, 1,990 utterances were recorded, of which 1,918 were classified as request-like. Request-like utterances averaged 93.2 per hour when Guided Access was ON and 54.4 per hour when it was OFF, a reduction of approximately 41.6%. Mom-related utterances similarly decreased from 46.6 to 27.8 per hour. However, no clear corresponding change in observable regulation, engagement or response time was identified. The findings therefore suggest an association between unrestricted digital access and reduced repetitive AAC output, while not establishing whether this reflects regulation, autonomous access to preferred content, attentional or motor competition, or a combination of these factors.

Keywords: *autism, augmentative and alternative communication, AAC, speech-generating device, autonomy, repetitive requesting, regulation, engagement, single-case study.*

ACKNOWLEDGMENTS

I would like to express my sincere gratitude to everyone who supported me throughout this research project. First and foremost, I would like to thank SAERA and my supervisor, Dr Nerea Ortega, for their guidance, support and encouragement throughout the research process. I am also very grateful to GS for giving me the opportunity to conduct this research within the school and for welcoming me into the environment. I would especially like to thank Lou, whose participation, communication and individual way of engaging with the world made this research possible and meaningful. Finally, I would like to thank Lou's family for trusting me with this research, for allowing Lou to participate, and for their openness, support and encouragement throughout the process. To everyone involved, thank you for your time, trust and support.

INTRODUCTION

Communication is imperative to everybody, as it helps us express our wants, needs and desires. Most people are able to communicate through speech; however, when speech is not an option, augmentative and alternative communication (AAC from now on), can be a very beneficial tool for nonspeaking individuals. AAC can take many forms, ranging from a communication book or picture board to a speech-generating device. The latter includes applications such as Proloquo2Go, a symbol-based AAC application that can be used on an iPad or iPhone. The software organises vocabulary into a grid of buttons containing visual symbols and written words, which the user can select individually or combine to create longer messages. The vocabulary is organised across different folders and categories, allowing the user to navigate between pages to access words relating to people, actions, feelings, food, places and many other topics. Once selected, these words or phrases can be read aloud through a synthesised voice, allowing the device to effectively act as the person's voice. Proloquo2Go can also be personalised by adding vocabulary, photographs and phrases that are particularly relevant to the individual, meaning that the AAC system can develop around the person's own communication needs and everyday life.

This thesis follows a student, referred to by her pseudonym as Lou. Lou is an 18 year old nonspeaking autistic student with Level 3 Autism who uses Proloquo2Go on an iPad as her primary means of communication. Though she has a very good mastery of her AAC device, she is known at school for making continuous and repetitive requests throughout the day. Though repetition is a key characteristic of autism, the question does arise whether these communicative traits stem from her autism, or whether it is a learned and functional behavioural trait.

Upon initial observation, it becomes apparent that these requests mainly fall within three domains. Firstly, the majority of the requests she makes are for her mother. Secondly, Lou is known to repetitively ask for her preferred foods, such as "I want chocolate" or "I want lollipop". Alternatively, and lastly, Lou will make multiple requests per hour for activities or locations outside of the classroom, such as "I want Willo Cafe" and "I want

Greensborough Plaza". Interestingly, many of these requests persist even after the request has been granted, suggesting that obtaining the requested person, item or activity may not always be the only function of the communication. It is therefore worth considering whether the repeated request itself produces another outcome that reinforces and sustains it, such as gaining attention, reassurance, predictability or continued interaction with a communication partner. Rather than simply attempting to reduce the behaviour, this thesis is interested in understanding why Lou communicates in this way, what these repeated messages may represent for her, and whether the responses they produce from the people and environment around her may contribute to their repetition.

Because Lou's communication profile is so complex, the speech pathology team at school struggle to clearly discern the function of her communication patterns. A repeated message such as "I want Mom" may represent a literal desire to see her mother, but it could also be a request for reassurance, social connection, something associated with her mother, a familiar routine or another meaning that is not apparent from the words themselves. Similarly, repeated requests for food or music could represent genuine preferences, sensory or emotional regulation, attention seeking, or be the result of boredom or simply a desire for control and autonomy.

Autism is a neurodevelopmental condition characterised by differences in social communication and interaction, alongside restricted or repetitive patterns of behaviour, interests or activities (American Psychiatric Association, 2022). These characteristics can present very differently from one autistic person to another and may include differences in social-emotional reciprocity, the use and understanding of verbal and non-verbal communication, sensory processing, preference for routines and highly focused interests. The level and type of support required can therefore vary considerably between individuals and across different environments and stages of life (Baumer & Spence, 2018).

Communication abilities vary considerably between autistic individuals, with some experiencing difficulties with spoken language or being nonspeaking and therefore relying on alternative forms of communication, such as AAC (White et al., 2021). Repetitive behaviours are not uncommon in autism and can serve various functions depending on the individual, the time and the context. Lung et al. (2024) identified four recurring functions of restricted and repetitive behaviours and interests: regulating sensory experiences, coping with anxiety, introducing certainty into the environment and making sense of the world. Cunningham and Schreibman (2008) refer to repetitive behaviours as "stereotypy" and discuss the importance of its function in autism. It is said to help with regulation and predictability, offer sensory experiences and/or act as a coping mechanism for environmental demands. It is for this reason that analysing and taking into account the style, time and context in which Lou communicates is very important. Lou's repetitive behaviours should not be seen as meaningless or inherently problematic, but rather as potentially functional. Her

communication style is thus not something to quell, but rather something to understand, and in so doing support Lou while offering her greater dignity and autonomy.

As a rule, Lou's iPad is put into Guided Access mode on Proloquo2Go upon arrival at school. The idea is that while at school she should only have access to her "voice" and not any of the many apps she tends to browse through at home as this would be disruptive. By enabling Guided Access Lou cannot freely move between applications. However, upon observation and trialling different strategies to see how her communication styles change accordingly, it was noted that with Guided Access removed Lou would generally move between Proloquo2Go, the Photos application, YouTube and Spotify. She tends to swipe through photographs of family members and play videos and songs she has taken a liking to. In these observations it was also interesting to note that she rarely seems to remain with one item for very long but switches from and between photographs, videos, songs and applications after only a few seconds. As mentioned, from a school's perspective this could be interpreted as distractibility, poor attention or a lack of engagement. However, from a speech pathology perspective, it could actually represent active choice-making, sensory seeking, self-regulation, or rather a means to independently entertain herself.

All these observations subsequently lead to the central question for the thesis: could greater autonomous access to preferred digital content be associated with fewer repetitive requests and increased regulation and engagement? As such the study will analyse and compare Lou's communication and behaviours when Guided Access is switched on as well as switched off. This will be accomplished by both a semi-structured interview with Lou's mother as well as by data collection whereby requests, engagement, responsiveness and regulation are tracked.

Meet Lou

Lou is a 18 year old student with Level 3 Autism who is completely nonspeaking and uses Proloquo2Go as her primary means of expressive communication. She attends a specialist school and is currently in a one-to-one educational programme designed to prepare her for the transition to completely individualised adult services. Lou is able to use Proloquo2Go independently and communicates a range of desires, needs and wants with it. Additionally, Lou tends to be highly responsive to other forms of visual supports such as her daily schedule, which she independently points at when she wants to know when a preferred activity will occur. That being said, her communication, processing time and level of independence vary considerably depending on the day and context. At times she will respond immediately to requests and at other times this may take several minutes, if at all. Her regulation and participation also tend to vary and are heavily influenced by several factors such as, for example, her menstrual cycle and the intense pain this brings for her. In her daily life Lou is not on any prescribed medication. However, on days where she is in intense physical pain painkillers get crushed up and dissolved into her juice boxes as she will refuse to consume any medication otherwise given.

Lou possesses substantial gross motor skills and can independently use her iPad and conduct several day-to-day activities. Lou's fine motor skills, however, generally require assistance. Opening her juice boxes or packets of chips for example requires help from other people. Lou seems to prefer sitting on the floor, often in corners, and prefers limited interaction with peers during unstructured periods.

Lou loves music, photographs and videos of familiar people, and sensory experiences such as perfumes and moisturisers. This is evident in her frequent requests for preferred songs, foods, activities and familiar people, as well as her activity on her iPad when in unrestricted mode where she tends to watch her favourite pop videos as well as browse through pictures of herself and her loved ones. At times, these requests become repetitive and insistent, and when she feels unheard, she may yell, bang walls or doors, or attempt to gain attention from others. As mentioned, the meaning of these repeated requests is not always evident. A repeated request for mom could possibly represent anything from the literal desire for mom to a desire for something associated with her such as actions or behaviours mom is known to do. For example, giving Lou reassurance, a hug or a kiss. It is also important to be aware of the fact that Lou has a very strong understanding of expectation and is wont to reply to a question with an answer she knows she is expected to give rather than a true reflection of her feelings. For example, during the first lesson of the day, known as morning meeting, Lou is always asked how she is feeling that day. Lou has a great mastery over Proloquo2Go and knows exactly where her "feelings" folder is. However, she tends to answer the question with random feelings that don't seem to represent her true state. She thus tends to answer with "sick" even though she shows no signs of actually being sick or "hungry" despite her lunchbox being open and next to her without her eating any of it. It is clear that in situations like these her communication seems to be that of appeasement/filling expectation, rather than an honest communication of feelings/wants/needs.

