INTRODUCTION TO PRESENTATION AND STUDY (Video of Janice):

(Slide 1) Today's presentation will be on AAC interventions to maximize intervention for young children. Although I have the pleasure of standing here today doing the presentation, the work that I'm going to be talking about is actually the result of the hard work and commitment of a large group of people from Penn State who are part of the AAC community there: Kathy Drager, a colleague in the department of Communication Sciences and Disorders and then a wide range of graduate schools in the program including Jen Curran, Liz Hayes, Lina Christianson, Wendy Lewis, Holly Maye, Becca Page, Beth Pannick, Sarah Pendergast, and Melissa Witte. For those of you who are here, please interrupt as I go along if you have questions or comments that you'd like to share with the group. For those of you joining us over the web, unfortunately you won't be able to ask questions live, but please feel free to e-mail me if you have questions or comments that you'd like to share and I will get back to you. Later in the presentation I will share with you my e-mail address.

(Slide 2) So all of us know that children who have significant communication disabilities are very much at risk in all aspects of their development. They are at risk in terms of functional communication, language development – without access to speech it's very difficult to have a means to learn language, and all aspects of cognitive development and learning for it's through communication that we are able to teach and others are able to learn. They're at risk for literacy development, for literacy development rests on the foundation of language skills. They're at risk in terms of social participation and developing friendships and close relationships with others. Obviously all of these areas will impact the quality of their life so early intervention is critical.

(Slide 3) The challenge for us to provide children who have complex communication needs to access to all of the magic and power of language and communication at an early age. AAC intervention certainly offer us the potential to do that: the potential to enhance communication language and development. But to date I believe we have not fully realized that potential, particularly for young children. As a result, those young children may fall behind in terms of their language and communication development and we're forever left playing catch-up. There are a variety of reasons why we haven't been fully successful to date but two of the contributing reasons are that we have yet to develop what I think are appropriate AAC systems for young children and we have yet to develop really effective intervention.

(Slide 4) My goals today are to share with you the results of a large research project that we've been involved with here at Penn State that is intended to enhance communication and language development in young children who require AAC. I want to focus on the implications of that research for practice, obviously with the goal to improve outcomes of young children who have complex communication needs and I will be sharing video tapes of some of the children we've been working with so that you can see some of the interventions we've been engaged in and see the progress the children have made.

(Slide 5) The research as I indicated before is part of the AAC-RERC, which is a collaborative virtual research center involving the work of many partners. If you need any more information, I'd encourage you to visit our website: www.aac-rerc.com or if you have particular questions about this project, please feel free to e-mail me.

(Slide 6) The project that we're going to be talking about is a project that has evaluated the effects of AAC interventions with young kids. It is a longitudinal study, we have involved seven participants to date and continue to recruit new participants to the study. The children that have been involved in this study, when we have first begun with them, have ranged in age from 16 months to 36 months. All of the children in the study have significant communication disabilities, they have a wide range of disabilities. Some of the kids have cerebral palsy, some of downs syndrome, others have multiple handicaps including motor impairments as well as visual impairments or other types of difficulties. When we first become involved with the children, all of them have been very minimally symbolic. Typically they've had less than 10 concepts they've been able to communicate. We have followed those children through our interventions longitudinally for as much as over a year for some of the children now and we'll be following them over the long period.

(Slide 7) Our AAC interventions have three major components to them. First of all is develop appropriate AAC systems, and this is the way we can ensure that the children have the appropriate tools they require to communicate effectively. Just having those tools is not going to be enough for any of those children, and so obviously we are providing intervention to help those children build their language and communication skills so that they learn linguistic and social skills that they will need to communicate effectively. And then the third component, which is integral to our intervention, is to work with parents and facilitators to ensure that children have meaningful opportunities to communicate and to also ensure that they have the scaffolding support within their interactions to be successful and effectful in their communication. In our intervention sessions we always have parents involved with us in those sessions and are working with them informally to teach them how to communicate effectively with their children. Our interventions are scheduled once a week for approximately an hour. Because we're working with parents, we hope and encourage parents to continue when we're not there.

