



Research

Fall 2021

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



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NECC Hosted On-site ABA Conference



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EDITOR'S NOTE: *Every spring, NECC sends dozens of staff to the Association for Behavior Analysis International (ABAI) Convention, where NECC researchers are often key presenters. With the pandemic forcing conferences to go virtual, Dr. Ahearn and Dr. Roscoe created a two-day symposium held in the John and Diane Kim Autism Institute instead.*

NECC clinicians and researchers participated in sharing their research at a two-day conference with both live and virtual attendees. At the start and end of each conference day, a senior clinician presented an in depth 1-hour presentation describing their work. Topics ranged from the effects of contingency descriptions during delay discounting to the generality of treatment effects. Listed below is a brief overview of each of the four keynote addresses presented. In the Day 1 opening keynote address, Stefanie Upshaw described a study evaluating delay discounting when descriptions of the consequences were and were not provided. Delay discounting is the extent to which delays to a reward decrease the subjective value of the reward. In each session of a delay discounting preparation, multiple choices between a smaller sooner and larger later reward are presented. The experimenter then generates indifference points across a variety of delays to rewards to identify the amount

of a reward available immediately that approximately equals a larger reward available at a delay. An example of a hypothetical reward preparation is asking an individual if they would like to receive \$1000 now or \$1000 in a month. If they choose to receive \$1000 now, then they would be asked if they would like to receive \$980 now or \$1000 in a month. The series of questions about choices continue until the participant is indifferent between receiving a smaller sooner reward and larger later reward. For example, if given the choice between \$1000 in a month and \$500 now, the individual may respond equally to both options. Some individuals will show a pattern that indicates less sensitivity to delay (there is little decrease in reward value as the delay increases, whereas other individuals will show greater sensitivity to delay (they show impulsivity in that they frequently choose the smaller sooner reward rather than the larger later reward). Delay discounting preparations have been used across species to assess the degree

to which delays devalue consequences. Among the studies that have used these preparations with humans, none have assessed indifference points in the absence of contingency descriptions, making the relative role of contingency descriptions and reinforcers in determining responding unclear. Stefanie reviewed research evaluating the role of contingency descriptions (i.e., the experimenter describing the consequences to participants prior to their selections) and reinforcers on delay discounting in hypothetical reward preparations. They found clear indifference points between conditions with contingency descriptions and those without for 14 of 18 participants, suggesting that contingency descriptions can influence outcomes during discounting preparations. The implication of this finding is that hypothetical-reward arrangements may not be appropriate substitutes for preparations that involve contact with the consequences alone.

Keynotes Featured Talent from NECC Past & Present

In the Day 1 closing keynote address, Cormac MacManus discussed a review of the literature on how to facilitate generality of differential reinforcement of alternative behavior (DRA) treatment outcomes. DRA is one of the most effective interventions for decreasing severe problem behavior and increasing appropriate alternative behavior, such as communication and compliance. An important consideration when conducting DRA is the extent to which treatment effects will have generality. Generality refers to whether the treatment will continue to be effective when implemented in new settings, with new caregivers, and across time. Cormac noted the importance of this topic in his role as a program specialist at NECC. A focus of his work was identifying ways to best facilitate generality to help students transition from NECC to adult placement. Cormac identified twenty-seven studies that included a tactic to facilitate generality. Cormac highlighted three tactics that are useful for promoting generality when conducting DRA. First, clinicians should teach alternative behaviors that will result in powerful reinforcing consequences that do not need to be programmed by a therapist or behavior change agent. Identifying the consequences



Stefanie Upshaw, MS, BCBA, LABA



Cormac MacManus PhD, BCBA-D, LABA

maintaining challenging behavior and using this information in the arrangement of reinforcement for an alternative behavior is reflected with this generalization tactic. Second, clinicians should modify the consequences for problem behavior so that they no longer result in the maintaining reinforcer. Third, clinicians should ensure that reinforcers are delivered for appropriate behavior by recruiting individuals in the natural environment. For example, parents, caregivers, and teachers could be trained to implement the DRA intervention. In the opening keynote address for the second day of NECC-ABA, Haley Steinhauser discussed a literature review on redirection, a treatment procedure that is often used for decreasing problem behavior maintained by automatic reinforcement (i.e., behavior maintained by the sensory consequences it produces). Haley defined redirection as the contingent delivery of prompts to emit alternative responses. This definition has also been used for procedures referred to as overcorrection, contingent demands, and response interruption and redirection (RIRD). Haley emphasized three important findings from her review of 48 studies published in the last 20 years. First, redirection is an effective strategy for decreasing various forms of problem behavior maintained by automatic reinforcement. Although it has often been evaluated with stereotypy, it has also been used to decrease automatically reinforced pica, public masturbation, daytime sleep, body tensing, and hyperventilation. Second, promoting appropriate behavior can improve the efficacy of redirection. Because the goal of intervention is to promote independent functioning, Haley recommends that clinicians attempt to select appropriate behavior