Theoretical Framework and Literature Review

ASHA defines augmentative and alternative communication as a range of methods that supplement or replace spoken communication. These can include gestures, signs, communication boards and electronic speech-generating devices. AAC can support functions such as expressing wants and needs, feelings and ideas (American Speech-Language-Hearing Association [ASHA], n.d.). According to Light and McNaughton (2014) communicative competence "rests on the dynamic integration of linguistic, operational, social, and strategic skills in response to the communicative demands within real world interactions with various partners in the natural environment." Understanding communicative competence is pertinent to this research as it shows us that individuals such as Lou aim to communicate and interact with their environment using AAC devices. It begs not the question of whether Lou can communicate or not, but rather whether the environment and barriers of her communication influence what and how she communicates. Research to date has shown positive outcomes on the sheer usefulness of speech-generating devices for

autistic people (Lorah et al., 2015; Kaneda & Sasaki, 2025). According to research conducted by Still et al. (2014) majority of research on the use of high-tech AAC devices with autistic children was predominantly targeted at the making of requests. It is for this reason that other research, such as that of Logan et al. (2017) highlight the need to research not just the making of requests, but also a wider range of communicative functions and behaviours. These sentiments are further seconded by Mifsud et al. (2026) who also found that AAC research predominantly focuses only on the making of requests with very little attention being given to broader outcomes such as wellbeing, social interaction and quality of life. In the same vein, Therrien et al. (2025) highlight the limited research examining AAC beyond requesting, despite evidence that AAC interventions can support communication across diverse functions, and call for further research in this area.

For this research it is also important to acknowledge and understand the principles of autonomy and self-determination. Wehmeyer et al. (2017) conceptualise self-determination in terms of acting volitionally and being the causal agent in one's own life, including making choices and acting in accordance with personally chosen goals. Autonomy therefore involves having control over one's own choices and actions. It is important, however, to distinguish between communicating a preference and exercising control over what happens as a result. Communicating a preference may demonstrate that an individual has expressed a choice, but this does not necessarily mean that they have been able to influence or control the subsequent outcome. Lou might communicate "I want music", but subsequently she has no control over how this request is interpreted. The song that gets played, for how long it gets played, how loud it gets played and many other variables are out of her hands. Light et al., 2007 discuss how AAC technologies can integrate multiple functions, supporting not only communication but also social interaction, play, artistic expression and other activities. For Lou, her iPad can thus serve as a means of communication, but also as a tool for greater control over her own desires. It allows her to open apps as she pleases, interact with her preferred content when and how she decides, without needing another person to - most likely falsely - interpret her requests. Research has consistently highlighted the importance of self-determination during adolescence and the transition to adulthood. This is particularly relevant for autistic young people, for whom self-determination is associated with more positive outcomes during the transition to adulthood (Martino et al., 2025; Cristescu et al., 2025). Research by Cristescu et al. (2025) also highlights that self-determination is shaped by the interaction between the individual and their environment, rather than being merely an individual skill. This thesis therefore considers autonomy not only as an educational objective, but also as a potential factor influencing Lou's communication itself.

Another important concept for this thesis is restricted and repetitive behaviour (RRB hereafter), and its potential role in regulation. RRBs are a core diagnostic feature of autism and encompass a heterogeneous range of behaviours, including repetitive motor behaviours and speech, restricted interests, and

insistence on sameness (Uljarević et al., 2023). Importantly, RRBs should not necessarily be understood as maladaptive behaviours; research suggests that they can serve regulatory and adaptive functions, including helping autistic people regulate sensory experiences, cope with anxiety, and introduce certainty into their environment (Lung et al., 2024). That being said, the form an RRB takes often provides limited information about its underlying function, meaning that the same or similar behaviours may serve different functions depending on the individual and context - as is the case with Lou. Additionally, research by Bodfish et al. (2000) highlights the considerable variety in the types of repetitive behaviours observed among autistic individuals. Similarly, Cunningham and Schreibman (2008) argue that RRBs should be understood in relation to their possible functions rather than taken at face value based solely on their observable form. They emphasise that similar behaviours may be associated with different functional properties and therefore caution against assuming a particular function based on the behaviour's form alone. Lung et al. (2024) go on to argue that restricted and repetitive behaviours and interests are proven to serve as self-regulatory and adaptive roles. This can take many forms, such as helping to regulate sensory experiences, cope with anxiety and introduce predictability or control into one's environment. Lastly, Bird et al. (2024) found positive associations between restrictive/repetitive behaviours, anxiety, and intolerance of uncertainty in autistic people. Their findings further suggest that RRBs may be relevant to how autistic people respond to uncertainty and anxiety, highlighting the importance of understanding the possible function of these behaviours rather than viewing them solely in terms of their observable form. In Lou's case, repetitive requests for "Mom", "Bee", food, or music may serve different communicative functions depending on the context in which they occur. Although the observable form of the request may remain the same, its underlying function may vary: it could represent a literal request for the desired person or activity, an attempt to gain social attention, a means of seeking reassurance or predictability, an expression of preference, or a strategy for supporting self-regulation. Thus, interpreting Lou's repetitive requesting requires consideration of the broader context and the possible function of each communicative act, rather than assuming that the form of the behaviour alone indicates its purpose.

Next, this thesis aims to discuss 'engagement' and how it relates to young adults with Autism. Firstly, it should be noted that engagement is not solely equivalent to remaining on one activity for an extended period of time (Meduri et al., 2026). In the case of Lou for example, when Guided Access is removed, she is seen to rapidly move and switch between Proloquo2Go, photographs, YouTube and Spotify. She often looks at a photograph or listens to a song for just a few seconds before moving to something else. Viewed without consideration of the broader context, such behaviour could be interpreted as distraction, poor attention or disengagement. However, an autism-informed interpretation could instead interpret these behaviours as active choice-making, sensory exploration, regulation and/or environmental control. Research by

Grynszpan et al. (2014), Kagohara et al. (2013), and Wang et al. (2024) suggests that digital technologies can provide useful and potentially engaging opportunities for autistic individuals across a range of activities and intervention contexts. However, the benefits of digital technology are not universal, with outcomes varying across individuals, technologies, activities, and contexts. This highlights the importance of considering not simply whether technology is used, but how it is used, for whom, and for what purpose. As is the case with Lou, Maun et al. (2024) highlight that engagement with digital technology among autistic people is influenced by individual preferences and needs, as well as by the structure, context and support provided. Thereby reinforcing the importance of understanding what the technology means to the individual at hand rather than judging engagement only by conventional measures of sustained attention. Additionally, preferred interests may play an important role in participation and engagement. Koegel et al. (2013) found that incorporating autistic adolescents' preferred interests into social activities increased both their engagement with peers and their rate of social initiations. For Lou it would thus be interesting to see how engaged and responsive she remains during class, where she is often called on to make choices or respond to questions. Will having unrestricted access to her device distract her or will it help her regulate herself and feel more at ease to the point that participation becomes easier?

Lastly, this theoretical framework seeks to discuss how AAC communication, as with all communication, is heavily influenced by communication partners and context. A person using an AAC device does not communicate in isolation and the responses they get from communication partners strongly determines what happens after the interaction occurs. Kent-Walsh et al. (2015) found that communication partner teaching was highly effective in improving the communication performance of individuals who use AAC, with a very large overall effect across the studies reviewed. This highlights the importance of training communication partners, rather than focusing AAC intervention solely on the individual who uses the device. Similarly, AAC literature emphasises the importance of providing communication opportunities within naturalistic and contextually relevant environments, while supporting the generalisation of communication skills across settings and communication partners (Kleinert et al., 2023; Schlosser & Lee, 2000). For this thesis this is particularly relevant to grasp as interpreting Lou's repetitive requests may happen differently by all the different people in her life such as her mother, her support worker and her teachers, based on their own experiences with her. Training and information sharing on Lou's requests and their assumed interpretations across the different environments can help illuminate certain requests that one would never know as they are context driven. It is for this reason that alongside quantitative research, an interview will be conducted to obtain an understanding of the different contexts in which Lou finds herself and the different interpretations and responses offered.

In conclusion, on a theoretical level this thesis deliberately opts for a broad lens. Lou's repetitive AAC requests may be the result of several intersectional factors, such as literal communication, seeking autonomy, attempts at regulation, sharing preferred interests, fostering engagement, and understanding social interaction and the environment in which communication takes place. The study does not attempt to pinpoint in advance whether her requests represent gestalt language processing, stimming, attention seeking, boredom or another function. Instead, it seeks to ascertain whether changing one environmental factor, such as, in this case, her autonomous access to preferred digital content, will lead to any measurable changes in requests, regulation and engagement. This individualised approach is consistent with the wider AAC literature, which highlights the importance of considering individual characteristics, preferences and communication needs when selecting and implementing AAC. Research indicates that different AAC systems and interventions do not necessarily produce equivalent outcomes across individuals, with learner characteristics and intervention factors potentially influencing effectiveness (Ganz, 2015; Gevarter et al., 2013; Ganz et al., 2023).

Research Questions and Hypotheses

Main research question

Does increasing autonomous access to preferred digital content reduce repetitive requesting and support regulation and engagement in a nonspeaking autistic student who uses a speech generating device?

Alternative hypothesis

H1: Increased autonomous access to preferred digital content will be associated with a lower frequency of repetitive requesting and increased regulation and engagement.

Null hypothesis

H0: Increased autonomous access to preferred digital content will not be associated with a meaningful difference in repetitive requesting, regulation or engagement.