(Slide 8) The goals of our AAC intervention are to maximize language and communication. We always start initially by increasing participation of children, by building their social interaction and turn-taking. Many are very passive when we first meet them, so we work with them to become active participants who are socially engaged in communication. We're working with the kids to express a wide range of communication functions, not just needs and wants, but to engage in social interaction and joint attention. As we move forward, we are developing a breath of semantic concepts and expanding vocabulary. As the children progress, we are also working on building their phonological awareness skills.

(Slide 9) FIVE STEPS IN AAC INTERVENTION:

(Slide 10-11) Step 1: Identifying meaningful contexts for communication

This is a place where our interventions differ a little bit from what has been done in the past. Very often with young children or beginning communicators where we have started with AAC intervention, is to identify some kind of object or activity that the child likes and we have taught the child to request that object or activity, which has resulted in children affectively expressing their needs and wants. We tend to start our interventions in situations that are highly interactive. The problem with this is they tend to be dead-end interactions, once I've got what I want, there is nothing more to say or do. There isn't the opportunity to continue to engage with your partner. Instead, we've worked with families to identify contexts that are highly interactive for the children, contexts that are motivating for the children, contexts that are meaningful and familiar (usually routines that are enjoyed), contexts that are high frequency because they provide the children more opportunities to communicate with family and for the family to practice interacting with the kids in an effective way. We're obviously looking for contexts that are going to be valued for the child and the family. It's very important that we follow parent priorities, because if the parents and family don't believe what we're doing is meaningful, they are not going to follow through, so it's important that we meet the goals that they feel are important for their child. We're always looking for contexts that will have the highest impact and address the greatest need for the child. On a more specific level, what that translates into, is starting with opportunities for sustained social interaction. In many cases that may mean interacting with music and songs, shared reading activities, and play activities that will extend and provide an opportunity for ongoing interactions. We're not just looking at the expression of needs or wants, but are focusing on social interaction. Eventually we'll extend into all activities, but we start with a small handful so families don't feel overwhelmed, but each work we add more and more contexts.

(Slide 12) Step 2: Develop appropriate AAC systems

As we do this, there are four criteria we are always thinking about:

1) The systems must be versatile
2) The systems must be appealing
3) The systems must be dynamic
4) The systems must be easy to us

(Slide 13) First, the AAC system must be versatile, which particularly comes into play when we're dealing with young children, because they participate in a wide range of situations and they're engaged with a lot of different materials and contexts. The systems must be flexible, and they must provide with growth potential. We need to be sure that

the AAC systems encourage language growth and not impede it. In our interventions, we look at multiple modes of communication. We are always encouraging speech where that's a possibility. Many of the children are already utilizing gestures in communication, which we definitely encourage. All of our children are involved in using aided AAC systems as well, both light-tech, graphic symbols that might be on paper and covered in contact paper, as well as using computer based technology. All of the children in the project are using dynamic display systems.

(Slide 14-15) Second, the AAC systems must be appealing. Unfortunately, many AAC systems don't have a strong appeal to young children. If AAC systems are appealing, it seems logical to think that kids are more apt to use them and their peers are more apt to come and play if the systems are more appealing and look fun. So how can we make our AAC systems more appealing? Well, we've been involved in a number of research studies at Penn State. The first study looked at comparing AAC systems to popular toys on the market to see what are the features of popular toys and how might we incorporate those features into AAC systems to make them more appealing to young children. The second study involved bringing in a group of children and setting them loose to build a machine, to design machines to allow kids with disabilities who can't communicate via speech a means to participate more effectively with their families and with their friends at school. Some of those suggestions out of the study to increase appeal are the following: first of all we need to make sure we are infusing fun activities into the AAC systems (activities that are highly motivating to the kids); a second possibility is to incorporate popular characters (e.g. some of the Disney characters) so they can play and interact and have fun with the characters they are familiar with. We make use of a lot of sound affects within the AAC systems we develop with songs, musical instruments, laughter, and different voices, which can be a fun way to increase play with AAC systems. For example, Melissa was involved in programming the opportunity to play with a play phone. It has the ringing of the telephone, hi, and all kinds of things you might do using sound effects. We use as many bright colors as we can, adding decorations to the systems so there is interest in how the system looks. We try as much as possible to allow the child to choose, it is really powerful for young children to have their choice in how things look and feel to them. And most importantly to have fun, we don't want to develop systems that are appropriate for middle-aged speech-language pathologists, but to develop systems that are appropriate for kids.