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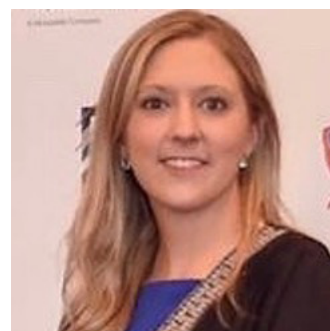
that are likely to contact the natural consequences in the community. Third, clinicians should consider the individual and the treatment context when selecting the most effective and socially acceptable variation of redirection (i.e., the duration of the redirection procedure and the type of reinforcement to include). Haley recommended that clinicians arrange additional sources of reinforcement (e.g., providing continuous access to competing leisure items or delivering reinforcement for an appropriate behavior, such as appropriate speech or task productivity). When redirection alone is ineffective, clinicians may consider combining additional direct procedures, such as contingent reprimands; response blocking; or response cost with redirection. Two final recommendations were to assess the social acceptability of redirection procedures and treatment goals with relevant stakeholders and to promote the generality of treatment effects across naturalistic settings, activities, and implementers. In the final keynote address, Amanda Verriden, discussed a review paper that she completed for her doctoral degree at Western New England University. The purpose was to discuss the use of punishment procedures in the last 20 years for reducing problem behavior



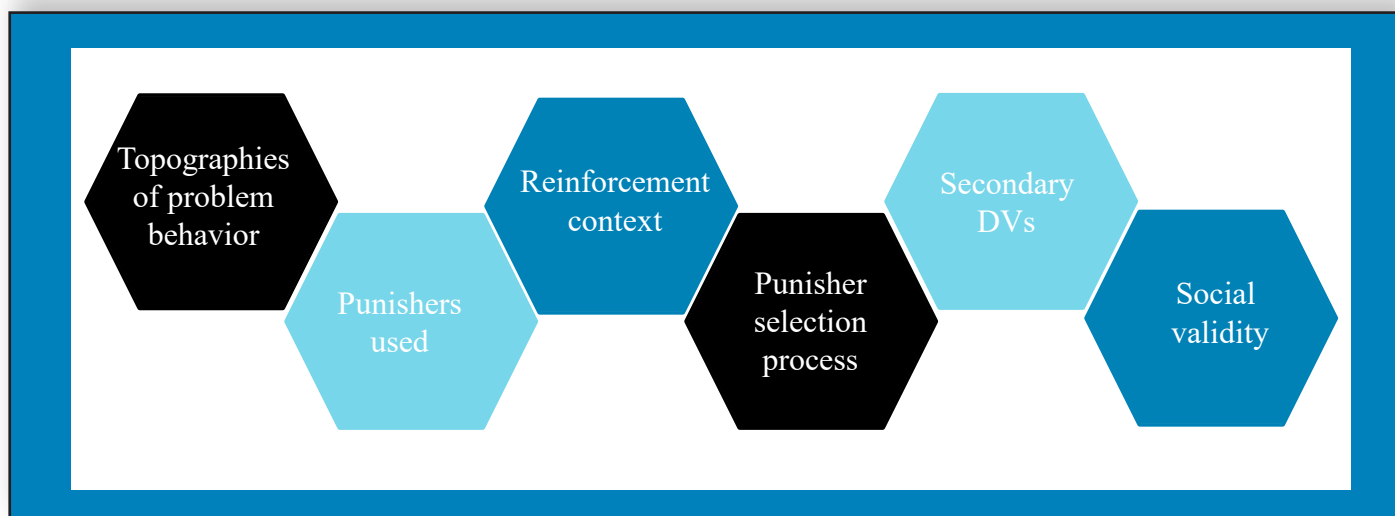
Haley Steinhauser PhD, BCBA, LABA

maintained by automatic reinforcement. The term punishment was defined as the presentation of or removal of a stimulus contingent on problem behavior, that results in a subsequent decrease in that behavior. Amanda noted that the most often used punishment procedure for automatically reinforced behavior was response interruption and redirection (RIRD). RIRD involves presenting motor instructions contingent on the problem behavior. Additional procedures that were found to be effective included overcorrection, contingent exercise, response blocking, hands down, response cost, and contingent reprimands. There were few examples of more intrusive procedures, such as baskethold, aversive taste, and visual screen. Amanda noted that it is critical that clinicians assess reinforcement-based intervention components alone prior to conducting punishment, and always include a reinforcement component in conjunction with punishment. The most reported