METHODOLOGY

Research design

This study used a single-case mixed-methods approach combining quantitative observations with a semi-structured interview. The research plan was presented to Lou's mother and the school before data collection so that the necessary consent and permission could be obtained. Quantitative data were collected across 26 one-hour observation periods, comprising 13 Guided Access ON observations and 13 Guided Access OFF observations. The two conditions were interspersed across the data-collection period rather than forming a conventional sequential AB design. During each observation period, staff recorded Lou's verbatim AAC utterances and their frequency, response time, engagement and regulation ratings, together with contextual notes. Existing school engagement and regulation scales were used. The qualitative component consisted of a 19-question semi-structured interview with Lou's

mother exploring Lou's communication, repetitive requesting, iPad use and possible contextual influences.

Quantitative data

Quantifying Lou's requests will take place within Lou's usual school environment during classroom activities and not during any of her regular outdoor activities. The familiar and everyday setting is important for this study as it aims to examine her baseline, everyday communication and regulation rather than behaviour produced in an unfamiliar environment. The primary independent variable will be Lou's access to digital content on her iPad. When Guided Access is on, the device will be restricted to Proloquo2Go. When Guided Access is off, Lou will have independent access to her preferred digital content, which includes photographs, favourite videos and music. The study will therefore compare her communication, engagement, regulation and response time under these different conditions while she remains in her usual school environment.

To ensure consistency in quantifying the data across days and staff members an observation sheet will be made available. The sheet will require the staff member interacting with Lou during that hour to write the date and time, as well as their own name and whether guided access is on or off. Subsequently they will be required to write down each distinct prompt or request made by Lou and tally the number of times that prompt was repeated in that hour. Throughout the hour staff members will also be advised to make notes of any observations or thoughts they might have on the research topic. Additionally, they will be asked to count and write down the number of seconds between each instruction they give Lou or each question they ask her and the time it takes her to respond or initiate a response. At the end of the hour the staff member will also be asked to consult the regulation and engagement scales and give an average score for that hour as well as determine whether the average response time for the time period was very slow, slow, good or very good. To ensure consistency all staff members will need to fully understand the above instructions as well as guaranteeing that they each track exactly one hour of data and that the data only be tracked in classroom settings. Ultimately the research aims to have an equal number of hours of data both on and off guided access and also of the same times.

Table 1.

Observation sheet. Date. Guided Access ON/OFF. Data taken by. Time.

Prompt	Amount	Comments
lore ipsum	X	
Engagement	X/5	
Regulation	X/5	
Response time		
Observations:		
Observations:		

Table 2.

Regulation scale

5	Fingers in ears/repetitive adjusting of clothes
4	Exaggerated blinking/throwing items/spitting out food/tapping ears
3	Grabbing staff/ crying with tears/ teeth grinding
2	Kicking or hitting door or furniture/dropping to ground/screaming
1	Targeting/pinching staff/biting self or others

Table 3.

Engagement scale

1	Actively Disengaged
2	Disengaged
3	Onlooking
4	Supported engagement
5	Coordinated engagement

Table 4.

Response time

Very good	under 30 seconds
Good	30-60 seconds
Slow	60-120 seconds
Very slow	120+ seconds

Qualitative data

The interview will explore the occurrence and possible function of Lou's repetitive requests across settings, including whether she requests particular people at home, whether similar behaviours occur outside school, what tends to happen before and after a request, how communication partners respond, whether she has independent access to digital media, how she spends unstructured time and whether familiar people believe that particular phrases may have meanings beyond their literal wording. The qualitative data will be analysed thematically to identify recurring patterns in Lou's communication, regulation and use of digital content. These accounts will not be treated as definitive explanations of Lou's communication but will provide additional perspectives that can be considered alongside the direct observations.

1. What kinds of words, phrases or sentences does Lou use most frequently on her AAC device around you, and are there any that she repeats particularly often?
2. For each of the requests you mentioned, how do you usually respond?
3. Why do you think Lou requests you (Mum) so much? Is there something you offer or do that nobody else does that she might be hinting at?
4. Does Lou ask for you as well when she is actually with you?
5. Do you think she is actually requesting you, or could she sometimes be requesting something you represent, offer or do?

6. What are the most common activities you do with Lou, both at home and out of the house?
7. Do you think Lou's requests are always literal, or could they sometimes refer to broader concepts that she is trying to communicate?
8. Does Lou also repetitively request things when she is around you? If so, why do you think she does this?
9. Do you think the meaning of a request can change depending on the situation? Can you think of an example?
10. Does Lou usually stop requesting something after it has been offered to her?
11. Have you noticed situations in which Lou's repetitive requesting becomes more frequent or less frequent? What factors do you think might influence this?
12. How does Lou usually communicate or behave when she feels that she is not being heard or understood?
13. How does Lou use her iPad when she has greater independent access to it, rather than being restricted by Guided Access? What does she typically look at or do?
14. What effect do you think access to photographs, videos, music or other preferred digital content has on Lou? For example, do you think it regulates her, entertains her, reassures her, gives her something to focus on, or something else? What have you observed that makes you think this?
15. Does Lou have her iPad on Guided Access or not when she is with you?
16. What happens when Lou cannot immediately access something she is requesting? Does her communication or behaviour change?
17. Do you think giving Lou greater independent access to preferred digital content could change how often she requests people, songs, food or other things? Why or why not?
18. Are there particular things you do with Lou, or ways you respond to her, that you think may be different from how other people interact with her and could influence her communication or regulation?
19. Is there anything else about Lou's communication, repetitive requesting, iPad use, regulation or need for autonomy that you think is important for me to understand for this study?

Data analysis

Once the data has been collected this will be analysed as follows. Firstly, a list of all requests and prompts will be compiled ordered from most to least requested. Secondly, an average amount of requests with guided access on will be compared to the average amount of requests with guided access off, both for the total amount of requests as well as merely the requests for mom. SCED line graphs of session-by-session total utterances and Mom-related utterances will also be plotted by Guided Access condition to allow visual analysis of level, variability, trend and overlap across observations. Thirdly, contextual patterns will also examined descriptively across time of day, weekday and recurring school activities, irrespective of Guided Access condition. Fourthly, to complement the

visual analysis, Nonoverlap of All Pairs (NAP) and Tau-U will be calculated for all total and Mom-related utterances, treating Guided Access ON as the reference condition and fewer utterances under Guided Access OFF as the direction of effect. NAP will be selected because it uses all pairwise comparisons between conditions, while Tau-U additionally allows adjustment for trend in the reference series (Parker & Vannest, 2009; Parker et al., 2011). Given the alternating rather than conventional AB design, Tau-U will be interpreted descriptively. Fifthly, the research will aim to make note of any interesting observations made regarding Lou's communication. Lastly, the quantitative and qualitative findings will then be considered together. For example, a reduction in repetitive requesting during periods of increased digital access could be considered alongside interview responses concerning Lou's behaviour at home and the possible functions of particular requests. Conversely, if requesting does not decrease, the qualitative information may help identify alternative explanations, such as social connection, reassurance or another communicative function. The qualitative findings will therefore complement rather than prove or determine the meaning of the quantitative observations.

Ethical considerations and potential confounding variables

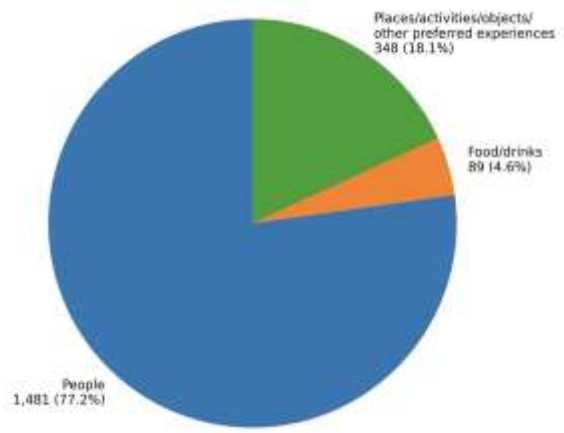
At all times, Lou's privacy and dignity will be protected throughout the study, and her real name and identifying information will not be included in the thesis. Additionally, appropriate consent procedures will be followed. Similarly, Proloquo2Go will remain available throughout the study so she always has access to her "voice", and it will remain important to always remember that the purpose of increasing access to digital content is not to suppress her repetitive communication or restrict Lou's ability to communicate. Rather, the study investigates whether greater autonomy over preferred content may change the frequency or type of some repetitive requests. Any digital content made available will comply with school policies and safeguarding requirements, and information obtained from interviews, school records and AAC history will remain confidential. A number of potential confounding variables will also be considered because Lou's behavioural patterns can vary substantially between days. Many influencing factors include menstrual cycle and menstrual pain, tiredness, hunger, changes in routine, transitions, time of day, staff member, type of lesson, physical discomfort, level of adult interaction and processing demands. Recording these factors will help ensure that changes in requesting or regulation are not automatically attributed to iPad access when they may instead be associated with other aspects of Lou's environment or state.

RESULTS

Across 26 hours of observation, 1,990 utterances were recorded, averaging 76.5 utterances per hour. Of these, 1,918 were classified as request-like utterances. People accounted for 1,481 requests (77.2%), food or drinks for 89 (4.6%), and places, activities, objects or other preferred experiences for 348 (18.1%).

