



Research

Summer 2019

News and Notes About
Scientific Research on ASD
and Other Developmental and
Behavioral Disorders



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Autism is Not Caused by Vaccines: MMR or Otherwise

Bill Ahearn, PhD, BCBA-D, LABA
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For many years there have been claims that vaccines cause autism. Historically there have been two variations of this claim. The one that was initially most prominent in the U.S. was that thimerosal, a preservative used in some vaccines, caused autism. In 1999 the American Academy of Pediatrics, showing an abundance of caution, called for the removal of thimerosal from vaccines in order to increase the public's confidence in the vaccine program.

Thimerosal had already been removed from the vaccines of other developed countries, such as Canada and Denmark, prior to it being removed from vaccines in the U.S. If thimerosal was causing autism, a decrease in the prevalence of autism should have been detected in those countries and the U.S., but no such change has been detected as prevalence estimates continue to rise. In a definitive study on this topic Danish researchers (Hviid et al., 2003) looked at thousands of children who received either vaccines containing thimerosal or vaccines without it and found that the rates of autism were identical in the two groups. The claim that thimerosal in vaccines causes autism is false.

The other claim was that the MMR vaccine, which does not contain thimerosal, causes autism. In a recently published study, again involving Danish researchers surveying an extensive database of health information, Hviid

and colleagues (2019) examined all children born to Danish mothers from January 1999 through December 2010. There were over 650,000 children born whose records were reviewed for information on MMR vaccination, autism diagnoses, other childhood vaccines, sibling history of autism, and autism risk factors. The researchers found no support for the hypothesis of increased risk for autism after MMR vaccination. In fact, those without MMR vaccination were slightly more likely to have an autism diagnosis though this was not statistically significant for the entire population sample.

Some have suggested that the MMR vaccine triggers autism but this study found no support for MMR vaccination triggering autism in susceptible subgroups characterized by environmental and familial risk factors. Some have also suggested that the MMR triggers a regressive form of autism close in time to the receipt of the MMR vaccine. The study found there was also no support for a clustering of autism cases in specific time periods after MMR vaccination.

In addition to this study surveying the Danish population, similar findings have been obtained in studies conducted with populations in Poland, Japan, the United Kingdom, as well as the U.S. The degree of confidence in claiming that the MMR causes autism hypothesis is false is incredibly high.

Increasing Immunization Coverage. Committee on Practice and Ambulatory Medicine and Council on Community Pediatrics. *Pediatrics*. Jun 2010, 125 (6) 1295-1304; DOI: 10.1542/peds.2010-0743

Hviid, A., Stellfeld, M., Wohlfahrt, J., & Melbye, M. (2003). Association between thimerosal-containing vaccine and autism. *Journal of the American Medical Association*, 290, 1763-1766.

Hviid, A., Hansen, J.V., Frisch, M., & Melbye, M. (2019). Measles, Mumps, Rubella Vaccination and Autism: A Nationwide Cohort Study. *Annals of Internal Medicine*, 170, 513-520. doi: 10.7326/M18-2101.

NECC Published Research on Increasing Learning Opportunities

Eileen Roscoe, PhD, BCBA-D, LABA
Director of Behavior Analytic Research, NECC



Individuals with autism spectrum disorder (ASD) often show restricted, repetitive behavior patterns. These repetitive patterns can be problematic because they may limit opportunities for learning new skills and engaging in social interaction.

One example of a restricted pattern that may occur is refusal to remove **protective equipment**. Protective equipment, such as helmets and arm splints, is used to prevent the opportunity for students to engage in severe forms of self-injury that may cause tissue damage. However, for some individuals, wearing protective equipment may become a comforting or preferred activity. As a result, these individuals may refuse to participate in independent social activities that require equipment removal, such as eating.

Chelsea Fleck, MS, BCBA, LABA, NECC Program Specialist, and Jason Bourret, PhD, BCBA-D, LABA, NECC Associate Clinical Director, evaluated an intervention to increase equipment removal and meal consumption in two

NECC students who frequently refused meals so they could avoid removing their protective equipment.

Intervention included providing the students with a highly preferred meal to facilitate increases in equipment removal and meal consumption. In addition, the equipment was modified to allow the participant to access both the equipment and the meal simultaneously. For example, the therapist prompted one participant to pull his arm splints below his elbows to allow for unrestricted movement necessary for self-feeding. This combination of intervention components was found to be effective in increasing meal consumption for both students.