reinforcement procedure conducted both prior to and concurrent with punishment was noncontingent reinforcement (NCR). NCR involves providing continuous access to preferred leisure items that may compete with the automatically reinforced problem behavior. Amanda discussed the importance of empirically identifying procedures to use as potential punishers. An empirical approach involves interviewing caregivers to identify acceptable procedures, and then assessing multiple potential punishment procedures in the context of a reinforcement-based intervention. Additionally, Amanda suggested that clinicians record multiple dependent measures to determine the most effective intervention that is associated with the fewest side effects. Finally, Amanda discussed the importance of assessing social validity to ensure communication and rapport with relevant stakeholders in the treatment selection process.



Amanda Verriden PhD, BCBA, LABA



Highlighted Symposia

There were many excellent symposia offered during the two-day NECC ABA event. Presenters discussed research on a range of topics, including teaching verbal behavior, conducting remediation strategies during teaching, assessments of social interaction, increasing compliance with pill swallowing and other medical procedures, and treating automatically reinforced problem behavior. Three symposia are highlighted below with summaries of key themes, and the titles and abstracts from each presentation. The topics included current research from Abu Dhabi, research assessing early markers and treatment in infants, and strategies for enhancing generality of treatment outcomes.

Research from Abu Dhabi

EDITOR'S NOTE: Listed below are abstracts from three papers for a symposium highlighting research from Abu Dhabi. The first presenter was Aline Atallah, who described a study on functional communication training (FCT). Functional communication training involves withholding the maintaining reinforcer for problem behavior and providing it following an appropriate communication response. In the second presentation, Lizahn Zimmermann described a study on teaching parents to implement pre-session pairing skills via telehealth. In the third presentation, Belen Inaraja Lopez discussed research that involved decreasing elopement by teaching a young child with ASD to follow instructions in English and Arabic across multiple locations (classroom, hallway, cafeteria, library).



PRACTICAL FUNCTIONAL ASSESSMENT AND DIFFERENTIATING THE OMNIBUS MAND TO SPECIFIC MANDS TO TREAT PROBLEM BEHAVIOR IN A CHILD WITH AUTISM

Atallah, A.

When problem behavior is maintained by multiple reinforcers or a combination of reinforcers, functional communication training (FCT; Carr & Durrand, 1991) may begin with an omnibus mand (Hanley et al., 2014; Ghaemmaghami et al., 2018). However, specific and complex communicative responses may be a desirable outcome of treatment (Tiger et al., 2008). The present study replicated the methods described by Ward et al. (2020) to differentiate an omnibus mand (“my way please”) into specific mands (“Break, please”, “I want iPad”). First, an interview informed synthesized contingency analysis (IISCA; Hanley et al., 2014) was conducted and suggested that the problem behavior of a young

child to be sensitive to escape from demands to access tangibles, edibles, and attention. An omnibus mand was taught to replace problem behavior and then the omnibus mand was differentiated into specific mands using the systematic shaping process described by Ghaemmaghami et al., (2018) to increase the complexity of functional communication. Problem behavior remained low while specific FCRs were acquired. Terminal probes suggested that the systematic shaping process was necessary to teach complex communicative responses while maintaining low rates of problem behavior. A social validity questionnaire indicated that classroom teachers were satisfied with the outcomes.

TEACHING PARENTS TO IMPLEMENT PRE-SESSION PAIRING VIA TELEHEALTH

Zimmermann, L.

Research has demonstrated that the generalization of behavioral treatments depends on the extent to which individuals in the natural environment implement the intervention procedures with fidelity. Therefore, parent/caregiver training is an essential component of treatment. Due to the current pandemic, the training of caregivers and parents in the natural environment has become increasingly difficult. The use of telehealth may help reduce the current barriers and help increase the long-lasting effects of effective treatments. To date, there is a paucity of research on the training of caregivers/parents using telehealth. Thus, the purpose of the current study was to teach parents/caregivers to implement pre-session pairing skills via telehealth. Three parent-child dyads participated in this study. All parents learned to implement the procedures with high procedural fidelity.