Figure 1.

Request-like utterances by category (n = 1,918)



Mom-related utterances were by far the most frequent request target, occurring 968 times and accounting for 50.5% of all request-like utterances and 65.4% of all person-related requests. Bee was the next most frequently requested person (198), followed by Dad (62). Together, Mom, Bee and Dad accounted for 82.9% of all person-related requests.

A substantial descriptive difference emerged between Guided Access conditions. Across 13 Guided Access ON hours, 1,211 request-like utterances were recorded, averaging 93.2 per hour, compared with 707 across 13 Guided Access OFF hours, averaging 54.4 per hour. Request-like output was therefore approximately 41.6% lower when Guided Access was OFF. However, this reduction was not accompanied by a clear corresponding change in Lou's observable regulation, engagement or response time. Engagement, regulation and response time continued to vary across individual observation periods.

Figures 2 and 3 present the session-by-session data and demonstrate considerable variability and overlap between conditions despite generally lower levels during Guided Access OFF observations.

Figure 2.

Session-by-session total recorded utterances under Guided Access ON and OFF.

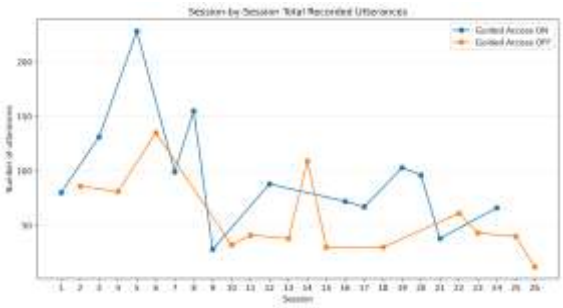
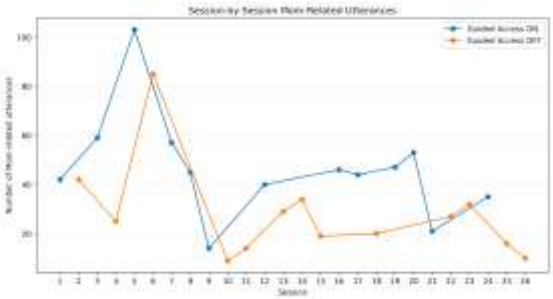


Figure 3.

Session-by-session Mom-related utterances under Guided Access ON and OFF.



Nonoverlap analyses supported the same overall pattern: NAP was .740 for request-like utterances and .822 for Mom-related utterances, while the corresponding trend-adjusted Tau-U values were .314 and .527, respectively. The condition difference was therefore more consistent for Mom-related communication than for request-like utterance frequency overall.

Requesting also appeared strongly related to time of day and context when Guided Access condition was disregarded. Food and drink requests were somewhat more frequent before noon, occurring 55 times across 14 morning observations (3.9 per hour), compared with 34 times across 12 observations from noon onwards (2.8 per hour). This pattern was particularly apparent between 9 and 10am, although a single 12–1pm observation also contained a high number of food requests. A much stronger temporal pattern occurred for Bee-related communication. Of 198 Bee-related requests, 187 (94.4%) occurred from noon onwards. As Bee is the person who picks Lou up, this concentration later in the day is consistent with anticipation of going home. Bag-related communication showed a different pattern: 60 of 79 bag-related requests occurred before noon. As Lou wears her bag whenever leaving for another location, including offsite activities as well as going home, bag may instead be associated with anticipation of transitions or leaving more generally.

Several requests also showed strong associations with recurring school activities. All 12 hair-related requests occurred during Monday 2–3pm observations, corresponding with Friendship Group, with nine occurring during an observation explicitly recorded as taking place while the group was doing hair. Hall-related requests showed an even stronger concentration: 54 of 57 (94.7%) occurred during a Tuesday 12–1pm observation, consistent with Giant Jamboree taking place on Tuesdays in the school hall. In contrast, perfume showed no fixed weekday or time-of-day pattern, occurring across Tuesday morning, Wednesday early afternoon and Friday afternoon observations. This is consistent with Take a Moment being scheduled flexibly by the classroom teacher rather than occurring at a fixed time. Willo Cafe also showed a temporal pattern, with all 24 requests occurring before noon. Together, these observations suggest that some recurrent utterances were closely associated with anticipated transitions, familiar activities and the structure of Lou's school day. Lou also sometimes requested items that were already available without subsequently using or consuming them.

These quantitative observations were supported and nuanced by the qualitative interview with Lou's mother, referred to here by the pseudonym Nancy. Nancy reported that Lou's common communication at home includes "I want Mum", "I want book", and numerous food and drink requests. Importantly, she reported that repetitive requesting also occurs at home, where Lou does not use Guided Access. Nancy additionally reported that Lou frequently requests Mom while Mom is already physically present, does not necessarily stop requesting once something has been provided, and generally remains calm if something cannot immediately be accessed, instead simply continues to ask for it.

Nancy also suggested that Lou's requests are not necessarily literal. She proposed that "I want" may sometimes function more like "I like", particularly because Lou may request something she already has. In relation to Mom specifically, Nancy suggested that Lou may be requesting one-to-one interaction. When Nancy approaches her, Lou will often smell

her hair, and Nancy described herself as particularly present with Lou at home. Food requesting was similarly described as potentially anticipatory: Nancy suggested that Lou likes to "plan ahead" and ensure that she has a steady stream of food.

During unrestricted iPad access, Lou independently moved between Proloquo2Go, YouTube and Photos. On YouTube, she predominantly skimmed through music and ASMR-type videos, including clips involving sweet and chocolate wrappers; in Photos, she viewed photographs of herself, family members and her dog. Nancy similarly reported that Lou independently accesses digital content at home and suggested that photographs and videos may sometimes help her "make sense of things", giving the example of Lou watching an old video of herself playing with Play-Doh following a current Play-Doh activity.

Finally, menstrual pain appeared to coincide with quieter and less varied communication. During several pain-related observations Lou was described as quieter, slower to respond and less engaged, sometimes becoming chattier as pain medication appeared to take effect. Mom nevertheless remained a recurring communicative theme even when Lou's overall output was reduced.

Discussion

The Guided Access comparison provides an interesting but more nuanced result than the original hypothesis predicted. Removing Guided Access was associated with a substantial reduction in request-like utterances, from 93.2 to 54.4 per hour, while Mom-related utterances decreased from 46.6 to 27.8 per hour. The NAP and Tau-U estimates supported the same direction of effect, particularly for Mom-related utterances, while the session graphs demonstrated substantial variability and overlap between conditions. Importantly, this reduction did not correspond with any clear observable improvement or deterioration in regulation, engagement or response time.

The findings may suggest that unrestricted iPad access changes how Lou distributes her attention and communicative activity. When Guided Access was ON, Proloquo2Go was essentially the available pathway through the device, and recorded AAC output was substantially higher. When Guided Access was OFF, Lou could independently move between communication, photographs and videos, and AAC requesting decreased without an observable accompanying change in regulation or engagement. This may mean that some functions otherwise expressed through AAC are alternatively met through autonomous digital activity. However, the reduction could also reflect attentional or motor competition: while Lou was navigating YouTube or Photos, her visual attention and physical interaction with the iPad were directed towards media rather than Proloquo2Go, meaning the present study cannot determine whether requesting decreased because an underlying regulatory need was met or simply because fewer attentional and motor resources were available for AAC use. The absence of a corresponding observable change in regulation, engagement or response time makes this distinction particularly important.

The interview also makes it difficult to conclude that digital restriction alone causes Lou's repetitive requesting. Nancy reports that Lou requests frequently at home despite having unrestricted access to her iPad. The most defensible interpretation is therefore not that Guided Access creates repetitive communication, but that the availability of alternative independently accessible activities may influence its frequency, while the underlying communicative functions remain considerably more complex.

Mom-related utterances represented 50.5% of all request-like communication and 65.4% of all person-related requests, yet Nancy reports that Lou also says "I want Mom" while Mom is already beside her. Nancy's suggestion that Lou may instead be requesting one-to-one interaction, combined with her observation that Lou commonly smells her hair when she approaches, raises the possibility that "Mom" represents a broader experience involving closeness, familiarity, interaction or sensory experience.

The possibility of object permanence is worth considering here but cannot be resolved by the present study. Lou's extremely frequent requests for an absent Mom might initially raise the question of whether she fully understands that Mom remains elsewhere when not visible or accessible. However, the qualitative finding that Lou also requests Mom while Mom is physically present argues against treating difficulties with object permanence as the obvious explanation. The present data were not designed to assess Lou's understanding of object permanence, absence or location, so this remains an interesting question for future investigation rather than a conclusion.

Nancy's interpretation that Lou sometimes uses "I want" to communicate something closer to "I like" may also explain several otherwise puzzling quantitative observations. Lou sometimes requested food she already possessed, continued requesting after an item became available, or requested something without subsequently using it. Nancy similarly reports this behaviour at home. Consequently, counting each "I want X" as an instrumental attempt to obtain X risks imposing a linguistic interpretation that may not correspond with Lou's intended meaning.