Another restricted interest pattern frequently observed among individuals with ASD is repetitively requesting the same items and activities. Restricted interest patterns present a problem because they may limit additional learning opportunities. To address this concern, Jon Seaver, PhD, BCBA-D, LABA, Senior Clinician, and Jason

Bourret conducted a study to teach NECC students to request a larger variety of items. Eight students who exhibited this restricted interest pattern participated. The authors evaluated a variety of strategies, including making it easier for students to make requests for various items and activities, reminding students of what was available for each request, and making items more valuable. As a result of intervention, all eight students began appropriately requesting a variety of different items.

These findings indicate that clinicians can successfully teach individuals to request a variety of items, allowing them access to more activities and varied learning opportunities. This is an important goal toward increasing students' quality of life and independence.

Fleck, C. R., Bourret, J. B., & Lloveras, L. A. (in press). *Behavioral Interventions*. DOI:10.1002/bin.1681

Seaver, J. & Bourret J. Producing mands in concurrent operant environments (in press). *Journal of Applied Behavior Analysis*.

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Research at ABAI

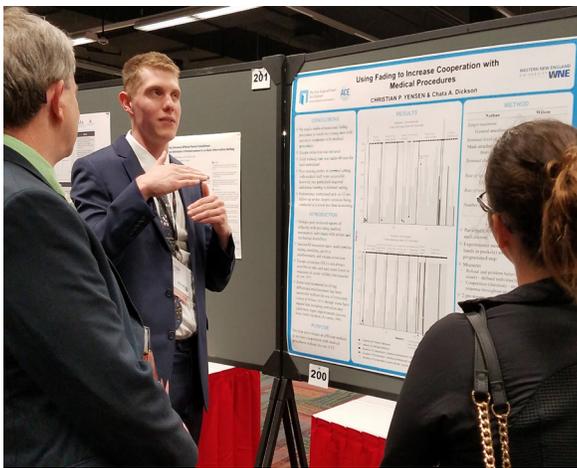
Staff from NECC presented more than 40 papers, presentations, symposia, and workshops at the Association for Behavior Analysis International (ABAI) Annual Convention on May 25-27, 2019, in Chicago. The following are highlights of our work.

Using Fading Along Multiple Dimensions to Increase Cooperation With Medical and Hygiene Procedures

Yensen, C. & Dickson, C.

EDITOR'S NOTE:

A goal for NECC students is to increase their overall health and wellness. An important step toward achieving this goal involves teaching them to cooperate with medical procedures. The authors of this study successfully taught two NECC students this valuable skill by gradually introducing medical exam steps.



Christian Yensen

Two young men with autism who were students at NECC were taught to cooperate with medical procedures (an ear exam with an otoscope or application of an anesthetic mask). Both individuals had a history of severe problem behavior in the context of medical procedures, which previously had required sedation or physical restraint. Attempting to implement **escape extinction** in this context would not be safe for the students or therapists. To teach cooperation we used stimulus fading without extinction and placed emphasis on errorless learning by fading gradually across multiple dimensions (duration and evocativeness). **IOA** was calculated for 33% of sessions with 97% agreement. Both students refused to cooperate or engaged in challenging behavior during baseline. The teaching procedure was efficient in terms of the number of sessions to mastery (42 and 48) and the total amount of time in training (21 and 39 minutes). Following completion of the teaching steps, both students cooperated with the targeted medical procedures with their teachers and with a less familiar medical professional.

WHAT DOES IT MEAN?

Escape extinction: when a previously reinforced behavior no longer receives reinforcement. For example, a student hits someone while writing and gets out of (escapes) writing. Extinction means the student no longer gets out of writing (the behavior s/he is trying to escape) for hitting.

Fading: decreasing the level of assistance needed for a student to complete a task or activity. When teaching a skill, the overall goal is for the student to eventually engage in the skill independently.

IOA - Interobserver agreement: the degree to which two or more observers report the same observed values after measuring the same events. IOA is important because it helps avoid errors in data collection.

Mand: a request for an item or object.

Protective equipment: gear such as helmets, arm limiters, mouthguards, or specialty clothing that helps to reduce bodily harm or injury.

Tact: saying the label or name for an object or thing.