TEACHING TO RESPOND TO STOP ACROSS LANGUAGES AND SETTINGS USING A MATRIX TRAINING STRATEGY

Lopez, B. I.

Elopement is common in children with autism spectrum disorder (ASD) and can lead to fatal accidents. In a parent survey, Anderson et al. (2012) found that children who went missing as a result of an elopement incident were less likely to have certain skills in their repertoire (e.g., not responding to name). Function-based treatments have been found to be effective (Jessel et al., 2017), however, acquisition of skills incompatible with elopement (e.g., stopping upon a cue) may prove to be beneficial. This study evaluated the use of a 4x4 matrix to teach a young child with ASD to respond to stop across four locations (classroom, hallway, cafeteria, library) using four instructions provided in English and Arabic (stop, hold on, waggif, terayya). After direct training of four targets, the participant acquired the remaining 12 targets without explicit instruction providing preliminary evidence that matrix training may be useful to teach safety skills efficiently. Target skills were maintained at 4- and 7-week probes.

Symposium on Infant Work

EDITOR'S NOTE: *In a symposium on infant research, three papers were presented on infant siblings of individuals with ASD. In the first paper, Kathryn Couger described a study that involved documenting early markers of autism using a specialized assessment tool. They found that the tool was useful and identified five key early markers of autism in infants. In the second presentation, Victoria Weisser described research documenting the emergence of early markers and the outcomes of early treatment in a sibling. As a result of early intervention in applied behavior analysis, the participant no longer met the requirements for an ASD diagnosis at 22 months. In the final presentation, Morgan Scully reviewed data on the treatment of motor stereotypy in an infant at risk of ASD. Non-physical redirection of stereotypy to toy play and reinforcement for toy engagement was effective in decreasing stereotypy to near-zero levels.*

IDENTIFICATION OF EARLY MARKERS OF AUTISM IN INFANT SIBLINGS

Couger, K.

While a preponderance of evidence indicates that autism symptomatology emerges at 6 to 12 months of age (Zwaigenbaum et. al, 2005), a recent study by Graupner and Sallows (2017) suggests that symptoms of autism can emerge in infants as early as 3 months of age. The purpose of the current investigation is to document the early emergence of autism symptomatology in high-risk infant siblings younger than 6 months of age. The second purpose of this study is to pilot the Early Markers of Autism (EMA) assessment tool for young infants, developed by the authors. Currently 52 high-risk siblings and 13

low-risk babies under 6 months are participating in this study They receive bi-weekly developmental screenings in addition to the EMA. Data to date reveal that there are five key early markers of autism in infants, and each can be effectively assessed using the EMA. Interobserver agreement on the data obtained using the EMA averaged 95%. Data will be presented on the presence of these markers and the specific behavioral profile configuration of these infants. These findings have implications for the early identification of autism in infants, leading to long term positive outcomes for infants and families.

HOW EARLY IS DEVELOPMENT DISRUPTED IN AUTISM?

- Parent Report
 - Less Reliable
- Retrospective Studies from Videotapes
 - Parents usually do not film atypical behavior
- Neuroimaging Studies
 - Intrusive and expensive
- Prospective Studies
 - Longitudinal studies from birth
 - Timing of emergence of ASD
 - Use Siblings, 18.8% recurrence rate at 3
- Findings more robust**



TREATMENT OUTCOMES FOR A SIBLING IDENTIFIED AS SYMPTOMATIC FOR AUTISM AT 8 WEEKS OLD

Weisser, V.



Victoria Weisser MS

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 early emergence of symptomatology in a sibling and the outcomes of early treatment. Early markers were first noted at eight weeks 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. At three months, parent-implemented treatment was initiated with little change in symptoms. At six months, 15

hours of Applied Behavior Analysis (ABA) began with greater gains in skills. However, the participant continued to perform below age level by 12 months of age. At 12 months, 30 hours of ABA began and at 22 months, the participant no longer met the requirements for an ASD diagnosis. The participant has continued to not meet requirements for an ASD diagnosis at 38 months. Interobserver agreement was assessed with an average of 82.9% across sessions. The attached graph shows the participant's age equivalent scores on the Mullen Scales of Early Learning Assessment over time.