The temporal and activity-related patterns provide further support for this interpretation. Bee-related communication was overwhelmingly concentrated later in the day, which is consistent with Bee's role in picking Lou up, whereas bag-related communication occurred more frequently in the morning and may therefore relate more broadly to anticipated transitions or offsite activities. Hair-related communication occurred exclusively during Monday 2–3pm observations associated with Friendship Group, while almost all hall-related communication occurred during one Tuesday observation, consistent with the timing of Giant Jamboree. Perfume did not show a fixed day or time pattern, which is consistent with Take a Moment being scheduled flexibly. These patterns suggest that some recurrent utterances may reflect anticipation, association with familiar routines or signalling of upcoming activities rather than only literal attempts to obtain an immediately available person, place or object.

The same issue is apparent in utterances such as "I want Lou", "Finished Andy", "Finished tissue", "Finished garbage bin", "God", "Jug", "Coffee maker", and emotional vocabulary including "Curious", "Tired", "Depressed", "Happy", "Sad" and "Sick". Some corresponded clearly with immediate events, while others did not. Nancy's observation that Lou occasionally uses words appropriately that she has never explicitly been taught, leading her to believe that Lou may "know more than we realise", is particularly relevant here. These utterances may represent exploration, associations, commenting or other communicative functions rather than erroneous requests. The present study cannot establish their intended meaning, but it provides good reason not to dismiss them simply because their literal interpretation is unclear.

The digital behaviour observed under Guided Access OFF may similarly be more meaningful than simply "watching YouTube". Lou repeatedly selected music, sensory/ASMR content and photographs of herself, her family and her dog. Nancy's observation that photographs and videos may help Lou make sense of experiences suggests another possible function for this behaviour. The iPad may therefore operate simultaneously as a communication system, entertainment source, collection of familiar people and memories, sensory resource and means of exercising independent choice.

Taken together, the qualitative and quantitative findings suggest that the central issue is not simply whether repetitive requesting increases or decreases. Lou produced substantially fewer requests when given greater digital autonomy, but she was not observably more or less regulated, engaged or responsive. At the same time, the interview suggests that many of her requests cannot be understood literally and that repetitive communication persists even in an unrestricted home environment. The more useful question may therefore be what individual utterances allow Lou to express or achieve in different contexts.

Limitations of the Study

The findings should be interpreted cautiously. Lou's communication varied alongside numerous uncontrolled factors, including time of day, menstrual pain, medication, hunger, tiredness, lesson type, routine, staff member, processing demands, activities immediately preceding observations and potentially circumstances at home. These were recognised within the study as possible confounding variables.

Data collection itself was also understandably imperfect. Staff were simultaneously responsible for teaching and supporting Lou and could not dedicate their full attention to tallying every utterance. Additionally, no observation period was independently and simultaneously coded by a second observer, meaning that Inter-Observer Agreement (IOA) could not be calculated. The absence of IOA represents a primary threat to internal validity, as consistency in how different observers identified and tallied Lou's utterances cannot be quantified. Offsite programmes further restricted available observation periods, meaning data were disproportionately collected during particular parts of the school

day. Differences between Guided Access conditions could therefore partly reflect contextual differences rather than Guided Access itself.

The measures of engagement, regulation and response time were observational rather than objective physiological measures. The absence of an observable difference between conditions therefore means only that no clear difference was captured by these measures, not that unrestricted access had no internal emotional, cognitive or regulatory effect on Lou.

The qualitative data likewise provide valuable context but cannot determine Lou's intended meaning. Nancy knows Lou extremely well, but interpretations such as "I want" meaning "I like", food requesting representing planning, or Mom representing one-to-one interaction remain hypotheses rather than established communicative functions. As intended by the study's mixed-methods approach, these accounts should complement rather than determine interpretation of the quantitative findings.

Future Research Directions and Prospects

Future research should move beyond simply counting utterances and investigate what happens before, during and after particular recurrent messages. "I want Mom" is especially important. Future observations could compare instances when Mom is absent versus present, during transitions and home-time anticipation, and following different adult responses. This could help distinguish whether "Mom" functions differently across contexts. A separate appropriately designed study would be required to investigate questions surrounding Lou's understanding of absence, location or object permanence.

Digital behaviour should also be examined more closely. Rather than treating Guided Access as simply ON versus OFF, future studies could measure the amount of time Lou independently spends on Proloquo2Go, Photos and YouTube; the content she selects; how frequently she switches between them; and what communication occurs immediately before and afterwards. Nancy's suggestion that photographs and videos can help Lou make sense of experiences provides a particularly interesting avenue for investigating whether personal digital media supports memory, understanding, anticipation or regulation.

Future research should also collect more systematic data across home and school. This is particularly important because Nancy reports that repetitive requesting remains common at home despite unrestricted iPad access. Comparing the same utterances across environments could help establish whether their apparent functions change according to communication partner, setting and available autonomy.

Finally, future studies should examine communication diversity alongside frequency. The period observations suggest that physical discomfort may reduce the variety of Lou's communication even where highly salient messages such as Mom remain present. Measures such as number of unique utterances, communicative functions and vocabulary diversity may therefore reveal more than total request counts alone. Future studies should

also have a second independent observer for the same sessions so that interobserver agreement can be calculated and the reliability of the observational data can be established.

Conclusions

This thesis set out to investigate whether increasing Lou's autonomous access to preferred digital content on her iPad would reduce repetitive requesting while supporting her regulation and engagement. The findings partially supported this hypothesis. Across 26 hours of observation, request-like utterances decreased from an average of 93.2 per hour when Guided Access was ON to 54.4 per hour when it was OFF, a reduction of approximately 41.6%. However, this decrease was not accompanied by any clear observable change in regulation, engagement or response time. Greater autonomous access therefore appeared to influence how frequently Lou used Proloquo2Go for request-like communication, but the results do not demonstrate that it clearly improved or worsened her overall regulation or participation.

More importantly, the findings suggest that Lou's repetitive communication is more complex than the literal wording of her requests. Mom-related utterances accounted for just over half (50.5%) of all request-like communication, yet Lou's mother reported that she also requests Mom when Mom is already physically present. Lou similarly requested foods and objects that were already available to her and sometimes continued requesting them after they had been provided. Her mother suggested that "I want" may sometimes function more like "I like", while "Mom" may sometimes represent one-to-one interaction, familiarity or something else associated with her mother. The strong relationship between request content, time of day and recurring activities further supports this interpretation. Food requests were somewhat more frequent earlier in the day, Bee-related communication was overwhelmingly concentrated later in the day as home time approached, and requests such as hair and hall were strongly clustered around recurring school activities. Perfume appeared across different days and times, consistent with the flexible scheduling of Take a Moment. These patterns suggest that Lou's AAC communication may involve anticipation, transitions, preferences, associations and familiar routines rather than straightforward requesting alone.

Ultimately, this study does not provide one definitive explanation for why Lou communicates in the way she does, nor should reducing her repetitive communication necessarily be considered the end goal. Instead, the findings highlight the importance of looking beyond the words produced by the AAC device and considering the individual, context and possible function behind them. Greater digital autonomy was associated with considerably less repetitive AAC output without an observable negative effect on Lou's regulation, engagement or responsiveness, making it worthy of further investigation. At the same time, the complexity and context-dependence of her communication demonstrate the importance of continuing to observe, listen and question what individual utterances may allow Lou to express or

achieve. In doing so, the people around her may be better able to understand her communication, respect her autonomy and support her as she transitions into adulthood.

REFERENCES

American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders* (5th ed.). https://doi.org/10.1176/appi.books.9780890425787

American Speech-Language-Hearing Association. (n.d.). *Augmentative and alternative communication (AAC).* https://www.asha.org/practice-portal/professional-issues/augmentative-and-alternative-communication/

Baumer, N., & Spence, S. J. (2018). Evaluation and management of the child with autism spectrum disorder. *Continuum, 24*(1), 248–275. doi.org/10.1212/CON.0000000000000578

Bird, S., Moid, L. A. E., Jones, C. A., & Surtees, A. D. R. (2024). The relationships between restrictive/repetitive behaviours, intolerance of uncertainty, and anxiety in autism: A systematic review and meta-analysis. *Research in Autism Spectrum Disorders, 117*, 102428. doi: 10.1016/j.rasd.2024.102428

Bodfish, J. W., Symons, F. J., Parker, D. E., & Lewis, M. H. (2000). Varieties of repetitive behavior in autism: Comparisons to mental retardation. *Journal of Autism and Developmental Disorders, 30*(3), 237–243. doi:10.1023/A:1005596502855

Cristescu, L., Papoudi, D., & Douglas, G. (2025). A systematic review of interventions on self-determination for autistic individuals and those with a learning disability: An ecological approach. *Review Journal of Autism and Developmental Disorders.* Advance online publication. doi.org/10.1007/s40489-025-00508-y

Cunningham, A. B., & Schreibman, L. (2008). Stereotypy in autism: The importance of function. *Research in Autism Spectrum Disorders, 2*(3), 469–479. doi: 10.1016/j.rasd.2007.09.006

Ganz, J. B. (2015). AAC interventions for individuals with autism spectrum disorders: State of the science and future research directions. *Augmentative and Alternative Communication, 31*(3), 203–214. doi:10.3109/07434618.2015.1047532

Ganz, J. B., Pustejovsky, J. E., Reichle, J., Vannest, K. J., Foster, M., Pierson, L. M., Wattanawongwan, S., Bernal, A. J., Chen, M., Haas, A. N., Liao, C.-Y., Sallese, M. R., Skov, R., & Smith, S. D. (2023). Participant characteristics predicting communication outcomes in AAC implementation for individuals with ASD and IDD: A systematic review and meta-analysis. *Augmentative and Alternative Communication, 39*(1), 7–22.