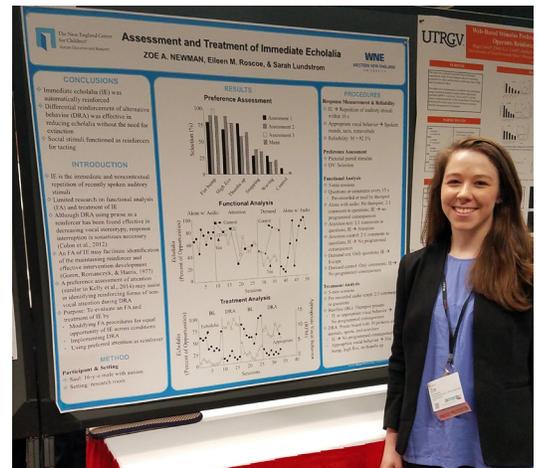
Assessment and Treatment of Immediate Echolalia

Newman, Z., Lundstrom, S., & Roscoe, E. M.

EDITOR'S NOTE:

Another important consideration in increasing independence in individuals with autism is to decrease interfering problem behavior that impedes communication and learning. In this study, NECC researchers conducted an assessment and treatment of immediate echolalia, repeating words that have just been spoken. After identifying that the behavior was caused by nonsocial variables (i.e., automatic reinforcement; the stimulation of the response was the reinforcer), they treated the behavior by teaching the NECC student to emit appropriate forms of communication (in the form of tacts, appropriately labeling items).

Immediate echolalia is a type of vocal stereotypy that involves the noncontextual repetition of auditory stimuli that has just been spoken. This behavior can be difficult to assess and treat because it requires additional controls to ensure that equal opportunities to emit the behavior are presented across conditions. Colon et al. (2012) showed that differential reinforcement of an alternative response (DRA) during verbal operant training is effective in reducing vocal stereotypy. However, common reinforcers during DRA present a challenge in reducing the occurrence of immediate echolalia. For instance, praise involves presenting an auditory stimulus that provides more opportunities for immediate echolalia to occur. The purpose of the study was to assess DRA with preferred social stimuli as an intervention to reduce immediate echolalia. A functional analysis (FA) was conducted to identify the function of immediate echolalia prior to treatment. In baseline, there were no programmed consequences for immediate echolalia. In DRA, pictures of objects and activities were presented on a poster board, and appropriate tacts were reinforced with preferred social stimuli with no programmed consequences for immediate echolalia. Results showed that social stimuli can function as reinforcers for tacting during DRA to reduce immediate echolalia for one participant. IOA was collected for 33% of sessions and averaged 92%.



Zoe Newman

Autism Symptom Onset for an Infant Sibling in the First Year of Life: A Case Study

MacDonald, R. P. F., MacDonald, A., Couger, K., Krueger, H. M., McFadden, A. K., Peterson, P. N., Stevenson, S. A., Ahearn, W. H.

EDITOR'S NOTE:

The authors of this study conducted weekly assessments to document early behavioral markers consistent with autism. The participant was an infant with two older siblings with autism. This important work can help identify autism symptomatology early enough to acquire early intervention support.

Infant siblings of children diagnosed with autism spectrum disorder (ASD) have an 18% recurrence risk at 3 years old (Osnoff et al., 2011). Graupner and Sallows (2017) reported symptoms in children under 3 months of age. The purpose of the current investigation was to document the early emergence of symptomatology and to replicate the findings of Graupner and Sallows (2017). The participant in the study was a sibling who had two older brothers with an ASD diagnosis. Using weekly developmental assessments, early markers were first noted at 8 weeks of age and included: flat affect, no response to sound out of sight, no response to name/voice, eye contact avoidance, and inconsistent tracking of visual stimuli. Skill deficits identified during the first year of his life and the age at which typical children acquire each skill are presented. IOA was assessed with an average of 95% across sessions. The participant was three to five months delayed across domains, with the largest delays being in the social and communication areas. Results are discussed as they relate to early markers for ASD and the importance of early intervention.

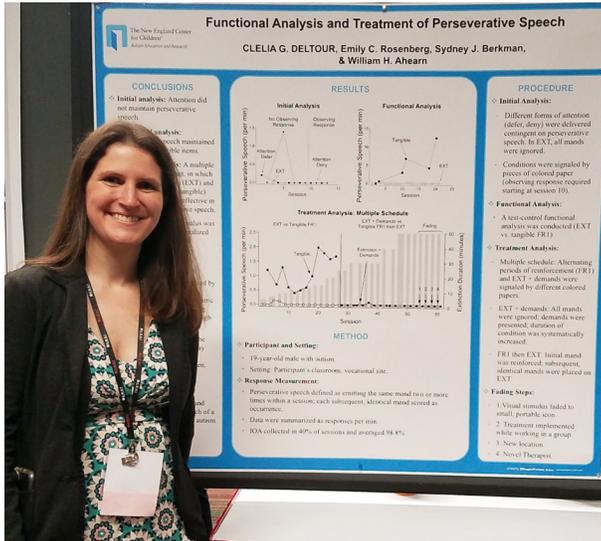
Assessment and Treatment of Perseverative Speech

Deltour, C., Rosenberg, E., Berkman, S. & Ahearn, W. H.