(Slide 16) Step 3: <u>Develop systems that are dynamic</u>

If you look at the research of language develop in young children, you will learn that they acquire language very rapidly, in fact they may learn as many as 5 new concepts in a day. Unfortunately, the children we work with aren't able to just grab those new words out of the air and then produce or attempt to produce them in their speech. Kids who use AAC can only learn words if we provide them with access to the vocabulary, whether it be via signs or aided AAC symbols. That's a problem because sometimes we constrain the children because we don't provide them with access to new vocabulary concepts. For example, how many people know 50 signs? How many know 100 signs? The child we work with will be capped then on our competence with the language (sign) not based on

what they are capable of learning or acquiring. What we often is see is that the child only knows the signs that the teacher and/or parent knows. It's equivalent to a child learning to speak and only saying to that child the words they can already say. That parent would probably be up on child abuse charges for neglect, yet that often happens with children using AAC.

(Slide 17) We need to make sure we are adding vocabulary regularly and we are teaching new concepts to children. That also applies when we are using aided AAC symbols. Very often what we see happen is people spend time developing a communication board or book or programming a dynamic display or simple digitized system, but when they get done, it sits static over a long period of time. That means over time, that child has no way to grow their language expressively. In terms of selecting appropriate vocabulary, we need to make sure we have a range of concept available. Too often what we see in AAC systems is they include a lot of objects, labels for things, toys, and people, but they often don't include social words, relational words, questions, words that are very powerful in interactions (ways to ask why, tell someone they are silly and laugh). You need to make sure the vocabulary is individualized, motivating and fun, functional for the child, developmentally appropriate, culturally appropriate, and it supports language learning. As we think about the concepts, we need to think about the appropriate wording, so kids sound like kids. Too often we have kids out there using AAC systems that sound like middle-aged speech-language pathologists. We should be modeling concepts the child knows as well as modeling new concepts, some of which the child may grasp and choose to learn, others of which the child may not choose to grab and learn.

(Slide 18-19) Step 4: Develop systems that are easy to learn

Most of our current technology reflects the conceptual models of us as adults. The models we have are not congruent with how children understand the world; therefore, these AAC systems are difficult for children to learn to use effectively. What's happened in the past is we've spent a huge amount of time teaching kids to use their system. If you think about it, there is no inherent value in learning how to use a system; the only value in learning a system is to communicate effectively. It is equivalent to spending huge amount of time at school on how to hold the pencil. We do spend some time on that, but move very quickly on how to write so you can communicate with others. Similarly to that, the same thing needs to happen here.

(Slide 20-21) So how can we develop AAC systems that are easier for kids to learn? We can redesign AAC systems to reduce learning demands for young children. We need to think about the most effect way to represent concepts using AAC systems. We need to think about layout, organization, and navigation through AAC systems. We need to think about selection and output, to make sure it's intelligible and comprehensible to young children. We know from research at Penn State that young kids, when they learn concepts, they are learning them in context. More over, their understanding of concepts differs quantitatively from what adults understand about those concepts. The problem is that many AAC symbol sets that are used to represent concepts represent how we as adults think about those concepts rather than how children think about those concepts.

Often AAC symbols sets incorporate parts of objects or people, and children typically don't think in parts, they think in wholes, and whole items embedded in those concepts. Often those AAC symbols require a meta-analysis to understand them. The symbols may not be meaningful to young children, and therefore it may take a long time for children to learn those representations. For example, the symbol representation for the concept 'Who' is very difficult for children to comprehend. Previous research showed that when children were asked to draw the concept of 'who,' they almost always drew themselves and they were with a familiar adult, and they almost always drew in a distance or further away, a strange looking individual and they would draw themselves pointing to the individual with a story that they were with their mom and I said "Who's that?" This for the kids is their understanding of the concept 'who,' not this meta-linguistic concept. Another example is the representation of 'want.' Children in our study found this disturbing and wanted to know why the guy's hands had been cut off, and many didn't understand this was reaching for something they desired. Again, when we asked the children to draw the concept of 'want,' the typically represented the same concept of two kids, with one having the desirable object and the other is reaching for it. Again, this is clearly an indication that we need to think about how young children think about concepts and make sure the representations match that.