doi.org/10.1080/07434618.2022.2116355

Gevarter, C., O'Reilly, M. F., Rojeski, L., Sammarco, N., Lang, R., Lancioni, G. E., & Sigafoos, J. (2013). Comparing communication systems for individuals with developmental disabilities: A review of single-case research studies. *Research in Developmental Disabilities, 34*(12), 4415–4432. doi: 10.1016/j.ridd.2013.09.017

Grynszpan, O., Weiss, P. L., Perez-Diaz, F., & Gal, E. (2014). Innovative technology-based interventions for autism spectrum disorders: A meta-analysis. *Autism, 18*(4), 346–361. doi:10.1177/1362361313476767

Kagohara, D. M., van der Meer, L., Ramdoss, S., O'Reilly, M. F., Lancioni, G. E., Davis, T. N., Rispoli, M., Lang, R., Marschik, P. B., Sutherland, D., Green, V. A., & Sigafoos, J. (2013). Using iPods® and iPads® in teaching programs for individuals with developmental disabilities: A systematic review. *Research in Developmental Disabilities, 34*(1), 147–156. doi: 10.1016/j.ridd.2012.07.027

Kaneda, M., & Sasaki, G. (2025). The relationship between the use of speech-generating devices and verbal requests in children with autism spectrum disorder and intellectual disabilities. *Journal of Autism and Developmental Disorders*. Advance online publication. doi:10.1007/s10803-025-06910-z

Kent-Walsh, J., Murza, K. A., Malani, M. D., & Binger, C. (2015). Effects of communication partner instruction on the communication of individuals using AAC: A meta-analysis. *Augmentative and Alternative Communication, 31*(4), 271–284. doi:10.3109/07434618.2015.1052153

Kleinert, J. O., Kearns, J. F., Page, J. L., & Kleinert, H. L. (2023). Promising strategies for teaching augmentative and alternative communication in inclusive educational settings: A systematic review. *Language, Speech, and Hearing Services in Schools, 54*(4), 1333–1357. doi:10.1044/2023_LSHSS-22-00178

Koegel, R. L., Kim, S., Koegel, L. K., & Schwartzman, B. (2013). Improving socialization for high school students with ASD by using their preferred interests. *Journal of Autism and Developmental Disorders, 43*(9), 2121–2134. doi:10.1007/s10803-013-1765-3

Light, J., & McNaughton, D. (2014). Communicative competence for individuals who require augmentative and alternative communication: A new definition for a new era of communication? *Augmentative and Alternative Communication, 30*(1), 1–18. doi:10.3109/07434618.2014.885080

Light, J., Page, R., Curran, J., & Pitkin, L. (2007). Children's ideas for the design of AAC assistive technologies for young children with complex communication needs. *Augmentative and Alternative Communication, 23*(4), 274–287. doi:10.1080/07434610701390475

Logan, K., Iacono, T., & Trembath, D. (2017). A systematic review of research into aided AAC to increase social-communication functions in children with autism spectrum disorder. *Augmentative and Alternative Communication, 33*(1), 51–64. doi:10.1080/07434618.2016.1267795

Lorah, E. R., Parnell, A., Whitby, P. S., & Hantula, D. (2015). A systematic review of tablet computers and portable media players as speech generating devices for individuals with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 45*(12), 3792–3804. doi:10.1007/s10803-014-2314-4

Lung, S. L. M., Picard, È., Soulières, I., & Bertone, A. (2024). Identifying the functions of restricted and repetitive behaviours and interests in autism: A scoping review. *Research in Autism Spectrum Disorders, 117*, 102458. doi: 10.1016/j.rasd.2024.102458

Martino, D. C., Brantley, A., & Scarpa, A. (2025). The role of self-advocacy and self-determination in positive adjustment for autistic adolescents and young adults: A mini-review. *Frontiers in Child and Adolescent Psychiatry, 4*, 1542543. doi:10.3389/frcha.2025.1542543

Maun, R., Fabri, M., & Trevorrow, P. (2024). Participatory methods to engage autistic people in the design of digital technology: A systematic literature review. *Journal of Autism and Developmental Disorders, 54*(8), 2960–2971. doi.org/10.1007/s10803-023-06015-5

Meduri, A., Marraffa, C., Roccaforte, G., Chilà, P., Failla, C., Gugliotta, G., Pioggia, G., & Marino, F. (2026). Engagement, motivation, or sustained attention? Rethinking the effects of technology in autism. *Frontiers in Digital Health, 8*, 1802286. doi:10.3389/fdgth.2026.1802286

Mifsud, S., Thomas, D., Bowron, R., & Sutherland, R. (2026). The predominant focus is still on teaching children to make requests: A systematic review of AAC for autistic adults and children. *International Journal of Language & Communication Disorders, 61*(3), e70251. doi:10.1111/1460-6984.70251

Parker, R. I., & Vannest, K. J. (2009). An improved effect size for single-case research: Nonoverlap of all pairs. *Behavior Therapy, 40*(4), 357–367. doi.org/10.1016/j.beth.2008.10.006

Parker, R. I., Vannest, K. J., Davis, J. L., & Sauber, S. B. (2011). Combining

nonoverlap and trend for single-case research: Tau-U. *Behavior Therapy, 42*(2), 284–299. doi.org/10.1016/j.beth.2010.08.006

Schlosser, R. W., & Lee, D. L. (2000). Promoting generalization and maintenance in augmentative and alternative communication: A meta-analysis of 20 years of effectiveness research. *Augmentative and Alternative Communication, 16*(4), 208–226. doi:10.1080/07434610012331279074

Still, K., Rehfeldt, R. A., Whelan, R., May, R., & Dymond, S. (2014). Facilitating requesting skills using high-tech augmentative and alternative communication devices with individuals with autism spectrum disorders: A systematic review. *Research in Autism Spectrum Disorders, 8*(9), 1184–1199. doi: 10.1016/j.rasd.2014.06.003

Therrien, M. C. S., Whalon, K., Nunes, D., Marti, P., & Sellers, A. (2025). A systematic review of AAC interventions using speech generating devices for autistic preschoolers. *Augmentative and Alternative Communication, 41*(2), 114–128. doi:10.1080/07434618.2025.2479768

Uljarević, M., Spackman, E. K., Whitehouse, A. J. O., Frazier, T. W., Billingham, W., Condron, P., Hardan, A., & Leekam, S. R. (2023). Arriving at the empirically based conceptualization of restricted and repetitive behaviors: A systematic review and meta-analytic examination of factor analyses. *Clinical Psychology Review, 103*, 102286. doi: 10.1016/j.cpr.2023.102286

Wang, T., Ma, Y., Du, X., Li, C., Peng, Z., Wang, Y., & Zhou, H. (2024). Digital interventions for autism spectrum disorders: A systematic review and meta-analysis. *Pediatric Investigation, 8*(3), 224–236. doi:10.1002/ped4.12417

Wehmeyer, M. L., Shogren, K. A., Little, T. D., & Lopez, S. J. (Eds.). (2017). *Development of self-determination through the life-course*. Springer. doi:10.1007/978-94-024-1042-6

White, E. N., Ayres, K. M., Snyder, S. K., Cagliani, R. R., & Ledford, J. R. (2021). Augmentative and alternative communication and speech production for individuals with ASD: A systematic review. *Journal of Autism and Developmental Disorders, 51*(11), 4199–4212. doi.org/10.1007/s10803-021-0486

APPENDICES

Quantitative data findings

1. 24/08/2026. Guided Access ON. Data taken by Jan. Time: 9-10am.

Prompt	Amount	Comment
I want spoon	1	
I want Mom	40	
I want apple	1	Apple cut up and made available, she did not eat any
I want bbq shapes	1	
I want Dad	1	
I want car	1	
Dad	1	
I want chocolate shake	2	
I want lollipop	5	given lollipop, requests again and only then start eating it
I want chocolate	2	
I want bubbles	1	
I want chips	5	chip bag opened, holds it in hand but does not eat any
Mom	2	
I want chocolate Up & Go	3	
Vanilla Up & Go	1	
I want red apple	2	apple already cut up and available, but she is not eating it
I want the Veronicas	2	
I want Willo Cafe	2	
I want Greensborouh Plaza	2	

I want bag	4	brought to her and she went through it
Yes	1	as a response to a yes/no question
Engagement	4/5	
Regulation	5/5	
Response time	Very Good	
Going through her own prompt history		

2. 24/08/2026. Guided Access OFF. Data taken by Jan. Time: 10-11am.

Prompt	**Amount**	**Comment**
I want Mom	41	
Yes	6	In response to any question, if non-yes/no questions
I want slide	2	
I want Willo Cafe	7	
Hello	1	After being asked to say hello
Sick	4	After being asked how she feels - note that she is not sick
I want bag	9	Despite bag being next to her the whole time
Mom	1	
I want Bee	2	
Driving my tractor	1	Response to “what video do you want to watch?”
I want Abby	1	
Andy	1	
I want slide	9	

I want toilet	1	Does not go to toilet even though it is available to her
Engagement	5/5	
Regulation	5/5	
Response time	Good	
Watching YouTube videos, flicking through videos after just a few seconds each		
Opened Spotify, playing songs for just a few seconds		
Going through photos: screenshots, dog photos and family pictures		

3. 24/08/2026. Guided Access ON. Data taken by Jan. Time: 2-3pm.

