



■Title of Project : The Effectiveness of tablet computer-based interventions for individuals with ASD: A Meta-Analysis and Examination of Evidence-Based Practice

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■Research Area : Autism Spectrum Disorder, Augmentative and Alternative Communication System, Applied Behavior Analysis

■Keyword : Autism, tablet computer-based interventions, iPad™, iPod™, meta-analysis, single-case research, evidence-based practice

【Purpose and Background of the Research】

The purposes of this research are to investigate the effectiveness of high technology (high-tech) augmentative and alternative communication (AAC) systems in improving social, communication, adaptive, and functional living skills of individuals with autism spectrum disorders (ASD). The use of handheld AAC devices has become widely utilized by individuals with ASD since these types of devices are readily accessible to those individuals (Peluso, 2012). While the effects of the use of the high-tech AAC systems have been investigated, there are no meta-analytic reviews that have provided an overall measure of its effectiveness. Therefore, it is hard to know about for whom and under what conditions the high-tech AAC systems are most effective and the overall magnitude of effects in each of targeted skills of individuals with AS. In the United States, current legislations including the Individuals with Disabilities Education Improvement Act of 2004 and the No Child Left Behind Act of 2001 mandated that educators utilize scientifically and empirically validated practices, called evidence-based practices (EBPs; Horner et al., 2005). Given the emphasis on use of EBPs and the increasing trend in the use of the high-tech AAC systems for individuals with ASD, it is critical to evaluate whether or not the use of the high-tech AAC systems can be considered an EBP for those individuals to improve their performances.

【Research Outline and Achievements】

This research project will yield three articles. Study 1 in this project will analyze the quality of the body of single-case research to determine whether or not use of the high-tech AAC systems can be considered evidence-based practices (EBPs; Horner et al., 2005) for individuals with ASD. Study 2 in this project will determine the effects of use of the high-tech AAC systems on improving targeted skills of individuals with ASD by

conducting a meta-analytic review. Finally, Study 3 in this project will provide practitioners and researchers with instructional guides on how to utilize the high-tech AAC systems for individuals with ASD.

【Research Scientific Significance and Ripple Effect】

This research project has several potential impacts on the field. First, based on an evaluation of single-case research on the high-tech AAC systems with the evidence standards, findings of this research project can help researchers and practitioners select an evidence-validated practice when they work with individuals with ASD to improve various skills of those individuals. Second, by conducting a meta-analytic review that makes comparisons related to the potential moderators, such as the outcome measures (e.g., verbal, nonverbal or recognizable words, social play behaviors, employment skills, self-help skills, academic skills), the participant characteristics (e.g., ages, diagnoses, functioning levels, communication and language levels), and the instructional contexts (e.g., instructional protocols, implementers, duration/length of training sessions, settings/context), this research project will provide researchers and practitioners with valuable information about to whom and under what condition they can utilize the high-tech AAC systems to improve the outcome variables of individuals with ASD. Third, findings of this research project will provide suggestions and implications for practice and future research regarding the high-tech AAC systems for individuals with ASD.

【Main Thesis and Publications, Homepage Address, and Other Contact Information】

Publications: Peer Reviewed (In press and published)

Neely, L., Ganz, J.B., Davis, J.L., Boles, M.B., Ninci, J., ***Hong, E.R.**, & Gilliland, W.

(accepted for publication). Generalization and maintenance of functional living skills for individuals with autism spectrum disorder: A review and meta-analysis. *Review Journal of Autism and Developmental Disabilities*.

Camargo, S. P. H., Rispoli, M. J., Ganz, J. B., ***Hong, E.R.**, Davis, H., & Mason, R. (10-2015, in press). Behaviorally-based interventions for teaching social interaction skills to children with ASD in inclusive settings: A meta-analysis. *Journal of Behavioral Education*. doi: 10.1007/s10864-015-9240-1

***Hong, E.R.**, Ganz, J.B., Ninci, J., Neely, L., Gilliland, W., & Boles, M. (9-2015, in press). A review of the quality of research evaluation for evidence-based practices for daily living skill research for individuals with autism spectrum disorder. *Journal of Autism and Developmental Disorders*. doi: 10.1007/s10803-015-2444-3