(Slide 22) So we need to use appropriate representations, representations that reflect the child's understanding of the concept. We need to use representations that are parts of meaningful concepts and experiences in the child's life. Very often we use digital photos of the child and family in meaningful activities. Sometimes we're using line drawing and we try to avoid using isolated objects of parts of objects or events so that it's truly meaningful to the children. We're always introducing those symbols in context and linking the symbol to the concept.

(Slide 23) Once we have more than one language concept, of course we have new challenges we confront. When we have multiple language concepts and representations, we need to organize them in some way. We need to display them in some way, and the user needs to navigate and find them and locate the concept they want. The way we organize the system and navigate the system can definitely affect the ease of learning for the child as well as ease and accuracy of use. In the past, we've organized and navigated systems without giving much thought to the learning demands that we've been imposing on young children. A study at Penn State looking at how young children try to organize concepts found that children almost always group together vocabulary based on familiar events and activities. They use personalized schematic organizations. So if you ask children to organize schematic concepts, they'll put baby with bottle, crib, diaper, cry, mommy, but they don't organize baby with people. The second thing we found in our research is that children really operate on fairly small groupings. Young children usually understand between three or four concepts, but they don't understand large groupings. That suggests that as we're building organizations or pages within AAC systems, we need to be building them starting with small groups as opposed to starting at the page level with large groups.

(Slide 24) We also need to deal with how we lay out those representations or concepts for the child. There are a number of different types of layouts you can use. Traditionally in this field we've used traditional grid layouts, and increasingly in our research, we've made use of what we call 'visual screen displays,' and then there are hybrids that combine elements of the two.

(Slide 25) Traditional grid layouts are what most of you are familiar with and these, vocabulary is represented by a separate AAC symbol and those separate symbols are put in a box/grid in rows and columns. Language is taken out of context because the symbol is isolated, it's decontextualized. The concepts are presented separately from each other, there is no integration of concepts. It's been suggested in research that this approach imposes greater processing demands, particularly for very young children.

(Slide 26) An alternative that we've been exploring within our research at Penn State has been to use visual scene layouts. With this, vocabulary is embedded under hot spots within an integrated visual scene. That scene would represent, for example, a familiar context within the child's life. That vocabulary is then presented within a meaningful context rather than being isolated. The concepts are linked visually and conceptually for the child.

(Slide 27) Our research would suggest that for very young children, typically developing 2-year-olds are more accurate using visual scene layouts versus traditional grid layouts. Many of the children within our study have transitioned to use various layouts over time. They've all begun using visual scene displays, many have moved to using hybrid displays that would combine items and have some presented in visual scene and some in a grid layout, and then obviously some have moved to using traditional grid displays as well.

(Slide 28) One of the challenges for kids like Jackson as they acquire new vocabulary is learning how to navigate through systems to locate language concepts. Traditionally, we've been very aware of that problem as a field, and what we've tended to do is to either not prescribe dynamic display systems for very young children, instead prescribing simple digitized systems with fixed displays, or we simply reduce the number of items available to children. The problem with that is that we've already artificially capped their language development or limited it simply because it's difficult to navigate through the system. What we've been recommending in our current research is that we not hold back language development but try to reduce the navigational demands. We do that in a couple of ways: One, by using appropriate designs to help kids learn to navigate through systems and as we start with young children, to allow partners to scaffold or help them find the right page. So rather than waiting for kids to be able to use menus or forward/back arrows, we'll simply help them find the pages they need initially.

(Slide 29) Some of the ways we design systems for young kids to make it easier to navigate is by using explicit menus and make the options visible. Specifically what we do is take screen shots of the actual pages the children are trying to get to and use those as the choices on the menu pages, so the kids are actually looking at a mini symbol that is the page they are trying to get to. Our research suggests that seems to make it easier for kids to locate the page they want. We do provide kids with scaffolding support in finding the page so we don't worry about them using the main menus or forward and back arrows initially. All of our children have learned to use those pages and navigational tools through us modeling use of those and teaching the organization of the system.

(Slide 30) The next thing for us to think and talk about is how do we implement these AAC systems with the kids. It is very difficult for young children to use AAC systems because they have to coordinate attention to a variety of locations. They need to think about themselves, their partner, the ongoing activity, and then the AAC symbols. We've found that that is very hard for young kids because they need to attend to various locations and that joint attention can be very demanding. When we first start to intervene with children. When we first begin intervening with young children, we provide a lot of scaffolding support to help reduce those attentional demands, and that's very important in the early stages. First of all we look at positioning the partner appropriately to reduce those demands. Then we're looking at ways to infuse the AAC system into activities, or infuse activities into the AAC system so the kids don't have two separate places to attend to but rather we've brought them into one.