Prompt	**Amount**	**Comments**
I want mom	56	
I want hair	8	requesting during a lesson called friendship group where she and her friends get their hair plated, but when the time came, she did not want her hair to be done
I want Dad	11	
Hair	1	
I want Jennah	1	
I want Lou	4	Asking for herself
Jennah	3	
I want car	4	
I want hall	1	
Mom	3	

I want Bee	18	
I want Lou	2	
Dad	1	
I want Andy	3	
I want bag	4	
I want library	1	
I want Jinja Safari	5	” What video do you want to watch?”
I want Greenborough Plaza	2	
Ride	2	
K-mart	1	
Engagement	5/5	
Regulation	5/5	
Response time	Very Good	
Does Lou have object permanence regarding her mother, does she not understand that her mother is gone and not close by?		
It is interesting that she hasn’t requested any food, just things regarding going home		

4. 25/08/2026. Guided Access OFF. Data taken by Ruby. Time: 9-10am.

Prompt	**Amount**	**Comments**
I want gummy bears	1	
Mom	5	
I want Mom	20	
Dad	2	
Ruby	5	

I want chocolate Up & Go	2	Up & Go opened and given to her
I want Jinja Safari	1	Video played for her
I want chicken shapes	4	Packet opened and give to her
I want perfume	5	Perfume not available
Chickpeas	1	
I want chickpeas	5	
Knife	2	
I want Abby	10	
Sick	2	Note, she is not sick
Hungry	2	Yet food is readily available
I want bag	10	
I want Greensborough Plaza	1	
I want Willo Cafe	3	It is indeed on her schedule for later today
Engagement	4/5	
Regulation	4/5	
Response time	Very good	
Switching between Prolo, camera roll and YouTube. On Prolo, Lou is making her utterances and requests as tallied, on YouTube Lou is mainly skimming through music video clips and ASMR clips such as somebody tapping on and opening sweet and chocolate wrappers, on camera roll Lou looks at pictures of herself, family members and her dog.		
Ate and drank all of her food - big appetite		

5. 25/08/2026. Guided Access ON. Data taken by Ruby. Time: 12-1pm.

Prompt	**Amount**	**Comment**

I want Mom	101	
I want hall	44	
Library	2	
I want toilet	2	Requested toilet once, then went to the toilet and then requested it again right after going
I want Dad	7	
Ruby	8	
I want Ruby	5	
I want bag	3	
Hall	10	
Finished apple	1	After eating some of her apple
Dad	4	
Susan	1	
I want apple	1	requested after apple was previously removed after her telling us she was finished with it
Mom	2	
I want bread	6	Not available during this hour
Hall yes	1	
I want Bee	14	
I want hot chips	2	
Lou	3	
I want Matt	2	
I want playground	3	
I want chickpeas	6	

Engagement	2/5	
Regulation	3/5	
Response time	Very good	

6. 26/08/2026. Guided Access OFF. Data taken by Jan. Time: 1-2pm.

Prompt	**Amount**	**Comment**
I want coco boms	2	
I want Mom	85	20 of these requests made back to back in less than a minute
I want Matt	1	
Andy	7	
Kaleb	2	
Milo	1	
I want Milo	2	
I want hall	2	
I want library	1	
I want playground	1	
Finished Dua Lipa	1	We were not watching any Dua Lipa
Leon 1	1	
I want Dad	1	
Susan	1	
I want slide	11	
I want perfume	7	
I want fork	4	

I want Jennah	5	
I want Bee	1	
Engagement	4/5	
Regulation	5/5	
Response time	Good	
Scrolling through photos of family members most of the time		

7. 26/08/2026. Guided Access ON. Data taken by Jan. Time: 2-3pm.

Prompt	**Amount**	**Comments**
I want water	1	
I want chickpeas	1	
I want Bee	5	
I want Mom	48	
I want bag	12	
Mom	9	
Bee	1	
Abby	1	
I want Abby	3	
Andy	6	
Kaleb	1	
Finley	1	
Yes	2	
I want Lou	2	
Ally	4	

Susan	2	
Engagement	4/5	
Regulation	5/5	
Response time	Very slow	

8. 28/08/2026. Guided Access ON. Data taken by Caitlyn. Time 2-3pm.

Prompt	**Amount**	**Comments**
I want chocolate	1	Not available
I want car	1	
I want Bee	85	
I want Mom	45	
I want Lou	8	
Caitlyn	7	
I want Lollipop	1	After already finished her lollipop
I want other side	1	Video then played for her
I want perfume	3	Perfume then given to her
I want Dad	3	

9. 31/08/2026. Guided Access ON. Data taken by Ruby. Time 9-10am.

Prompt	**Amount**	**Comment**
I want Mom	14	
I want car	2	
I want pine orange juice	1	
I want Jinja Safari	1	
I want Ruby	2	

I want Pretzel	1	
I want chocolate Up & Go	1	
I want the Veronica's	1	
I want bag	2	
I want Willo Cafe	2	Not on schedule for today
Nicole	1	
Engagement	3/5	
Regulation	4/5	
Response time	Slow	

10. 31/08/2026. Guided Access OFF. Data taken by Ruby. Time: 10-11am.

Prompt	**Amount**	**Comment**
I want Mom	9	
Ruby	2	
I want Daming	1	
Hungry	1	Unprompted
Curious	1	Unprompted
Yes	1	Unprompted
I want chocolate Up & Go	1	
Sick	1	Unprompted
Tired	1	
Depressed	1	Unprompted
I want car	7	
I want Dua Lipa	1	"What video do you want?"
I want slide	1	

I want toilet	2	
I want Jinja Safari	1	
I want Danger Zone	1	
Engagement	2/5	
Regulation	3/5	
Response time	Good	
Watching videos on her device on and off		

11. 01/09/2026. Guided Access OFF. Data taken by Jan. Time 9-10am.

Prompt	**Amount**	**Comment**
I want Mom	13	
I want car	7	
Mom	1	
I want Jinja Safari	1	
I want Willo Cafe	5	
Finished tissue	1	There was no tissue in the area
I want pine orange juice	7	
I want Andy	2	
I want chocolate Up & Go	1	
The other side	1	
Finished garbage bin	1	After finishing juice box
I want toilet	1	Get up and goes to toilet
Engagement	2/5	

Regulation	5/5	
Response time	Slow	
Very quiet today - period starting? Wasting less than usual - period starting?		
Watching YouTube and scrolling through pictures		

12. 01/09/2026. Guided Access ON. Data taken by Jan. Time: 10-11am.

Prompt	**Amount**	**Comments**
I want Mom	40	
Hungry	1	”How do you feel?”
Sick	1	In continuation of “how do you feel?”
Happy	1	In continuation of “how do you feel?”
I want Bee	2	
I want Andy	11	
Jug	1	
Coffee maker	2	
I want playground	2	
I want Matt	3	
I want car	3	
Sports car	1	
Finished Andy	1	Andy is not in the room
Tissue	1	
I want slide	7	
Leon	2	He is not in the classroom
I want grapes	1	Not packed in her lunch box

I want strawberry	1	Not packed din her lunch box
I want bag	3	
Sienna	1	
Beck	2	
Steph	1	
Engagement	3/5	
Regulation	4/5	
Response time	Good	

13. 01/09/2026. Guided Access OFF. Data taken by Jan. Time: 2-3pm.

Prompt	**Amount**	**Comments**
I want Mom	29	
I want water	1	
I want Dua Lipa	1	
I want Bee	6	
Hungry	1	” How do you feel?” - there is food next to her
Engagement	4/5	
Regulation	4/5	
Response time	Good	

Thought: data will be heavily influenced by staff interpretations, staff accuracy, iPad battery, menstrual cycle, activities done before the hour, situation at home		

14. 02/09/2026. Guided Access OFF. Data taken by Maria. Time: 1-2pm.

Prompt	**Amount**	**Comments**
I want Mom	34	
I want Bee	39	
I want Matt	6	
I want Abby	2	
I want Dad	7	
I want milkshake	2	
Hungry	1	Lunchbox and banan available but not eating
Banana finished	1	Packed away banana and lunch box herself
Emma	2	
I want Ruby	5	
Sad	1	Unprompted
I want Lou	2	
I want Sienna	2	
I want Maddie	3	
Soap play	2	
Engagement	5/5	
Regulation	4/5	
Response time	Good	

When videos are playing on the board Lou reduces use of ipad
Lou engaged in every question asked to her

15. 04/09/2026. Guided Access OFF. Data taken by Jan. Time: 9-10am.

Prompt	**Amount**	**Comments**
I want Mom	19	
I want Andy	6	
I want toilet	1	Gets up and walks to toilet
Andy	4	
Engagement	5/5	
Regulation	5/5	
Response time	Very good	

16. 04/09/2026. Guided Access ON. Data taken by Jan. Time: 10-11am.

Prompt	**Amount**	**Comment**
Hello	1	
I want bag	2	
Yes	1	
Sad	1	
I want Mom	46	
I want Abby	2	
Andy	3	
I want slide	8	
I want Andy	2	
I want Bee	1	

I want Dad	1	
Danger Zone	2	
I want	1	
I want Danger Zone	1	
Engagement	4/5	
Regulation	4/5	
Response time	Slow	

17. 04/09/2026. Guided Access ON. Data taken by Jan. Time: 2-3pm.