ASSESSMENT AND TREATMENT OF STEREOTYPY IN INFANTS AT RISK OF ASD

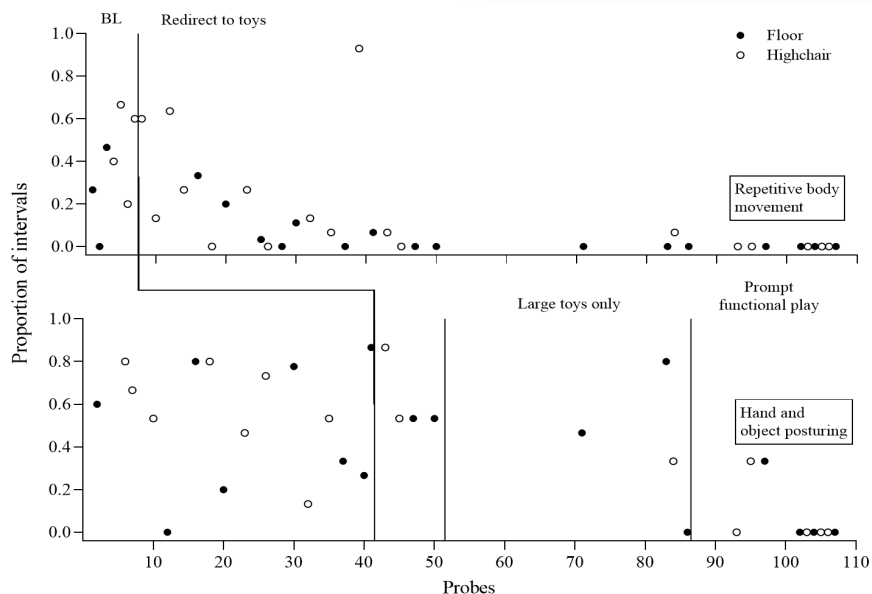
Scully, M.

Stereotypy can be one of the most persistent and difficult to treat topographies of challenging behavior exhibited by children with autism spectrum disorder (ASD). Although stereotypy is often not physically dangerous, decreasing stereotypy is a common target for clinicians and researchers for a variety of reasons. Stereotypy can interfere with skill acquisition and long-term treatment outcomes, decrease the likelihood of positive social interactions, and is often viewed as socially stigmatizing. The purpose of this study was to identify and treat motor stereotypy in an infant at risk of ASD. Although several studies have investigated the prevalence and topographies of stereotypy in young children, none have identified the age at which it emerges and demonstrated the efficacy of an intervention strategy with individuals under one year of age. Non-physical redirection of stereotypy to toy play and reinforcement for toy engagement was implemented in a multiple baseline design across topographies

of stereotypy. Results indicate decreases in all topographies of stereotypy to near-zero levels across the course of the study. These findings are discussed as they relate to the implications of identifying stereotypy in infancy and developing the treatment strategies needed to intervene as soon as it is identified.

These results speak to the feasibility of both the identification of and intervention for symptoms of ASD in infancy and the speed at which they can be reduced if they are identified at this age.

No Interaction Probe



Symposium on the Increase and Generalization of Behavior

EDITOR'S NOTE: *In the symposium highlighted below, there were three papers on increasing socially important behavior. In the first paper, Lauren Rae described a study on a self-monitoring intervention for increasing task engagement. For both participants, the intervention was found to be effective. For one participant, reinforcement of accurate self-monitoring was sufficient for maintaining task engagement. In the second presentation, Hannah Krueger reviewed a study on a progressive treatment approach for increasing physical activity (PA) engagement in two individuals with ASD. Treatment was effective in increasing and maintaining walking on a treadmill for both participants. In the final presentation, Irene Looi discussed the concept of the generality (i.e., the extent to which treatment is effective across settings, implementers, and time) and how it has been addressed in research published within the last 10 years.*

A COMPONENT ANALYSIS OF SELF-MONITORING FOR INCREASING TASK ENGAGEMENT

Rae, L.