(Slide 31) When we think about positioning the partner, we want to make sure that the partner is closely aligned with the AAC system. You may have noticed in the video tape that the system is right with the partner, close to their head and face and also that the activity was embedded in the system. That reduces the attentional demands for the child and allows them to attend to the partner, AAC system, and activity all at once without having to shift attention too dramatically. As the child becomes more sophisticated, we can have the AAC system away from the partner, and an on-going activity and the child switches attention.

(Slide 32) Besides positioning the partner, we also think of ways to bring the AAC system and activity together. We know that children learning language through daily communication is infused in play and daily activities. What happens too often is that the aided AAC systems seem to sit outside of kids lives, which decontextualizes the system and activity. What we've been trying to do is infuse the AAC system and activities together. We do that in two ways: with our light tech systems, we construct them on paper covered in contact paper with Velcro on the back so they can be taken out of the system and brought into the play activity. So if we're playing with a school bus, the symbol of a school bus can be right there in the activity and move around. The symbol can be brought into the activity and become part of the play actually. The other way we combine is by infusing play activities into AAC systems. For example, if we're playing telephone, the entire activity may take place in and through the AAC system, versus having separate equipment.

(Slide 33) The next step is to work with parents to make sure they're providing effective scaffolding support to ensure the child is participating effectively in interactions. The first step is to identify opportunities within the context for the child to communicate. We need to be modeling speech and AAC for the child, waiting and allowing them time to communicate, always responding to the child, and monitoring progress and outcomes.

(Slide 34) Within each context, what we're trying to do is not just identify a single opportunity for the child to communicate, but rather multiple opportunities for the child to communicate, so it's not just a question and then the interaction is over, but how we can have fun and play with the toy and provide multiple opportunities to be engaged and interact. We're always looking for numerous situations, meaningful situations, motivating ones, varied situations, and of course fun situations so we're playing like kids and not boring, middle-aged people.

(Slide 35) Once we've identified the opportunities for the child to communicate within the context, then what we teach parents or facilitators to do is clearly mark those opportunities for the child. Many of the kids we interact with become quite passive communicators and are use to not interacting very actively. So we start by clearly marking the opportunities for them to take their turns. The way we do that is by simply waiting at the junctures that they might be able to participate and allowing them the time to communicate. We'll make use of expectant delay for kids that need that, focusing our attention on the child, maintaining eye contact with them, using expectact body posture and facial expressions to encourage them that it's an opportunity to communicate and they need to fulfill that turn. That's a very powerful way to encourage kids to interact.

(Slide 36) If the child attempts to communicate in the interaction, we encourage parents to respond immediately by fulfilling whatever intent the child had, whether it's commenting or engaged in a fun activity or their asking for something. We teach the parents to expand on the child's message using AAC and speech. That might include modeling the use of sign or modeling on the aided AAC systems. We're always trying to expose the children to more complex language than they're already using. For example, in Jackson's case when he was using 2-word combinations, you saw me using 3-word combinations so he begins to see more complex language. We always continue the activity with the child, and encourage parents to continue to set up ongoing meaningful opportunities for the child to communicate.

(Slide 37) If the child then does not attempt to communicate, we'll model an appropriate turn for the child using AAC or speech. We sometimes make use of third-party models, and that might be a parent or sibling that will show the child what they might do, and then present the opportunity again. We do not work off strict scripts where the same thing is said and done every time. What often happens in those situations is that kids do learn very quickly what to do, but once you deviate from the script, they have a hard time participating. So we always vary the cues to the kids and vary our responses.

(Slide 38) We're always modeling AAC and speech, and that might include signs or gestures for kids using unaided modes, and for the kids using aided modes, this will include modeling using their light-tech system or high-tech system so kids can see language being used and communicated via AAC. That model as a means to communicate is very important for the kids. In addition to doing that, it provides the child the opportunity to see the use of other concepts and language structures that they may be exposed to.