Prompt	**Amount**	**Comments**
I want Mom	44	
I want Andy	1	
Nicole	2	
Ally	3	
Bee	2	
Matt	1	
I want bread	3	
I want Bee	2	
I want Dad	4	
Yes	1	” How do you feel?”
Sad	1	Continuation on “How do you feel?”
Happy	1	Continuation on “How do you feel?”
Sick	1	Continuation on “How do you feel?”
Andy	1	

Engagement	4/5	Period pains
Regulation	5/5	
Response time	Good	
Clearly less requesting and eating when she is on her period.		

18. 07/09/2026. Guided Access OFF. Data taken by Jan. 9-10am.

Prompt	**Amount**	**Comments**
I want Mom	20	
Dad	4	
Yes	1	Unprompted
Sad	1	”Can you say hello for me?”
Hello	1	”No, can you say hello for me?”
I want Willo Cafe	2	It is on the schedule for today
Hungry	1	How do you feel?
Engagement	5/5	
Regulation	4/5	
Response time	Good	
Does she ask for mom so much because of object permanence? Does she not realise mom is not close by?		
Very quiet today, Spending time in break out space, not coming into classroom, wants space and to be alone - definitely on her period		
Not eating - drinking well enough - hiding lunchbox away in places she doesn’t have to see it		
Switching between YouTube and Photos		

19. 07/09/2026. Guided Access ON. Data taken by Jan. 10-11am.

Prompt	Amount	Comments
I want Mom	36	
Andy	2	
I want Greensborough Plaza	3	
Ride	3	
I want bag	28	Bag right next to her, not touching it
Dad	7	
I want chocolate	1	Not available
Mom	11	
I want Willo Cafe	3	
Jennah	1	
Bag	2	
Car	1	
I want small fries	2	
I want medium fries	1	
Emma	2	
Engagement	2/5	Period pains
Regulation	4/5	Period pains
Response time	Slow	Period pains
Data influenced by the fact that data trackers also have to do their job and teach the lessons and cannot be purely focused on the data for the whole hour		
It is also important to note that Lou has many offsite programmes that deter data tracking and that obviously take precedence, as a result only about a maximum of 3 hours of data can be tracked per day - often 9-11 am and 2-3pm.		

20. 07/09/2026. Guided Access ON. Data taken by Jan. Time: 2-3pm.

Prompt	**Amount**	**Comments**
Mom	10	
I want Mom	43	
Maddie	4	
Bee	4	
I want hair	3	
Emma	2	
Lollipop	1	While eating lollipop
I want lollipop	3	While eating lollipop
I want Bee	1	
Yes	1	”Can you tell me what today is?”
Sad	1	Continuation of “can you tell me what today is?”
Hello	1	Continuation of “can you tell me what today is?”
Andy	1	
Yes	1	” How are you feeling?”
Hello	1	Continuation of “How are you feeling?”
Sad	1	Continuation of “How are you feeling?”
I want toilet	1	Gets up and goes to toilet
I want car	16	
Bee	1	
Engagement	4	Period pains
Regulation	4	Period pains

Response time	Good	
Interesting how she requests things she has access to/is holding in her hand but does nothing with		
All direct questions get responded with yes, a feeling and hello. Interesting.		
Some requests seem more prominent depending on day and time ie hall, hair, food, activities and going home, perfume (take a moment)		

21. 08/09/2026. Guided Access ON. Data taken by Jan. 9-10am.

Prompt	**Amount**	**Comments**
I want Mom	14	
Tyrell	5	
Mom	7	
Do	1	
Hello	1	Unprompted during morning meeting
Yes	2	Unprompted
Hello	1	” Hello”
Bye	1	After walking closer to her
Yes	1	” How do you feel?”
Hello	1	” How do you feel?”
Sad	1	” How do you feel?”
Dad	3	
Engagement	3/5	Period
Regulation	5/5	
Response time	Slow	

22. 08/09/2026. Guided Access OFF. Data taken by Jan. 10-11am.

Prompt	**Amount**	**Comments**
I want Mom	19	
I want ride	2	
Ruby	2	
I want lollipop	2	
Matt	2	
Sienna	1	
I want Abby	8	
Mom	4	
Tyrell	1	
Emma	2	
Andy	1	
Mom	4	
Jennah	1	
Bee	3	
Dad	5	
I want Matt	2	
Maddie	2	
Engagement	4/5	
Regulation	5/5	
Response time	Slow	

23. 08/09/2026. Guided Access OFF. Data taken by Jan. 2-3pm.

Prompt	Amount	Comments
I want Mom	28	
I want Danger Zone	3	
I want Bee	3	
I want apple	2	Apple cut up and made available
I want lollipop	1	Lollipop given
Andy	1	
Mia	1	
Mom	4	
Engagement	3/5	
Regulation	4/5	
Response time	Good	
Eating more towards the end of the day. Not as chatty as usual.		

24. 09/09/2026. Guided Access ON. Data taken by Jan. 9-10am.

Prompt	Amount	Comments
Mom	21	
Jennah	2	
I want Mom	14	
Lou	3	
Yes	1	” Can you say hello for me?”
Sick	1	” Can you say hello for me?”

Hello	2	” Can you say hello for me?”
Yes	1	” How do you feel?”
Sick	1	In continuation of” How do you feel?”
I want Matt	1	
I want Bee	3	
I want car	5	
Minivan	1	
Luke	1	
James	1	
Matt	3	
God	2	
Abby	2	
Beck	1	
Engagement	4/5	
Regulation	5/5	
Response time	Good	
Data heavily influenced by her period and the pain. Comes in very quiet and gets chattier as her pain meds start kicking in more and more		

25. 09/09/2026. Guided Access OFF. Data taken by Caitlyn. 2-3pm.

Prompt	**Amount**	**Comments**
I want Mom	16	
I want car	2	
Bee	3	

Ruby	7	
Ally	2	
Susan	2	
Sienna	8	
Engagement	2/5	Period pain
Regulation	4/5	
Response time	Slow	Period pain

26. 10/09/2026. Guided Access OFF. Data taken by Kaleb. 2-3pm.

Prompt	**Amount**	**Comments**
I want Mom	10	
I want Bee	2	
Engagement	2/5	Period pain
Regulation	4/5	
Response time	Slow	Period pain

Qualitative data findings

The following is the interview conducted with Lou's mother:

What kinds of words, phrases or sentences does Lou use most frequently on her AAC device around you, and are there any that she repeats particularly often?

I want mum, I want book, all sorts of food and drink requests.

For each of the requests you mentioned, how do you usually respond?

Mum - I go over to her or if I'm busy, I say I'm here. Book - read to her (it usually means she wants to go to sleep). Food - I'll give it to her unless it's excessive and I'll say rest tummy or later.
Why do you think Lou requests you (Mum) so much? Is there something you offer or do that nobody else does that she might be hinting at?

I work late and am often out on weekends. Maybe she misses me. When she first started saying it a lot, I thought it was because she was sick but I don't think so now.

Does Lou ask for you as well when she is actually with you?

Yes often

Do you think she is actually requesting you, or could she sometimes be requesting something you represent, offer or do?

Maybe she is seeking 1:1 interaction. If I go over to her, she will usually smell my hair.

What are the most common activities you do with Lou, both at home and out of the house?

Helping with self-care, food etc. Bubbles. Reading. 'Chatting' on our iPads - I have one with promo

Do you think Lou's requests are always literal, or could they sometimes refer to broader concepts that she is trying to communicate?

No, I don't think they're always literal. Maybe using I want for I like because she often has the item she's requesting.

Does Lou also repetitively request things when she is around you? If so, why do you think she does this?

Yes. Saying she likes perhaps.

Do you think the meaning of a request can change depending on the situation? Can you think of an example?

Yes. See 2 questions back

Does Lou usually stop requesting something after it has been offered to her?

Sometimes
Have you noticed situations in which Lou's repetitive requesting becomes more frequent or less frequent? What factors do you think might influence this?

Mostly around food. I think she likes to plan ahead and make sure she has a steady stream of food.

How does Lou usually communicate or behave when she feels that she is not being heard or understood?

She doesn't seem overly frustrated she just keeps asking.

How does Lou use her iPad when she has greater independent access to it, rather than being restricted by Guided Access? What does she typically look at or do?

I don't have it on guided access when she's with me.

What effect do you think access to photographs, videos, music or other preferred digital content has on Lou? For example, do you think it regulates her, entertains her, reassures her, gives her something to focus on, or something else? What have you observed that makes you think this?

I think it sometimes helps her make sense of things. For example the speech therapist played with play doh with her and then she watched a video of her playing with plays oh as a young child.

Does Lou have her iPad on Guided Access or not when she is with you?

No

What happens when Lou cannot immediately access something she is requesting? Does her communication or behaviour change?

Not really. She's pretty calm

Do you think giving Lou greater independent access to preferred digital content could change how often she requests people, songs, food or other things? Why or why not?

No because she requests a lot at home while having full access.
Are there particular things you do with Lou, or ways you respond to her, that you think may be different from how other people interact with her and could influence her communication or regulation?

At home I think I'm a bit more present than others with her.

Is there anything else about Lou's communication, repetitive requesting, iPad use, regulation or need for autonomy that you think is important for me to understand for this study?

I think the interest in photos and videos would be interesting to explore. Occasionally she'll use a word in context that she hasn't been taught. I think she knows more than we realise.