EDITOR'S NOTE:

The authors conducted a functional assessment and treatment of a student's perseverative speech (i.e., repetitively asking for the same item). The authors successfully treated this behavior by conducting an intervention that involved no longer providing items for repeated requests.

Perseverative speech (i.e., repetitively talking about restricted topics, engaging in high rates of repeated **mands**) in individuals with autism may be difficult to redirect and hinder social relationships (Fisher, Rodriguez, & Owen, 2013). The purpose of the study was to assess and treat the perseverative speech of a young man with autism. Perseverative speech was defined as emitting the same mand two or more times within a session. An initial analysis showed that different forms of attention did not maintain perseverative speech. A subsequent functional analysis demonstrated that perseverative speech was maintained by access to tangible items. A treatment consisting of a multiple schedule arrangement, in which signaled periods of extinction and reinforcement were alternated, was implemented. During the extinction condition, mands were ignored while demands were presented for increasingly longer durations to mimic the student's typical hourly classroom schedule. During the reinforcement condition, mands were initially reinforced on a FR1 schedule. The schedule was then faded such that only the first mand was reinforced. Perseverative speech remained at zero in both conditions at the target extinction duration (50 minutes). IOA was 98.8% (collected for 40% of all sessions).



Clelia Deltour

Increasing and Generalizing Variability in Toy Play Actions of Children with ASD Using Lag Schedules of Reinforcement

Baruni, R., Sheridan, D.J., Clodagh, M.M., Kelly, M.P., Seaver, J.P.

Restricted repetitive behaviors are frequently demonstrated by children with autism (Wilson et al., 2017). Invariable behaviors, along with limited play skills, may result in little contact with social sources of reinforcement (Miller & Neuringer, 2000).

Research has demonstrated variability to be an operant element of behavior, sensitive to reinforcement contingencies (Neuringer, 1993). Baruni, Rapp, Lipe, and Novotny (2014) increased variability in play behavior of children using lag schedules of reinforcement. The current study replicated and extended Baruni et al. (2014) by investigating the use of lag schedules of reinforcement to occasion novel toy-play with three children diagnosed with ASD in the United Arab Emirates. A non-concurrent multiple baseline was utilized to evaluate the effects of lag schedules of reinforcement on variable toy-play behavior. During baseline conditions, play behavior was observed in the absence of intervention. During intervention conditions, reinforcers were delivered contingent on responses that met the lag parameter. Furthermore, prompts were introduced and faded to further induce variable toy-play behavior. Results from post-intervention probes, generalization probes, and social validity are discussed. The data for all three participants indicate that the procedure was effective in increasing novel toy-play responding. IOA averaged 94.5% (range, 80%-100%).



Rasha Baruni

Research at DBA

Staff from the Mohammed bin Rashid Center for Special Education operated by The New England Center for Children recently presented at the Division of Behaviour Analysis – Psychological Society of Ireland.



Reinforcement Considerations: Evaluating Effects, Preference Over Time, and Teaching New Mands

Chair: Verriden, A.; Presenters: Davey, J., Elcan, A. & Ward, S.

Reinforcement is one of the governing laws of behavior analysis and a critical component to skill-acquisition and behavior-management programs. Several empirical methods for identifying reinforcers that can be used when working with individuals with autism have been described in the literature (DeLeon & Iwata, 1996; Fisher et al., 1992). This symposium shared applications for establishing reinforcers, measuring preferences of potential reinforcers over time, and teaching children to request for their reinforcers. The first presentation described a method for evaluating social attention as a reinforcer; the authors described a method for measuring preference of different types of social attention and whether the preferred forms of attention function as reinforcers. The second presentation described a method for evaluating client preferences of activities and edibles over time and discussed considerations for fluctuating preferences. The final presentation described a method for teaching young children with autism to request specific reinforcers when problem behavior is maintained by a combination of multiple reinforcers; the authors described a method for teaching specifying mands while maintaining low rates of challenging behavior.



Amanda Verriden, Shannon Ward, Angela Elcan, John Davey, Franco Esterhuyse, and Dan Gould

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