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- Ganz, J. B., ***Hong, E. R.**, Gilliland, W., Morin, K., & Svenkerud, N. (3-2015). Comparison between visual scene displays and exchange-based communication in augmentative and alternative communication for children with ASD. *Research in Autism Spectrum Disorders*, 11, 27-41. doi: 10.1016/j.rasd.2014.11.005
- *Hong, E.R.**, Neely, L., & Lund, E.M. (2014). Addressing bullying of students with ASD: Suggestions for families and educators. *Intervention in School and Clinic*, 50, 157-162.
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- *Hong, E.R.**, Neely, L., Rispoli, M.J., Trepinski, T.M., Gregori, G.V., & Davis, T.N. (2014). The efficacy of a signaled delay cue for decreasing tangible-maintained challenging behaviors in a child with autism. *Developmental Neuropsychology*, 1-7. doi: 10.3109/17518423.2013.874378
- *Hong, E.R.**, Ganz, J.B., Gilliland, W., & Ninci, J. (2014). Teaching caregivers to implement an augmentative and alternative communication intervention to an adult with ASD. *Research in Autism Spectrum Disorders*, 8, 570-580. doi: 10.1016/j.rasd.2014.01.012
- Ganz, J.B., Rispoli, M.J., Mason, R.A., & ***Hong, E.R.** (2013). Moderation of effects of AAC based on setting and types of aided AAC on outcome variables: An aggregate study of single-case research with individuals with ASD. *Developmental Neuropsychology*. (1-year IF: 1.577), 1-9.
- Ganz, J.B., ***Hong, E.R.**, Goodwyn, F. D., Kite, E., & Gilliland, W. (2013). Impact of PECS tablet computer app on conditional discrimination of pictures given a verbal stimulus. *Developmental Neuropsychology*, (0), 1-6. DOI: 10.3109/17518423.2013.821539

- *Hong, E.R.** & Lund, E.M. (2013). The Effectiveness of In-Vivo Modeling on Oral Shape Imitations in a Child with Autism. *Journal of Korean Association for Persons with Autism*, 13(1), 1-19.
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- *Hong, E.R.** (2011). Early communication intervention for children with autism: using the pivotal response treatment (PRT) model, *Journal of Korean Association for Persons with Autism*, 11(3), 1-14.

Book Chapter (s) and Contributions

- Ganz, J.B. & ***Hong, E.R.** (2014). Chapter 5: Naturalistic Aided AAC. In J.B. Ganz, *Speaking for ourselves: Aided augmentative and alternative communication for people with ASD*. In J. Matson (series ed.), Autism and Child Psychopathology Series. New York, NY: Springer.
- Ganz, J.B. & ***Hong, E.R.** (2014). Chapter 7: FCT and Autism. In J.B. Ganz, *Speaking for ourselves: Aided augmentative and alternative communication for people with ASD*. In J. Matson (series ed.), Autism and Child Psychopathology Series. New York, NY: Springer.
- Ganz, J.B. & ***Hong, E.R.** (2014). Chapter 6: Parent and Peer Mediated AAC In J.B. Ganz, *Speaking for ourselves: Aided augmentative and alternative communication for people with ASD*. In J. Matson (series ed.), Autism and Child Psychopathology Series. New York, NY: Springer.

【Other things you want us to put on our home page, or you want to appeal to us 】

As the PI in the current research project, the majority of my publications report single-case research investigating the effectiveness of interventions utilizing augmentative and alternative communication (AAC) systems to improve social and communication skills of young children with ASD. Both my clinical and research experiences have involved working with family members and diverse individuals with disabilities. From Fall 2011 to Spring 2014, I was a behavioral therapist at Autism Clinic. The majority of the clients with whom I have worked are aged 6 and younger and a large proportion of the clients

are from culturally and linguistically diverse backgrounds. As a behavioral therapist, I utilized evidence-based practices to promote communication, behavior, and social skills of individuals with autism. I worked with parents weekly to discuss their concerns, receive their input, and provide training in communication and behavior interventions. Further, my research has involved providing and evaluating training provided to caregivers to teach them to implement evidence-based practices (EBPs). Further, in Fall 2014, as a clinical specialist, I supervised implementation of behavioral therapy and training novice behavior therapists in the implementation of EBPs for their clients with ASD at the Autism Clinic. The therapists mainly consisted of undergraduate and graduate students who were majoring in special education or school psychology at Texas A&M University. To support my research and scholarly activities with individuals with ASD, I have received numerous internal grants including graduate research and travel grants. I became a Board Certified Behavior Analyst in September 2013. By this August, I will have met all of the requirements to be eligible to apply to become a Doctoral level Board Certified Behavior Analyst-Doctoral. Currently, I am an assistant professor in the Department of Human Sciences at University of Tsukuba. I have been actively engaged in research, writing, and professional presentation, particularly related to young children and their caregivers. The thrust of my unique research agenda relates to social and communication interventions for individuals with ASD.