(Slide 39) I'm going to now share a case with you. This is a little boy who has severe cerebral palsy, severe quadriparesis. He has a tracheotomy and a seizure disorder. We first got involved with him when he had just turned 2. He had no vocalizations at that time, and is very severely motorically involved so not able to use gestures or signs. His parents are incredible parents and very resourceful and they had taken digital photos of some of his favorite toys so he could indicate if he wanted to play with them. But he participated very minimally in interactions, expressed one concept or less in 20 minutes of interaction, so a very passive communicator. Only able to request objects, these particular toys, and obviously communicating very telegraphically. We began intervention with this little guide, and introduced him to some light-tech symbols. Our initial goal was to increase his participation by providing multiple opportunities to communicate. We wanted to empower him and provide him with control over play and

interactions and allow him a way to build vocabulary and semantic concepts that he was able to communicate.

(Slide 40) After 12 weeks of intervention, he's not 28 months of age, he has over 480 words that he's able to express using his systems. He's increased his vocabulary by more than 5 words/day, so really he's keeping pace with typical language development. He's a much more active participant in interactions, expressing more than 48 concepts in a 20-minute interaction, and that's a huge increase from baseline where he had less than 1 concept in a 20-minute interaction. He's communicating now in one and two word messages, and expressing a wide range of semantic relations including agent, action, object, locative.

(Slide 41) He is at this stage, after 9 months of intervention, age 34 months, expressing well over 1000 concepts. He continues to keep pace by increasing his vocabulary with more than 5 concepts/day, which obviously imposes significant programming demands. He's a very active communicator and even as the interactions have become more complex, he's still able to keep up that turn-taking. He's not communicating in 1-4 word messages, expressing a wide range of semantic relations. He's beginning to use grammatical markers and develop phonological awareness skills. Our goal for him is to become a reader, so we've begun to work with him on some of the sounds language produces and letter-sound associations and those early literacy skills.

(Slide 42) After 12-14 months of intervention, currently Garrith is 39 months, he has thousands of concepts in his vocabulary, continues to increase his vocabulary, we can barely keep up with him. He not only participates in interactions with adults, but he's begun school and uses his computer as a shared focus for interaction: reading books to other kids, playing songs and using sound effects, and doing other things to really contribute and draw kids to him in those interactions. His mom told me the other day that he's actually getting in trouble in school for talking all the time when he shouldn't be talking. He uses a wide range of grammatical markers as they are required. We don't require them in all his interactions, but he often enjoys writing books and putting together stories, so he's acquired those in not only a receptive point of view, but also expressively. We have started to teach Garrith how to read, even though he's only 3. He needs access to so much language and literacy will be so powerful for him, that we've actually initiated him into one of our literacy research studies. He's made rapid progress in that study. He's now able to segment initial phonemes of words, he's able to blend sounds to create words, he understands all his letter-sound associations, and he's able to decode CVC words in isolation and shared reading situations and is able to do that with about 100 words at this stage. Clearly he's made incredible gains.

(Slides 43-44 not addressed)

(Slide 45) To sum up, all of the kids in our studies have made significant gains: they've all increased their rate of turn taking, they're all able to sustain interactions with others for much longer periods of time, they're all able to participate in interactions that involve social routines and play activities and not just needs and wants.

(Slide 46) The kids use their AAC systems not just to communicate with others, but also for play and learning, so they're using them independently. We have one little boy that will use his system and set up dramatic play situations and talk away. Some of the kids that are in school will use their systems for interactions with peers and contexts for those interactions

(Slide 47) All of the kids have acquired a range of semantic concepts and all but one of the kids has learned to combined concepts.

(Slide 48) All of the children have learned to use scene displays on initial introduction once we've modeled use. They seem to be much more motivated and interested when the scene displays are used and integrated into play, book reading, or music. All of the kids have learned to use other displays as well, although they've started with scene display.

(Slide 49) The kids have moved through various stages, first of all increasing their participation and social interaction, then developing a breadth of semantic concepts, increasing their vocabulary. Many of the children are building more complex language structures to support complex communication, and some of the children are building phonological awareness skills for later literacy development.

(Slide 50) So what does the future hold? For us we're really excited to see the gains the kids are making and our dream is to realize the magic and power of communication for young kids who have complex communication needs so they can ultimately achieve their full potential.

(Slide 51) Again, if any of you want more information, feel free to look at the AAC RERC website or feel free to email me at jcl4@psu.edu. Thank you.