Self-monitoring has been found to be an effective treatment approach for increasing a variety of skills, such as leisure item engagement; social initiations; and vocational task productivity. Because a self-monitoring intervention often includes multiple treatment components (e.g., differential reinforcement of alternative behavior; DRA), the potential benefit of simply providing self-monitoring materials alone remains unclear. The purpose of the current study was to conduct a component analysis of a self-monitoring intervention for increasing task engagement and productivity in two individuals with autism spectrum disorder. During the treatment analysis, various intervention components were evaluated sequentially, including self-monitoring alone (baseline) before and after training, self-monitoring plus DRA (accuracy), self-monitoring plus DRA (accuracy & engagement), and DRA (engagement). Dependent variables measured were task engagement, self-monitoring accuracy, productivity, and stereotypy. Self-monitoring alone was shown to be ineffective for both participants; however, reinforcing accurate self-monitoring of task engagement was observed to be effective for one participant following a history of reinforcement for engagement.

ASSESSMENT AND TREATMENT FOR INCREASING PHYSICAL ACTIVITY FOR INDIVIDUALS WITH INTELLECTUAL DISABILITIES AND AUTISM

Krueger, H.

Although many children in the United States do not meet the Center for Disease Control's (CDC) recommendations for physical activity engagement, individuals with Autism Spectrum Disorder (ASD) are at an even greater risk for having sedentary lifestyles. Previous research on increasing physical activity engagement has been primarily conducted with typically developing children and adults. The treatment methodologies and activities included in these studies may not be amenable to individuals with ASD who may have more limited repertoires. The purpose

of this study was to develop a systematic technology for increasing physical activity (PA) engagement for individuals with ASD. A physical activity analysis with a progressive treatment approach identified the most effective physical activity and treatment pairs for increasing PA engagement. These outcomes maintained during extended sessions. The inclusion of the effective treatment components resulted in a shift in preference to PA engagement when compared to no intervention.

Experiment 2: Selection-Based Preference Assessment

- Procedure:
 - No intervention context
 - Intervention context
 - Reversal design

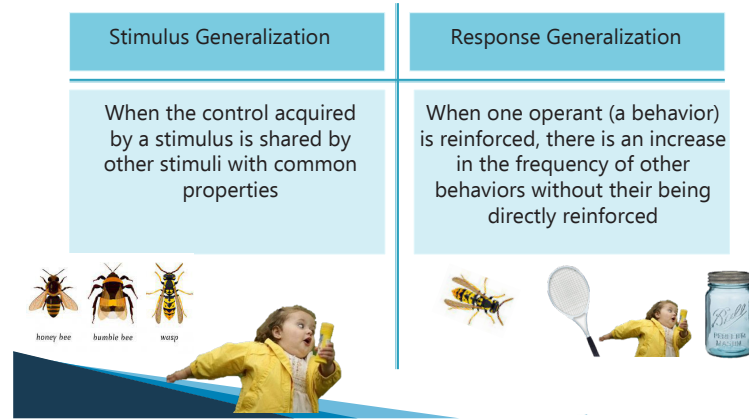


STATUS REPORT ON ABA'S IMPLICIT TECHNOLOGY OF GENERALIZATION

Looi, I.

Generality is one of seven dimensions of applied behavior analysis (ABA; Baer et al., 1968) and yet within the field, there are various terms, definitions, and explanatory accounts; these differences might suggest different strategies to promote generalized behavior. A proper conceptualization of generalization is therefore much needed. This literature review aims to identify diverse accounts of generalization, different types of generalization, and various strategies to promote generalization. Research published in ABA's flagship professional journal, the Journal of Applied Behavior Analysis will be reviewed from the past 10 years to see how generality has been targeted for intervention outcomes, the strategies employed to encourage it, and the outcome data on generalized behavior. The objective of this review is to describe the current status of generality in ABA research and propose

a unifying conceptualization of generalization which in turn will hopefully encourage additional research into effective teaching practices that promote it.



From Irene's presentation:

Stimulus generalization is when the control acquired by a stimulus is shared by other stimuli with common properties. As an example, the girl was once stung by a bee. In the future, in the presence of a honey bee, bumble bee, butterfly, or wasp, or a fly, the little girl runs away. Response generalization is when in the presence of the wasp, the little girl could run away, swat at it, or trap it in a mason jar.



The 48th Annual Convention
Saturday, May 28–Monday, May 30
Boston Convention & Exhibition Center

The Research Department is beginning the process to plan for ABAI conference attendance. NECC staff interested in submitting a proposal for a presentation at ABAI is asked to contact Kathy Clark.

To be considered, staff should submit the title, presentation format (paper, poster, or workshop), their team at NECC, and whether or not they are a grad student. ABAI only recognizes full-time students and does not consider students enrolled in thesis/dissertation continuation.

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